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PJ.17-01

SWIM-TI PURPLE PROFILE FOR AIR/GROUND ADVISORY INFORMATION SHARING

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Abstract

The present document is the TRL6 Technical Validation Report (TVALR) concerning the SESAR Technological Solution PJ.17-01. It aims at consolidating technical validation results from PJ.17-01 TRL6 prototyping and technical validation activities.

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1 Executive summary

The present document is the TRL6 Technical Validation Report (TVALR) concerning the SESAR Technological Solution PJ.17-01. It aims at consolidating technical validation results from PJ.17-01 TRL6 prototyping and technical validation activities.

PJ.17-01 TRL6 activities are built on top of TRL4 results reported in the TRL4 TVALR [52]. Taking into account those results, in TRL6 the validation activities are characterized as follows:

- Focus on technical metrics including performance (time behaviour, capacity), reliability (e.g. fault tolerance, delivery guarantees) and security (e.g. end to end message integrity, etc.).
- Technical interoperability metrics evaluated in activities involving Purple Profile infrastructure, services and applications from different industry members.
- More realistic/mature Purple Profile enabled SWIM services.
- More realistic A/G network prototypes (e.g. AeroMACS, SATCOM, multilink, etc.).
- Scenarios used to validate Purple Profile related prototypes should be more realistic in terms of workload (e.g. live data, number of aircraft, number of concurrent consumers, etc.).

Four different technical validation exercises have been planned in TVALP [44] and executed. They are based on validation platforms distributed across several European countries including Italy, Spain, France, Belgium, Austria and Germany.

Here below a summary of key validation results and recommendations is provided.

Summary of solution level validation results

Almost all the technical validation objectives and success criterions have been successfully validated resulting with OK validation status. These results demonstrate the technical feasibility and the flexibility of the designed solution for Air-Ground SWIM for advisory information sharing.

Only for validation objectives linked to time-behaviour performance efficiency sub-characteristic (from OBJ-17.01-TRL6-TVALP-PERF.0009 to OBJ-17.01-TRL6-TVALP-PERF.0024) the validation results are “NOK”. Although the class of service based approach was successfully validated, the measured latency for all these validation objectives did not met the required latency. These results are not impacting the maturity of this solution. The purpose was to perform an initial assessment of the performances mitigating the issue due to lack of top-down inputs. Additional deployment options, more realistic reference workload, and time behaviour requirements should be defined and assessed during industrialization phase when a more complete view in terms of services and stakeholders involvement will be available. The reference workload (consolidated load condition in the TRL6 TS §4.3.4.3 [40] and further refined during validation activities) is mainly characterized in terms of maximum number of aircraft connected to the Ground SWIM Node and uplink, downlink and consolidated (uplink + downlink) message rates.

Summary of solution level key recommendations

Following recommendations have been identified:

- To implement in the final TRL6 TS improvements and refinements reported by the validation exercises.
- Performance (KPAs, and technical measures like latency, TVALP §4.3.1 [44]) assessment should be done in a real-life technical and operational deployment (including deployment options illustrated in the deployment views in TS §4.2.3 [40]). Time-behaviour performance requirements should be specified/refined accordingly.
- Consider real deployment, and address global interfaces to external systems, such as Network Operating Centre (NOC), Security Operating Centre (SOC), safety based recording, etc..
- A human factor analysis against a global operational use concept and an airworthiness evaluation of crew human performance impacts when operating over PP SWIM on-board.
- A global hazard analysis, supporting airworthiness evaluation for safety related operations over the SWIM Purple Profile.

2 Introduction

2.1 Purpose of the document

PJ.17-01 TRL6 Technical Validation Report (TVALR) aims at consolidating technical validation results from PJ.17-01 TRL6 prototyping and technical validation activities. It provides the analysis of technical validation activities aiming at validating and properly assessing the target Technical Specification (TS).

In particular the present document provides key validation result at both solution and EXEs Levels by reporting about technical validation objectives and requirements implementation and technical validation. Furthermore it also provides a consolidated set of recommendations as input to the target maturity assessment and next maturity phase.

2.2 Intended readership

The intended readership of the present document is as follows:

- SJU to assess and to manage this SESAR 2020 deliverable.
- PJ.19 to assess this deliverable in accordance with its role.
- PJ.14-02 solutions interested in the PJ.17-01 TRL6 technical validation activities.
- PJ.18-04 solutions interested in the PJ.17-01 TRL6 technical validation activities.
- Any additional SESAR 2020 projects and solutions interested in the PJ.17-01 TRL6 technical validation activities.

2.3 Background

PJ.17-01 TRL6 activities are built on top of TRL4 results. In particular PJ.17-01 TRL6 aimed at addressing recommendations described in the TRL4 TVALR [52].

2.4 Structure of the document

This document is organized as follows:

Chapter 1: Executive summary.

Chapter 2: General introduction about the purpose of the document, background and reference terminology.

Chapter 3~~3~~: Technical Validation Context description.

Chapter 4~~4~~: Technical Validation activities results.

Chapter 5~~5~~: Conclusions and recommendations.

Chapter 6~~6~~: Applicable and Referenced documents.

Appendix A~~Appendix A~~: Technical Validation Exercise #01 Report.

Appendix B~~Appendix B~~: Technical Validation Exercise #02 Report.

Appendix C~~Appendix C~~: Technical Validation Exercise #03 Report.

Appendix D~~Appendix D~~: Technical Validation Exercise #04 Report.

Appendix E: Safety Assessment Report (SAR).

Appendix F: Security Assessment Report (SecAR).

Appendix G: Human Performance Assessment Report (HPAR).

Appendix H: SESAR Technological Solution(s) Maturity Assessment.

Appendix I: High level Economic Appraisal.

Appendix J: SESAR Technological Solution requirements and objectives coverage

2.5 Glossary of terms

Term	Definition	Source of the definition
Access Control	ITU-T IdM X.1252 defines this term as a procedure used to determine if an entity should be granted access to resources, facilities, services, or information based on pre-established rules and specific rights or authority associated with the requesting party	ITU-T IdM X.1252
A/G SWIM Access Point	Either Aircraft A/G SWIM Access Point or Ground A/G SWIM Access Point	PJ.17-01
Aircraft Meteorological Data Relay	WMO (World Meteorological Organization) program for reporting and collecting automatic meteorological reports from aircraft.	Eurocae ED-151
Aircraft A/G SWIM Access Point	See Aircraft Purple Profile SWIM Node.	PJ.17-01
Aircraft Purple Profile SWIM Node	SWIM Node specialization providing aircraft side capabilities of the Air-Ground SWIM segment.	PJ.17-01
Air–Ground SWIM segment	A set of Aircraft and Ground capabilities that allow Aircraft SWIM Enabled applications to interact with Ground SWIM Enabled applications via provisioning and consumption of SWIM Services. The SWIM Purple profile is covering the needs and constraints identified for this segment.	PJ.17-01
ATM Service or SWIM ATM Service	A service representing the exchange of well-defined ATM information.	SESAR1 WP14

Authentication (Entity)	ITU-T IdM X.1252 defines this term as a process used to achieve sufficient confidence in the binding between the entity and the presented identity.	ITU-T IdM X.1252
Authorization	ITU-T IdM X.1252 defines this term as the granting of rights and, based on these rights, the granting of access.	ITU-T IdM X.1252
Certificate	ITU-T IdM X.1252 defines this term as a set of security-relevant data issued by a security authority or a trusted third party, that, together with security information, is used to provide the integrity and data origin authentication services for the data.	ITU-T IdM X.1252
Ground A/G SWIM Access Point	See Ground Purple Profile SWIM Node.	PJ.17-01
Ground Purple Profile SWIM Node	SWIM Node specialization providing ground side capabilities of the Air-Ground SWIM segment.	PJ.17-01
Ground-Ground SWIM segment	A set of Ground capabilities that allow Ground SWIM Enabled applications to interact via SWIM Services. This SWIM segment has been further segmented identifying the SWIM Yellow and Blue profiles	PJ.17-01
Interface binding	See SWIM Interface binding.	SESAR1 WP14
Mutual Authentication	ITU-T IdM X.1252 defines this term as a process by which two entities (e.g., a client and a server) authenticate each other such that each is assured of the other's identity.	ITU-T IdM X.1252
Public Key Cryptography	Public Key Cryptography refers to a cryptographic technique in which one key is secret private and a corresponding key one is public. Information are is encrypted using the public key and can only be decrypted by the corresponding secret/private key or vice-versa, information is encrypted using the private key and can only be decrypted by the corresponding public key.. Public Key Cryptography can also be used for Digital Signatures; in this case the private key is used for signing, and the corresponding public key for verifying.	SESAR1 WP14

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Public Key Infrastructure	A Public Key Infrastructure (PKI) is a system, which may include hardware, software, human in the loop, policies and procedures, needed to create, manage, distribute, use, store and revoke digital identities in X.509 certificates based IdM. PKIs represent the instantiation of the ITU-T X.1252 IdP when the X.509 certificates based security is adopted.	SESAR1 WP14
Purple Profile aircraft and ground asynchronous messaging capabilities federation	Architecture, requirements and configurations describing the federation of the messaging capabilities between Aircraft Purple Profile SWIM Node and Ground Purple Profile SWIM Node.	PJ.17-01
Purple Profile technical architecture	The Technical View of the Purple Profile. Guidance (PJ.17-01): The SWIM-TI TAD defines 3 views: functional, technical and deployment.	PJ.17-01
Purple Profile SWIM Node	Either Aircraft Purple Profile SWIM Node or Ground Purple Profile SWIM Node	PJ.17-01
Purple Profile Enabled SWIM Service	SWIM Service consumed or provided over the Purple Profile. Guidance (PJ.17-01): The design artefacts characterizing a SWIM Service over the Purple Profile are: - Pair of aircraft and ground «Service Binding» used to consume/provide the service. - Service specific artefacts describing the «contract» field of the selected «Service Binding» pair. - Purple Profile Messaging Technical architecture and related configuration aspects.	PJ.17-01
Security Domain	ITU-T IdM X.1252 defines this term as a set of elements, a security policy, a security authority, and a set of security-relevant activities in which the elements are managed in accordance with the security policy.	ITU-T IdM X.1252
Service	The contractual provision of something (a non-physical object), by one, for the use of one or more others. Services involve interactions	EATMA

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	between providers and consumers, which may be performed in a digital form (data exchanges) or through voice communication or written processes and procedures. Guidance: Services are key to describe the relationships between the different aspects of the Architecture: operational and solution. Services have one or more Service Interfaces.	
Service instance	The actual implementation of applicable Service Interfaces Definitions by a stakeholder.	SWIM Foundation/Compliance
Service Interface	The mechanism by which a service communicates. Guidance: The Service Interface is the actual endpoint (port) by which the Service communicates.	EATMA
Service Interface Definition	The specification of the service interface.	EATMA
SWIM Access Point	A SWIM access point is a logical entity which bundles a number of technical capabilities (e.g. messaging, security, logging, interface management, etc.). Guidance (PJ.17-01): ICAO SWIM Access Point and SWIM Node are understood as to be conceptually the same.	ICAO Doc 10039, Manual on SWIM Concept. (draft edition available at March 2017)
SWIM Enabled application	(1) A SWIM Enabled System/Application is a system/application exchanging information with other ATM actors according to the SWIM ATM Services and the appropriate SWIM-TI. (2) A SWIM enabled application consumes or provides SWIM information services using SWIM standards. Also referred to as “application”. Guidance (PJ.17-01): Service Provider and Consumer roles are in general applicable to organizations, people and applications/systems. In EATMA services are consumed or provided by Capability Configurations or Technical Systems and Service Instances are consumed or provided by “Instances of” Capability Configurations or	(1) SESAR 1 SWIM-TI TAD/TSs (2) ICAO Doc 10039, Manual on SWIM Concept (draft edition available at March 2017).

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	Technical Systems. In the SWIM Purple Profile specification (technical view) the Service Provider and Consumer roles are intended to be played by SWIM enabled applications which: - Represent instances of EATMA Technical Systems belonging to specific Capability Configuration that - Consume or provide SWIM services using SWIM standards.	
SWIM Enabled system	See SWIM Enabled application	SESAR 1 P14.01.03 D30
SWIM Interface binding	Standard based protocol stack (technical interoperability). In the context of SWIM-TI, following interface binding types are defined: - <Service binding>. This kind of binding is external to the SWIM-TI and related to SWIM service only. - <Internal service binding>. This kind of binding is internal to the SWIM-TI only and related to internal service (e.g. PKI services). - <Network binding>. This kind of binding is external to the SWIM-TI and related to the Network only. - <External service binding>. This kind of binding is external to the SWIM-TI and not a <Service binding> or a <Network binding> (e.g. Time Service).	SESAR 1 P14.01.03 D30
SWIM Message Exchange Pattern (MEP)	A Message Exchange Pattern (MEP) or interaction pattern describes how different parts of a message passing system connect and communicate with each other. A MEP describes the roles of distinct participants, their individual actions, and the sequence of messages in a distributed collaborative action in order to achieve an objective in a predictable manner. In order to ensure interoperability, all participants need to share the same understanding of the MEP and act as prescribed by the MEP. MEPs can exist at various levels of abstraction and any MEP can be emulated on top of another	SESAR 1 P14.01.03 D39 and P14.01.03 D30

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	MEP. MEPs are characterised through four groups of attributes: Conversation direction, Cardinality, Decoupling (Time, Space and Synchronization) and Push/Pull.	
SWIM Node or SWIM-TI Node	A SWIM-TI Node is an autonomous point of presence in the Distributed System (of Systems) that interacts with other SWIM-TI Nodes in the Distributed System (of Systems).	SESAR1 WP14
SWIM Purple Profile <Internal service binding> interface binding	SWIM Interface binding of type <Internal service binding> and included in the SWIM Purple Profile Technical Specification.	PJ.17-01
SWIM Purple Profile <Service binding> interface binding	SWIM Interface binding of type <Service binding> and included in the SWIM Purple Profile Technical Specification.	PJ.17-01
SWIM Purple Profile interface binding	SWIM Interface binding included in the SWIM Purple Profile Technical Specification.	PJ.17-01
SWIM Service	A "Service" designed in accordance with SWIM principles and applying the Working Method on Services.	
SWIM Technical Infrastructure (SWIM-TI)	The SWIM Technical Infrastructure (SWIM-TI) contributes to the services' solution, aspects providing means supporting effective and secure ATM-specific service provision and consumption among SWIM-enabled ATM systems.	SESAR1 WP14
SWIM-TI Solution	Software and Hardware representing the implementation of (applicable) SWIM-TI Technical Specifications.	SESAR1 WP14
Symmetric Key Cryptography (algorithms)	A Symmetric Key algorithm uses the same cryptographic key (shared secret key) for both encryption of plaintext and decryption of cipher text.	SESAR1 WP14
System of systems (SoS)	System of systems (SoS) is the viewing of multiple, dispersed, independent systems in context as part of a larger, more complex system. A system is a group of interacting, interrelated and interdependent components that form a	SESAR1 WP14

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	complex and unified whole.	
X.509 certificates	In cryptography, X.509 is an ITU-T standard for a public key infrastructure (PKI) and Privilege Management Infrastructure (PMI). X.509 specifies, amongst other things, standard formats for public key certificates, certificate revocation lists, attribute certificates, and a certification path validation algorithm.	SESAR1 WP14

Table 1: Glossary of terms

2.6 Acronyms and Terminology

Term	Definition
A/C	Aircraft
A/G	Air/Ground
ACD	Aircraft Control Domain
ACSP	Air/Ground Communications Service Provider
ADD	Architecture Definition Document
AeroMACS	Aeronautical Mobile Airport Communication System
AES	Advanced Encryption Standard
AIM	Aeronautical Information Management
AIS	Aeronautical Information Services
AISD	Airline Information Services Domain
AIXM	Aeronautical Information eXchange Model
AMDAR	Aircraft Meteorological Data Relay
AMQP	Advanced Message Queuing Protocol
AMQPs	AMQP 1.0 over TLS in the amqps form
AN	Availability Note
CA	Certification Authority (in the context of PKI)
CDP	Certificates Revocation List Distribution Point
CRL	(X.509) Certificate revocation list
ATM	Air Traffic Management
DSCP	Differentiated Services Code Point
EFB	Electronic Flight Bag

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EN	Enabler
EXE	Validation exercise
FCI	Future communication infrastructure
FIFO	First-in first-out
FIXM	Flight Information Exchange Model
FL	Flight Level
FRQ	Frequentis, PJ.17 beneficiary
G/G	Ground/Ground
GMTIB	Ground side Message Topic Internal Service Binding. Refer to Purple Profile technical architecture.
HMAC	Keyed-hash message authentication code or Hash-based message authentication code
HTTP(S)	HyperText Transfer Protocol (Secure)
HTTP CDP	HTTP based CDP
IBP	Industry Based Platform
IPv4	Internet Protocol version 4
IPv6	Internet Protocol version 6
IPSec	Internet Protocol Security
IRS	Interface Requirements Specification
INTEROP	Interoperability Requirements
iWXXM	ICAO Weather Information Exchange Model
JMS	Java Messaging Service
KPA	Key Performance Area
KPI	Key Performance Indicator
LDAP	Lightweight Directory Access Protocol
LDAP CDP	LDAP based CDP
LDACS	L-band Digital Aeronautical Communication System
LDO	Leonardo S.p.a., PJ.17 beneficiary
MEP	Message Exchange Pattern
MET	Meteo or Meteorological
NFR	Non-Functional Requirement

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(D-)NOTAM	(Digital-) NOTice To AirMen
OCSP	Online Certificate Status Protocol
OSED	Operational Service and Environment Definition
OTS	Of The Shelf
PI	Performance Indicator
PKI	Public Key Infrastructure
PMP	Project Management Plan
PP	Purple Profile
QoS	Quality of Service
RSA	Rivest–Shamir–Adleman
SATCOM	Satellite Communications
SLA	Service Level Agreement
SAR	Security Assessment Report
SESAR	Single European Sky ATM Research Programme
SJU	SESAR Joint Undertaking (Agency of the European Commission)
SPR	Safety and Performance Requirements
SUT	System Under Test
SWIM	System Wide Information Management
SWIM-TI	SWIM Technical Infrastructure
TRL	Technology Readiness Level
TS	Technical Specification
TVALP	Technical Validation Plan
TVALR	Technical Validation Report
V&V	Verification and Validation
V&VP	V&V platform
V&VI	V&V infrastructure
VPN	Virtual Private Network
WAN	Wide Area Network

Table 2: Acronyms and terminology

3 Context of the Technical Validation

This chapter provides the description of the TRL6 technical validation context for SESAR PJ.17-01 technological solution. In particular the summary of the technological solution and TVALP are provided.

3.1 SESAR Technological Solution PJ.17-01: a summary

PJ.17-01 technological solution contributes to one of the SESAR Key Features: ENABLING AVIATION INFRASTRUCTURE [4]. In particular in the context of this solution the enabling SWIM-TI capabilities for Air-Ground SWIM are designed, specified and validated (technical validation).

The identification of what information has to be exchanged over the Air-Ground SWIM or what SWIM Service is consumed or provided by the aircraft over the Air-Ground SWIM is out of scope of this solution. ATM solutions must consider how their concept operates alongside transversal concepts arising from all of the SESAR Key Features (including ENABLING AVIATION INFRASTRUCTURE) and whether these need to be reflected in their validation scenarios.

PJ.17-01 technological solution TS/IRS and TVALP are based on both bottom-up and top-down activities. As part of the top-down activities, this solution takes into account operational scenarios/use cases (as described in applicable OSED and/or SPR, [38]), SWIM services level requirements, design constraints and requirements identified by other solutions and allocated to (or relevant for) the Air-Ground SWIM infrastructure. Currently the reference TS related to this document is based on the EUROCAE/RTCA ED-151/DO-308 (OSED for aeronautical information (AIS) and meteorological (MET) data link services) [38].

Table 3 provides the SESAR Enablers relevant for this solution.

SESAR Technological Solution ID	SESAR Technological Solution Description	Master or Contributing (M or C)	Contribution to the SESAR Solution short description	Enabler ref. (from EATMA)
PJ.17-01, SWIM-TI Purple Profile For Air/Ground Advisory Information Sharing	SWIM-TI Purple Profile for Air/Ground Advisory Information Sharing consists of open standards based, reliable and secure SWIM technical infrastructure enabling the integration of the aircraft into the SWIM network, thus giving it access to air/ground SWIM services (e.g. uplink and downlink of meteorological and	M	This solution provides functional and non-functional requirements concerning the ground side Air-Ground SWIM infrastructure.	SWIM-INFR-06b
		M	This solution provides functional and non-functional requirements concerning the air side Air-Ground SWIM infrastructure.	SWIM-INFR-06c

SESAR Technological Solution ID	SESAR Technological Solution Description	Master or Contributing (M or C)	Contribution to the SESAR Solution short description	Enabler ref. (from EATMA)
	aeronautical information). The solution supports ATM operational improvements that depend on Air/Ground (A/G) information exchanges to enable a better situational awareness and collaborative decision making, with a focus on advisory information (supplemental information that is not necessary for and not directly interfering with the command and control of an aircraft).			

Table 3: SESAR Technological Solution under Validation

Table 4 provides the ENs addressed by each TRL6 technical validation exercise with explanation of the coverage (refer to §3.2 and TVALP [44]).

Enabler ID (from EATMA)	EXE1	EXE2	EXE3	EXE4
SWIM-INFR-06b	Addressed by covering all mandatory and optional profile parts.	Addressed by covering core profile part and some requirements in the optional/advanced profile parts.	Addressed by covering core profile part and some requirements in the optional/advanced profile parts.	Covered by INDRA Ground SWIM Node (core profile part).
SWIM-INFR-06c	Addressed by covering all mandatory and optional profile parts.	Not addressed.	Addressed by covering Core and Air profile parts and optional profile parts' requirements compatibles with operations over an avionics based on a secure aircraft server	Covered by LDO Air SWIM Node (core profile part).

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Enabler ID (from EATMA)	EXE1	EXE2	EXE3	EXE4
			over two independent C-PED.	

Table 4: SESAR Technological Solution under Validation, EXEs and Enablers

The maturity assessment in Appendix H has been filled in for both system enablers SWIM-INFR-06b and SWIM-INFR-06c.

3.2 Summary of the Technical Validation Plan

3.2.1 Validation Plan Purpose

The TRL6 TVALP [44] describes the technical validation activities, exercises and validation platforms addressing TRL6 PJ.17-01 activities. In particular the TVALP targets technical validation activities aiming at verifying the PJ17-01 TRL6 Technical Specification [40].

Four different technical validation exercises are documented in the TVALP [44]. They are based on validation platforms distributed across several European countries including Italy, Spain, France and Austria.

PJ.17-01 TRL6 activities are built on top of TRL4 results reported in the TRL4 TVALR [52]. Taking into account those results, in TRL6 the validation activities are characterized as follows:

- Focus on technical metrics including performance (time behaviour, capacity), reliability (e.g. fault tolerance, delivery guarantees) and security (e.g. end to end message integrity, etc.).
- Technical interoperability metrics evaluated in activities involving Purple Profile infrastructure, services and applications from different industry members.
- More realistic/mature Purple Profile enabled SWIM services.
- More realistic A/G network prototypes (e.g. AeroMACS, SATCOM, multilink, etc.).
- Scenarios used to validate Purple Profile related prototypes should be more realistic in terms of workload (e.g. live data, number of aircraft, number of concurrent consumers, etc.).

3.2.2 Summary of Technical Validation Objectives and success criteria

As reported in the TRL4 TVALR [52] the technical feasibility of the core elements concerning technical architecture, messaging capabilities, information exchange level security controls and interface requirements has been successfully validated at solution level during TRL4 activities. Although the TRL6 TS has been updated in terms of design and requirements concerning these aspects, in TRL6 validation objectives concerning technical use cases (nominal cases), data link modes and technical architecture deployment options [40] do not represent the main focus (technical feasibility was

already successfully demonstrated). Requirements linked to these objectives represent the basis for validating TRL6 technical validation objectives. In particular, in TRL6 the validation objectives are defined focusing more on non-functional characteristics:

- technical metrics including performance (time behaviour, capacity), reliability (e.g. fault tolerance, delivery guarantees) and security (e.g. end to end message integrity, etc.).
- technical interoperability metrics evaluated in activities involving Purple Profile infrastructure, services and applications from different industry members.

Provided technical validation objectives have been derived from the high level objectives provided in the PJ.17 PMP [39] and defined in accordance to TRL6 PJ.17-01 TS [40]. Above mentioned characteristics concern OBJ-PJ1701-PMP.004 and OBJ-PJ1701-PMP.005 high level validation objective described in the PJ.17 PMP [39]. No specific technical validation objectives have been derived from the OBJ-PJ1701-PMP.006 high level validation objective described in PJ.17 PMP [39]. That high level objective is linked to system enablers covered by this solution. The success criteria does not require technical validation objectives. All the requirements provide the traceability to the applicable enabler. The maturity of the contribution of this solution to a given enabler is linked to the maturity of the requirements validated in other technical validation objectives.

TRL6 technical validation objectives have been defined in accordance with a subset of ISO/IEC 25010:2011 characteristics:

- (TVALP §4.3.3 [44]) Performance efficiency including time behaviour, capacity and resource utilization sub-characteristics.
- (TVALP §4.3.4 [44]) Reliability including availability, fault tolerance and recoverability sub-characteristics.
- (TVALP §4.3.5 [44]) Security including confidentiality, integrity, non-repudiation, accountability and authenticity sub-characteristics.

Four different technical validation exercises have been planned and executed in TRL6 (TVALP [44]). They are based on validation platforms distributed across several European countries:

- EXE1 [45]: it represents the evolution of TRL4 EXE1 according to TRL6 validation activities purposes and applicable validation objectives. EXE1 has been split in two in order to take into account different validation objectives and V&VI constraints. In particular EXE-17.01-TRL6-TVALP-EXE1.0001 focus is more on operational-oriented scenarios involving Purple Profile SWIM Node prototypes (both ground and aircraft) and Purple Profile enabled SWIM services (both uplink and downlink) developed by the EXE members and interconnected in a WAN. The A/G communication network is emulated via WAN equipped with a firewall that allows introducing in the data packet a specific DSCP (Differentiated Services Code Point). On the other hand, EXE-17.01-TRL6-TVALP-EXE1.0002 focus is more on the technical validation of non-functional characteristics (performances, reliability, etc.) of uplink and downlink advisory information (weather, aeronautical) information sharing in technical oriented scenarios. These technical scenarios involve Purple Profile SWIM Node prototypes (both ground and aircraft), emulated only Purple Profile enabled applications (both uplink and downlink) and A/G network infrastructure (PJ.14-02) prototypes. In terms of dependencies and relationships, EXE-17.01-TRL6-TVALP-EXE1.0002 depends on EXE-17.01-TRL6-TVALP-EXE1.0001 and PJ.14.02.04 EXE PJ.14.02.04 EXE-040. (included in D5.1.030 – Initial Technical Validation Plan). EXE1 prototypes and (a sub-set of) technical scenarios will be reused in EXE4.

- EXE2 [46]: it represents the evolution of TRL4 EXE2 according to TRL6 validation activities purposes and applicable validation objectives. A completely functional Ground System will be connected to several simulated Aircraft systems in order to test the correct performance of the entities in a one-to-many Purple Profile SWIM nodes in a real scenario. The number of SWIM Nodes (Ground and Air nodes) will be defined for each test, according to the different validation objectives. Ground and Air systems will interchange meteorological and aeronautical data through specific MEPs that support those real scenarios. ICARO, a real data provider system, will be connected to the Ground node in order to distribute any necessary information requested from any aircraft through a Request/Response or Publish/Subscribe MEP. Communication between nodes will be performed through SATCOM (WAN emulator). During TRL4, EXE2 focused on the functional and technical aspect. It is intended to evolve EXE2 focusing on Performance, Reliability, Security and non-nominal cases. In terms of dependencies and relationships, EXE2 does not depend on any EXE. EXE2 prototypes will be reused in EXE4.

- EXE3 [47]: it represents the evolution of TRL4 EXE3 according to TRL6 validation activities purposes and applicable validation objectives. The EXE aims at technically validating the capabilities and the robustness of the A/G SWIM Segment supporting interoperable communication between Aircraft and Ground SWIM Enabled Applications. In this EXE the A/G SWIM Segment is comprised of two different (i.e. provided by different partners) Purple Profile SWIM nodes, which in turn enable information exchanges between Aircraft and Ground SWIM Enabled Applications in an interoperable manner. In order to demonstrate robustness, this EXE makes use of SWIM Enabled Applications and even of simulated SWIM nodes. This EXE does not depend and has no relationships with other exercises.

- EXE4 [48]: it aims at demonstrating the technical interoperability at Purple Profile level of uplinking and downlinking advisory information (weather, aeronautical) in technically oriented scenarios involving prototypes from different industrial members. These technical scenarios involve Purple Profile SWIM Node prototypes (both ground and aircraft) and emulated only Purple Profile enabled applications (both uplink and downlink) and they are defined to demonstrate the technical interoperability of core elements of the Purple Profile. Furthermore A/G network infrastructure layer will be based on PJ.14.02.04 prototypes. In terms of dependencies and relationships, EXE4 depends on EXE-17.01-TRL6-TVALP-EXE1.0002, EXE-17.01-TRL6-TVALP-EXE2.0001 and PJ.14.02.04 EXEs.

In TRL6, all the planned exercises are not based on real or shadow mode operational environments. Furthermore, the technical validation technique is <Laboratory Test> for all the exercises with emulated traffic and SWIM services.

More detailed guidance for requirements coverage analysis is provided in the introduction of TVALP §4.3 [44].

3.2.3 Technical Validation Assumptions

No solution level assumptions concerning the validation activities have been recorded in the TVALP §4.4 [44].

Identifier	Title	Type of Assumption	Description	Justification	Flight Phase	KPA Impacted	Source	Value(s)	Owner	Impact on Assessment

Table 5: Technical Validation Assumptions overview

3.2.4 Technical Validation Exercises List

This section provides and overview of the three technical validation exercises planned for TRL6. Additional details are provided in the TVALP §5 [44].

Identifier	EXE-17.01-TRL6-TVALP-EXE1.0001
Title	Uplink and downlink air-ground advisory information sharing
Description	This EXE aims at technically validating uplink and downlink advisory information (weather, aeronautical) information sharing in operational oriented scenarios. The operational-oriented scenarios involve Purple Profile SWIM Node prototypes (both ground and aircraft) and Purple Profile enabled SWIM services (both uplink and downlink) developed by the EXE members and interconnected in a WAN. Building on top of TRL4 EXE1 results (successful validation of the technical feasibility of messaging and information security capabilities), in order to properly evaluate TRL6 maturity level of Aircraft and Ground Purple Profile SWIM Node prototypes in terms of performance and reliability, the operational-oriented scenarios are instantiated in different conditions characterized in terms of live data, workload, network bandwidth and non-nominal-cases. In particular, the WAN VPN (Leonardo Rome – Leonardo Turin) representing the emulated A/G communication network is equipped with a firewall that allows introducing in the data packet a specific DSCP (Differentiated Services Code Point).
Expected achievements	Technical validation of TRL6 maturity of requirements linked to applicable technical validation objectives in a representative and operational-oriented scenarios involving application level and SWIM-TI level prototypes from different partners.
T. Validation Technique	<Laboratory Test>
T. Validation Coordinator	Leonardo

T. Validation Platform	Remotely interconnected (WAN) Leonardo, Selex-ES GmbH, Frequentis IBPs (Industry Based Platforms) and NLR radar/tower simulation facilities: Leonardo and NLR ground platform (Leonardo – Rome). LDO Ground Purple Profile SWIM Nodes. LDO Emulated Ground applications. LDO Purple Profile enabled D-NOTAM service. LDO SWIM Viewer. SWIM-TI layer of the Selex GMBH ground MET Information service. NLR's Air Traffic Control Research Simulator (NARSIM). LDO CA. Leonardo aircraft platform (Leonardo – Turin): LDO Aircraft Purple Profile SWIM Node integrated with the cockpit simulator. LDO Purple Profile enabled EFB. LDO Purple Profile enabled Meteoprobe SWIM service. Aircraft Simulator. LDO Emulated Aircraft applications. Frequentis ground platform (Frequentis – Vienna). Ground data centre, hosting a Ground Purple Profile SWIM Node. Ground Aeronautical Information service (ePIB prototype). Semantic Container (Integration of the H2020 Project "BEST" SESAR Exploratory Research Concept). Selex ES GmbH ground platform (Selex ES GmbH – Neuss): Ground MET Information service (GWMS prototype).
T. Validation Location	Leonardo ground platform: Leonardo – Rome (Italy). NLR ground platform: Leonardo – Rome (Italy). Leonardo aircraft platform: Leonardo – Turin (Italy). Frequentis ground platform: Frequentis – Vienna (Austria). Selex ES GmbH ground platform: Selex ES GmbH – Neuss (Germany)

Identifier	EXE-17.01-TRL6-TVALP-EXE1.0002
Title	Non-functional characteristics of air-ground advisory information sharing

Description	This EXE aims at technically validating non-functional characteristics (performances, reliability, etc.) of uplink and downlink advisory information (weather, aeronautical) information sharing in technical oriented scenarios. These technical scenarios involve Purple Profile SWIM Node prototypes (both ground and aircraft), emulated only Purple Profile enabled applications (both uplink and downlink) and A/G network infrastructure (PJ.14-02) prototypes.
Expected achievements	Technical scenarios based validation of TRL6 maturity of requirements linked to technical validation objectives concerning non-functional characteristics (including performances, security and reliability) in technical scenarios.
T. Validation Technique	<Laboratory Test>
T. Validation Coordinator	Leonardo
T. Validation Platform	Physical platform hosted by LDO/Rome where following components are deployed (LAN): Application layer: LDO Emulated aircraft and ground SWIM enabled applications. SWIM-TI layer: LDO Aircraft and Ground SWIM Nodes. Network layer: PJ14.02.04 FCI prototype (HON Aircraft Router integrating LDO AeroMACS and INDRA SATCOM links). This integration is part of Pj14.02.04 EXEs.
T. Validation Location	LDO/Rome
Dependencies	EXE-17.01-TRL6-TVALP-EXE1.0001, EXE-14.02.04-TRL4-TVALP-EXE-040

Table 6: PJ.17-01 TRL6 EXE1 brief description

Identifier	EXE-17.01-TRL6-TVALP-EXE2.0001
Title	Non-functional characteristics of Air-Ground Meteorological and Aeronautical Information Sharing
Description	This exercise is focused on the validation of robustness and capacities of the SWIM Purple Profile in a scenario of air/ground and ground/air meteorological and aeronautical information exchanging through

	Publish/Subscribe and Request/Response patterns. The Ground SWIM Node will be connected to several simulated Air SWIM Nodes in a one-to-many cardinality. The tests will be coherent with the operational aspect, but it will not be the main goal of the validation since it was already validated in TRL4.
Expected achievements	Check the appropriate behaviour (robustness) of the SWIM Nodes in non-nominal cases. Validation of requirements linked to Performance, Reliability, Security objectives.
T. Validation Technique	<Laboratory Test>
T. Validation Coordinator	Indra
T. Validation Platform	Physical Platform with several machines connected through WAN Simulator: Ground Purple Profile SWIM Node Simulated Air Purple Profile SWIM Node Simulated Air SWIM Enabled Applications Simulated Ground SWIM Enabled Applications ICARO (Data Provider) SATCOM (Wan Simulator).
T. Validation Location	Torrejón de Ardoz, Spain
Dependencies	None

Table 7: PJ.17-01 TRL6 EXE2 brief description

Identifier	EXE-17.01-TRL6-TVALP-EXE3.0001
Title	Robust information exchanges between Aircraft and Ground Applications over A/G SWIM.
Description	The EXE aims at technically validating the capabilities and the robustness of the A/G SWIM Segment vis-à-vis supporting interoperable communication between Aircraft and Ground SWIM Enabled Applications. In this EXE the A/G SWIM Segment is comprised of two different (i.e. provided by different partners) Purple Profile SWIM nodes, which in turn enable information exchanges between Aircraft and Ground SWIM Enabled Applications in an interoperable manner. Furthermore, the EXE involves for the sake of capability validation SWIM Enabled Applications. In order to demonstrate robustness this EXE

	makes use of SWIM Enabled Applications and even of simulated SWIM nodes. The EXE will also include the enforcement of a set of security controls (e.g. authentication) as specified in the TRL6 TS.
Expected achievements	- The technical validation of the capabilities and the robustness of the A/G SWIM Segment vis-à-vis supporting interoperable communication between Aircraft and Ground SWIM Enabled Applications. - Achievement of applicable technical validation objectives and validation of their associated TS requirements in the context of several reasonable representative scenarios. - The validation of the feasibility, completeness and interoperability of the solution vis-à-vis Publish/Subscribe and Request/Response messaging in a multi-stakeholder environment.
T. Validation Technique	<Laboratory Test>
T. Validation Coordinator	Thales
T. Validation Platform	Physical platform (several physical machines, LAN): EUROCONTROL WAN simulator: THALES AIR SYS Ground A/G SWIM Access Point: THALES AIR SYS Simulated SWIM Enabled Applications and simulated SWIM Access Points: EUROCONTROL Avionics Physical platform (connected through VPN): THALES Avionics Air SWIM Purple Profile Access Point: THALES Avionics SWIM Enabled Applications: THALES Avionics Backup architecture is having all hardware at EUROCONTROL.
T. Validation Location	Brétigny sur Orge (France) Avionics Physical platform located in Toulouse (France)
Dependencies	None

Table 8: PJ.17-01 TRL6 EXE3 brief description

Identifier	EXE-17.01-TRL6-TVALP-EXE4.0001
Title	Technical interoperability of air-ground advisory information sharing
Description	This EXE aims at demonstrating the technical interoperability at Purple Profile level of uplink and downlink advisory information (weather, aeronautical) information sharing in technical oriented scenarios

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	involving prototypes from different industry members. These technical scenarios involve Purple Profile SWIM Node prototypes (both ground and aircraft) and emulated only Purple Profile enabled applications (both uplink and downlink) and they are defined to demonstrate the technical interoperability of core elements of the Purple Profile. This EXE builds on top of software and scenarios from EXE-17.01-TRL6-TVALP-EXE1.0001/2 and EXE-17.01-TRL6-TVALP-EXE2.0001.
Expected achievements	To increase the confidence level in the validation results in terms of technical interoperability of core Purple Profile capabilities and design.
T. Validation Technique	<Laboratory Test>
T. Validation Coordinator	Leonardo
T. Validation Platform	Physical platform hosted by LDO/Rome where following components are deployed (LAN): Application layer: LDO Emulated aircraft and ground SWIM enabled applications. INDRA Emulated ground SWIM enabled applications. INDRA data provider tool integrated with ICARO. SWIM-TI layer: LDO Aircraft and Ground SWIM Nodes. INDRA Ground SWIM Node. Network layer: PJ14.02.04 FCI prototype (HON Aircraft Router integrating LDO AeroMACS and INDRA SATCOM links). Certification authority/PKI: LDO CA
T. Validation Location	LDO/Rome
Dependencies	EXE-17.01-TRL6-TVALP-EXE1.0001, EXE-17.01-TRL6-TVALP-EXE1.0002, EXE-17.01-TRL6-TVALP-EXE2.0001, EXE-14.02.04-TRL4-TVALP-EXE-040

Table 9: PJ.17-01 TRL6 EXE4 brief description

Table 10 provides the technical validation objectives coverage as planned by the four EXEs in the TVALP [44].

Technical Validation Objective ID	Success Criterion ID	EXE1	EXE2	EXE3	EXE4
OBJ-17.01-TRL6-TVALP-PERF.0001	CRT-17.01-TRL6-TVALP-PERF.0001	Fully covered	Fully covered	Fully covered	Fully covered
OBJ-17.01-TRL6-TVALP-PERF.0002	CRT-17.01-TRL6-TVALP-PERF.0002	Fully covered	Fully covered	Fully covered	Fully covered
OBJ-17.01-TRL6-TVALP-PERF.0003	CRT-17.01-TRL6-TVALP-PERF.0003	Fully covered	Fully covered	Fully covered	Fully covered
OBJ-17.01-TRL6-TVALP-PERF.0004	CRT-17.01-TRL6-TVALP-PERF.0004	Fully covered	Fully covered	Fully covered	Fully covered
OBJ-17.01-TRL6-TVALP-PERF.0005	CRT-17.01-TRL6-TVALP-PERF.0005	Fully covered	Fully covered	Fully covered	Not covered
OBJ-17.01-TRL6-TVALP-PERF.0005	CRT-17.01-TRL6-TVALP-PERF.0006	Fully covered	Fully covered	Fully covered	Not covered
OBJ-17.01-TRL6-TVALP-PERF.0006	CRT-17.01-TRL6-TVALP-PERF.0007	Fully covered	Fully covered	Fully covered	Not covered
OBJ-17.01-TRL6-TVALP-PERF.0006	CRT-17.01-TRL6-TVALP-PERF.0006	Fully covered	Fully covered	Fully covered	Not covered
OBJ-17.01-TRL6-TVALP-PERF.0007	CRT-17.01-TRL6-TVALP-PERF.0008	Fully covered	Fully covered	Fully covered	Not covered
OBJ-17.01-TRL6-TVALP-PERF.0007	CRT-17.01-TRL6-TVALP-PERF.0006	Fully covered	Fully covered	Fully covered	Not covered
OBJ-17.01-TRL6-TVALP-PERF.0008	CRT-17.01-TRL6-TVALP-PERF.0009	Fully covered	Fully covered	Fully covered	Not covered
OBJ-17.01-TRL6-TVALP-PERF.0008	CRT-17.01-TRL6-TVALP-PERF.0006	Fully covered	Fully covered	Fully covered	Not covered
OBJ-17.01-TRL6-TVALP-PERF.0009	CRT-17.01-TRL6-TVALP-PERF.0010	Partially covered	Partially covered	Fully covered	Not covered
OBJ-17.01-TRL6-TVALP-PERF.0010	CRT-17.01-TRL6-TVALP-PERF.0011	Partially covered	Partially covered	Fully covered	Not covered
OBJ-17.01-TRL6-TVALP-PERF.0011	CRT-17.01-TRL6-TVALP-PERF.0012	Partially covered	Partially covered	Fully covered	Not covered
OBJ-17.01-TRL6-TVALP-PERF.0012	CRT-17.01-TRL6-TVALP-PERF.0013	Partially covered	Partially covered	Fully covered	Not covered
OBJ-17.01-TRL6-TVALP-PERF.0013	CRT-17.01-TRL6-TVALP-PERF.0014	Partially covered	Partially covered	Fully covered	Not covered

Company General Use

Technical Validation Objective ID	Success Criterion ID	EXE1	EXE2	EXE3	EXE4
OBJ-17.01-TRL6-TVALP-PERF.0014	CRT-17.01-TRL6-TVALP-PERF.0015	Partially covered	Partially covered	Fully covered	Not covered
OBJ-17.01-TRL6-TVALP-PERF.0015	CRT-17.01-TRL6-TVALP-PERF.0016	Partially covered	Partially covered	Fully covered	Not covered
OBJ-17.01-TRL6-TVALP-PERF.0016	CRT-17.01-TRL6-TVALP-PERF.0017	Partially covered	Partially covered	Fully covered	Not covered
OBJ-17.01-TRL6-TVALP-PERF.0017	CRT-17.01-TRL6-TVALP-PERF.0018	Partially covered	Partially covered	Fully covered	Not covered
OBJ-17.01-TRL6-TVALP-PERF.0018	CRT-17.01-TRL6-TVALP-PERF.0019	Partially covered	Partially covered	Fully covered	Not covered
OBJ-17.01-TRL6-TVALP-PERF.0019	CRT-17.01-TRL6-TVALP-PERF.0020	Partially covered	Partially covered	Fully covered	Not covered
OBJ-17.01-TRL6-TVALP-PERF.0020	CRT-17.01-TRL6-TVALP-PERF.0021	Partially covered	Partially covered	Fully covered	Not covered
OBJ-17.01-TRL6-TVALP-PERF.0021	CRT-17.01-TRL6-TVALP-PERF.0022	Partially covered	Partially covered	Fully covered	Not covered
OBJ-17.01-TRL6-TVALP-PERF.0022	CRT-17.01-TRL6-TVALP-PERF.0023	Partially covered	Partially covered	Fully covered	Not covered
OBJ-17.01-TRL6-TVALP-PERF.0023	CRT-17.01-TRL6-TVALP-PERF.0024	Partially covered	Partially covered	Fully covered	Not covered
OBJ-17.01-TRL6-TVALP-PERF.0024	CRT-17.01-TRL6-TVALP-PERF.0025	Partially covered	Partially covered	Fully covered	Not covered
OBJ-17.01-TRL6-TVALP-PERF.0025	CRT-17.01-TRL6-TVALP-PERF.0026	Fully covered	Partially covered	Not covered	Not covered
OBJ-17.01-TRL6-TVALP-PERF.0026	CRT-17.01-TRL6-TVALP-PERF.0027	Fully covered	Partially covered	Not covered	Not covered
OBJ-17.01-TRL6-TVALP-REL.0001	CRT-17.01-TRL6-TVALP-REL.0001	Fully covered	Fully covered	Fully covered	Not covered
OBJ-17.01-TRL6-TVALP-REL.0001	CRT-17.01-TRL6-TVALP-REL.0002	Fully covered	Fully covered	Fully covered	Not covered
OBJ-17.01-TRL6-TVALP-REL.0001	CRT-17.01-TRL6-TVALP-REL.0026	Fully covered	Fully covered	Fully covered	Not covered
OBJ-17.01-TRL6-TVALP-REL.0001	CRT-17.01-TRL6-TVALP-REL.0003	Fully covered	Fully covered	Fully covered	Not covered

Technical Validation Objective ID	Success Criterion ID	EXE1	EXE2	EXE3	EXE4
OBJ-17.01-TRL6-TVALP-REL.0001	CRT-17.01-TRL6-TVALP-REL.0004	Fully covered	Fully covered	Fully covered	Not covered
OBJ-17.01-TRL6-TVALP-REL.0001	CRT-17.01-TRL6-TVALP-REL.0027	Fully covered	Fully covered	Fully covered	Not covered
OBJ-17.01-TRL6-TVALP-REL.0001	CRT-17.01-TRL6-TVALP-REL.0005	Fully covered	Fully covered	Not covered	Not covered
OBJ-17.01-TRL6-TVALP-REL.0001	CRT-17.01-TRL6-TVALP-REL.0006	Fully covered	Fully covered	Not covered	Not covered
OBJ-17.01-TRL6-TVALP-REL.0001	CRT-17.01-TRL6-TVALP-REL.0007	Fully covered	Fully covered	Partially covered	Not covered
OBJ-17.01-TRL6-TVALP-REL.0002	CRT-17.01-TRL6-TVALP-REL.0008	Fully covered	Fully covered	Fully covered	Not covered
OBJ-17.01-TRL6-TVALP-REL.0002	CRT-17.01-TRL6-TVALP-REL.0009	Fully covered	Fully covered	Fully covered	Not covered
OBJ-17.01-TRL6-TVALP-REL.0002	CRT-17.01-TRL6-TVALP-REL.0028	Fully covered	Fully covered	Fully covered	Not covered
OBJ-17.01-TRL6-TVALP-REL.0002	CRT-17.01-TRL6-TVALP-REL.0010	Fully covered	Fully covered	Fully covered	Not covered
OBJ-17.01-TRL6-TVALP-REL.0002	CRT-17.01-TRL6-TVALP-REL.0011	Fully covered	Fully covered	Fully covered	Not covered
OBJ-17.01-TRL6-TVALP-REL.0002	CRT-17.01-TRL6-TVALP-REL.0029	Fully covered	Fully covered	Fully covered	Not covered
OBJ-17.01-TRL6-TVALP-REL.0002	CRT-17.01-TRL6-TVALP-REL.0005	Fully covered	Fully covered	Not covered	Not covered
OBJ-17.01-TRL6-TVALP-REL.0002	CRT-17.01-TRL6-TVALP-REL.0006	Fully covered	Fully covered	Not covered	Not covered
OBJ-17.01-TRL6-TVALP-REL.0002	CRT-17.01-TRL6-TVALP-REL.0007	Fully covered	Fully covered	Partially covered	Not covered
OBJ-17.01-TRL6-TVALP-REL.0003	CRT-17.01-TRL6-TVALP-REL.0012	Fully covered	Fully covered	Fully covered	Not covered
OBJ-17.01-TRL6-TVALP-REL.0003	CRT-17.01-TRL6-TVALP-REL.0013	Fully covered	Fully covered	Fully covered	Not covered
OBJ-17.01-TRL6-TVALP-REL.0003	CRT-17.01-TRL6-TVALP-REL.0030	Fully covered	Fully covered	Fully covered	Not covered

Technical Validation Objective ID	Success Criterion ID	EXE1	EXE2	EXE3	EXE4
OBJ-17.01-TRL6-TVALP-REL.0003	CRT-17.01-TRL6-TVALP-REL.0005	Fully covered	Fully covered	Not covered	Not covered
OBJ-17.01-TRL6-TVALP-REL.0003	CRT-17.01-TRL6-TVALP-REL.0006	Fully covered	Fully covered	Not covered	Not covered
OBJ-17.01-TRL6-TVALP-REL.0003	CRT-17.01-TRL6-TVALP-REL.0007	Fully covered	Fully covered	Partially covered	Not covered
OBJ-17.01-TRL6-TVALP-REL.0004	CRT-17.01-TRL6-TVALP-REL.0014	Fully covered	Fully covered	Fully covered	Not covered
OBJ-17.01-TRL6-TVALP-REL.0004	CRT-17.01-TRL6-TVALP-REL.0015	Fully covered	Fully covered	Fully covered	Not covered
OBJ-17.01-TRL6-TVALP-REL.0004	CRT-17.01-TRL6-TVALP-REL.0031	Fully covered	Fully covered	Fully covered	Not covered
OBJ-17.01-TRL6-TVALP-REL.0004	CRT-17.01-TRL6-TVALP-REL.0005	Fully covered	Fully covered	Not covered	Not covered
OBJ-17.01-TRL6-TVALP-REL.0004	CRT-17.01-TRL6-TVALP-REL.0006	Fully covered	Fully covered	Not covered	Not covered
OBJ-17.01-TRL6-TVALP-REL.0004	CRT-17.01-TRL6-TVALP-REL.0007	Fully covered	Fully covered	Partially covered	Not covered
OBJ-17.01-TRL6-TVALP-REL.0005	CRT-17.01-TRL6-TVALP-REL.0016	Fully covered	Not covered	Not covered	Not covered
OBJ-17.01-TRL6-TVALP-REL.0005	CRT-17.01-TRL6-TVALP-REL.0017	Fully covered	Not covered	Not covered	Not covered
OBJ-17.01-TRL6-TVALP-REL.0005	CRT-17.01-TRL6-TVALP-REL.0032	Fully covered	Not covered	Not covered	Not covered
OBJ-17.01-TRL6-TVALP-REL.0005	CRT-17.01-TRL6-TVALP-REL.0018	Fully covered	Not covered	Not covered	Not covered
OBJ-17.01-TRL6-TVALP-REL.0005	CRT-17.01-TRL6-TVALP-REL.0019	Fully covered	Not covered	Not covered	Not covered
OBJ-17.01-TRL6-TVALP-REL.0005	CRT-17.01-TRL6-TVALP-REL.0033	Fully covered	Not covered	Not covered	Not covered
OBJ-17.01-TRL6-TVALP-REL.0005	CRT-17.01-TRL6-TVALP-REL.0005	Fully covered	Not covered	Not covered	Not covered
OBJ-17.01-TRL6-TVALP-REL.0005	CRT-17.01-TRL6-TVALP-REL.0006	Fully covered	Not covered	Not covered	Not covered

Technical Validation Objective ID	Success Criterion ID	EXE1	EXE2	EXE3	EXE4
OBJ-17.01-TRL6-TVALP-REL.0005	CRT-17.01-TRL6-TVALP-REL.0007	Fully covered	Not covered	Not covered	Not covered
OBJ-17.01-TRL6-TVALP-REL.0006	CRT-17.01-TRL6-TVALP-REL.0020	Fully covered	Not covered	Not covered	Not covered
OBJ-17.01-TRL6-TVALP-REL.0006	CRT-17.01-TRL6-TVALP-REL.0021	Fully covered	Not covered	Not covered	Not covered
OBJ-17.01-TRL6-TVALP-REL.0006	CRT-17.01-TRL6-TVALP-REL.0034	Fully covered	Not covered	Not covered	Not covered
OBJ-17.01-TRL6-TVALP-REL.0006	CRT-17.01-TRL6-TVALP-REL.0022	Fully covered	Not covered	Not covered	Not covered
OBJ-17.01-TRL6-TVALP-REL.0006	CRT-17.01-TRL6-TVALP-REL.0011	Fully covered	Not covered	Not covered	Not covered
OBJ-17.01-TRL6-TVALP-REL.0006	CRT-17.01-TRL6-TVALP-REL.0035	Fully covered	Not covered	Not covered	Not covered
OBJ-17.01-TRL6-TVALP-REL.0006	CRT-17.01-TRL6-TVALP-REL.0005	Fully covered	Not covered	Not covered	Not covered
OBJ-17.01-TRL6-TVALP-REL.0006	CRT-17.01-TRL6-TVALP-REL.0006	Fully covered	Not covered	Not covered	Not covered
OBJ-17.01-TRL6-TVALP-REL.0006	CRT-17.01-TRL6-TVALP-REL.0007	Fully covered	Not covered	Not covered	Not covered
OBJ-17.01-TRL6-TVALP-REL.0007	CRT-17.01-TRL6-TVALP-REL.0023	Fully covered	Not covered	Not covered	Not covered
OBJ-17.01-TRL6-TVALP-REL.0007	CRT-17.01-TRL6-TVALP-REL.0024	Fully covered	Not covered	Not covered	Not covered
OBJ-17.01-TRL6-TVALP-REL.0007	CRT-17.01-TRL6-TVALP-REL.0036	Fully covered	Not covered	Not covered	Not covered
OBJ-17.01-TRL6-TVALP-REL.0007	CRT-17.01-TRL6-TVALP-REL.0005	Fully covered	Not covered	Not covered	Not covered
OBJ-17.01-TRL6-TVALP-REL.0007	CRT-17.01-TRL6-TVALP-REL.0006	Fully covered	Not covered	Not covered	Not covered
OBJ-17.01-TRL6-TVALP-REL.0007	CRT-17.01-TRL6-TVALP-REL.0007	Fully covered	Not covered	Not covered	Not covered
OBJ-17.01-TRL6-TVALP-REL.0008	CRT-17.01-TRL6-TVALP-REL.0025	Fully covered	Not covered	Not covered	Not covered

Technical Validation Objective ID	Success Criterion ID	EXE1	EXE2	EXE3	EXE4
OBJ-17.01-TRL6-TVALP-REL.0008	CRT-17.01-TRL6-TVALP-REL.0038	Fully covered	Not covered	Not covered	Not covered
OBJ-17.01-TRL6-TVALP-REL.0008	CRT-17.01-TRL6-TVALP-REL.0037	Fully covered	Not covered	Not covered	Not covered
OBJ-17.01-TRL6-TVALP-REL.0008	CRT-17.01-TRL6-TVALP-REL.0005	Fully covered	Not covered	Not covered	Not covered
OBJ-17.01-TRL6-TVALP-REL.0008	CRT-17.01-TRL6-TVALP-REL.0006	Fully covered	Not covered	Not covered	Not covered
OBJ-17.01-TRL6-TVALP-REL.0008	CRT-17.01-TRL6-TVALP-REL.0007	Fully covered	Not covered	Not covered	Not covered
OBJ-17.01-TRL6-TVALP-SEC.0001	CRT-17.01-TRL6-TVALP-SEC.0001	Fully covered	Fully covered	Partially covered	Not covered
OBJ-17.01-TRL6-TVALP-SEC.0001	CRT-17.01-TRL6-TVALP-SEC.0002	Fully covered	Fully covered	Fully covered	Not covered
OBJ-17.01-TRL6-TVALP-SEC.0001	CRT-17.01-TRL6-TVALP-SEC.0003	Fully covered	Fully covered	Fully covered	Not covered
OBJ-17.01-TRL6-TVALP-SEC.0001	CRT-17.01-TRL6-TVALP-SEC.0004	Fully covered	Fully covered	Fully covered	Not covered
OBJ-17.01-TRL6-TVALP-SEC.0001	CRT-17.01-TRL6-TVALP-SEC.0008	Fully covered	Fully covered	Partially covered	Not covered
OBJ-17.01-TRL6-TVALP-SEC.0001	CRT-17.01-TRL6-TVALP-SEC.0009	Fully covered	Not covered	Not covered	Not covered
OBJ-17.01-TRL6-TVALP-SEC.0002	CRT-17.01-TRL6-TVALP-SEC.0001	Fully covered	Fully covered	Not covered	Not covered
OBJ-17.01-TRL6-TVALP-SEC.0002	CRT-17.01-TRL6-TVALP-SEC.0002	Fully covered	Fully covered	Not covered	Not covered
OBJ-17.01-TRL6-TVALP-SEC.0002	CRT-17.01-TRL6-TVALP-SEC.0003	Fully covered	Fully covered	Not covered	Not covered
OBJ-17.01-TRL6-TVALP-SEC.0002	CRT-17.01-TRL6-TVALP-SEC.0005	Fully covered	Not covered	Not covered	Not covered
OBJ-17.01-TRL6-TVALP-SEC.0002	CRT-17.01-TRL6-TVALP-SEC.0006	Fully covered	Not covered	Not covered	Not covered
OBJ-17.01-TRL6-TVALP-SEC.0002	CRT-17.01-TRL6-TVALP-SEC.0007	Fully covered	Not covered	Not covered	Not covered

Technical Validation Objective ID	Success Criterion ID	EXE1	EXE2	EXE3	EXE4
OBJ-17.01-TRL6-TVALP-SEC.0002	CRT-17.01-TRL6-TVALP-SEC.0008	Fully covered	Fully covered	Not covered	Not covered
OBJ-17.01-TRL6-TVALP-SEC.0002	CRT-17.01-TRL6-TVALP-SEC.0009	Fully covered	Not covered	Not covered	Not covered
OBJ-17.01-TRL6-TVALP-SEC.0003	CRT-17.01-TRL6-TVALP-SEC.0010	Fully covered	Not covered	Partially covered	Not covered
OBJ-17.01-TRL6-TVALP-SEC.0003	CRT-17.01-TRL6-TVALP-SEC.0011	Fully covered	Fully covered	Fully covered	Not covered
OBJ-17.01-TRL6-TVALP-SEC.0003	CRT-17.01-TRL6-TVALP-SEC.0012	Fully covered	Fully covered	Fully covered	Not covered
OBJ-17.01-TRL6-TVALP-SEC.0003	CRT-17.01-TRL6-TVALP-SEC.0004	Fully covered	Fully covered	Fully covered	Not covered
OBJ-17.01-TRL6-TVALP-SEC.0003	CRT-17.01-TRL6-TVALP-SEC.0008	Fully covered	Fully covered	Partially covered	Not covered
OBJ-17.01-TRL6-TVALP-SEC.0003	CRT-17.01-TRL6-TVALP-SEC.0009	Fully covered	Not covered	Not covered	Not covered
OBJ-17.01-TRL6-TVALP-SEC.0004	CRT-17.01-TRL6-TVALP-SEC.0010	Fully covered	Not covered	Not covered	Not covered
OBJ-17.01-TRL6-TVALP-SEC.0004	CRT-17.01-TRL6-TVALP-SEC.0011	Fully covered	Fully covered	Not covered	Not covered
OBJ-17.01-TRL6-TVALP-SEC.0004	CRT-17.01-TRL6-TVALP-SEC.0012	Fully covered	Fully covered	Not covered	Not covered
OBJ-17.01-TRL6-TVALP-SEC.0004	CRT-17.01-TRL6-TVALP-SEC.0005	Fully covered	Not covered	Not covered	Not covered
OBJ-17.01-TRL6-TVALP-SEC.0004	CRT-17.01-TRL6-TVALP-SEC.0006	Fully covered	Not covered	Not covered	Not covered
OBJ-17.01-TRL6-TVALP-SEC.0004	CRT-17.01-TRL6-TVALP-SEC.0007	Fully covered	Not covered	Not covered	Not covered
OBJ-17.01-TRL6-TVALP-SEC.0004	CRT-17.01-TRL6-TVALP-SEC.0008	Fully covered	Fully covered	Not covered	Not covered
OBJ-17.01-TRL6-TVALP-SEC.0004	CRT-17.01-TRL6-TVALP-SEC.0009	Fully covered	Not covered	Not covered	Not covered
OBJ-17.01-TRL6-TVALP-SEC.0005	CRT-17.01-TRL6-TVALP-SEC.0013	Fully covered	Not covered	Partially covered	Not covered

Technical Validation Objective ID	Success Criterion ID	EXE1	EXE2	EXE3	EXE4
OBJ-17.01-TRL6-TVALP-SEC.0005	CRT-17.01-TRL6-TVALP-SEC.0014	Fully covered	Not covered	Fully covered	Not covered
OBJ-17.01-TRL6-TVALP-SEC.0005	CRT-17.01-TRL6-TVALP-SEC.0015	Fully covered	Not covered	Fully covered	Not covered
OBJ-17.01-TRL6-TVALP-SEC.0005	CRT-17.01-TRL6-TVALP-SEC.0016	Fully covered	Not covered	Partially covered	Not covered
OBJ-17.01-TRL6-TVALP-SEC.0005	CRT-17.01-TRL6-TVALP-SEC.0017	Fully covered	Not covered	Not covered	Not covered
OBJ-17.01-TRL6-TVALP-SEC.0005	CRT-17.01-TRL6-TVALP-SEC.0018	Fully covered	Not covered	Not covered	Not covered
OBJ-17.01-TRL6-TVALP-SEC.0005	CRT-17.01-TRL6-TVALP-SEC.0019	Fully covered	Not covered	Partially covered	Not covered
OBJ-17.01-TRL6-TVALP-SEC.0006	CRT-17.01-TRL6-TVALP-SEC.0020	Fully covered	Not covered	Partially covered	Not covered
OBJ-17.01-TRL6-TVALP-SEC.0006	CRT-17.01-TRL6-TVALP-SEC.0021	Fully covered	Not covered	Fully covered	Not covered
OBJ-17.01-TRL6-TVALP-SEC.0006	CRT-17.01-TRL6-TVALP-SEC.0022	Fully covered	Not covered	Fully covered	Not covered
OBJ-17.01-TRL6-TVALP-SEC.0006	CRT-17.01-TRL6-TVALP-SEC.0016	Fully covered	Not covered	Partially covered	Not covered
OBJ-17.01-TRL6-TVALP-SEC.0006	CRT-17.01-TRL6-TVALP-SEC.0017	Fully covered	Not covered	Not covered	Not covered
OBJ-17.01-TRL6-TVALP-SEC.0006	CRT-17.01-TRL6-TVALP-SEC.0018	Fully covered	Not covered	Not covered	Not covered
OBJ-17.01-TRL6-TVALP-SEC.0006	CRT-17.01-TRL6-TVALP-SEC.0019	Fully covered	Not covered	Partially covered	Not covered
OBJ-17.01-TRL6-TVALP-SEC.0007	CRT-17.01-TRL6-TVALP-SEC.0013	Fully covered	Not covered	Not covered	Not covered
OBJ-17.01-TRL6-TVALP-SEC.0007	CRT-17.01-TRL6-TVALP-SEC.0014	Fully covered	Not covered	Not covered	Not covered
OBJ-17.01-TRL6-TVALP-SEC.0007	CRT-17.01-TRL6-TVALP-SEC.0015	Fully covered	Not covered	Not covered	Not covered
OBJ-17.01-TRL6-TVALP-SEC.0007	CRT-17.01-TRL6-TVALP-SEC.0016	Fully covered	Not covered	Not covered	Not covered

Technical Validation Objective ID	Success Criterion ID	EXE1	EXE2	EXE3	EXE4
OBJ-17.01-TRL6-TVALP-SEC.0007	CRT-17.01-TRL6-TVALP-SEC.0017	Fully covered	Not covered	Not covered	Not covered
OBJ-17.01-TRL6-TVALP-SEC.0007	CRT-17.01-TRL6-TVALP-SEC.0023	Fully covered	Fully covered	Not covered	Not covered
OBJ-17.01-TRL6-TVALP-SEC.0008	CRT-17.01-TRL6-TVALP-SEC.0020	Fully covered	Not covered	Not covered	Not covered
OBJ-17.01-TRL6-TVALP-SEC.0008	CRT-17.01-TRL6-TVALP-SEC.0021	Fully covered	Not covered	Not covered	Not covered
OBJ-17.01-TRL6-TVALP-SEC.0008	CRT-17.01-TRL6-TVALP-SEC.0022	Fully covered	Not covered	Not covered	Not covered
OBJ-17.01-TRL6-TVALP-SEC.0008	CRT-17.01-TRL6-TVALP-SEC.0016	Fully covered	Not covered	Not covered	Not covered
OBJ-17.01-TRL6-TVALP-SEC.0008	CRT-17.01-TRL6-TVALP-SEC.0017	Fully covered	Not covered	Not covered	Not covered
OBJ-17.01-TRL6-TVALP-SEC.0008	CRT-17.01-TRL6-TVALP-SEC.0024	Fully covered	Fully covered	Not covered	Not covered
OBJ-17.01-TRL6-TVALP-SEC.0009	CRT-17.01-TRL6-TVALP-SEC.0025	Fully covered	Fully covered	Fully covered	Not covered
OBJ-17.01-TRL6-TVALP-SEC.0009	CRT-17.01-TRL6-TVALP-SEC.0016	Fully covered	Not covered	Partially covered	Not covered
OBJ-17.01-TRL6-TVALP-SEC.0009	CRT-17.01-TRL6-TVALP-SEC.0026	Fully covered	Fully covered	Partially covered	Not covered
OBJ-17.01-TRL6-TVALP-SEC.0010	CRT-17.01-TRL6-TVALP-SEC.0027	Fully covered	Fully covered	Not covered	Not covered
OBJ-17.01-TRL6-TVALP-SEC.0010	CRT-17.01-TRL6-TVALP-SEC.0016	Fully covered	Not covered	Not covered	Not covered
OBJ-17.01-TRL6-TVALP-SEC.0010	CRT-17.01-TRL6-TVALP-SEC.0028	Fully covered	Fully covered	Not covered	Not covered
OBJ-17.01-TRL6-TVALP-SEC.0011	CRT-17.01-TRL6-TVALP-SEC.0029	Fully covered	Not covered	Not covered	Fully covered
OBJ-17.01-TRL6-TVALP-SEC.0011	CRT-17.01-TRL6-TVALP-SEC.0030	Fully covered	Fully covered	Fully covered	Fully covered
OBJ-17.01-TRL6-TVALP-SEC.0011	CRT-17.01-TRL6-TVALP-SEC.0031	Fully covered	Not covered	Fully covered	Partially covered

Technical Validation Objective ID	Success Criterion ID	EXE1	EXE2	EXE3	EXE4
OBJ-17.01-TRL6-TVALP-SEC.0011	CRT-17.01-TRL6-TVALP-SEC.0032	Fully covered	Fully covered	Partially covered	Fully covered
OBJ-17.01-TRL6-TVALP-SEC.0011	CRT-17.01-TRL6-TVALP-SEC.0033	Fully covered	Fully covered	Partially covered	Not covered
OBJ-17.01-TRL6-TVALP-SEC.0011	CRT-17.01-TRL6-TVALP-SEC.0034	Fully covered	Fully covered	Fully covered	Not covered
OBJ-17.01-TRL6-TVALP-SEC.0011	CRT-17.01-TRL6-TVALP-SEC.0035	Fully covered	Not covered	Not covered	Not covered
OBJ-17.01-TRL6-TVALP-SEC.0012	CRT-17.01-TRL6-TVALP-SEC.0036	Fully covered	Fully covered	Fully covered	Not covered
OBJ-17.01-TRL6-TVALP-SEC.0012	CRT-17.01-TRL6-TVALP-SEC.0037	Fully covered	Not covered	Not covered	Not covered
OBJ-17.01-TRL6-TVALP-SEC.0012	CRT-17.01-TRL6-TVALP-SEC.0038	Fully covered	Not covered	Not covered	Not covered
OBJ-17.01-TRL6-TVALP-SEC.0013	CRT-17.01-TRL6-TVALP-SEC.0029	Fully covered	Not covered	Not covered	Not covered
OBJ-17.01-TRL6-TVALP-SEC.0013	CRT-17.01-TRL6-TVALP-SEC.0030	Fully covered	Fully covered	Fully covered	Not covered
OBJ-17.01-TRL6-TVALP-SEC.0013	CRT-17.01-TRL6-TVALP-SEC.0031	Fully covered	Not covered	Fully covered	Not covered
OBJ-17.01-TRL6-TVALP-SEC.0013	CRT-17.01-TRL6-TVALP-SEC.0032	Fully covered	Not covered	Partially covered	Not covered
OBJ-17.01-TRL6-TVALP-SEC.0013	CRT-17.01-TRL6-TVALP-SEC.0039	Fully covered	Not covered	Partially covered	Not covered
OBJ-17.01-TRL6-TVALP-SEC.0013	CRT-17.01-TRL6-TVALP-SEC.0040	Fully covered	Not covered	Partially covered	Not covered
OBJ-17.01-TRL6-TVALP-SEC.0013	CRT-17.01-TRL6-TVALP-SEC.0041	Fully covered	Not covered	Partially covered	Not covered
OBJ-17.01-TRL6-TVALP-SEC.0013	CRT-17.01-TRL6-TVALP-SEC.0042	Fully covered	Not covered	Not covered	Not covered
OBJ-17.01-TRL6-TVALP-SEC.0014	CRT-17.01-TRL6-TVALP-SEC.0043	Fully covered	Not covered	Not covered	Not covered
OBJ-17.01-TRL6-TVALP-SEC.0014	CRT-17.01-TRL6-TVALP-SEC.0044	Fully covered	Not covered	Not covered	Not covered

Technical Validation Objective ID	Success Criterion ID	EXE1	EXE2	EXE3	EXE4
OBJ-17.01-TRL6-TVALP-SEC.0014	CRT-17.01-TRL6-TVALP-SEC.0045	Fully covered	Not covered	Not covered	Not covered
OBJ-17.01-TRL6-TVALP-SEC.0014	CRT-17.01-TRL6-TVALP-SEC.0046	Fully covered	Not covered	Not covered	Not covered
OBJ-17.01-TRL6-TVALP-SEC.0014	CRT-17.01-TRL6-TVALP-SEC.0047	Fully covered	Not covered	Not covered	Not covered
OBJ-17.01-TRL6-TVALP-SEC.0014	CRT-17.01-TRL6-TVALP-SEC.0048	Fully covered	Not covered	Not covered	Not covered
OBJ-17.01-TRL6-TVALP-SEC.0015	CRT-17.01-TRL6-TVALP-SEC.0049	Fully covered	Not covered	Fully covered	Partially covered
OBJ-17.01-TRL6-TVALP-SEC.0015	CRT-17.01-TRL6-TVALP-SEC.0050	Fully covered	Not covered	Fully covered	Partially covered
OBJ-17.01-TRL6-TVALP-SEC.0015	CRT-17.01-TRL6-TVALP-SEC.0051	Fully covered	Not covered	Fully covered	Partially covered
OBJ-17.01-TRL6-TVALP-SEC.0015	CRT-17.01-TRL6-TVALP-SEC.0052	Fully covered	Not covered	Fully covered	Partially covered
OBJ-17.01-TRL6-TVALP-SEC.0015	CRT-17.01-TRL6-TVALP-SEC.0053	Fully covered	Not covered	Partially covered	Not covered
OBJ-17.01-TRL6-TVALP-SEC.0015	CRT-17.01-TRL6-TVALP-SEC.0054	Fully covered	Not covered	Not covered	Not covered
OBJ-17.01-TRL6-TVALP-SEC.0015	CRT-17.01-TRL6-TVALP-SEC.0055	Fully covered	Not covered	Fully covered	Partially covered
OBJ-17.01-TRL6-TVALP-SEC.0015	CRT-17.01-TRL6-TVALP-SEC.0056	Fully covered	Not covered	Fully covered	Not covered
OBJ-17.01-TRL6-TVALP-SEC.0015	CRT-17.01-TRL6-TVALP-SEC.0057	Fully covered	Not covered	Fully covered	Partially covered
OBJ-17.01-TRL6-TVALP-SEC.0015	CRT-17.01-TRL6-TVALP-SEC.0058	Fully covered	Not covered	Fully covered	Not covered
OBJ-17.01-TRL6-TVALP-SEC.0016	CRT-17.01-TRL6-TVALP-SEC.0059	Fully covered	Not covered	Fully covered	Partially covered
OBJ-17.01-TRL6-TVALP-SEC.0016	CRT-17.01-TRL6-TVALP-SEC.0060	Fully covered	Not covered	Fully covered	Partially covered
OBJ-17.01-TRL6-TVALP-SEC.0016	CRT-17.01-TRL6-TVALP-SEC.0061	Fully covered	Not covered	Fully covered	Partially covered

Technical Validation Objective ID	Success Criterion ID	EXE1	EXE2	EXE3	EXE4
OBJ-17.01-TRL6-TVALP-SEC.0016	CRT-17.01-TRL6-TVALP-SEC.0062	Fully covered	Not covered	Fully covered	Partially covered
OBJ-17.01-TRL6-TVALP-SEC.0016	CRT-17.01-TRL6-TVALP-SEC.0053	Fully covered	Not covered	Partially covered	Not covered
OBJ-17.01-TRL6-TVALP-SEC.0016	CRT-17.01-TRL6-TVALP-SEC.0054	Fully covered	Not covered	Not covered	Not covered
OBJ-17.01-TRL6-TVALP-SEC.0016	CRT-17.01-TRL6-TVALP-SEC.0063	Fully covered	Not covered	Fully covered	Fully covered
OBJ-17.01-TRL6-TVALP-SEC.0016	CRT-17.01-TRL6-TVALP-SEC.0064	Fully covered	Not covered	Fully covered	Not covered
OBJ-17.01-TRL6-TVALP-SEC.0016	CRT-17.01-TRL6-TVALP-SEC.0065	Fully covered	Not covered	Fully covered	Partially covered
OBJ-17.01-TRL6-TVALP-SEC.0016	CRT-17.01-TRL6-TVALP-SEC.0066	Fully covered	Not covered	Fully covered	Not covered
OBJ-17.01-TRL6-TVALP-SEC.0017	CRT-17.01-TRL6-TVALP-SEC.0067	Fully covered	Fully covered	Partially covered	Not covered
OBJ-17.01-TRL6-TVALP-SEC.0017	CRT-17.01-TRL6-TVALP-SEC.0068	Fully covered	Fully covered	Partially covered	Not covered
OBJ-17.01-TRL6-TVALP-SEC.0017	CRT-17.01-TRL6-TVALP-SEC.0069	Fully covered	Fully covered	Partially covered	Not covered
OBJ-17.01-TRL6-TVALP-SEC.0017	CRT-17.01-TRL6-TVALP-SEC.0070	Fully covered	Fully covered	Partially covered	Not covered
OBJ-17.01-TRL6-TVALP-SEC.0017	CRT-17.01-TRL6-TVALP-SEC.0071	Fully covered	Fully covered	Partially covered	Not covered
OBJ-17.01-TRL6-TVALP-SEC.0017	CRT-17.01-TRL6-TVALP-SEC.0072	Fully covered	Fully covered	Partially covered	Not covered
OBJ-17.01-TRL6-TVALP-SEC.0017	CRT-17.01-TRL6-TVALP-SEC.0073	Fully covered	Fully covered	Partially covered	Not covered
OBJ-17.01-TRL6-TVALP-SEC.0018	CRT-17.01-TRL6-TVALP-SEC.0074	Fully covered	Fully covered	Not covered	Not covered
OBJ-17.01-TRL6-TVALP-SEC.0018	CRT-17.01-TRL6-TVALP-SEC.0075	Fully covered	Fully covered	Not covered	Not covered
OBJ-17.01-TRL6-TVALP-SEC.0018	CRT-17.01-TRL6-TVALP-SEC.0076	Fully covered	Fully covered	Not covered	Not covered

Technical Validation Objective ID	Success Criterion ID	EXE1	EXE2	EXE3	EXE4
OBJ-17.01-TRL6-TVALP-SEC.0018	CRT-17.01-TRL6-TVALP-SEC.0077	Fully covered	Fully covered	Not covered	Not covered
OBJ-17.01-TRL6-TVALP-SEC.0019	CRT-17.01-TRL6-TVALP-SEC.0078	Fully covered	Fully covered	Not covered	Not covered
OBJ-17.01-TRL6-TVALP-SEC.0019	CRT-17.01-TRL6-TVALP-SEC.0079	Fully covered	Fully covered	Not covered	Not covered
OBJ-17.01-TRL6-TVALP-SEC.0019	CRT-17.01-TRL6-TVALP-SEC.0080	Fully covered	Fully covered	Not covered	Not covered
OBJ-17.01-TRL6-TVALP-SEC.0019	CRT-17.01-TRL6-TVALP-SEC.0081	Fully covered	Fully covered	Not covered	Not covered
OBJ-17.01-TRL6-TVALP-SEC.0020	CRT-17.01-TRL6-TVALP-SEC.0078	Fully covered	Fully covered	Not covered	Not covered
OBJ-17.01-TRL6-TVALP-SEC.0020	CRT-17.01-TRL6-TVALP-SEC.0079	Fully covered	Fully covered	Not covered	Not covered
OBJ-17.01-TRL6-TVALP-SEC.0020	CRT-17.01-TRL6-TVALP-SEC.0080	Fully covered	Fully covered	Not covered	Not covered
OBJ-17.01-TRL6-TVALP-SEC.0020	CRT-17.01-TRL6-TVALP-SEC.0081	Fully covered	Fully covered	Not covered	Not covered
OBJ-17.01-TRL6-TVALP-SEC.0021	CRT-17.01-TRL6-TVALP-SEC.0082	Fully covered	Fully covered	Fully covered	Not covered
OBJ-17.01-TRL6-TVALP-SEC.0021	CRT-17.01-TRL6-TVALP-SEC.0083	Fully covered	Fully covered	Fully covered	Not covered
OBJ-17.01-TRL6-TVALP-SEC.0021	CRT-17.01-TRL6-TVALP-SEC.0084	Fully covered	Fully covered	Not covered	Not covered
OBJ-17.01-TRL6-TVALP-SEC.0021	CRT-17.01-TRL6-TVALP-SEC.0085	Fully covered	Fully covered	Not covered	Not covered
OBJ-17.01-TRL6-TVALP-SEC.0021	CRT-17.01-TRL6-TVALP-SEC.0086	Fully covered	Fully covered	Fully covered	Not covered
OBJ-17.01-TRL6-TVALP-SEC.0021	CRT-17.01-TRL6-TVALP-SEC.0087	Fully covered	Fully covered	Partially covered	Not covered
OBJ-17.01-TRL6-TVALP-SEC.0022	CRT-17.01-TRL6-TVALP-SEC.0088	Fully covered	Fully covered	Fully covered	Not covered
OBJ-17.01-TRL6-TVALP-SEC.0022	CRT-17.01-TRL6-TVALP-SEC.0089	Fully covered	Fully covered	Not covered	Not covered

Technical Validation Objective ID	Success Criterion ID	EXE1	EXE2	EXE3	EXE4
OBJ-17.01-TRL6-TVALP-SEC.0022	CRT-17.01-TRL6-TVALP-SEC.0090	Fully covered	Fully covered	Not covered	Not covered
OBJ-17.01-TRL6-TVALP-SEC.0022	CRT-17.01-TRL6-TVALP-SEC.0091	Fully covered	Fully covered	Fully covered	Not covered
OBJ-17.01-TRL6-TVALP-SEC.0022	CRT-17.01-TRL6-TVALP-SEC.0092	Fully covered	Fully covered	Partially covered	Not covered
OBJ-17.01-TRL6-TVALP-SEC.0023	CRT-17.01-TRL6-TVALP-SEC.0088	Fully covered	Fully covered	Fully covered	Not covered
OBJ-17.01-TRL6-TVALP-SEC.0023	CRT-17.01-TRL6-TVALP-SEC.0089	Fully covered	Fully covered	Not covered	Not covered
OBJ-17.01-TRL6-TVALP-SEC.0023	CRT-17.01-TRL6-TVALP-SEC.0090	Fully covered	Fully covered	Not covered	Not covered
OBJ-17.01-TRL6-TVALP-SEC.0023	CRT-17.01-TRL6-TVALP-SEC.0091	Fully covered	Fully covered	Fully covered	Not covered
OBJ-17.01-TRL6-TVALP-SEC.0023	CRT-17.01-TRL6-TVALP-SEC.0092	Fully covered	Fully covered	Partially covered	Not covered
OBJ-17.01-TRL6-TVALP-SEC.0024	CRT-17.01-TRL6-TVALP-SEC.0093	Fully covered	Fully covered	Not covered	Not covered
OBJ-17.01-TRL6-TVALP-SEC.0024	CRT-17.01-TRL6-TVALP-SEC.0094	Fully covered	Fully covered	Not covered	Not covered
OBJ-17.01-TRL6-TVALP-SEC.0024	CRT-17.01-TRL6-TVALP-SEC.0095	Fully covered	Fully covered	Not covered	Not covered
OBJ-17.01-TRL6-TVALP-SEC.0025	CRT-17.01-TRL6-TVALP-SEC.0096	Fully covered	Fully covered	Not covered	Not covered
OBJ-17.01-TRL6-TVALP-SEC.0025	CRT-17.01-TRL6-TVALP-SEC.0097	Fully covered	Fully covered	Not covered	Not covered
OBJ-17.01-TRL6-TVALP-SEC.0026	CRT-17.01-TRL6-TVALP-SEC.0096	Fully covered	Fully covered	Not covered	Not covered
OBJ-17.01-TRL6-TVALP-SEC.0026	CRT-17.01-TRL6-TVALP-SEC.0097	Fully covered	Fully covered	Not covered	Not covered

Table 10: Planned PJ.17-01 TRL6 EXEs technical validation objectives coverage

3.3 Deviations

3.3.1 Deviations with respect to the SJU Project Handbook

No deviations with respect to the SJU project handbook have been recorded.

3.3.2 Deviations with respect to the Technical Validation Plan

Overall, no relevant deviations in terms of solution level technical validation objectives coverage with respect to what was as planned in the TVALP [44] have been reported.

Further details are included in the deviations reported by EXE1 (§A.2), EXE2 (§B.2), EXE3 (§C.2) and EXE4 (§D.2).

Company General Use

4 SESAR Technological Solution PJ.17-01 Validation Results

4.1 Summary of SESAR Technological Solution PJ.17-01 Validation Results

Table 11~~Table 11~~ provides a summary of the validation results per validation objective. For each objective, the reported validation results and validation objective status have been consolidated at solution level taking into account EXE1 (§A.3.1), EXE2 (§B.3.1), EXE3 (§C.3.1) and EXE4 (§D.3.1) validation results. In particular:

- OK: technical validation objective achieves the expectations (exercise results achieve success criteria).
- NOK: technical validation objective does not achieve the expectations (exercise results do not achieve success criteria).
- Partially OK: technical validation objective achieves the expectations to a certain extent. The reasons why the technical validation objective is not fully achieved have been recorded in table below.

Taking into account the exercises' coverage and validation results, overall coverage of traced requirements and feedback from prototyping and validation activities, the solution evaluated the related success criteria as follows:

Company General Use

Solution level Technical Validation Objective ID	Solution level Technical Validation Objective Title	Solution level Success Criterion ID	Solution level Success Criterion	Solution level Validation Results	Solution level Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-PERF.0001	FIFO message queue level ordering guarantees QoS for uplink service	CRT-17.01-TRL6-TVALP-PERF.0001	Messages sent by the ground sender are received in the same FIFO order by the aircraft application.	Success criterion fully covered and successfully validated.	OK
OBJ-17.01-TRL6-TVALP-PERF.0002	FIFO message queue level ordering guarantees QoS for downlink service	CRT-17.01-TRL6-TVALP-PERF.0002	Messages sent by the air sender are received in the same FIFO order by the ground application.	Success criterion fully covered and successfully validated.	OK
OBJ-17.01-TRL6-TVALP-PERF.0003	FIFO message topic level ordering guarantees QoS for uplink service	CRT-17.01-TRL6-TVALP-PERF.0003	Messages published by the ground publisher are received in the same FIFO order by the aircraft application(s).	Success criterion fully covered and successfully validated.	OK
OBJ-17.01-TRL6-TVALP-PERF.0004	FIFO message topic level ordering guarantees QoS for downlink service	CRT-17.01-TRL6-TVALP-PERF.0004	Messages published by the air publisher(s) are received in the same FIFO order by the ground application(s).	Success criterion fully covered and successfully validated.	OK
OBJ-17.01-TRL6-TVALP-PERF.0005	Message priority message queue level ordering guarantees QoS for uplink service	CRT-17.01-TRL6-TVALP-PERF.0005	The ground sender sends messages with different priorities and the aircraft application receives them ordered according to the priority (best effort).	Success criterion fully covered and successfully validated.	OK
OBJ-17.01-TRL6-TVALP-PERF.0005	Message priority message queue level ordering guarantees QoS for uplink service	CRT-17.01-TRL6-TVALP-PERF.0006	Messages with the same priority are received with FIFO ordering.	Success criterion fully covered and successfully validated.	OK
OBJ-17.01-TRL6-TVALP-PERF.0006	Message priority message queue level ordering guarantees QoS for downlink service	CRT-17.01-TRL6-TVALP-PERF.0007	The air sender sends messages with different priorities and the ground application receives them ordered according to the priority (best effort).	Success criterion fully covered and successfully validated.	OK

Solution level Technical Validation Objective ID	Solution level Technical Validation Objective Title	Solution level Success Criterion ID	Solution level Success Criterion	Solution level Validation Results	Solution level Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-PERF.0006	Message priority message queue level ordering guarantees QoS for downlink service	CRT-17.01-TRL6-TVALP-PERF.0006	Messages with the same priority are received with FIFO ordering.	Success criterion fully covered and successfully validated.	OK
OBJ-17.01-TRL6-TVALP-PERF.0007	Message priority topic level ordering guarantees QoS for uplink service	CRT-17.01-TRL6-TVALP-PERF.0008	The ground publisher publishes messages with different priorities and the aircraft applications receive them ordered according to the priority (best effort).	Success criterion fully covered and successfully validated.	OK
OBJ-17.01-TRL6-TVALP-PERF.0007	Message priority topic level ordering guarantees QoS for uplink service	CRT-17.01-TRL6-TVALP-PERF.0006	Messages with the same priority are received with FIFO ordering.	Success criterion fully covered and successfully validated.	OK
OBJ-17.01-TRL6-TVALP-PERF.0008	Message priority message topic level ordering guarantees QoS for downlink service	CRT-17.01-TRL6-TVALP-PERF.0009	The air publisher publishes messages with different priorities and the ground applications receive them ordered according to the priority (best effort).	Success criterion fully covered and successfully validated.	OK
OBJ-17.01-TRL6-TVALP-PERF.0008	Message priority message topic level ordering guarantees QoS for downlink service	CRT-17.01-TRL6-TVALP-PERF.0006	Messages with the same priority are received with FIFO ordering.	Success criterion fully covered and successfully validated.	OK

Solution level Technical Validation Objective ID	Solution level Technical Validation Objective Title	Solution level Success Criterion ID	Solution level Success Criterion	Solution level Validation Results	Solution level Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-PERF.0009	End to end message latency for Category A uplink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-PERF.0010	The measured end to end message latency for Category A uplink Request/Response Purple Profile enabled SWIM services is <= 20s for 95% of the messages and <= 40s for 98% of the messages in the reference measurement conditions.	Success criterion partially covered (V&VPs limitations do not allow to emulate 1000 A/C) by EXE2 and EXE3. Taking into account reported results, the success criterion validation status is NOK.	**NOK**
OBJ-17.01-TRL6-TVALP-PERF.0010	End to end message latency for Category A downlink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-PERF.0011	The measured end to end message latency for Category A downlink Request/Response Purple Profile enabled SWIM services is <= 20s for 95% of the messages and <= 40s for 98% of the messages in the reference measurement conditions.	Success criterion partially covered (V&VPs limitations do not allow to emulate 1000 A/C) by EXE2 and EXE3. Taking into account reported results, the success criterion validation status is NOK.	**NOK**
OBJ-17.01-TRL6-TVALP-PERF.0011	End to end message latency for Category B uplink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-PERF.0012	The measured end to end message latency for Category B uplink Request/Response Purple Profile enabled SWIM services is <= 30s for 95% of the messages and <= 60s for 98% of the messages in the reference measurement conditions.	Success criterion partially covered (V&VPs limitations do not allow to emulate 1000 A/C) by EXE2 and EXE3. Taking into account reported results, the success criterion validation status is NOK.	**NOK**

Solution level Technical Validation Objective ID	Solution level Technical Validation Objective Title	Solution level Success Criterion ID	Solution level Success Criterion	Solution level Validation Results	Solution level Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-PERF.0012	End to end message latency for Category B downlink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-PERF.0013	The measured end to end message latency for Category B downlink Request/Response Purple Profile enabled SWIM services is <= 30s for 95% of the messages and <= 60s for 98% of the messages in the reference measurement conditions.	Success criterion partially covered (V&VPs limitations do not allow to emulate 1000 A/C) by EXE2 and EXE3. Taking into account reported results, the success criterion validation status is NOK.	**NOK**
OBJ-17.01-TRL6-TVALP-PERF.0013	End to end message latency for Category C uplink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-PERF.0014	The measured end to end message latency for Category C uplink Request/Response Purple Profile enabled SWIM services is <= 50s for 95% of the messages and <= 100s for 98% of the messages in the reference measurement conditions.	Success criterion partially covered (V&VPs limitations do not allow to emulate 1000 A/C) by EXE2 and EXE3. Taking into account reported results, the success criterion validation status is NOK.	**NOK**
OBJ-17.01-TRL6-TVALP-PERF.0014	End to end message latency for Category C downlink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-PERF.0015	The measured end to end message latency for Category C downlink Request/Response Purple Profile enabled SWIM services is <= 50s for 95% of the messages and <= 100s for 98% of the messages in the reference measurement conditions.	Success criterion partially covered (V&VPs limitations do not allow to emulate 1000 A/C) by EXE2 and EXE3. Taking into account reported results, the success criterion validation status is NOK.	**NOK**

Solution level Technical Validation Objective ID	Solution level Technical Validation Objective Title	Solution level Success Criterion ID	Solution level Success Criterion	Solution level Validation Results	Solution level Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-PERF.0015	End to end message latency for Category D uplink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-PERF.0016	The measured end to end message latency for Category D uplink Request/Response Purple Profile enabled SWIM services is <= 60s for 95% of the messages and <= 120s for 98% of the messages in the reference measurement conditions.	Success criterion partially covered (V&VPs limitations do not allow to emulate 1000 A/C) by EXE2 and EXE3. Taking into account reported results, the success criterion validation status is NOK.	**NOK**
OBJ-17.01-TRL6-TVALP-PERF.0016	End to end message latency for Category D downlink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-PERF.0017	The measured end to end message latency for Category D downlink Request/Response Purple Profile enabled SWIM services is <= 60s for 95% of the messages and <= 120s for 98% of the messages in the reference measurement conditions.	Success criterion partially covered (V&VPs limitations do not allow to emulate 1000 A/C) by EXE2 and EXE3. Taking into account reported results, the success criterion validation status is NOK.	**NOK**
OBJ-17.01-TRL6-TVALP-PERF.0017	End to end message latency for Category A uplink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-PERF.0018	The measured end to end message latency for Category A uplink Publish/Subscribe Purple Profile enabled SWIM services is <= 20s for 95% of the messages and <= 40s for 98% of the messages in the reference measurement conditions.	Success criterion partially covered (V&VPs limitations do not allow to emulate 1000 A/C) by EXE2 and EXE3. Taking into account reported results, the success criterion validation status is NOK.	**NOK**

Solution level Technical Validation Objective ID	Solution level Technical Validation Objective Title	Solution level Success Criterion ID	Solution level Success Criterion	Solution level Validation Results	Solution level Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-PERF.0018	End to end message latency for Category A downlink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-PERF.0019	The measured end to end message latency for Category A downlink Publish/Subscribe Purple Profile enabled SWIM services is <= 20s for 95% of the messages and <= 40s for 98% of the messages in the reference measurement conditions.	Success criterion partially covered (V&VPs limitations do not allow to emulate 1000 A/C) by EXE2 and EXE3. Taking into account reported results, the success criterion validation status is NOK.	**NOK**
OBJ-17.01-TRL6-TVALP-PERF.0019	End to end message latency for Category B uplink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-PERF.0020	The measured end to end message latency for Category B uplink Publish/Subscribe Purple Profile enabled SWIM services is <= 30s for 95% of the messages and <= 60s for 98% of the messages in the reference measurement conditions.	Success criterion partially covered (V&VPs limitations do not allow to emulate 1000 A/C) by EXE2 and EXE3. Taking into account reported results, the success criterion validation status is NOK.	**NOK**
OBJ-17.01-TRL6-TVALP-PERF.0020	End to end message latency for Category B downlink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-PERF.0021	The measured end to end message latency for Category B downlink Publish/Subscribe Purple Profile enabled SWIM services is <= 30s for 95% of the messages and <= 60s for 98% of the messages in the reference measurement conditions.	Success criterion partially covered (V&VPs limitations do not allow to emulate 1000 A/C) by EXE2 and EXE3. Taking into account reported results, the success criterion validation status is NOK.	**NOK**

Solution level Technical Validation Objective ID	Solution level Technical Validation Objective Title	Solution level Success Criterion ID	Solution level Success Criterion	Solution level Validation Results	Solution level Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-PERF.0021	End to end message latency for Category C uplink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-PERF.0022	The measured end to end message latency for Category C uplink Publish/Subscribe Purple Profile enabled SWIM services is <= 50s for 95% of the messages and <= 100s for 98% of the messages in the reference measurement conditions.	Success criterion partially covered (V&VPs limitations do not allow to emulate 1000 A/C) by EXE2 and EXE3. Taking into account reported results, the success criterion validation status is NOK.	**NOK**
OBJ-17.01-TRL6-TVALP-PERF.0022	End to end message latency for Category C downlink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-PERF.0023	The measured end to end message latency for Category C downlink Publish/Subscribe Purple Profile enabled SWIM services is <= 50s for 95% of the messages and <= 100s for 98% of the messages in the reference measurement conditions.	Success criterion partially covered (V&VPs limitations do not allow to emulate 1000 A/C) by EXE2 and EXE3. Taking into account reported results, the success criterion validation status is NOK.	**NOK**
OBJ-17.01-TRL6-TVALP-PERF.0023	End to end message latency for Category D uplink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-PERF.0024	The measured end to end message latency for Category D uplink Publish/Subscribe Purple Profile enabled SWIM services is <= 60s for 95% of the messages and <= 120s for 98% of the messages in the reference measurement conditions.	Success criterion partially covered (V&VPs limitations do not allow to emulate 1000 A/C) by EXE2 and EXE3. Taking into account reported results, the success criterion validation status is NOK.	**NOK**

Solution level Technical Validation Objective ID	Solution level Technical Validation Objective Title	Solution level Success Criterion ID	Solution level Success Criterion	Solution level Validation Results	Solution level Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-PERF.0024	End to end message latency for Category D downlink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-PERF.0025	The measured end to end message latency for Category C downlink Publish/Subscribe Purple Profile enabled SWIM services is <= 60s for 95% of the messages and <= 120s for 98% of the messages in the reference measurement conditions.	Success criterion partially covered (V&VPs limitations do not allow to emulate 1000 A/C) by EXE2 and EXE3. Taking into account reported results, the success criterion validation status is NOK.	**NOK**
OBJ-17.01-TRL6-TVALP-PERF.0025	On-the-fly compression QoS for uplink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-PERF.0026	Response messages sent by the ground responder are compressed and uncompressed on-the-fly by the Ground-Air SWIM Nodes pair, without violating message integrity, and received by the aircraft application.	Success criterion fully covered and successfully validated.	OK
OBJ-17.01-TRL6-TVALP-PERF.0026	On-the-fly compression QoS for uplink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-PERF.0027	Publication messages sent by the ground publisher are compressed and uncompressed on-the-fly by the Ground-Air SWIM Nodes pair, without violating message integrity, and received by the aircraft application.	Success criterion fully covered and successfully validated.	OK

Solution level Technical Validation Objective ID	Solution level Technical Validation Objective Title	Solution level Success Criterion ID	Solution level Success Criterion	Solution level Validation Results	Solution level Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-REL.0001	End-to-end at-least-once delivery guarantees QoS for uplink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0001	A request message from aircraft requestor is received at least once by the ground responder although, while routing the request message, a connection establishment failure event (successfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	Success criterion fully covered and successfully validated.	OK
OBJ-17.01-TRL6-TVALP-REL.0001	End-to-end at-least-once delivery guarantees QoS for uplink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0002	A request message from aircraft requestor is received at least once by the ground responder although, while routing the request message, an abnormal disconnection event due to transient network error (successfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	Success criterion fully covered and successfully validated.	OK
OBJ-17.01-TRL6-TVALP-REL.0001	End-to-end at-least-once delivery guarantees QoS for uplink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0026	A request message from aircraft requestor is received at least once by the ground responder although, while routing the request message, an abnormal disconnection event due to ground peer restart (successfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	Success criterion fully covered and successfully validated.	OK

Solution level Technical Validation Objective ID	Solution level Technical Validation Objective Title	Solution level Success Criterion ID	Solution level Success Criterion	Solution level Validation Results	Solution level Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-REL.0001	End-to-end at-least-once delivery guarantees QoS for uplink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0003	A response message from the ground responder is received at least once by the aircraft requestor although, while routing the response message, a connection establishment failure event (successfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	Success criterion fully covered and successfully validated.	OK
OBJ-17.01-TRL6-TVALP-REL.0001	End-to-end at-least-once delivery guarantees QoS for uplink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0004	A response message from the ground responder is received at least once by the aircraft requestor although, while routing the response message, an abnormal disconnection event due to transient network error (successfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	Success criterion fully covered and successfully validated.	OK
OBJ-17.01-TRL6-TVALP-REL.0001	End-to-end at-least-once delivery guarantees QoS for uplink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0027	A response message from the ground responder is received at least once by the aircraft requestor although, while routing the response message, an abnormal disconnection event due to ground peer restart (successfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	Success criterion fully covered and successfully validated.	OK

Solution level Technical Validation Objective ID	Solution level Technical Validation Objective Title	Solution level Success Criterion ID	Solution level Success Criterion	Solution level Validation Results	Solution level Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-REL.0001	End-to-end at-least-once delivery guarantees QoS for uplink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0005	Message not delivered failure event is logged and traced because, while routing the message, a connection establishment failure event (unsuccessfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	Success criterion fully covered and successfully validated.	OK
OBJ-17.01-TRL6-TVALP-REL.0001	End-to-end at-least-once delivery guarantees QoS for uplink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0006	Message not delivered failure event is logged and traced because, while routing the message, an abnormal disconnection event (unsuccessfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	Success criterion fully covered and successfully validated.	OK
OBJ-17.01-TRL6-TVALP-REL.0001	End-to-end at-least-once delivery guarantees QoS for uplink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0007	Message not delivered failure event is logged and traced because, while handling abnormal disconnection or connection establishment failure events at Air-Ground SWIM Nodes connection level, the message expires.	Success criterion fully covered and successfully validated.	OK

Solution level Technical Validation Objective ID	Solution level Technical Validation Objective Title	Solution level Success Criterion ID	Solution level Success Criterion	Solution level Validation Results	Solution level Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-REL.0002	End-to-end at-least-once delivery guarantees QoS for downlink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0008	A request message from ground requestor is received at least once by the aircraft responder although, while routing the request message, a connection establishment failure event (successfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	Success criterion fully covered and successfully validated.	OK
OBJ-17.01-TRL6-TVALP-REL.0002	End-to-end at-least-once delivery guarantees QoS for downlink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0009	A request message from ground requestor is received at least once by the aircraft responder although, while routing the request message, an abnormal disconnection event due to transient network error (successfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	Success criterion fully covered and successfully validated.	OK
OBJ-17.01-TRL6-TVALP-REL.0002	End-to-end at-least-once delivery guarantees QoS for downlink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0028	A request message from ground requestor is received at least once by the aircraft responder although, while routing the request message, an abnormal disconnection event due to ground peer restart (successfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	Success criterion fully covered and successfully validated.	OK

Solution level Technical Validation Objective ID	Solution level Technical Validation Objective Title	Solution level Success Criterion ID	Solution level Success Criterion	Solution level Validation Results	Solution level Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-REL.0002	End-to-end at-least-once delivery guarantees QoS for downlink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0010	A response message from the aircraft responder is received at least once by the ground requestor although, while routing the response message, a connection establishment failure event (successfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	Success criterion fully covered and successfully validated.	OK
OBJ-17.01-TRL6-TVALP-REL.0002	End-to-end at-least-once delivery guarantees QoS for downlink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0011	A response message from the aircraft responder is received at least once by the ground requestor although, while routing the response message, an abnormal disconnection event due to transient network error (successfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	Success criterion fully covered and successfully validated.	OK
OBJ-17.01-TRL6-TVALP-REL.0002	End-to-end at-least-once delivery guarantees QoS for downlink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0029	A response message from the aircraft responder is received at least once by the ground requestor although, while routing the response message, an abnormal disconnection event due to ground peer restart (successfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	Success criterion fully covered and successfully validated.	OK

Solution level Technical Validation Objective ID	Solution level Technical Validation Objective Title	Solution level Success Criterion ID	Solution level Success Criterion	Solution level Validation Results	Solution level Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-REL.0002	End-to-end at-least-once delivery guarantees QoS for downlink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0005	Message not delivered failure event is logged and traced because, while routing the message, a connection establishment failure event (unsuccessfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	Success criterion fully covered and successfully validated.	OK
OBJ-17.01-TRL6-TVALP-REL.0002	End-to-end at-least-once delivery guarantees QoS for downlink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0006	Message not delivered failure event is logged and traced because, while routing the message, an abnormal disconnection event (unsuccessfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	Success criterion fully covered and successfully validated.	OK
OBJ-17.01-TRL6-TVALP-REL.0002	End-to-end at-least-once delivery guarantees QoS for downlink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0007	Message not delivered failure event is logged and traced because, while handling abnormal disconnection or connection establishment failure events at Air-Ground SWIM Nodes connection level, the message expires.	Success criterion fully covered and successfully validated.	OK

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OBJ-17.01-TRL6-TVALP-REL.0003	End-to-end at-least-once delivery guarantees QoS for uplink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0012	A publication message from ground publisher is received at least once by the aircraft subscriber although, while routing the message, a connection establishment failure event (successfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	Success criterion fully covered and successfully validated.	OK
OBJ-17.01-TRL6-TVALP-REL.0003	End-to-end at-least-once delivery guarantees QoS for uplink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0013	A publication message from ground publisher is received at least once by the aircraft subscriber although, while routing the message, an abnormal disconnection event due to transient network error (successfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	Success criterion fully covered and successfully validated.	OK
OBJ-17.01-TRL6-TVALP-REL.0003	End-to-end at-least-once delivery guarantees QoS for uplink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0030	A publication message from ground publisher is received at least once by the aircraft subscriber although, while routing the message, an abnormal disconnection event due to ground peer restart (successfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	Success criterion fully covered and successfully validated.	OK

Solution level Technical Validation Objective ID	Solution level Technical Validation Objective Title	Solution level Success Criterion ID	Solution level Success Criterion	Solution level Validation Results	Solution level Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-REL.0003	End-to-end at-least-once delivery guarantees QoS for uplink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0005	Message not delivered failure event is logged and traced because, while routing the message, a connection establishment failure event (unsuccessfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	Success criterion fully covered and successfully validated.	OK
OBJ-17.01-TRL6-TVALP-REL.0003	End-to-end at-least-once delivery guarantees QoS for uplink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0006	Message not delivered failure event is logged and traced because, while routing the message, an abnormal disconnection event (unsuccessfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	Success criterion fully covered and successfully validated.	OK
OBJ-17.01-TRL6-TVALP-REL.0003	End-to-end at-least-once delivery guarantees QoS for uplink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0007	Message not delivered failure event is logged and traced because, while handling abnormal disconnection or connection establishment failure events at Air-Ground SWIM Nodes connection level, the message expires.	Success criterion fully covered and successfully validated.	OK

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OBJ-17.01-TRL6-TVALP-REL.0004	End-to-end at-least-once delivery guarantees QoS for downlink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0014	A publication message from aircraft publisher is received at least once by the ground subscriber although, while routing the message, a connection establishment failure event (successfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	Success criterion fully covered and successfully validated.	OK
OBJ-17.01-TRL6-TVALP-REL.0004	End-to-end at-least-once delivery guarantees QoS for downlink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0015	A publication message from aircraft publisher is received at least once by the ground subscriber although, while routing the message, an abnormal disconnection event due to transient network error (successfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	Success criterion fully covered and successfully validated.	OK
OBJ-17.01-TRL6-TVALP-REL.0004	End-to-end at-least-once delivery guarantees QoS for downlink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0031	A publication message from aircraft publisher is received at least once by the ground subscriber although, while routing the message, an abnormal disconnection event due to ground peer restart (successfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	Success criterion fully covered and successfully validated.	OK

Solution level Technical Validation Objective ID	Solution level Technical Validation Objective Title	Solution level Success Criterion ID	Solution level Success Criterion	Solution level Validation Results	Solution level Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-REL.0004	End-to-end at-least-once delivery guarantees QoS for downlink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0005	Message not delivered failure event is logged and traced because, while routing the message, a connection establishment failure event (unsuccessfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	Success criterion fully covered and successfully validated.	OK
OBJ-17.01-TRL6-TVALP-REL.0004	End-to-end at-least-once delivery guarantees QoS for downlink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0006	Message not delivered failure event is logged and traced because, while routing the message, an abnormal disconnection event (unsuccessfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	Success criterion fully covered and successfully validated.	OK
OBJ-17.01-TRL6-TVALP-REL.0004	End-to-end at-least-once delivery guarantees QoS for downlink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0007	Message not delivered failure event is logged and traced because, while handling abnormal disconnection or connection establishment failure events at Air-Ground SWIM Nodes connection level, the message expires.	Success criterion fully covered and successfully validated.	OK

Solution level Technical Validation Objective ID	Solution level Technical Validation Objective Title	Solution level Success Criterion ID	Solution level Success Criterion	Solution level Validation Results	Solution level Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-REL.0005	End-to-end exactly-once delivery guarantees QoS for uplink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0016	A request message from aircraft requestor is received exactly once by the ground responder although, while routing the request message, a connection establishment failure event (successfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	Success criterion fully covered and successfully validated. By at least one EXE (EXE1).	OK
OBJ-17.01-TRL6-TVALP-REL.0005	End-to-end exactly-once delivery guarantees QoS for uplink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0017	A request message from aircraft requestor is received exactly once by the ground responder although, while routing the request message, an abnormal disconnection event due to transient network error (successfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	Success criterion fully covered and successfully validated. By at least one EXE (EXE1).	OK
OBJ-17.01-TRL6-TVALP-REL.0005	End-to-end exactly-once delivery guarantees QoS for uplink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0032	A request message from aircraft requestor is received exactly once by the ground responder although, while routing the request message, an abnormal disconnection event due to ground peer restart (successfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	Success criterion fully covered and successfully validated. By at least one EXE (EXE1).	OK

Solution level Technical Validation Objective ID	Solution level Technical Validation Objective Title	Solution level Success Criterion ID	Solution level Success Criterion	Solution level Validation Results	Solution level Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-REL.0005	End-to-end exactly-once delivery guarantees QoS for uplink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0018	A response message from the ground responder is received exactly once by the aircraft requestor although, while routing the response message, a connection establishment failure event (successfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	Success criterion fully covered and successfully validated. By at least one EXE (EXE1).	OK
OBJ-17.01-TRL6-TVALP-REL.0005	End-to-end exactly-once delivery guarantees QoS for uplink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0019	A response message from the ground responder is received exactly once by the aircraft requestor although, while routing the response message, an abnormal disconnection event due to transient network error (successfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	Success criterion fully covered and successfully validated. By at least one EXE (EXE1).	OK
OBJ-17.01-TRL6-TVALP-REL.0005	End-to-end exactly-once delivery guarantees QoS for uplink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0033	A response message from the ground responder is received exactly once by the aircraft requestor although, while routing the response message, an abnormal disconnection event due to ground peer restart (successfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	Success criterion fully covered and successfully validated. By at least one EXE (EXE1).	OK

Solution level Technical Validation Objective ID	Solution level Technical Validation Objective Title	Solution level Success Criterion ID	Solution level Success Criterion	Solution level Validation Results	Solution level Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-REL.0005	End-to-end exactly-once delivery guarantees QoS for uplink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0005	Message not delivered failure event is logged and traced because, while routing the message, a connection establishment failure event (unsuccessfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	Success criterion fully covered and successfully validated.	OK
OBJ-17.01-TRL6-TVALP-REL.0005	End-to-end exactly-once delivery guarantees QoS for uplink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0006	Message not delivered failure event is logged and traced because, while routing the message, an abnormal disconnection event (unsuccessfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	Success criterion fully covered and successfully validated.	OK
OBJ-17.01-TRL6-TVALP-REL.0005	End-to-end exactly-once delivery guarantees QoS for uplink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0007	Message not delivered failure event is logged and traced because, while handling abnormal disconnection or connection establishment failure events at Air-Ground SWIM Nodes connection level, the message expires.	Success criterion fully covered and successfully validated.	OK

Solution level Technical Validation Objective ID	Solution level Technical Validation Objective Title	Solution level Success Criterion ID	Solution level Success Criterion	Solution level Validation Results	Solution level Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-REL.0006	End-to-end exactly-once delivery guarantees QoS for downlink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0020	A request message from ground requestor is received exactly once by the aircraft responder although, while routing the request message, a connection establishment failure event (successfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	Success criterion fully covered and successfully validated. By at least one EXE (EXE1).	OK
OBJ-17.01-TRL6-TVALP-REL.0006	End-to-end exactly-once delivery guarantees QoS for downlink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0021	A request message from ground requestor is received exactly once by the aircraft responder although, while routing the request message, an abnormal disconnection event due to transient network error (successfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	Success criterion fully covered and successfully validated. By at least one EXE (EXE1).	OK
OBJ-17.01-TRL6-TVALP-REL.0006	End-to-end exactly-once delivery guarantees QoS for downlink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0034	A request message from ground requestor is received exactly once by the aircraft responder although, while routing the request message, an abnormal disconnection event due to ground peer restart (successfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	Success criterion fully covered and successfully validated. By at least one EXE (EXE1).	OK

Solution level Technical Validation Objective ID	Solution level Technical Validation Objective Title	Solution level Success Criterion ID	Solution level Success Criterion	Solution level Validation Results	Solution level Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-REL.0006	End-to-end exactly-once delivery guarantees QoS for downlink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0022	A response message from the aircraft responder is received exactly once by the ground requestor although, while routing the response message, a connection establishment failure event (successfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	Success criterion fully covered and successfully validated. By at least one EXE (EXE1).	OK
OBJ-17.01-TRL6-TVALP-REL.0006	End-to-end exactly-once delivery guarantees QoS for downlink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0011	A response message from the aircraft responder is received exactly once by the ground requestor although, while routing the response message, an abnormal disconnection event due to transient network error (successfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	Success criterion fully covered and successfully validated. By at least one EXE (EXE1).	OK
OBJ-17.01-TRL6-TVALP-REL.0006	End-to-end exactly-once delivery guarantees QoS for downlink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0035	A response message from the aircraft responder is received exactly once by the ground requestor although, while routing the response message, an abnormal disconnection event due to ground peer restart (successfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	Success criterion fully covered and successfully validated. By at least one EXE (EXE1).	OK

Solution level Technical Validation Objective ID	Solution level Technical Validation Objective Title	Solution level Success Criterion ID	Solution level Success Criterion	Solution level Validation Results	Solution level Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-REL.0006	End-to-end exactly-once delivery guarantees QoS for downlink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0005	Message not delivered failure event is logged and traced because, while routing the message, a connection establishment failure event (unsuccessfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	Success criterion fully covered and successfully validated.	OK
OBJ-17.01-TRL6-TVALP-REL.0006	End-to-end exactly-once delivery guarantees QoS for downlink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0006	Message not delivered failure event is logged and traced because, while routing the message, an abnormal disconnection event (unsuccessfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	Success criterion fully covered and successfully validated.	OK
OBJ-17.01-TRL6-TVALP-REL.0006	End-to-end exactly-once delivery guarantees QoS for downlink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0007	Message not delivered failure event is logged and traced because, while handling abnormal disconnection or connection establishment failure events at Air-Ground SWIM Nodes connection level, the message expires.	Success criterion fully covered and successfully validated.	OK

Solution level Technical Validation Objective ID	Solution level Technical Validation Objective Title	Solution level Success Criterion ID	Solution level Success Criterion	Solution level Validation Results	Solution level Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-REL.0007	End-to-end exactly-once delivery guarantees QoS for uplink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0023	A publication message from ground publisher is received exactly once by the aircraft subscriber although, while routing the message, a connection establishment failure event (successfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	Success criterion fully covered and successfully validated. By at least one EXE (EXE1).	OK
OBJ-17.01-TRL6-TVALP-REL.0007	End-to-end exactly-once delivery guarantees QoS for uplink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0024	A publication message from ground publisher is received exactly once by the aircraft subscriber although, while routing the message, an abnormal disconnection event due to transient network error (successfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	Success criterion fully covered and successfully validated. By at least one EXE (EXE1).	OK
OBJ-17.01-TRL6-TVALP-REL.0007	End-to-end exactly-once delivery guarantees QoS for uplink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0036	A publication message from ground publisher is received exactly once by the aircraft subscriber although, while routing the message, an abnormal disconnection event due to ground peer restart (successfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	Success criterion fully covered and successfully validated. By at least one EXE (EXE1).	OK

Solution level Technical Validation Objective ID	Solution level Technical Validation Objective Title	Solution level Success Criterion ID	Solution level Success Criterion	Solution level Validation Results	Solution level Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-REL.0007	End-to-end exactly-once delivery guarantees QoS for uplink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0005	Message not delivered failure event is logged and traced because, while routing the message, a connection establishment failure event (unsuccessfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	Success criterion fully covered and successfully validated.	OK
OBJ-17.01-TRL6-TVALP-REL.0007	End-to-end exactly-once delivery guarantees QoS for uplink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0006	Message not delivered failure event is logged and traced because, while routing the message, an abnormal disconnection event (unsuccessfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	Success criterion fully covered and successfully validated.	OK
OBJ-17.01-TRL6-TVALP-REL.0007	End-to-end exactly-once delivery guarantees QoS for uplink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0007	Message not delivered failure event is logged and traced because, while handling abnormal disconnection or connection establishment failure events at Air-Ground SWIM Nodes connection level, the message expires.	Success criterion fully covered and successfully validated.	OK

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OBJ-17.01-TRL6-TVALP-REL.0008	End-to-end exactly-once delivery guarantees QoS for downlink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0025	A publication message from aircraft publisher is received exactly once by the ground subscriber although, while routing the message, a connection establishment failure event (successfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	Success criterion fully covered and successfully validated. By at least one EXE (EXE1).	OK
OBJ-17.01-TRL6-TVALP-REL.0008	End-to-end exactly-once delivery guarantees QoS for downlink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0038	A publication message from aircraft publisher is received exactly once by the ground subscriber although, while routing the message, an abnormal disconnection event due to transient network error (successfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	Success criterion fully covered and successfully validated. By at least one EXE (EXE1).	OK
OBJ-17.01-TRL6-TVALP-REL.0008	End-to-end exactly-once delivery guarantees QoS for downlink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0037	A publication message from aircraft publisher is received exactly once by the ground subscriber although, while routing the message, an abnormal disconnection event due to ground peer restart (successfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	Success criterion fully covered and successfully validated. By at least one EXE (EXE1).	OK

Solution level Technical Validation Objective ID	Solution level Technical Validation Objective Title	Solution level Success Criterion ID	Solution level Success Criterion	Solution level Validation Results	Solution level Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-REL.0008	End-to-end exactly-once delivery guarantees QoS for downlink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0005	Message not delivered failure event is logged and traced because, while routing the message, a connection establishment failure event (unsuccessfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	Success criterion fully covered and successfully validated.	OK
OBJ-17.01-TRL6-TVALP-REL.0008	End-to-end exactly-once delivery guarantees QoS for downlink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0006	Message not delivered failure event is logged and traced because, while routing the message, an abnormal disconnection event (unsuccessfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	Success criterion fully covered and successfully validated.	OK
OBJ-17.01-TRL6-TVALP-REL.0008	End-to-end exactly-once delivery guarantees QoS for downlink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0007	Message not delivered failure event is logged and traced because, while handling abnormal disconnection or connection establishment failure events at Air-Ground SWIM Nodes connection level, the message expires.	Success criterion fully covered and successfully validated.	OK
OBJ-17.01-TRL6-TVALP-SEC.0001	Basic message screening security controls for message queue based information exchange	CRT-17.01-TRL6-TVALP-SEC.0001	Different message screening policies are successfully configured for two or more message queues.	Success criterion fully covered and successfully validated.	OK

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OBJ-17.01-TRL6-TVALP-SEC.0001	Basic message screening security controls for message queue based information exchange	CRT-17.01-TRL6-TVALP-SEC.0002	Message screening policies are enforced on message queues used by Purple Profile enabled sender applications.	Success criterion fully covered and successfully validated.	OK
OBJ-17.01-TRL6-TVALP-SEC.0001	Basic message screening security controls for message queue based information exchange	CRT-17.01-TRL6-TVALP-SEC.0003	Message screening policies are enforced on Ground SWIM Node side message queues used by Air SWIM Nodes to send/consume messages.	Success criterion fully covered and successfully validated.	OK
OBJ-17.01-TRL6-TVALP-SEC.0001	Basic message screening security controls for message queue based information exchange	CRT-17.01-TRL6-TVALP-SEC.0004	A malformed AMQP 1.0 annotated message with uncomplete or invalid message properties is filtered out by enforcing the message screening policy.	Success criterion fully covered and successfully validated.	OK
OBJ-17.01-TRL6-TVALP-SEC.0001	Basic message screening security controls for message queue based information exchange	CRT-17.01-TRL6-TVALP-SEC.0008	Events concerning the message screening policies enforcement are logged in accordance with applicable audit policy.	Success criterion fully covered with Partial OK validation result status due to the implementation of a basic policy based auditing.	Partially OK
OBJ-17.01-TRL6-TVALP-SEC.0001	Basic message screening security controls for message queue based information exchange	CRT-17.01-TRL6-TVALP-SEC.0009	A message screening policy is successfully updated at run-time without restarting the Ground SWIM Node.	Success criterion fully covered and successfully validated. By at least one EXE (EXE1).	OK
OBJ-17.01-TRL6-TVALP-SEC.0002	Advanced message screening security controls for message queue based information exchange	CRT-17.01-TRL6-TVALP-SEC.0001	Different message screening policies are successfully configured for two or more message queues.	Success criterion fully covered and successfully validated. By at least one EXE (EXE1).	OK

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OBJ-17.01-TRL6-TVALP-SEC.0002	Advanced message screening security controls for message queue based information exchange	CRT-17.01-TRL6-TVALP-SEC.0002	Message screening policies are enforced on message queues used by Purple Profile enabled sender applications.	Success criterion fully covered and successfully validated. By at least one EXE (EXE1).	OK
OBJ-17.01-TRL6-TVALP-SEC.0002	Advanced message screening security controls for message queue based information exchange	CRT-17.01-TRL6-TVALP-SEC.0003	Message screening policies are enforced on Ground SWIM Node side message queues used by Air SWIM Nodes to send/consume messages.	Success criterion fully covered and successfully validated. By at least one EXE (EXE1).	OK
OBJ-17.01-TRL6-TVALP-SEC.0002	Advanced message screening security controls for message queue based information exchange	CRT-17.01-TRL6-TVALP-SEC.0005	A malformed AMQP 1.0 annotated message with syntactically invalid message payload is filtered out by enforcing the message screening policy.	Success criterion fully covered and successfully validated. By at least one EXE (EXE1).	OK
OBJ-17.01-TRL6-TVALP-SEC.0002	Advanced message screening security controls for message queue based information exchange	CRT-17.01-TRL6-TVALP-SEC.0006	A malformed AMQP 1.0 annotated message with unexpected message payload is filtered out by enforcing the message screening policy.	Success criterion fully covered and successfully validated. By at least one EXE (EXE1).	OK
OBJ-17.01-TRL6-TVALP-SEC.0002	Advanced message screening security controls for message queue based information exchange	CRT-17.01-TRL6-TVALP-SEC.0007	A malicious AMQP 1.0 annotated message with malicious property/payload is filtered out by enforcing the message screening policy.	Success criterion fully covered and successfully validated. By at least one EXE (EXE1).	OK

Solution level Technical Validation Objective ID	Solution level Technical Validation Objective Title	Solution level Success Criterion ID	Solution level Success Criterion	Solution level Validation Results	Solution level Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-SEC.0002	Advanced message screening security controls for message queue based information exchange	CRT-17.01-TRL6-TVALP-SEC.0008	Events concerning the message screening policies enforcement are logged in accordance with applicable audit policy.	Success criterion fully covered with Partial OK validation result status due to the implementation of a basic policy based auditing.	Partially OK
OBJ-17.01-TRL6-TVALP-SEC.0002	Advanced message screening security controls for message queue based information exchange	CRT-17.01-TRL6-TVALP-SEC.0009	A message screening policy is successfully updated at run-time without restarting the Ground SWIM Node.	Success criterion fully covered and successfully validated. By at least one EXE (EXE1).	OK
OBJ-17.01-TRL6-TVALP-SEC.0003	Basic message screening security controls for message topic based information exchange	CRT-17.01-TRL6-TVALP-SEC.0010	Different message screening policies are successfully configured for two or more message topics.	Success criterion fully covered and successfully validated.	OK
OBJ-17.01-TRL6-TVALP-SEC.0003	Basic message screening security controls for message topic based information exchange	CRT-17.01-TRL6-TVALP-SEC.0011	Message screening policies are enforced on message topics used by Purple Profile enabled publisher applications.	Success criterion fully covered and successfully validated.	OK
OBJ-17.01-TRL6-TVALP-SEC.0003	Basic message screening security controls for message topic based information exchange	CRT-17.01-TRL6-TVALP-SEC.0012	Message screening policies are enforced on Ground SWIM Node side message topics used by Air SWIM Nodes to publish/consume messages.	Success criterion fully covered and successfully validated.	OK
OBJ-17.01-TRL6-TVALP-SEC.0003	Basic message screening security controls for message topic based information exchange	CRT-17.01-TRL6-TVALP-SEC.0004	A malformed AMQP 1.0 annotated message with uncomplete or invalid message properties is filtered out by enforcing the message screening policy.	Success criterion fully covered and successfully validated.	OK

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OBJ-17.01-TRL6-TVALP-SEC.0003	Basic message screening security controls for message topic based information exchange	CRT-17.01-TRL6-TVALP-SEC.0008	Events concerning the message screening policies enforcement are logged in accordance with applicable audit policy.	Success criterion fully covered with Partial OK validation result status due to the implementation of a basic policy based auditing.	Partially OK
OBJ-17.01-TRL6-TVALP-SEC.0003	Basic message screening security controls for message topic based information exchange	CRT-17.01-TRL6-TVALP-SEC.0009	A message screening policy is successfully updated at run-time without restarting the Ground SWIM Node.	Success criterion fully covered and successfully validated. By at least one EXE (EXE1).	OK
OBJ-17.01-TRL6-TVALP-SEC.0004	Advanced message screening security controls for message topic based information exchange	CRT-17.01-TRL6-TVALP-SEC.0010	Different message screening policies are successfully configured for two or more message topics.	Success criterion fully covered and successfully validated. By at least one EXE (EXE1).	OK
OBJ-17.01-TRL6-TVALP-SEC.0004	Advanced message screening security controls for message topic based information exchange	CRT-17.01-TRL6-TVALP-SEC.0011	Message screening policies are enforced on message topics used by Purple Profile enabled publisher applications.	Success criterion fully covered and successfully validated. By at least one EXE (EXE1).	OK
OBJ-17.01-TRL6-TVALP-SEC.0004	Advanced message screening security controls for message topic based information exchange	CRT-17.01-TRL6-TVALP-SEC.0012	Message screening policies are enforced on Ground SWIM Node side message topics used by Air SWIM Nodes to publish/consume messages.	Success criterion fully covered and successfully validated. By at least one EXE (EXE1).	OK
OBJ-17.01-TRL6-TVALP-SEC.0004	Advanced message screening security controls for message topic based information exchange	CRT-17.01-TRL6-TVALP-SEC.0005	A malformed AMQP 1.0 annotated message with syntactically invalid message payload is filtered out by enforcing the message screening policy.	Success criterion fully covered and successfully validated. By at least one EXE (EXE1).	OK

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OBJ-17.01-TRL6-TVALP-SEC.0004	Advanced message screening security controls for message topic based information exchange	CRT-17.01-TRL6-TVALP-SEC.0006	A malformed AMQP 1.0 annotated message with unexpected message payload is filtered out by enforcing the message screening policy.	Success criterion fully covered and successfully validated. By at least one EXE (EXE1).	OK
OBJ-17.01-TRL6-TVALP-SEC.0004	Advanced message screening security controls for message topic based information exchange	CRT-17.01-TRL6-TVALP-SEC.0007	A malicious AMQP 1.0 annotated message with malicious property/payload is filtered out by enforcing the message screening policy.	Success criterion fully covered and successfully validated. By at least one EXE (EXE1).	OK
OBJ-17.01-TRL6-TVALP-SEC.0004	Advanced message screening security controls for message topic based information exchange	CRT-17.01-TRL6-TVALP-SEC.0008	Events concerning the message screening policies enforcement are logged in accordance with applicable audit policy.	Success criterion fully covered with Partial OK validation result status due to the implementation of a basic policy based auditing.	Partially OK
OBJ-17.01-TRL6-TVALP-SEC.0004	Advanced message screening security controls for message topic based information exchange	CRT-17.01-TRL6-TVALP-SEC.0009	A message screening policy is successfully updated at run-time without restarting the Ground SWIM Node.	Success criterion fully covered and successfully validated. By at least one EXE (EXE1).	OK
OBJ-17.01-TRL6-TVALP-SEC.0005	Maximum message size overload protection security controls for message queue based information exchange	CRT-17.01-TRL6-TVALP-SEC.0013	Different overload protection policies are successfully configured for two or more message queues.	Success criterion fully covered and successfully validated.	OK
OBJ-17.01-TRL6-TVALP-SEC.0005	Maximum message size overload protection security controls for message queue based information exchange	CRT-17.01-TRL6-TVALP-SEC.0014	Overload protection policies are enforced on message queues used by Purple Profile enabled sender applications.	Success criterion fully covered and successfully validated.	OK

Solution level Technical Validation Objective ID	Solution level Technical Validation Objective Title	Solution level Success Criterion ID	Solution level Success Criterion	Solution level Validation Results	Solution level Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-SEC.0005	Maximum message size overload protection security controls for message queue based information exchange	CRT-17.01-TRL6-TVALP-SEC.0015	Overload protection policies are enforced on Ground SWIM Node side message queues used by Air SWIM Nodes to send/consume messages.	Success criterion fully covered and successfully validated.	OK
OBJ-17.01-TRL6-TVALP-SEC.0005	Maximum message size overload protection security controls for message queue based information exchange	CRT-17.01-TRL6-TVALP-SEC.0016	Events concerning the overload protection policies enforcement are logged in accordance with applicable audit policy.	Success criterion fully covered with Partial OK validation result status due to the implementation of a basic policy based auditing.	Partially OK
OBJ-17.01-TRL6-TVALP-SEC.0005	Maximum message size overload protection security controls for message queue based information exchange	CRT-17.01-TRL6-TVALP-SEC.0017	An overload protection policy is successfully updated at run-time without restarting the Ground SWIM Node.	Success criterion fully covered by at least one EXE (EXE1) but validation result is NOK. It was not possible to update the overload protection policies without restarting the SWIM Node.	NOK
OBJ-17.01-TRL6-TVALP-SEC.0005	Maximum message size overload protection security controls for message queue based information exchange	CRT-17.01-TRL6-TVALP-SEC.0018	An AMQP 1.0 annotated message exceeding maximum message size is rejected by enforcing the overload protection policy, the sender is notified and the event routed according to the applicable context-based routing monitoring policy.	Success criterion fully covered and successfully validated.	OK

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OBJ-17.01-TRL6-TVALP-SEC.0005	Maximum message size overload protection security controls for message queue based information exchange	CRT-17.01-TRL6-TVALP-SEC.0019	An AMQP 1.0 annotated message exceeding maximum message size is dropped by enforcing the overload protection policy and the event routed according to the applicable context-based routing monitoring policy.	Success criterion fully covered and successfully validated.	OK
OBJ-17.01-TRL6-TVALP-SEC.0006	Maximum message size overload protection security controls for message topic based information exchange	CRT-17.01-TRL6-TVALP-SEC.0020	Different overload protection policies are successfully configured for two or more message topics.	Success criterion fully covered and successfully validated.	OK
OBJ-17.01-TRL6-TVALP-SEC.0006	Maximum message size overload protection security controls for message topic based information exchange	CRT-17.01-TRL6-TVALP-SEC.0021	Overload protection policies are enforced on message topics used by Purple Profile enabled publisher applications.	Success criterion fully covered and successfully validated.	OK
OBJ-17.01-TRL6-TVALP-SEC.0006	Maximum message size overload protection security controls for message topic based information exchange	CRT-17.01-TRL6-TVALP-SEC.0022	Overload protection policies are enforced on Ground SWIM Node side message topics used by Air SWIM Nodes to publish/consume messages.	Success criterion fully covered and successfully validated.	OK
OBJ-17.01-TRL6-TVALP-SEC.0006	Maximum message size overload protection security controls for message topic based information exchange	CRT-17.01-TRL6-TVALP-SEC.0016	Events concerning the overload protection policies enforcement are logged in accordance with applicable audit policy.	Success criterion fully covered with Partial OK validation result status due to the implementation of a basic policy based auditing.	Partially OK

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OBJ-17.01-TRL6-TVALP-SEC.0006	Maximum message size overload protection security controls for message topic based information exchange	CRT-17.01-TRL6-TVALP-SEC.0017	An overload protection policy is successfully updated at run-time without restarting the Ground SWIM Node.	Success criterion fully covered by at least one EXE (EXE1) but validation result is NOK. It was not possible to update the overload protection policies without restarting the SWIM Node.	NOK
OBJ-17.01-TRL6-TVALP-SEC.0006	Maximum message size overload protection security controls for message topic based information exchange	CRT-17.01-TRL6-TVALP-SEC.0018	An AMQP 1.0 annotated message exceeding maximum message size is rejected by enforcing the overload protection policy, the sender is notified and the event routed according to the applicable context-based routing monitoring policy.	Success criterion fully covered and successfully validated.	OK
OBJ-17.01-TRL6-TVALP-SEC.0006	Maximum message size overload protection security controls for message topic based information exchange	CRT-17.01-TRL6-TVALP-SEC.0019	An AMQP 1.0 annotated message exceeding maximum message size is dropped by enforcing the overload protection policy and the event routed according to the applicable context-based routing monitoring policy.	Success criterion fully covered and successfully validated.	OK
OBJ-17.01-TRL6-TVALP-SEC.0007	Maximum message queue capacity overload protection security controls	CRT-17.01-TRL6-TVALP-SEC.0013	Different overload protection policies are successfully configured for two or more message queues.	Success criterion fully covered and successfully validated.	OK
OBJ-17.01-TRL6-TVALP-SEC.0007	Maximum message queue capacity overload protection security controls	CRT-17.01-TRL6-TVALP-SEC.0014	Overload protection policies are enforced on message queues used by Purple Profile enabled sender applications.	Success criterion fully covered and successfully validated.	OK

Solution level Technical Validation Objective ID	Solution level Technical Validation Objective Title	Solution level Success Criterion ID	Solution level Success Criterion	Solution level Validation Results	Solution level Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-SEC.0007	Maximum message queue capacity overload protection security controls	CRT-17.01-TRL6-TVALP-SEC.0015	Overload protection policies are enforced on Ground SWIM Node side message queues used by Air SWIM Nodes to send/consume messages.	Success criterion fully covered and successfully validated.	OK
OBJ-17.01-TRL6-TVALP-SEC.0007	Maximum message queue capacity overload protection security controls	CRT-17.01-TRL6-TVALP-SEC.0016	Events concerning the overload protection policies enforcement are logged in accordance with applicable audit policy.	Success criterion fully covered with Partial OK validation result status due to the implementation of a basic policy based auditing.	Partially OK
OBJ-17.01-TRL6-TVALP-SEC.0007	Maximum message queue capacity overload protection security controls	CRT-17.01-TRL6-TVALP-SEC.0017	An overload protection policy is successfully updated at run-time without restarting the Ground SWIM Node.	Success criterion fully covered by at least one EXE (EXE1) but validation result is NOK. It was not possible to update the overload protection policies without restarting the SWIM Node.	NOK
OBJ-17.01-TRL6-TVALP-SEC.0007	Maximum message queue capacity overload protection security controls	CRT-17.01-TRL6-TVALP-SEC.0023	An attempt to send an AMQP 1.0 annotated message is rejected because maximum message queue capacity is exceeded.	Success criterion fully covered and successfully validated.	OK
OBJ-17.01-TRL6-TVALP-SEC.0008	Maximum message topic capacity overload protection security controls	CRT-17.01-TRL6-TVALP-SEC.0020	Different overload protection policies are successfully configured for two or more message topics.	Success criterion fully covered and successfully validated.	OK
OBJ-17.01-TRL6-TVALP-SEC.0008	Maximum message topic capacity overload protection security controls	CRT-17.01-TRL6-TVALP-SEC.0021	Overload protection policies are enforced on message topics used by Purple Profile enabled publisher applications.	Success criterion fully covered and successfully validated.	OK

Solution level Technical Validation Objective ID	Solution level Technical Validation Objective Title	Solution level Success Criterion ID	Solution level Success Criterion	Solution level Validation Results	Solution level Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-SEC.0008	Maximum message topic capacity overload protection security controls	CRT-17.01-TRL6-TVALP-SEC.0022	Overload protection policies are enforced on Ground SWIM Node side message topics used by Air SWIM Nodes to publish/consume messages.	Success criterion fully covered and successfully validated.	OK
OBJ-17.01-TRL6-TVALP-SEC.0008	Maximum message topic capacity overload protection security controls	CRT-17.01-TRL6-TVALP-SEC.0016	Events concerning the overload protection policies enforcement are logged in accordance with applicable audit policy.	Success criterion fully covered with Partial OK validation result status due to the implementation of a basic policy based auditing.	Partially OK
OBJ-17.01-TRL6-TVALP-SEC.0008	Maximum message topic capacity overload protection security controls	CRT-17.01-TRL6-TVALP-SEC.0017	An overload protection policy is successfully updated at run-time without restarting the Ground SWIM Node.	Success criterion fully covered by at least one EXE (EXE1) but validation result is NOK. It was not possible to update the overload protection policies without restarting the SWIM Node.	NOK
OBJ-17.01-TRL6-TVALP-SEC.0008	Maximum message topic capacity overload protection security controls	CRT-17.01-TRL6-TVALP-SEC.0024	An attempt to publish an AMQP 1.0 annotated message is rejected because maximum message topic capacity is exceeded.	Success criterion fully covered and successfully validated.	OK
OBJ-17.01-TRL6-TVALP-SEC.0009	Consolidated connections limits overload protection security controls	CRT-17.01-TRL6-TVALP-SEC.0025	Maximum number of consolidated connections is successfully configured.	Success criterion fully covered and successfully validated.	OK
OBJ-17.01-TRL6-TVALP-SEC.0009	Consolidated connections limits overload protection security controls	CRT-17.01-TRL6-TVALP-SEC.0016	Events concerning the overload protection policies enforcement are logged in accordance with applicable audit policy.	Success criterion fully covered with Partial OK validation result status due to the implementation of a basic policy based auditing.	Partially OK

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OBJ-17.01-TRL6-TVALP-SEC.0009	Consolidated connections limits overload protection security controls	CRT-17.01-TRL6-TVALP-SEC.0026	An attempt to establish an AMQP 1.0 connection is rejected because the maximum number of consolidated connections is exceeded.	Success criterion fully covered and successfully validated.	OK
OBJ-17.01-TRL6-TVALP-SEC.0010	Concurrent connections limits per connecting entity overload protection security controls	CRT-17.01-TRL6-TVALP-SEC.0027	Maximum number of concurrent connections per connecting entity is successfully configured.	Success criterion fully covered and successfully validated.	OK
OBJ-17.01-TRL6-TVALP-SEC.0010	Concurrent connections limits per connecting entity overload protection security controls	CRT-17.01-TRL6-TVALP-SEC.0016	Events concerning the overload protection policies enforcement are logged in accordance with applicable audit policy.	Success criterion fully covered with Partial OK validation result status due to the implementation of a basic policy based auditing.	Partially OK
OBJ-17.01-TRL6-TVALP-SEC.0010	Concurrent connections limits per connecting entity overload protection security controls	CRT-17.01-TRL6-TVALP-SEC.0028	An attempt to establish an AMQP 1.0 connection is rejected because the maximum number of concurrent connections for the connecting entity is exceeded.	Success criterion fully covered and successfully validated.	OK
OBJ-17.01-TRL6-TVALP-SEC.0011	Mutual authentication and basic certificate revocation status check security controls	CRT-17.01-TRL6-TVALP-SEC.0029	Amqps mutual authentication is enforced between aircraft application and Air SWIM Node.	Success criterion fully covered and successfully validated. By at least one EXE (EXE1).	OK
OBJ-17.01-TRL6-TVALP-SEC.0011	Mutual authentication and basic certificate revocation status check security controls	CRT-17.01-TRL6-TVALP-SEC.0030	Amqps mutual authentication is enforced between Air and Ground SWIM Node.	Success criterion fully covered and successfully validated.	OK

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OBJ-17.01-TRL6-TVALP-SEC.0011	Mutual authentication and basic certificate revocation status check security controls	CRT-17.01-TRL6-TVALP-SEC.0031	Amqps mutual authentication is enforced between Ground SWIM Node and ground application.	Success criterion fully covered and successfully validated.	OK
OBJ-17.01-TRL6-TVALP-SEC.0011	Mutual authentication and basic certificate revocation status check security controls	CRT-17.01-TRL6-TVALP-SEC.0032	Events concerning mutual authentication enforcement are logged in accordance with applicable audit policy.	Success criterion fully covered with Partial OK validation result status due to the implementation of a basic policy based auditing.	Partially OK
OBJ-17.01-TRL6-TVALP-SEC.0011	Mutual authentication and basic certificate revocation status check security controls	CRT-17.01-TRL6-TVALP-SEC.0033	Amqps peers successfully mutual authenticate although one of the peer requires the fallback to TLS 1.2.	Success criterion fully covered and successfully validated.	OK
OBJ-17.01-TRL6-TVALP-SEC.0011	Mutual authentication and basic certificate revocation status check security controls	CRT-17.01-TRL6-TVALP-SEC.0034	Mutual authentication between amqps peers fails in all the following cases:- one of the peer requires the fallback to a TLS version lower than TLS 1.2.- peer's X.509v3 certificate is not trusted.- peer's X.509v3 certificate is expired.- peer's X.509v3 certificate has been revoked (it is included in the local CRL).- the local CRL is not the current CRL or the CRL scope is not appropriate and the authentication policy does not allow potentially revoked or compromised certificates.	Success criterion fully covered and successfully validated.	OK

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OBJ-17.01-TRL6-TVALP-SEC.0011	Mutual authentication and basic certificate revocation status check security controls	CRT-17.01-TRL6-TVALP-SEC.0035	Amqps peers successfully mutual authenticate although the local CRL is not the current CRL or the CRL scope is not appropriate because the authentication policy allows potentially revoked or compromised certificate.	Success criterion fully covered and successfully validated. By at least one EXE (EXE1).	OK
OBJ-17.01-TRL6-TVALP-SEC.0012	CRL update mechanisms	CRT-17.01-TRL6-TVALP-SEC.0036	The CRL used by SWIM Node is successfully updated via administrative interface.	Success criterion fully covered and successfully validated.	OK
OBJ-17.01-TRL6-TVALP-SEC.0012	CRL update mechanisms	CRT-17.01-TRL6-TVALP-SEC.0037	The CRL used by SWIM Node is not the current CRL and it is successfully updated on-the-fly via the HTTP CDP.	Success criterion fully covered and successfully validated. By at least one EXE (EXE1).	OK
OBJ-17.01-TRL6-TVALP-SEC.0012	CRL update mechanisms	CRT-17.01-TRL6-TVALP-SEC.0038	A delta-CRL is used to successfully update the CRL used by SWIM Node.	Success criterion fully covered and successfully validated. By at least one EXE (EXE1).	OK
OBJ-17.01-TRL6-TVALP-SEC.0013	Mutual authentication with OCSP certificate revocation status check security controls	CRT-17.01-TRL6-TVALP-SEC.0029	Amqps mutual authentication is enforced between aircraft application and Air SWIM Node.	Success criterion fully covered and successfully validated. By at least one EXE (EXE1).	OK
OBJ-17.01-TRL6-TVALP-SEC.0013	Mutual authentication with OCSP certificate revocation status check security controls	CRT-17.01-TRL6-TVALP-SEC.0030	Amqps mutual authentication is enforced between Air and Ground SWIM Node.	Success criterion fully covered and successfully validated.	OK
OBJ-17.01-TRL6-TVALP-SEC.0013	Mutual authentication with OCSP certificate revocation status check security controls	CRT-17.01-TRL6-TVALP-SEC.0031	Amqps mutual authentication is enforced between Ground SWIM Node and ground application.	Success criterion fully covered and successfully validated.	OK

Solution level Technical Validation Objective ID	Solution level Technical Validation Objective Title	Solution level Success Criterion ID	Solution level Success Criterion	Solution level Validation Results	Solution level Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-SEC.0013	Mutual authentication with OCSP certificate revocation status check security controls	CRT-17.01-TRL6-TVALP-SEC.0032	Events concerning mutual authentication enforcement are logged in accordance with applicable audit policy.	Success criterion fully covered with Partial OK validation result status due to the implementation of a basic policy based auditing.	Partially OK
OBJ-17.01-TRL6-TVALP-SEC.0013	Mutual authentication with OCSP certificate revocation status check security controls	CRT-17.01-TRL6-TVALP-SEC.0039	Amqps peer's certificate revocation status is retrieved from the OCSP response, and the authentication is successfully completed because the certificate is not revoked.	Success criterion fully covered and successfully validated.	OK
OBJ-17.01-TRL6-TVALP-SEC.0013	Mutual authentication with OCSP certificate revocation status check security controls	CRT-17.01-TRL6-TVALP-SEC.0040	Amqps peer's certificate revocation status is retrieved from the OCSP response, and the authentication fails because the certificate has been revoked.	Success criterion fully covered and successfully validated.	OK
OBJ-17.01-TRL6-TVALP-SEC.0013	Mutual authentication with OCSP certificate revocation status check security controls	CRT-17.01-TRL6-TVALP-SEC.0041	OCSP responder URL is retrieved from pre-configured local resources.	Success criterion fully covered and successfully validated.	OK
OBJ-17.01-TRL6-TVALP-SEC.0013	Mutual authentication with OCSP certificate revocation status check security controls	CRT-17.01-TRL6-TVALP-SEC.0042	OCSP responder URL is retrieved from location identified in the OCSP field in the Authority Information Access extension in the peer's certificate.	Success criterion fully covered and successfully validated. By at least one EXE (EXE1).	OK
OBJ-17.01-TRL6-TVALP-SEC.0014	Mutual authentication with combined OCSP and CRL based certificate revocation status check security controls	CRT-17.01-TRL6-TVALP-SEC.0043	OCSP is configured and used as preferred certificate revocation status check mechanism disabling the fallback to CRL.	Success criterion fully covered and successfully validated. By at least one EXE (EXE1).	OK

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OBJ-17.01-TRL6-TVALP-SEC.0014	Mutual authentication with combined OCSP and CRL based certificate revocation status check security controls	CRT-17.01-TRL6-TVALP-SEC.0044	OCSP is configured as preferred certificate revocation status check mechanism but because the responder is not available and the fallback is enabled, the CRL is successfully used.	Success criterion fully covered and successfully validated. By at least one EXE (EXE1).	OK
OBJ-17.01-TRL6-TVALP-SEC.0014	Mutual authentication with combined OCSP and CRL based certificate revocation status check security controls	CRT-17.01-TRL6-TVALP-SEC.0045	CRL is configured and used as preferred certificate revocation status check mechanism disabling the fallback to OCSP.	Success criterion fully covered and successfully validated. By at least one EXE (EXE1).	OK
OBJ-17.01-TRL6-TVALP-SEC.0014	Mutual authentication with combined OCSP and CRL based certificate revocation status check security controls	CRT-17.01-TRL6-TVALP-SEC.0046	CRL is configured as preferred certificate revocation status check mechanism but because the CRL is not available/valid and the fallback is enabled, the OCSP is successfully used.	Success criterion fully covered and successfully validated. By at least one EXE (EXE1).	OK
OBJ-17.01-TRL6-TVALP-SEC.0014	Mutual authentication with combined OCSP and CRL based certificate revocation status check security controls	CRT-17.01-TRL6-TVALP-SEC.0047	Amqps peers successfully mutual authenticate although none of the combined certificate revocation status mechanisms are available but the authentication policy allows potentially revoked or compromised certificate.	Success criterion fully covered and successfully validated. By at least one EXE (EXE1).	OK

Solution level Technical Validation Objective ID	Solution level Technical Validation Objective Title	Solution level Success Criterion ID	Solution level Success Criterion	Solution level Validation Results	Solution level Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-SEC.0014	Mutual authentication with combined OCSP and CRL based certificate revocation status check security controls	CRT-17.01-TRL6-TVALP-SEC.0048	Mutual authentication between amqps peers fails because none of the combined certificate revocation status mechanisms are available and the authentication policy does not allow potentially revoked or compromised certificate.	Success criterion fully covered and successfully validated. By at least one EXE (EXE1).	OK
OBJ-17.01-TRL6-TVALP-SEC.0015	Authorization security controls for message queue based information exchange	CRT-17.01-TRL6-TVALP-SEC.0049	Different authorization policies are successfully configured for two or more message queues.	Success criterion fully covered and successfully validated.	OK
OBJ-17.01-TRL6-TVALP-SEC.0015	Authorization security controls for message queue based information exchange	CRT-17.01-TRL6-TVALP-SEC.0050	Authorization policies are enforced on message queue used by Purple Profile enabled sender applications.	Success criterion fully covered and successfully validated.	OK
OBJ-17.01-TRL6-TVALP-SEC.0015	Authorization security controls for message queue based information exchange	CRT-17.01-TRL6-TVALP-SEC.0051	Authorization policies are enforced on message queue used by Purple Profile enabled receiver applications.	Success criterion fully covered and successfully validated.	OK
OBJ-17.01-TRL6-TVALP-SEC.0015	Authorization security controls for message queue based information exchange	CRT-17.01-TRL6-TVALP-SEC.0052	Authorization policies are enforced on Ground SWIM Node side message queue used by Air SWIM Nodes to send/receive messages.	Success criterion fully covered and successfully validated.	OK
OBJ-17.01-TRL6-TVALP-SEC.0015	Authorization security controls for message queue based information exchange	CRT-17.01-TRL6-TVALP-SEC.0053	Events concerning the authorization policies enforcement are logged in accordance with applicable audit policy.	Success criterion fully covered with Partial OK validation result status due to the implementation of a basic policy based auditing.	Partially OK

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OBJ-17.01-TRL6-TVALP-SEC.0015	Authorization security controls for message queue based information exchange	CRT-17.01-TRL6-TVALP-SEC.0054	An authorization policy is successfully updated at run-time without restarting the Ground SWIM Node.	Success criterion fully covered and successfully validated. By at least one EXE (EXE1).	OK
OBJ-17.01-TRL6-TVALP-SEC.0015	Authorization security controls for message queue based information exchange	CRT-17.01-TRL6-TVALP-SEC.0055	An attempt to send a message to a queue is authorized because the sending entity is successfully authenticated with sender role for that queue.	Success criterion fully covered and successfully validated.	OK
OBJ-17.01-TRL6-TVALP-SEC.0015	Authorization security controls for message queue based information exchange	CRT-17.01-TRL6-TVALP-SEC.0056	An attempt to send a message to a queue is not authorized because the authenticated sending entity has not assigned the sender role for that queue.	Success criterion fully covered and successfully validated.	OK
OBJ-17.01-TRL6-TVALP-SEC.0015	Authorization security controls for message queue based information exchange	CRT-17.01-TRL6-TVALP-SEC.0057	An attempt to receive a message from a queue is authorized because the receiving entity is successfully authenticated with receiver role for that queue.	Success criterion fully covered and successfully validated.	OK
OBJ-17.01-TRL6-TVALP-SEC.0015	Authorization security controls for message queue based information exchange	CRT-17.01-TRL6-TVALP-SEC.0058	An attempt to receive a message from a queue is not authorized because the authenticated receiving entity has not assigned the receiver role for that queue.	Success criterion fully covered and successfully validated.	OK

Solution level Technical Validation Objective ID	Solution level Technical Validation Objective Title	Solution level Success Criterion ID	Solution level Success Criterion	Solution level Validation Results	Solution level Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-SEC.0016	Authorization security controls for message topic based information exchange	CRT-17.01-TRL6-TVALP-SEC.0059	Different authorization policies are successfully configured for two or more message topics.	Success criterion fully covered and successfully validated.	OK
OBJ-17.01-TRL6-TVALP-SEC.0016	Authorization security controls for message topic based information exchange	CRT-17.01-TRL6-TVALP-SEC.0060	Authorization policies are enforced on message topic used by Purple Profile enabled publisher applications.	Success criterion fully covered and successfully validated.	OK
OBJ-17.01-TRL6-TVALP-SEC.0016	Authorization security controls for message topic based information exchange	CRT-17.01-TRL6-TVALP-SEC.0061	Authorization policies are enforced on message topic used by Purple Profile enabled subscriber applications.	Success criterion fully covered and successfully validated.	OK
OBJ-17.01-TRL6-TVALP-SEC.0016	Authorization security controls for message topic based information exchange	CRT-17.01-TRL6-TVALP-SEC.0062	Authorization policies are enforced on Ground SWIM Node side message topic used by Air SWIM Nodes to publish/consume messages.	Success criterion fully covered and successfully validated.	OK
OBJ-17.01-TRL6-TVALP-SEC.0016	Authorization security controls for message topic based information exchange	CRT-17.01-TRL6-TVALP-SEC.0053	Events concerning the authorization policies enforcement are logged in accordance with applicable audit policy.	Success criterion fully covered with Partial OK validation result status due to the implementation of a basic policy based auditing.	Partially OK
OBJ-17.01-TRL6-TVALP-SEC.0016	Authorization security controls for message topic based information exchange	CRT-17.01-TRL6-TVALP-SEC.0054	An authorization policy is successfully updated at run-time without restarting the Ground SWIM Node.	Success criterion fully covered and successfully validated. By at least one EXE (EXE1).	OK

Solution level Technical Validation Objective ID	Solution level Technical Validation Objective Title	Solution level Success Criterion ID	Solution level Success Criterion	Solution level Validation Results	Solution level Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-SEC.0016	Authorization security controls for message topic based information exchange	CRT-17.01-TRL6-TVALP-SEC.0063	An attempt to publish a message to a topic is authorized because the publishing entity is successfully authenticated with publisher role for that topic.	Success criterion fully covered and successfully validated.	OK
OBJ-17.01-TRL6-TVALP-SEC.0016	Authorization security controls for message topic based information exchange	CRT-17.01-TRL6-TVALP-SEC.0064	An attempt to publish a message to a topic is not authorized because the authenticated publishing entity has not assigned the publisher role for that topic.	Success criterion fully covered and successfully validated.	OK
OBJ-17.01-TRL6-TVALP-SEC.0016	Authorization security controls for message topic based information exchange	CRT-17.01-TRL6-TVALP-SEC.0065	An attempt to subscribe to a topic is authorized because the subscribing entity is successfully authenticated with subscriber role for that topic.	Success criterion fully covered and successfully validated.	OK
OBJ-17.01-TRL6-TVALP-SEC.0016	Authorization security controls for message topic based information exchange	CRT-17.01-TRL6-TVALP-SEC.0066	An attempt to subscribe to a topic is not authorized because the authenticated subscribing entity has not assigned the subscriber role for that topic.	Success criterion fully covered and successfully validated.	OK
OBJ-17.01-TRL6-TVALP-SEC.0017	Authorization security controls for message queue and topic lifecycle management	CRT-17.01-TRL6-TVALP-SEC.0067	An entity fails to connect to a message queue because the queue does not exist and the messaging resources lifecycle management is only authorized via administrative interfaces.	Success criterion fully covered and successfully validated.	OK

Solution level Technical Validation Objective ID	Solution level Technical Validation Objective Title	Solution level Success Criterion ID	Solution level Success Criterion	Solution level Validation Results	Solution level Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-SEC.0017	Authorization security controls for message queue and topic lifecycle management	CRT-17.01-TRL6-TVALP-SEC.0068	An entity fails to connect to a message topic because the topic does not exist and the messaging resources lifecycle management is only authorized via administrative interfaces.	Success criterion fully covered and successfully validated.	OK
OBJ-17.01-TRL6-TVALP-SEC.0017	Authorization security controls for message queue and topic lifecycle management	CRT-17.01-TRL6-TVALP-SEC.0069	A message queue is successfully created via administrative interface by an user with administrator role.	Success criterion fully covered and successfully validated.	OK
OBJ-17.01-TRL6-TVALP-SEC.0017	Authorization security controls for message queue and topic lifecycle management	CRT-17.01-TRL6-TVALP-SEC.0070	A message topic is successfully created via administrative interface by an user with administrator role.	Success criterion fully covered and successfully validated.	OK
OBJ-17.01-TRL6-TVALP-SEC.0017	Authorization security controls for message queue and topic lifecycle management	CRT-17.01-TRL6-TVALP-SEC.0071	A message queue is successfully deleted via administrative interface by an user with administrator role.	Success criterion fully covered and successfully validated.	OK
OBJ-17.01-TRL6-TVALP-SEC.0017	Authorization security controls for message queue and topic lifecycle management	CRT-17.01-TRL6-TVALP-SEC.0072	A message topic is successfully deleted via administrative interface by an user with administrator role.	Success criterion fully covered and successfully validated.	OK
OBJ-17.01-TRL6-TVALP-SEC.0017	Authorization security controls for message queue and topic lifecycle management	CRT-17.01-TRL6-TVALP-SEC.0073	An user without administrator role fails to create/delete message queue/topic via administrative interface.	Success criterion fully covered and successfully validated.	OK

Solution level Technical Validation Objective ID	Solution level Technical Validation Objective Title	Solution level Success Criterion ID	Solution level Success Criterion	Solution level Validation Results	Solution level Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-SEC.0018	End-to-end confidentiality for uplink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-SEC.0074	Following steps are successfully completed:- The requestor creates and sends an AMQP 1.0 annotated request message with application-data section containing encrypted data and ENPT AMQP footer with value containing both Encryption-Algorithm and Encryption-Secret for the intender responder.- While the request message is in transit at SWIM nodes level, it is not possible to access/visualize sensitive information because both application data and shared secret are encrypted- The request message is delivered to the intended responder that successfully decrypts it relying on delivered ENPT AMQP footer.	Success criterion fully covered and successfully validated.	OK

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OBJ-17.01-TRL6-TVALP-SEC.0018	End-to-end confidentiality for uplink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-SEC.0075	Following steps are successfully completed: -The responder creates and sends an AMQP 1.0 annotated response message with application-data section containing encrypted data and ENPT AMQP footer with value containing both Encryption-Algorithm and Encryption-Secret for the requestor.- While the response message is in transit at SWIM nodes level, it is not possible to access request/visualize sensitive information because both application data and shared secret are encrypted.- The response message is delivered to the intended requestor that successfully decrypts it relying on delivered ENPT AMQP footer.	Success criterion fully covered and successfully validated.	OK

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OBJ-17.01-TRL6-TVALP-SEC.0018	End-to-end confidentiality for uplink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-SEC.0076	Following steps are successfully completed:- The requestor creates and sends an additional AMQP 1.0 annotated request message for the same responder with application-data section containing encrypted data and ENPT AMQP footer containing only the Encryption-Algorithm.- The request message is delivered to the intended responder that successfully decrypts it relying on delivered ENPT AMQP footer and cached Encryption-Secret from previous request messages.	Success criterion fully covered and successfully validated.	OK
OBJ-17.01-TRL6-TVALP-SEC.0018	End-to-end confidentiality for uplink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-SEC.0077	Following steps are successfully completed:- The requestor creates and sends an additional AMQP 1.0 annotated request message for the same responder with application-data section containing encrypted data and ENPT AMQP footer containing also a new Encryption-Secret.- The request message is delivered to the intended responder that successfully decrypts it relying on delivered ENPT AMQP footer replacing cached Encryption-Secret.	Success criterion fully covered and successfully validated.	OK

Solution level Technical Validation Objective ID	Solution level Technical Validation Objective Title	Solution level Success Criterion ID	Solution level Success Criterion	Solution level Validation Results	Solution level Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-SEC.0019	End-to-end confidentiality for uplink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-SEC.0078	Following steps are successfully completed:- The publisher creates and publishes an AMQP 1.0 annotated publication message with application-data section containing encrypted data and ENPT AMQP footer with value containing both Encryption-Algorithm and Encryption-Secret for two or more subscribers.- While the publication message is in transit at SWIM nodes level, it is not possible to access/visualize sensitive information because both application data and shared secret are encrypted.- The publication message is delivered to the intended subscribers that successfully decrypt it relying on delivered ENPT AMQP footer.	Success criterion fully covered and successfully validated.	OK

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OBJ-17.01-TRL6-TVALP-SEC.0019	End-to-end confidentiality for uplink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-SEC.0079	Following steps are successfully completed:- The publisher creates and publishes an additional AMQP 1.0 annotated publication message for the same subscribers with application-data section containing encrypted data and ENPT AMQP footer containing only the Encryption-Algorithm.- The publication message is delivered to the intended subscribers that successfully decrypt it relying on delivered ENPT AMQP footer and cached Encryption-Secret from previous messages.	Success criterion fully covered and successfully validated.	OK

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OBJ-17.01-TRL6-TVALP-SEC.0019	End-to-end confidentiality for uplink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-SEC.0080	Following steps are successfully completed:- An additional subscriber ("new_sub") successfully subscribes to the topic.- The publisher creates and publishes an additional AMQP 1.0 annotated publication message with application-data section containing encrypted data and ENPT AMQP footer containing the Encryption-Algorithm and only the Encryption-Secret for the new subscriber.- The publication message is delivered to all the subscribers and in particular to the new one that successfully decrypts the message relying on delivered ENPT AMQP footer.- The other subscribers successfully decrypt the message relying on delivered ENPT AMQP footer and cached Encryption-Secret from previous messages.	Success criterion fully covered and successfully validated.	OK

Solution level Technical Validation Objective ID	Solution level Technical Validation Objective Title	Solution level Success Criterion ID	Solution level Success Criterion	Solution level Validation Results	Solution level Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-SEC.0019	End-to-end confidentiality for uplink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-SEC.0081	Following steps are successfully completed:- The publisher creates and publishes an additional AMQP 1.0 annotated publication message with application-data section containing encrypted data and ENPT AMQP footer containing also a new Encryption-Secret.- The publication message is delivered to the intended subscribers that successfully decrypt it relying on delivered ENPT AMQP footer and replacing cached Encryption-Secret.	Success criterion fully covered and successfully validated.	OK

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OBJ-17.01-TRL6-TVALP-SEC.0020	End-to-end confidentiality for downlink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-SEC.0078	Following steps are successfully completed:- The publisher creates and publishes an AMQP 1.0 annotated publication message with application-data section containing encrypted data and ENPT AMQP footer with value containing both Encryption-Algorithm and Encryption-Secret for two or more subscribers.- While the publication message is in transit at SWIM nodes level, it is not possible to access/visualize sensitive information because both application data and shared secret are encrypted.- The publication message is delivered to the intended subscribers that successfully decrypt it relying on delivered ENPT AMQP footer.	Success criterion fully covered and successfully validated.	OK

Solution level Technical Validation Objective ID	Solution level Technical Validation Objective Title	Solution level Success Criterion ID	Solution level Success Criterion	Solution level Validation Results	Solution level Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-SEC.0020	End-to-end confidentiality for downlink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-SEC.0079	Following steps are successfully completed:- The publisher creates and publishes an additional AMQP 1.0 annotated publication message for the same subscribers with application-data section containing encrypted data and ENPT AMQP footer containing only the Encryption-Algorithm.- The publication message is delivered to the intended subscribers that successfully decrypt it relying on delivered ENPT AMQP footer and cached eEncryption-Secret from previous messages.	Success criterion fully covered and successfully validated.	OK

Solution level Technical Validation Objective ID	Solution level Technical Validation Objective Title	Solution level Success Criterion ID	Solution level Success Criterion	Solution level Validation Results	Solution level Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-SEC.0020	End-to-end confidentiality for downlink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-SEC.0080	Following steps are successfully completed:- An additional subscriber ("new_sub") successfully subscribes to the topic.- The publisher creates and publishes an additional AMQP 1.0 annotated publication message with application-data section containing encrypted data and ENPT AMQP footer containing the Encryption-Algorithm and only the Encryption-Secret for the new subscriber.- The publication message is delivered to all the subscribers and in particular to the new one that successfully decrypts the message relying on delivered ENPT AMQP footer.- The other subscribers successfully decrypt the message relying on delivered ENPT AMQP footer and cached Encryption-Secret from previous messages.	Success criterion fully covered and successfully validated.	OK

Solution level Technical Validation Objective ID	Solution level Technical Validation Objective Title	Solution level Success Criterion ID	Solution level Success Criterion	Solution level Validation Results	Solution level Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-SEC.0020	End-to-end confidentiality for downlink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-SEC.0081	Following steps are successfully completed:- The publisher creates and publishes an additional AMQP 1.0 annotated publication message with application-data section containing encrypted data and ENPT AMQP footer containing also a new Encryption-Secret.- The publication message is delivered to the intended subscribers that successfully decrypt it relying on delivered ENPT AMQP footer and replacing cached Encryption-Secret.	Success criterion fully covered and successfully validated.	OK
OBJ-17.01-TRL6-TVALP-SEC.0021	End-to-end HMAC based message level integrity and authenticity for uplink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-SEC.0082	Following steps are successfully completed:- The requestor creates and sends an AMQP 1.0 annotated request message with HMAC AMQP footer with value containing HMAC-Algorithm, HMAC-Target, HMAC-Digest and HMAC-Secret for the intender responder.- The request message is delivered to the intended responder that successfully validates the authenticity and integrity of the message relying on delivered HMAC AMQP footer.	Success criterion fully covered and successfully validated.	OK

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OBJ-17.01-TRL6-TVALP-SEC.0021	End-to-end HMAC based message level integrity and authenticity for uplink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-SEC.0083	Following steps are successfully completed: - The responder creates and sends an AMQP 1.0 annotated response message with HMAC AMQP footer with value containing HMAC-Algorithm, HMAC-Target, HMAC-Digest and HMAC-Secret for the requestor.- The response message is delivered to the intended requestor that successfully validates the authenticity and integrity of the message relying on delivered HMAC AMQP footer.	Success criterion fully covered and successfully validated.	OK
OBJ-17.01-TRL6-TVALP-SEC.0021	End-to-end HMAC based message level integrity and authenticity for uplink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-SEC.0084	Following steps are successfully completed:- The requestor creates and sends an additional AMQP 1.0 annotated request message for the same responder with HMAC AMQP footer containing only HMAC-Algorithm, HMAC-Target and HMAC-Digest.- The request message is delivered to the intended responder that successfully validates the authenticity and integrity of the message relying on delivered HMAC AMQP footer and cached HMAC-Secret from previous request messages.	Success criterion fully covered and successfully validated.	OK

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OBJ-17.01-TRL6-TVALP-SEC.0021	End-to-end HMAC based message level integrity and authenticity for uplink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-SEC.0085	Following steps are successfully completed:- The responder creates and sends an additional AMQP 1.0 annotated response message for the same requestor with HMAC AMQP footer containing only HMAC-Algorithm, HMAC-Target and HMAC-Digest.- The response message is delivered to the intended requestor that successfully validates the authenticity and integrity of the message relying on delivered HMAC AMQP footer and cached HMAC-Secret from previous response messages.	Success criterion fully covered and successfully validated.	OK
OBJ-17.01-TRL6-TVALP-SEC.0021	End-to-end HMAC based message level integrity and authenticity for uplink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-SEC.0086	Following steps are successfully completed:- The requestor creates and sends an additional AMQP 1.0 annotated request message for the same responder with HMAC AMQP footer containing HMAC-Algorithm, HMAC-Target, HMAC-Digest and the new shared secret.- The request message is delivered to the intended responder that successfully validates the authenticity and integrity of the message relying on delivered HMAC AMQP footer replacing cached HMAC-Secret.	Success criterion fully covered and successfully validated.	OK

Solution level Technical Validation Objective ID	Solution level Technical Validation Objective Title	Solution level Success Criterion ID	Solution level Success Criterion	Solution level Validation Results	Solution level Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-SEC.0021	End-to-end HMAC based message level integrity and authenticity for uplink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-SEC.0087	Following steps are successfully completed: - The responder creates and sends an AMQP 1.0 annotated response message with HMAC AMQP footer with value containing HMAC-Algorithm, HMAC-Target, HMAC-Digest and HMAC-Secret for the requestor.- While in transit the response message data section is modified.- The response message is delivered to the intended requestor that, relying on delivered HMAC AMQP footer, recognizes that the authenticity and integrity of the message have been violated.- The requestor discards the message and the event is logged in accordance with the applicable audit policy.	Success criterion fully covered and successfully validated.	OK

Solution level Technical Validation Objective ID	Solution level Technical Validation Objective Title	Solution level Success Criterion ID	Solution level Success Criterion	Solution level Validation Results	Solution level Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-SEC.0022	End-to-end HMAC based message level integrity and authenticity for uplink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-SEC.0088	Following steps are successfully completed:- The publisher creates and publishes an AMQP 1.0 annotated publication message with HMAC AMQP footer with value containing HMAC-Algorithm, HMAC-Target, HMAC-Digest and HMAC-Secret for two or more subscribers.- The publication message is delivered to the intended subscribers validate the authenticity and integrity of the message relying on delivered HMAC AMQP footer.	Success criterion fully covered and successfully validated.	OK
OBJ-17.01-TRL6-TVALP-SEC.0022	End-to-end HMAC based message level integrity and authenticity for uplink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-SEC.0089	Following steps are successfully completed:- The publisher creates and publishes an additional AMQP 1.0 annotated publication message for the same subscribers with HMAC AMQP footer containing only HMAC-Algorithm, HMAC-Target and HMAC-Digest.- The publication message is delivered to the intended subscribers that successfully validate the authenticity and integrity of the message relying on delivered HMAC AMQP footer and cached HMAC-Secret from previous messages.	Success criterion fully covered and successfully validated.	OK

Solution level Technical Validation Objective ID	Solution level Technical Validation Objective Title	Solution level Success Criterion ID	Solution level Success Criterion	Solution level Validation Results	Solution level Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-SEC.0022	End-to-end HMAC based message level integrity and authenticity for uplink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-SEC.0090	Following steps are successfully completed:- An additional subscriber ("new_sub") successfully subscribes to the topic.- The publisher creates and publishes an additional AMQP 1.0 annotated publication message with HMAC AMQP footer containing HMAC-Algorithm, HMAC-Target, HMAC-Digest and only the HMAC-Secret for the new subscriber.- The publication message is delivered to all the subscribers and in particular to the new one that successfully validates the authenticity and integrity of the message relying on delivered HMAC AMQP footer.- The other subscribers successfully validate the authenticity and integrity of the message relying on delivered HMAC AMQP footer and cached HMAC-Secret from previous messages.	Success criterion fully covered and successfully validated.	OK

Solution level Technical Validation Objective ID	Solution level Technical Validation Objective Title	Solution level Success Criterion ID	Solution level Success Criterion	Solution level Validation Results	Solution level Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-SEC.0022	End-to-end HMAC based message level integrity and authenticity for uplink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-SEC.0091	Following steps are successfully completed:- The publisher creates and publishes an additional AMQP 1.0 annotated publication message with HMAC AMQP footer containing also the new shared secret.- The publication message is delivered to the intended subscribers that successfully validate the authenticity and integrity of the message relying on delivered HMAC AMQP footer and replacing the cached HMAC-Secret.	Success criterion fully covered and successfully validated.	OK

Solution level Technical Validation Objective ID	Solution level Technical Validation Objective Title	Solution level Success Criterion ID	Solution level Success Criterion	Solution level Validation Results	Solution level Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-SEC.0022	End-to-end HMAC based message level integrity and authenticity for uplink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-SEC.0092	Following steps are successfully completed: -The publisher creates and publishes an additional AMQP 1.0 annotated publication message for the same subscribers with HMAC AMQP footer containing HMAC-Algorithm, HMAC-Target, HMAC-Digest and HMAC-Secret.- While in transit the publication message data section is modified.- The publication message is delivered to the intended subscribers that, relying on delivered HMAC AMQP footer, recognize that the authenticity and integrity of the message have been violated.- The subscribers discards the message and the event is logged in accordance with the applicable audit policy.	Success criterion fully covered and successfully validated.	OK

Solution level Technical Validation Objective ID	Solution level Technical Validation Objective Title	Solution level Success Criterion ID	Solution level Success Criterion	Solution level Validation Results	Solution level Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-SEC.0023	End-to-end HMAC based message level integrity and authenticity for downlink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-SEC.0088	Following steps are successfully completed:- The publisher creates and publishes an AMQP 1.0 annotated publication message with HMAC AMQP footer with value containing HMAC-Algorithm, HMAC-Target, HMAC-Digest and HMAC-Secret for two or more subscribers.- The publication message is delivered to the intended subscribers validate the authenticity and integrity of the message relying on delivered HMAC AMQP footer.	Success criterion fully covered and successfully validated.	OK
OBJ-17.01-TRL6-TVALP-SEC.0023	End-to-end HMAC based message level integrity and authenticity for downlink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-SEC.0089	Following steps are successfully completed:- The publisher creates and publishes an additional AMQP 1.0 annotated publication message for the same subscribers with HMAC AMQP footer containing only HMAC-Algorithm, HMAC-Target and HMAC-Digest.- The publication message is delivered to the intended subscribers that successfully validate the authenticity and integrity of the message relying on delivered HMAC AMQP footer and cached HMAC-Secret from previous messages.	Success criterion fully covered and successfully validated.	OK

Solution level Technical Validation Objective ID	Solution level Technical Validation Objective Title	Solution level Success Criterion ID	Solution level Success Criterion	Solution level Validation Results	Solution level Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-SEC.0023	End-to-end HMAC based message level integrity and authenticity for downlink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-SEC.0090	Following steps are successfully completed:- An additional subscriber ("new_sub") successfully subscribes to the topic.- The publisher creates and publishes an additional AMQP 1.0 annotated publication message with HMAC AMQP footer containing HMAC-Algorithm, HMAC-Target, HMAC-Digest and only the HMAC-Secret for the new subscriber.- The publication message is delivered to all the subscribers and in particular to the new one that successfully validates the authenticity and integrity of the message relying on delivered HMAC AMQP footer.- The other subscribers successfully validate the authenticity and integrity of the message relying on delivered HMAC AMQP footer and cached HMAC-Secret from previous messages.	Success criterion fully covered and successfully validated.	OK

Solution level Technical Validation Objective ID	Solution level Technical Validation Objective Title	Solution level Success Criterion ID	Solution level Success Criterion	Solution level Validation Results	Solution level Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-SEC.0023	End-to-end HMAC based message level integrity and authenticity for downlink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-SEC.0091	Following steps are successfully completed:- The publisher creates and publishes an additional AMQP 1.0 annotated publication message with HMAC AMQP footer containing also the new shared secret.- The publication message is delivered to the intended subscribers that successfully validate the authenticity and integrity of the message relying on delivered HMAC AMQP footer and replacing the cached HMAC-Secret.	Success criterion fully covered and successfully validated.	OK

Solution level Technical Validation Objective ID	Solution level Technical Validation Objective Title	Solution level Success Criterion ID	Solution level Success Criterion	Solution level Validation Results	Solution level Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-SEC.0023	End-to-end HMAC based message level integrity and authenticity for downlink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-SEC.0092	Following steps are successfully completed: -The publisher creates and publishes an additional AMQP 1.0 annotated publication message for the same subscribers with HMAC AMQP footer containing HMAC-Algorithm, HMAC-Target, HMAC-Digest and HMAC-Secret.- While in transit the publication message data section is modified.- The publication message is delivered to the intended subscribers that, relying on delivered HMAC AMQP footer, recognize that the authenticity and integrity of the message have been violated.- The subscribers discards the message and the event is logged in accordance with the applicable audit policy.	Success criterion fully covered and successfully validated.	OK

Solution level Technical Validation Objective ID	Solution level Technical Validation Objective Title	Solution level Success Criterion ID	Solution level Success Criterion	Solution level Validation Results	Solution level Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-SEC.0024	End-to-end digital signature based message level integrity and authenticity for uplink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-SEC.0093	Following steps are successfully completed:- The requestor creates and sends an AMQP 1.0 annotated request message with DSGN AMQP footer with value containing DSGN-Algorithm, DSGN-Target and DSGN-Signature.- The request message is delivered to the intended responder that successfully validates the authenticity and integrity of the message relying on delivered DSGN AMQP footer.	Success criterion fully covered and successfully validated.	OK
OBJ-17.01-TRL6-TVALP-SEC.0024	End-to-end digital signature based message level integrity and authenticity for uplink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-SEC.0094	Following steps are successfully completed: - The responder creates and sends an AMQP 1.0 annotated response message with DSGN AMQP footer with value containing DSGN-Algorithm, DSGN-Target and DSGN-Signature.- The response message is delivered to the intended requestor that successfully validates the authenticity and integrity of the message relying on delivered DSGN AMQP footer.	Success criterion fully covered and successfully validated.	OK

Solution level Technical Validation Objective ID	Solution level Technical Validation Objective Title	Solution level Success Criterion ID	Solution level Success Criterion	Solution level Validation Results	Solution level Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-SEC.0024	End-to-end digital signature based message level integrity and authenticity for uplink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-SEC.0095	Following steps are successfully completed: - The responder creates and sends an AMQP 1.0 annotated response message with DSGN AMQP footer with value containing DSGN-Algorithm, DSGN-Target and DSGN-Signature.- While in transit the response message data section is modified.- The response message is delivered to the intended requestor that, relying on delivered DSGN AMQP footer, recognizes that the authenticity and integrity of the message have been violated.- The requestor discards the message and the event is logged in accordance with the applicable audit policy.	Success criterion fully covered and successfully validated.	OK

Solution level Technical Validation Objective ID	Solution level Technical Validation Objective Title	Solution level Success Criterion ID	Solution level Success Criterion	Solution level Validation Results	Solution level Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-SEC.0025	End-to-end digital signature based message level integrity and authenticity for uplink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-SEC.0096	Following steps are successfully completed:- The publisher creates and publishes an AMQP 1.0 annotated publication message with DSGN AMQP footer with value containing DSGN-Algorithm, DSGN-Target and DSGN-Signature.- The publication message is delivered to the intended subscribers that successfully validate the authenticity and integrity of the message relying on delivered DSGN AMQP footer.	Success criterion fully covered and successfully validated.	OK

Solution level Technical Validation Objective ID	Solution level Technical Validation Objective Title	Solution level Success Criterion ID	Solution level Success Criterion	Solution level Validation Results	Solution level Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-SEC.0025	End-to-end digital signature based message level integrity and authenticity for uplink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-SEC.0097	Following steps are successfully completed: - The publisher creates and publishes an AMQP 1.0 annotated publication message with DSGN AMQP footer with value containing DSGN-Algorithm, DSGN-Target and DSGN-Signature.- While in transit the publication message data section is modified.- The publication message is delivered to the intended subscribers that, relying on delivered DSGN AMQP footer, recognize that the authenticity and integrity of the message have been violated.- The subscribers discard the message and the event is logged in accordance with the applicable audit policy.	Success criterion fully covered and successfully validated.	OK

Solution level Technical Validation Objective ID	Solution level Technical Validation Objective Title	Solution level Success Criterion ID	Solution level Success Criterion	Solution level Validation Results	Solution level Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-SEC.0026	End-to-end digital signature based message level integrity and authenticity for downlink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-SEC.0096	Following steps are successfully completed:- The publisher creates and publishes an AMQP 1.0 annotated publication message with DSGN AMQP footer with value containing DSGN-Algorithm, DSGN-Target and DSGN-Signature.- The publication message is delivered to the intended subscribers that successfully validate the authenticity and integrity of the message relying on delivered DSGN AMQP footer.	Success criterion fully covered and successfully validated.	OK

Solution level Technical Validation Objective ID	Solution level Technical Validation Objective Title	Solution level Success Criterion ID	Solution level Success Criterion	Solution level Validation Results	Solution level Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-SEC.0026	End-to-end digital signature based message level integrity and authenticity for downlink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-SEC.0097	Following steps are successfully completed: - The publisher creates and publishes an AMQP 1.0 annotated publication message with DSGN AMQP footer with value containing DSGN-Algorithm, DSGN-Target and DSGN-Signature.- While in transit the publication message data section is modified.- The publication message is delivered to the intended subscribers that, relying on delivered DSGN AMQP footer, recognize that the authenticity and integrity of the message have been violated.- The subscribers discard the message and the event is logged in accordance with the applicable audit policy.	Success criterion fully covered and successfully validated.	OK

Table 11: Summary of Technical Validation Exercises Results

4.2 Detailed analysis of SESAR Technological Solution Validation Results per Validation objective

This section provides solution level analysis of the validation results per validation objective group. It has to be noted that EXEs' partial or not coverage per validation objective does not necessary represent deviation with respect to the TVALP. All the deviations are reported in §3.3.2.

The solution level analysis consists of the consolidation of the analysis reported by EXE1 (§A.3.4), EXE2 (§B.3.4), EXE3 (§C.3.4) and EXE4 (§D.3.4).

Reported validation objectives status has been evaluated taking into account:

- Success criterion and,
- Traced requirements coverage and,
- Impact of partially or not coverage of traced requirements and,
- EXEs' feedback on traced requirements and finally,
- Confidence level in the validation results reported by the EXEs and summarized in §4.3.

Furthermore also a summary of the validation of Purple Profile Parts (TRL6 TS §B.3.8 [40]) is provided.

4.2.1 Performance efficiency characteristic Technical Validation Objectives

Performance efficiency characteristic validation objectives and requirements can be grouped as follows:

- Time behaviour (end to end message latency): technical validation objectives from OBJ-17.01-TRL6-TVALP-PERF.0009 to OBJ-17.01-TRL6-TVALP-PERF.0024 (**all partially covered with NOK validation status**).
- Ordering delivery guarantees (FIFO, message priority): technical validation objectives OBJ-17.01-TRL6-TVALP-PERF.0001, OBJ-17.01-TRL6-TVALP-PERF.0002, OBJ-17.01-TRL6-TVALP-PERF.0003, OBJ-17.01-TRL6-TVALP-PERF.0004, OBJ-17.01-TRL6-TVALP-PERF.0005, OBJ-17.01-TRL6-TVALP-PERF.0006, OBJ-17.01-TRL6-TVALP-PERF.0007 and OBJ-17.01-TRL6-TVALP-PERF.0008 (**all fully covered with OK validation status**).
- On-the-fly compression: technical validation objectives OBJ-17.01-TRL6-TVALP-PERF.0025 and OBJ-17.01-TRL6-TVALP-PERF.0026 (**all fully covered with OK validation status**).

The reported results analysis consists of the consolidation of the analysis reported by EXE1 (§A.3.4.1), EXE2 (§B.3.4.1), EXE3 (§C.3.4.1) and EXE4 (§D.3.4.1).

Time behaviour (end to end message latency)

During prototyping phase, it was recognized that the load characterization in the TS §4.3.4.3 [40] was not complete. In order to provide EXEs with complete and correct load characterization allowing

proper evaluation of time behaviour validation objectives, the updated load characterization in the tables below was defined.

Characteristic	Value
Deployment	"Single" Ground SWIM Node deployment
Maximum number of Air SWIM Nodes connected to the Ground SWIM Node.	1000
Air SWIM Nodes consuming/providing in-flight services	500
Air SWIM Nodes consuming/providing on-the-ground services	500
Maximum number of concurrent connection per Air SWIM Node	4
Air SWIM Node – Ground SWIM Node consolidated maximum concurrent connections	4000
# Of messages per service	10
Average uplink FDRR request messages rate (messages/h) for a given service	5
Average uplink publication messages rate (messages/h) for a given service	5
Consolidated uplink inflight message rate with one service for each PP CoS for each MEPs (messages/h) for all the services	30
Total end to end uplink inflight message rate (messages/h)	15000
Consolidated uplink on-the-ground message rate with one service for each PP CoS for each MEPs (messages/h) for all the services	30
Total end to end uplink on-the-ground message rate (messages/h)	15000
Average downlink FDRR request messages rate (messages/h) for a given service	5
Average downlink publication messages rate (messages/h) for a given service	5
Consolidated downlink inflight message rate with one service for each PP CoS for each MEPs (messages/h) for all the services	30
Total end to end downlink inflight message rate (messages/h)	15000
Consolidated downlink on-the-ground message rate with one service for each PP CoS for each MEPs (messages/h) for all the services	30
Total end to end downlink on-the-ground message rate (messages/h)	15000
Total consolidated uplink and downlink end to end message rate (messages/h)	60000
Observation period (h)	2

Total consolidated uplink and downlink end to end # messages in the observation period	120000

Table 12: Updated load characterization for time behaviour requirements/validation objectives

The load characterization is based on the class of service distribution described in the table below. Some figures are calculated taking into account characteristics from the load characterization (e.g. # Of messages per service, Air SWIM Nodes consuming/providing in-flight services, etc.).

Purple Profile enabled service and CoS	Air messaging entities	Ground messaging entities	# of Messages	Message entity	Total # of messages
1 Uplink FDRR service of CoS "Category A"	500 in-flight requestors	1 ground responder (at least)	10	request/response	10000
1 Uplink PSMEP service of CoS "Category A"	500 in-flight subscribers	1 ground publisher (at least)	10	publications	5000
1 Uplink FDRR service of CoS "Category B"	500 in-flight requestors	1 ground responder (at least)	10	request/response	10000
1 Uplink PSMEP service of CoS "Category B"	500 in-flight subscribers	1 ground publisher (at least)	10	publications	5000
1 Uplink FDRR service of CoS "Category C"	500 on-the-ground requestors	1 ground responder (at least)	10	request/response	10000
1 Uplink PSMEP service of CoS "Category C"	500 on-the-ground subscribers	1 ground publisher (at least)	10	publications	5000
1 Uplink FDRR service of CoS "Category D"	500 on-the-ground requestors	1 ground responder (at least)	10	request/response	10000
1 Uplink PSMEP service of CoS "Category D"	500 on-the-ground subscribers	1 ground publisher (at least)	10	publications	5000
1 Downlink FDRR service of CoS "Category A"	500 in-flight responders	1 ground requestor (at least)	10	request/response	10000
1 Downlink PSMEP service of CoS "Category A"	500 in-flight publishers	1 ground subscriber (at least)	10	publications	5000

1 Downlink FDRR service of CoS "Category B"	500 in-flight responders	1 ground requestor (at least)	10	request/response	10000
1 Downlink PSMEP service of CoS "Category B"	500 in-flight publishers	1 ground subscriber (at least)	10	publications	5000
1 Downlink FDRR service of CoS "Category C"	500 on-the-ground responders	1 ground requestor (at least)	10	request/response	10000
1 Downlink PSMEP service of CoS "Category C"	500 on-the-ground publishers	1 ground subscriber (at least)	10	publications	5000
1 Downlink FDRR service of CoS "Category D"	500 on-the-ground responders	1 ground requestor (at least)	10	request/response	10000
1 Downlink PSMEP service of CoS "Category D"	500 on-the-ground publishers	1 ground subscriber (at least)	10	publications	5000

Table 13: Updated load characterization and Class of Services

In the TVALP partial coverage was declared for EXE1, EXE2 and EXE3 mainly because hardware and software limitations of the V&VP (difficulties in deploying 1000 A/C instances, as required by the consolidated load, each with minimum Purple Profile enabled applications and Air SWIM Node capabilities). However, as stated in the TAVLP, EXEs may execute the tests with less “aircraft” analysing then the results with a linear extrapolation increasing the number of aircraft.

Only EXE2 (B.3.4.1) and EXE3 (C.3.4.1) performed these tests all with NOK status because, for all these objectives, the results would not met the required end to end latency (validation objective). Furthermore the figures (measure for 95% of the messages) concerning the validation objectives tracing the requirements REQ-17.01-TS-0230.0025 and REQ-17.01-TS-0230.0030 (OBJ-17.01-TRL6-TVALP-PERF.0013, OBJ-17.01-TRL6-TVALP-PERF.0014, OBJ-17.01-TRL6-TVALP-PERF.0015, OBJ-17.01-TRL6-TVALP-PERF.0016, OBJ-17.01-TRL6-TVALP-PERF.0021, OBJ-17.01-TRL6-TVALP-PERF.0022, OBJ-17.01-TRL6-TVALP-PERF.0023 and OBJ-17.01-TRL6-TVALP-PERF.0024) are not feasible: theoretical latency for a message of 20MB with a network speed/bandwidth of 2Mbps (no congestions) is 80s.

However, the key capability concerning the composition of Purple Profile level and network level class of services was designed, implemented and successfully validated by EXE1 and EXE2.

Ordering delivery guarantees (FIFO, message priority)

End to end FIFO message queue level ordering guarantees QoS for uplink, downlink, request/response and publish/subscribe Purple Profile enabled SWIM services has been successfully validated.

End to end message priority ordering guarantees for downlink and uplink, request/response and publish/subscribe Purple Profile enabled SWIM services has been successfully validated.

Furthermore, some EXEs validated also the composition of class of services at SWIM Node level and class of services at network level (both IPv4 and IPv6). In particular this has been successfully validated integrating also PJ.14-02-04 multilink A/G network prototypes.

On-the-fly compression

On-the-fly Purple Profile capability has been successfully validated for both uplink and downlink Purple Profile enabled SWIM services. It has been demonstrated that it reduces the A/G network bandwidth consumption and it is transparent to Purple Profile enabled application.

4.2.2 Reliability efficiency characteristic Technical Validation Objectives

Reliability efficiency characteristic validation objectives, success criteria and requirements concerns end to end delivery guarantees. All the related validation objectives (OBJ-17.01-TRL6-TVALP-REL.0001, OBJ-17.01-TRL6-TVALP-REL.0002, OBJ-17.01-TRL6-TVALP-REL.0003, OBJ-17.01-TRL6-TVALP-REL.0004, OBJ-17.01-TRL6-TVALP-REL.0005, OBJ-17.01-TRL6-TVALP-REL.0006, OBJ-17.01-TRL6-TVALP-REL.0007 and OBJ-17.01-TRL6-TVALP-REL.0008) and success criteria have been **fully covered with OK validation status**.

The reported results analysis consists of the consolidation of the analysis reported by EXE1 (§A.3.4.2), EXE2 (§B.3.4.2), EXE3 (§C.3.4.2) and EXE4 (§D.3.4.2).

End-to-end at-most-once (message loss), at-least-Once (message duplication), and exactly-once (message duplicates detection) delivery guarantees QoSs for both uplink and downlink request/response and publish/subscribe Purple Profile enabled SWIM services have been successfully validated when (in accordance with the success criteria):

- transient connection establishment failure event occurs.
- abnormal disconnection event due to transient network error occurs.
- abnormal disconnection event due to ground peer restart occurs.

These events have been injected:

- at Purple Profile enabled application - (Air or Ground) SWIM Node connection level.
- at Air SWIM Node – Ground SWIM Node(s) connection level.
- at both of the above.

The delivery guarantees have been implemented relying on reconnection, retry/redelivery and message duplication detection (end to end) capabilities.

Almost all the EXEs implemented and validated logging and tracing of message not delivered event.

Finally, the delivery guarantees QoSs have been successfully validated also in deployment scenarios involving PJ.14-02-04 multilink A/G network prototypes.

4.2.3 Security characteristic Technical Validation Objectives

Security characteristic validation objectives and requirements can be grouped as follows:

- Message screening security controls: technical validation objectives OBJ-17.01-TRL6-TVALP-SEC.0001, OBJ-17.01-TRL6-TVALP-SEC.0002, OBJ-17.01-TRL6-TVALP-SEC.0003 and OBJ-17.01-TRL6-TVALP-SEC.0004 (**all objectives and success criteria fully covered, all the success criteria with OK validation status**).

- Overload protection security controls: technical validation objectives OBJ-17.01-TRL6-TVALP-SEC.0005, OBJ-17.01-TRL6-TVALP-SEC.0006, OBJ-17.01-TRL6-TVALP-SEC.0007, OBJ-17.01-TRL6-TVALP-SEC.0008, OBJ-17.01-TRL6-TVALP-SEC.0009, OBJ-17.01-TRL6-TVALP-SEC.0010 (**all objectives and success criteria fully covered, almost all the success criteria with OK validation status, only CRT-17.01-TRL6-TVALP-SEC.0017 has been validated with NOK status**).

- Point to point mutual authentication and certificate revocation status check security controls: technical validation objectives OBJ-17.01-TRL6-TVALP-SEC.0011, OBJ-17.01-TRL6-TVALP-SEC.0012, OBJ-17.01-TRL6-TVALP-SEC.0013, OBJ-17.01-TRL6-TVALP-SEC.0014 (**all objectives and success criteria fully covered, all the success criteria with OK validation status**).

- Point to point authorization security controls: technical validation objectives OBJ-17.01-TRL6-TVALP-SEC.0015, OBJ-17.01-TRL6-TVALP-SEC.0016, and OBJ-17.01-TRL6-TVALP-SEC.0017 (**all objectives and success criteria fully covered, all the success criteria with OK validation status**).

- End to end integrity, authenticity and encryption: technical validation objectives OBJ-17.01-TRL6-TVALP-SEC.0018, OBJ-17.01-TRL6-TVALP-SEC.0019, OBJ-17.01-TRL6-TVALP-SEC.0020, OBJ-17.01-TRL6-TVALP-SEC.0021, OBJ-17.01-TRL6-TVALP-SEC.0022, OBJ-17.01-TRL6-TVALP-SEC.0023, OBJ-17.01-TRL6-TVALP-SEC.0024, OBJ-17.01-TRL6-TVALP-SEC.0025, OBJ-17.01-TRL6-TVALP-SEC.0026 (**all objectives and success criteria fully covered, all the success criteria with OK validation status**).

The reported results analysis consists of the consolidation of the analysis reported by EXE1 (§A.3.4.3), EXE2 (§B.3.4.3), EXE3 (§C.3.4.3) and EXE4 (§D.3.4.3).

Message screening

Message screening success criteria and requirements have been successfully implemented and validated.

It has been also reported that message screening implementations are configurable per SWIM service (i.e. messaging resources allocated to that service) and enforced on the messaging resource side used by requestor/publisher/responder/sender messaging entities (producers of the messages). Some EXEs implemented also policy based approach allowing both off-line and runt-time message screening policies update.

For almost all the EXEs, some success criteria have partially ok validation result status because, although logging and reporting (monitoring capabilities) of events concerning the message screening policies enforcement have been successfully validated, only really basic audit solutions have been implemented.

Overload protection

Overload protection success criteria and requirements have been successfully implemented and validated.

It has been also reported that overload protection implementations are configurable per SWIM service (i.e. messaging resources allocated to that service) and enforced on the messaging resource side used by requestor/publisher/responder/sender messaging entities (producers of the messages).

As part of overall SWIM Node logging and monitoring (highly configurable in terms of what has to be monitored, reported, etc.), also events concerning overload protection policies enforcement can be logged and/or reported.

For almost all the EXEs, some success criteria have partially ok validation result status because, although logging and reporting (monitoring capabilities) of events concerning the overload protection policies enforcement have been successfully validated, only really basic audit solutions have been implemented.

One success criteria has NOK validation result status because message screening policies can be only configured off-line (current EXE1 implementation does not allow to update overload protection policy at run-time without restarting the SWIM Node).

Point to point mutual authentication and certificate revocation status check

Amqps peers (i.e. AMQP 1.0 over TLS in the amqps form) mutual authentication and certificate revocation status check success criteria and requirements have been successfully validated at both application - SWIM Node and Air SWIM Node - Ground SWIM Node connection levels.

The authentication policy allows:

- to accept potentially revoked or compromised certificate only if the OCSP is not reachable over the network.
- to do not accept potentially revoked or compromised certificate only if the OCSP is not reachable over the network.

Some success criteria have partially ok validation result status because, although logging and reporting (monitoring capabilities) of authentication events concerning have been successfully validated, only really basic audit solutions have been implemented.

Point to point authorization

Air and Ground SWIM Node side authorization success criteria and requirements have been successfully validated.

Authorization policies configurability (via administrative interface) and enforcement have been successfully validated: policies can be configured offline but also at runtime (e.g. adding a new authorized entity) without restarting the SWIM Node.

Few success criteria have partially ok validation result status because, although logging and reporting (monitoring capabilities) of events concerning the authorisation policies enforcement have been successfully validated, only really basic audit solutions have been implemented.

End to end integrity, authenticity and encryption

End to end message level security mechanism (detached from the data) success criteria and requirements have been successfully validated. In end to end integrity and authenticity (both HMAC and digital signature) and confidentially have been validated for uplink, downlink, request/response and publish/subscribe Purple Profile enabled services. In accordance with the TS, end-to-end digital signature based message level integrity and authenticity success criteria have been validated also for subscription management FDRR-MEP.

While designing and implementing the solution few some must to have improvements concerning the TS have been identified by EXE1. Furthermore, EXE2 and EXE3 reported difficulties in using the AMQP footer because limitations of used OTS/libraries.

4.2.4 Analysis per Profile Parts

This section provides a summary of the validation results from the Purple Profile Parts (TRL6 TS §B.3.8 [40]) point of view. The analysis is the consolidation of requirements coverage reported by the EXEs. For completeness, the solution level and per-EXE requirements coverage is provided in the Appendix J.

In Figure 1 the number of requirements per-profile part is provided.

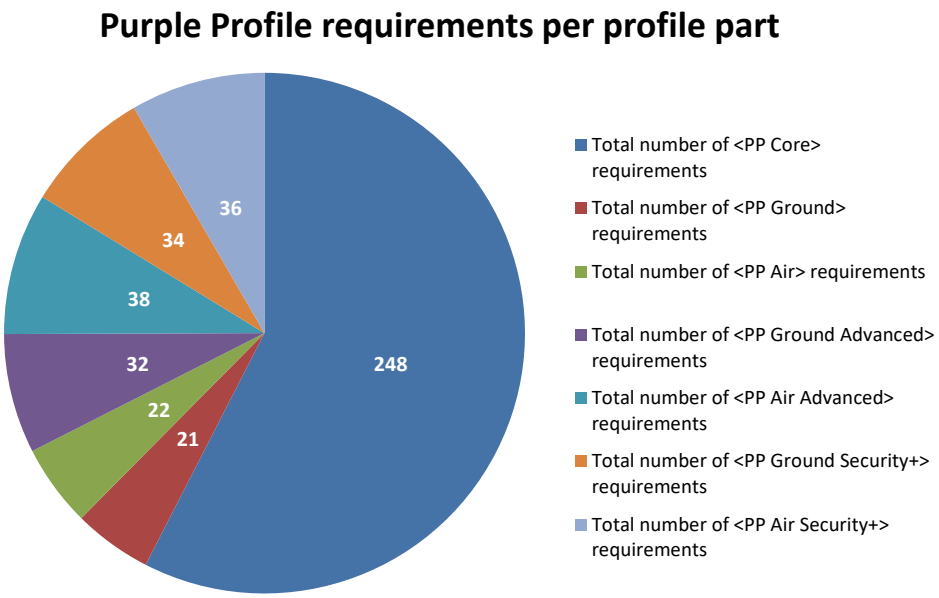


Figure 1: Per-profile parts requirements and solution level coverage summary

In Figure 2 the overall solution level requirements coverage is provided. The labels in the pie chart, provides both the number of requirements and the percentage respect the total number of requirements (e.g. 315; 88%).

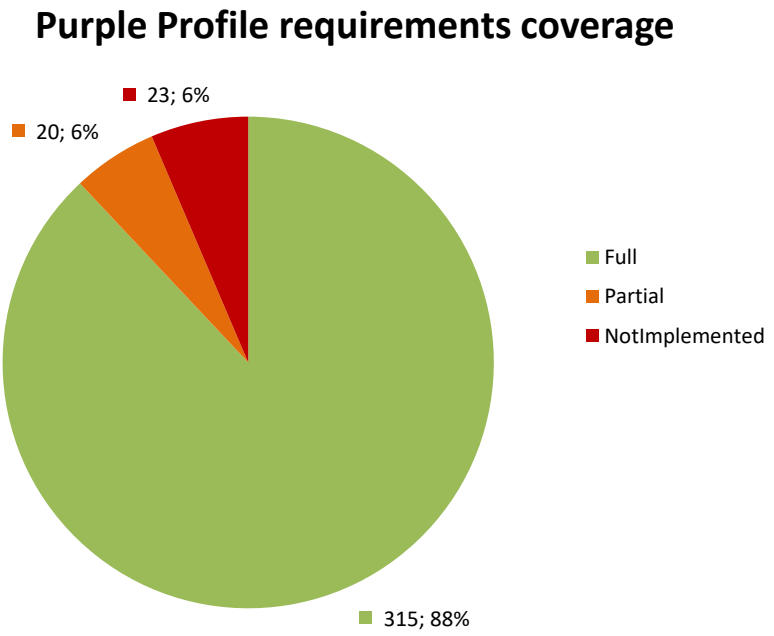


Figure 2: Overall solution level coverage summary

On top of 358 requirements:

- The 88% of requirements (315) has been fully covered at solution level (i.e. at least one EXE fully covered the requirements without reporting major feedback).
- The 6% of requirements (20) has been partially covered at solution level (i.e. there is no EXE fully covering the requirements but at least one EXE partially covered them).
- The 6% of requirements (23) has not been implemented.

Taking into account the above and feedback reported in the requirements coverage (Appendix J), the solution achieved very good results from prototyping and validation activities point of view. Although the TS will be improved accordingly, the feedback reported by EXEs and consolidated at solution level (Appendix J) are not evaluated as major impact on the TS.

Most of the partially or not covered requirements concern advanced (optional) profile parts and in particular “security +” and continuity/availability requirements. The main reason of this coverage is that concerned requirements can be only refined and validated in a more complete and realistic deployment (SWIM services, real platform, etc.). Similar considerations apply to time behaviour requirements that have been defined by this solution (bottom-up) as a sort of initial analysis of aspects to be further refined when covering SWIM service level performance requirements.

In Figure 3 the requirements coverage per mandatory profile parts is provided. The figures are in line with the overall analysis at solution level provided above. The labels in the pie chart, provides both the number of requirements and the percentage respect the total number of requirements.

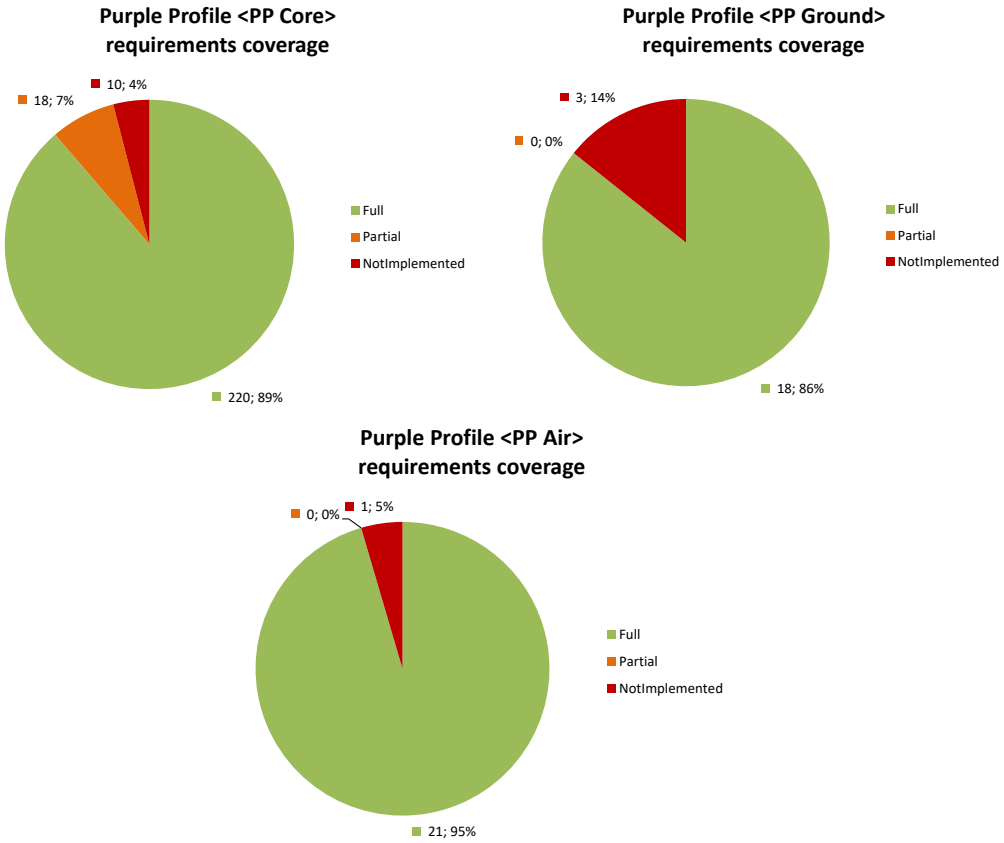


Figure 3: Mandatory profile parts solution level requirements coverage summary

In Figure 4 the requirements coverage per optional profile parts is provided. Also in this case, at solution level the archived coverage and results are satisfactory. The labels in the pie chart, provides both the number of requirements and the percentage respect the total number of requirements.

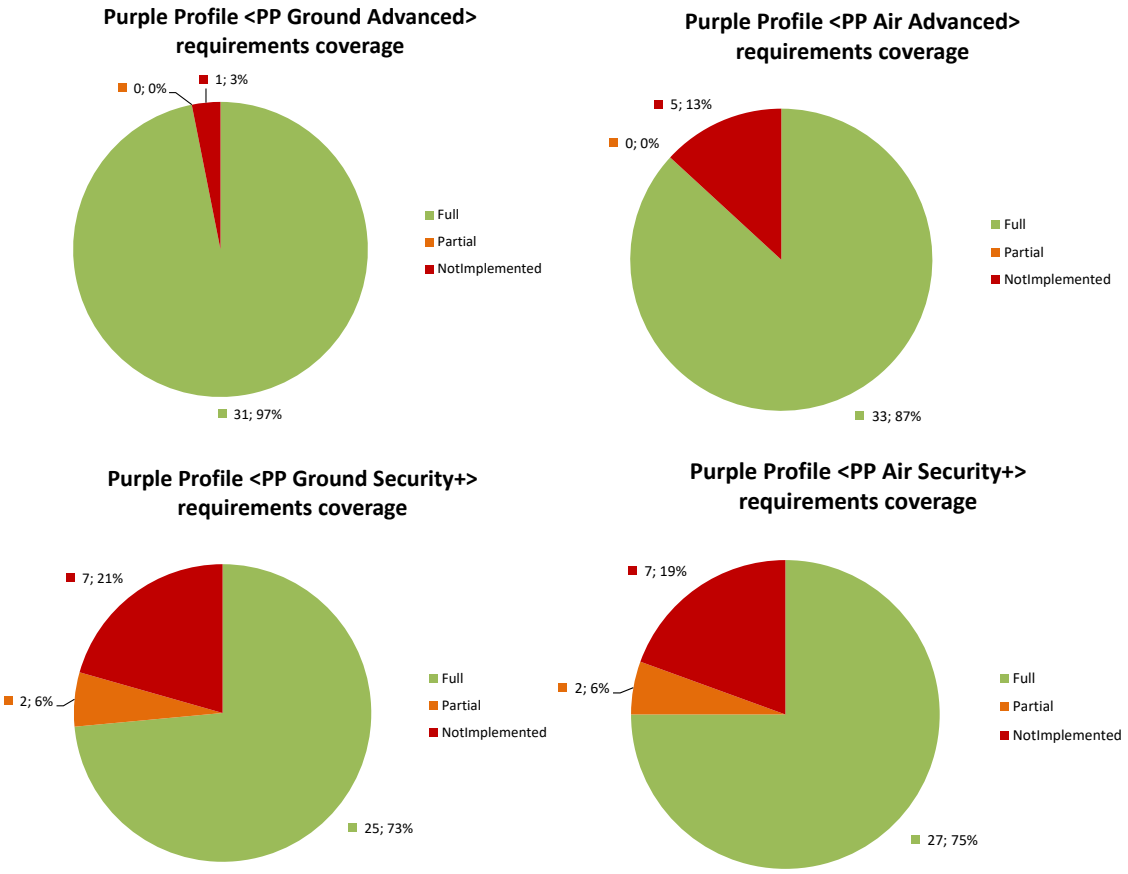


Figure 4: Optional profile parts solution level requirements coverage summary

For completeness, in the remaining part of this section, the same results analysis is reported for each EXE. For further details refer to EXEs appendixes and requirements coverage in Appendix J.

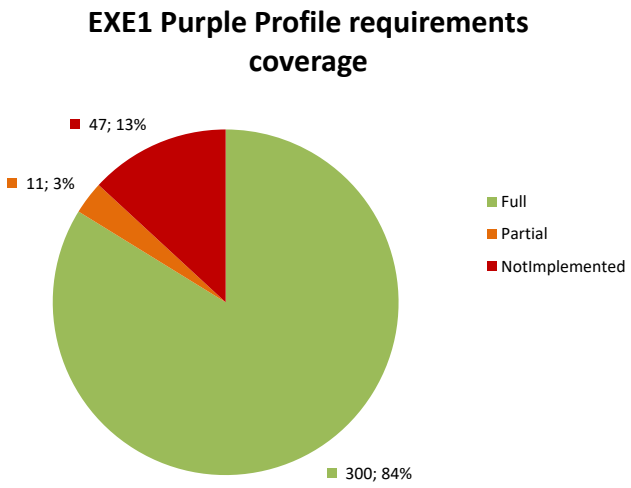


Figure 5: EXE1 requirements coverage summary

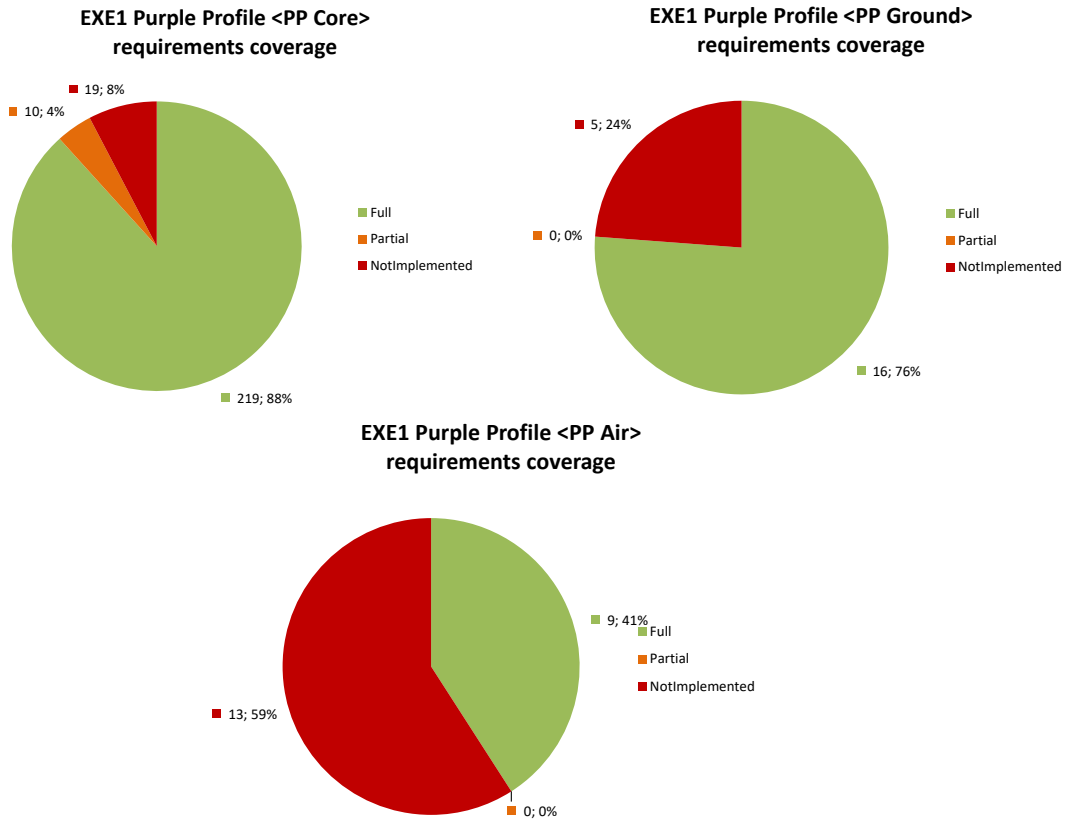


Figure 6: Mandatory profile parts EXE1 requirements coverage summary

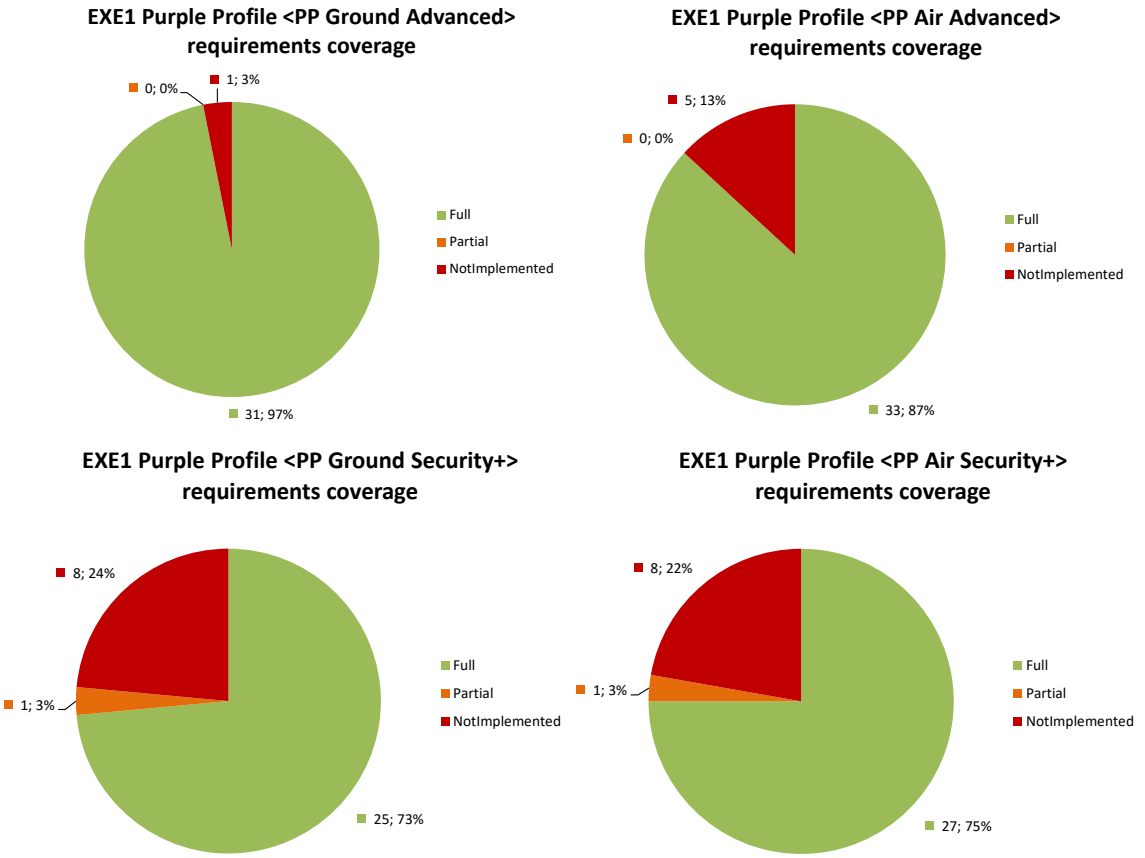


Figure 7: Optional profile parts EXE1 requirements coverage summary

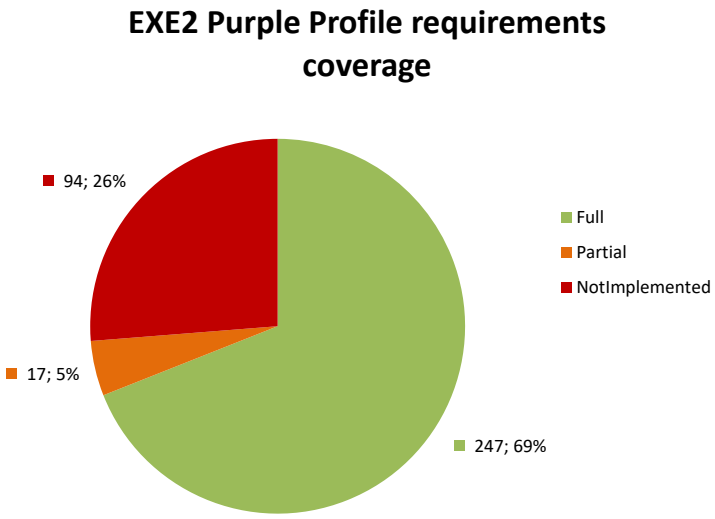


Figure 8: EXE2 requirements coverage summary

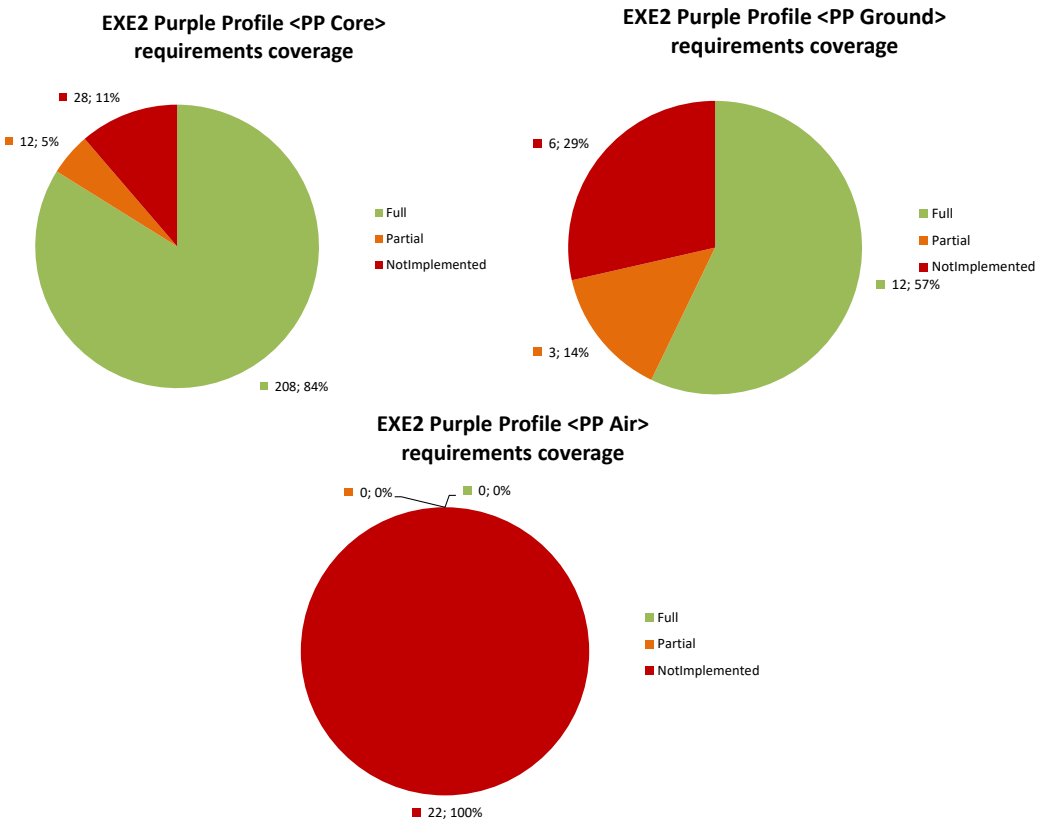


Figure 9: Mandatory profile parts EXE2 requirements coverage summary

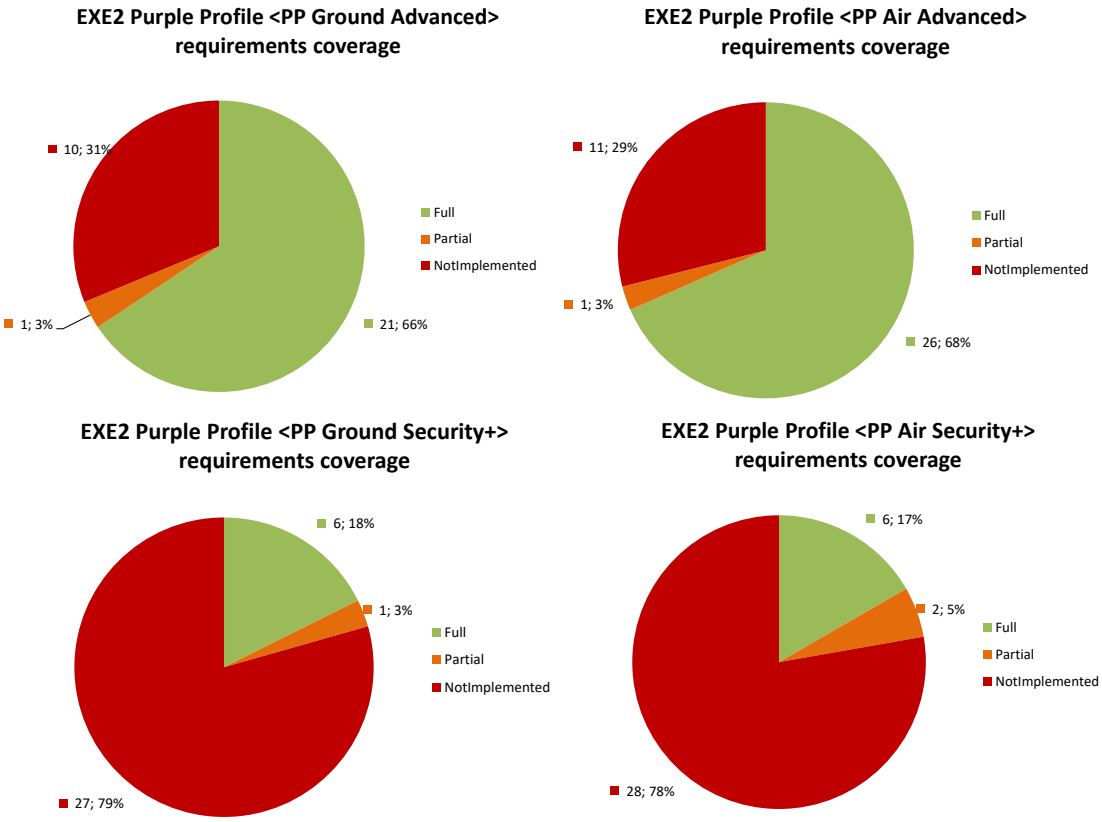


Figure 10: Optional profile parts EXE2 requirements coverage summary

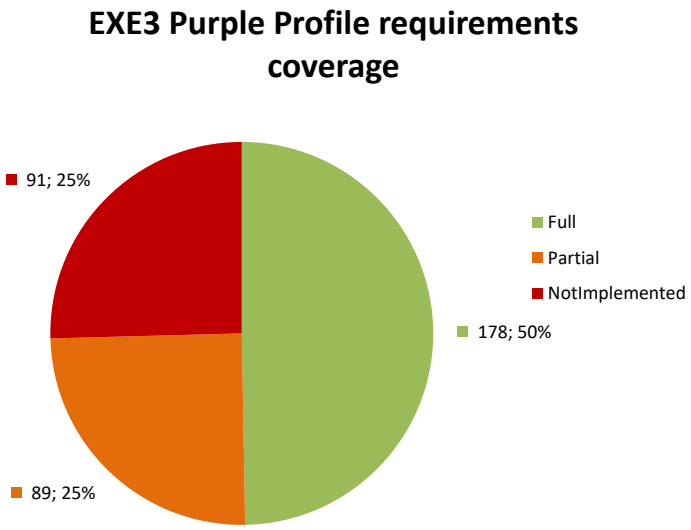


Figure 11: EXE3 requirements coverage summary

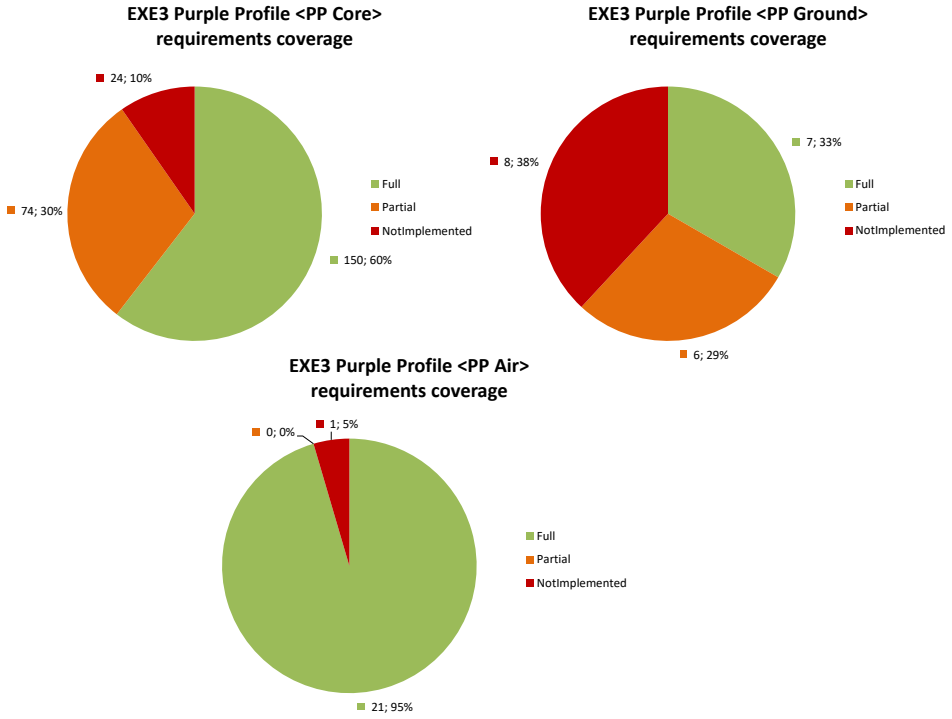


Figure 12: Mandatory profile parts EXE3 requirements coverage summary

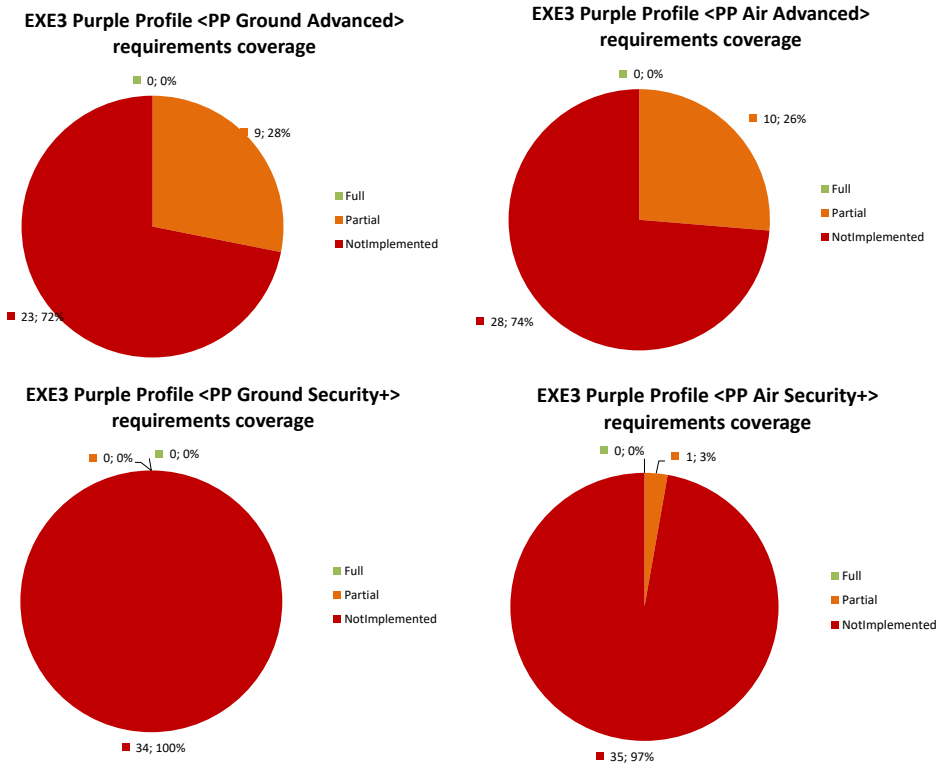


Figure 13: Optional profile parts EXE3 requirements coverage summary

4.3 Confidence in the Validation Results

4.3.1 Limitations of Technical Validation Results

Table 14 provides a summary of the validation results per validation objectives group. This table complements what provided in §4.2. For each group, the reported validation results and confidence level (this should not be confused with objective status reported in Table 11~~Table 11~~) have been consolidated at solution level starting from EXE1, EXE2, EXE3 and EXE4 validation results. Following confidence levels have been defined:

- HIGH: the solution is very confident in the reported results.
- MEDIUM: the solution has doubts about the reported validation results. Typically these doubts have to be clarified involving other solutions or/and via further design, specification or/and validation activities.
- LOW: the solution in not confident in the reported results. There are major issues/limitations/open points to be further investigated. As for MEDIUM level, the way forward may require further coordination or/and technical activities (TS and/or prototypes).

Technical Validation Objectives Group	Technical Validation Objectives sub-group	Technical Validation Objectives	Validation results	Confidence level in the Validation Results
Performance efficiency characteristic	Time behaviour	OBJ-17.01-TRL6-TVALP-PERF.0009 to OBJ-17.01-TRL6-TVALP-PERF.0024	All partially covered with NOK validation status.	MEDIUM (top-down time behaviour requirements and deployment analysis are needed).
	Ordering delivery guarantees	OBJ-17.01-TRL6-TVALP-PERF.0001 to OBJ-17.01-TRL6-TVALP-PERF.0008	All fully covered with OK validation status.	HIGH
	On-the-fly compression	OBJ-17.01-TRL6-TVALP-PERF.0025 and OBJ-17.01-TRL6-TVALP-PERF.0026	All fully covered with OK validation status.	HIGH
Reliability efficiency characteristic	-	OBJ-17.01-TRL6-TVALP-REL.0001 to OBJ-17.01-TRL6-TVALP-REL.0008	All fully covered with OK validation status.	HIGH
Security characteristic	Message screening	OBJ-17.01-TRL6-TVALP-SEC.0001 to OBJ-17.01-TRL6-TVALP-SEC.0004	All objectives and success criteria fully covered, all the success criteria with OK validation status.	HIGH
	Overload protection	OBJ-17.01-TRL6-TVALP-SEC.0005 to OBJ-17.01-TRL6-TVALP-SEC.0010	All objectives and success criteria fully covered, almost all the success criteria with OK validation status, only CRT-17.01-TRL6-TVALP-SEC.0017 has been validated with NOK status.	HIGH
	Point to point mutual authentication	OBJ-17.01-TRL6-TVALP-SEC.0011 to OBJ-17.01-TRL6-TVALP-SEC.0014	All objectives and success criteria fully covered, all the success criteria with OK validation status.	HIGH

Technical Validation Objectives Group	Technical Validation Objectives sub-group	Technical Validation Objectives	Validation results	Confidence level in the Validation Results
	Certificate revocation status check	OBJ-17.01-TRL6-TVALP-SEC.0011 to OBJ-17.01-TRL6-TVALP-SEC.0014	All objectives and success criteria fully covered, all the success criteria with OK validation status.	MEDIUM (certificate revocation status check requirements should be refined and validated taking into account the actual security policies and Identity Management solutions that will be put in place for "SWIM".
	Point to point authorization	OBJ-17.01-TRL6-TVALP-SEC.0015, OBJ-17.01-TRL6-TVALP-SEC.0016, and OBJ-17.01-TRL6-TVALP-SEC.0017	All objectives and success criteria fully covered, all the success criteria with OK validation status.	HIGH
	End to end integrity, authenticity and encryption	OBJ-17.01-TRL6-TVALP-SEC.0018 to OBJ-17.01-TRL6-TVALP-SEC.0026	All objectives and success criteria fully covered, all the success criteria with OK validation status.	HIGH

Table 14: Summary of Technical Validation Exercises Results Per Validation Objectives group

In the sections below the overall quality and significance of the validation results are further elaborated.

4.3.2 Quality of Technical Validation Exercises Results

All the EXEs reported very valuable and accurate results especially in terms of technical feasibility and developed scenarios.

4.3.3 Significance of Technical Validation Exercises Results

From a technical point of view, the significance of results is relevant because the main objective has been achieved: validate the technical feasibility of the SWIM-TI Purple Profile for A/G advisory information sharing. In particular, the reported results are valuable from different perspectives:

- Technical validation objectives coverage.

- Requirements coverage.
- Network: some EXEs have been executed on a V&VI composed by distributed IBPs around the Europe (WAN). Furthermore, also the integration with P14.02 prototypes (FCI) have been validated.
- Operational oriented scenarios: technical use cases have been instantiated over operational oriented scenarios (also in this case not complete with respect to real-life deployment).
- Purple Profile Enabled SWIM Service: although it was not the primary objective of this solution and some of them should not be considered representative of real-life services, EXEs used also Purple Profile enabled SWIM services. EXEs covered both uplink (request/response and publish/subscribe) and downlink (request/response and publish/subscribe) information exchange, and international standards were used for aeronautical (AIXM 5.1), weather (iWXXM 1.1) and flight (FIXM 4.1.0) data.

From the operational point of view, and due to the scope of this solution, the validation results have only a limited significance for real environments in terms of:

- Airspace type (class A, B, C, D, and E): En Route (ER), Terminal Manoeuvre Area (TMA), Arrival and Departure (ARR/DEP), Taxiing (Airport), assimilated to a single homogeneous data link environment.
- Realistic deployment.
- No live data and no realistic workload.
- Cockpit environment. Although some EXEs have been executed in aircraft representative environments, hazards analysis and human factor analysis were not addressed for the chosen deployment choice. Thus airworthiness for normal, abnormal, emergency, maintenance procedures including allowed phases of the flight are not evaluated.

5 Conclusions and recommendations

5.1 Conclusions

This section provides a summary of the conclusions raised by the synthesis of the four technical validation exercises results analysis provided in §4.

5.1.1 Conclusions on SESAR Technological Solution maturity

PJ.17-01 TRL6 maturity assessment is reported in Appendix H and it is based on the SESAR2020 maturity assessment tool. Overall the conclusion is that the solution successfully reached TRL6 maturity. This is based on the provided assessment spreadsheet and based on the fact that some criterions can be further detailed only taking into account real-life technical and operational deployment. Similar justifications apply to the NOK validation status for some advanced security and time-behaviour objectives.

5.1.2 Conclusions on technical feasibility

Technical validation activities results successfully demonstrated the technical feasibility of the TS in terms is of technical architecture, technical use cases, messaging, reliability, and point to point and end to end security and QoS.

Following results are also considered relevant from a technical point of view:

- Some EXEs have been executed on a V&VI distributed around the Europe (WAN).
- Some EXEs have been executed on a V&VI integrated with P14.02 prototypes (FCI).
- Technical interoperability, limited to core capabilities, between LDO and INDRA prototypes has been successfully demonstrated.

Although time-behaviour testing did not reach the required performance figures, this is not impacting technical feasibility, as the overall performances are closely depending on deployment choices and real operational deployment. Single ground SWIM Node deployment option (refer to the load characterization in §4.2.1) directly impacts how the load is distributed within the system's segments. In particular, attention should be driven on the ground SWIM node performances that were central segments in the deployment choice.

5.1.3 Conclusions on performance assessments

In accordance with TRL6 TVALP §4.3.1 [44] and taking into account the scope and perimeter of the technical validation activities, two main KPAs have been addressed at solution level in term of technical validation activities: **Security** and **Global Interoperability**.

- **Security KPA**: design and validation activities carried out by PJ.17-01 concern more the "Implementation measures" focus area. EXEs successfully implemented and validated almost all the solution level requirements and objectives concerning this focus area. In addition to

the technical feasibility of these measures, EXEs demonstrated that solution contributes positively to this KPA.

- **Global Interoperability**: taking into account that in most of the EXEs, and especially for EXE4, software prototypes (application/service, Air/Ground SWM infrastructure and Network layers) from different solution members have been successfully integrated (technical interoperability), and completeness and technical feasibility of the TS have been validated, it has been demonstrated that this solution contributes positively to this KPA.

There are additional KPAs (TRL6 TVALP §4.3.1 [44]) indirectly impacted by this solution. Those KPAs should be evaluated during next maturity phase in a real-life technical and operational deployment.

5.2 Recommendations

This section provides recommendations as consolidation of the results, conclusions and recommendations raised by the four technical validation exercises. It covers recommendations for the close out of TRL6, and then to industrialization and deployment phases. In addition, the TRL6 TS will be updated taking into account solution level consolidation of feedback reported by the EXEs (Appendix J).

5.2.1 Recommendations for next phase

Following recommendations have been identified:

- Performance (KPAs, and technical measures like latency, TVALP §4.3.1 [44]) assessment should be done in a real-life technical and operational deployment (including deployment options illustrated in the deployment views in TS §4.2.3 [40]). Time-behaviour performance requirements should be refined and specified accordingly.
- Taking into account performance and reliability results, it is recommended to do not adopt the “single Ground SWIM Node” deployment option. If mandated by specific deployment, multiple replica should be available. This may raise the needs/opportunities to design an AMQP based protocol to be used to synchronized federated Ground SWIM Nodes replica.
- Consider real deployment, and address global interfaces to external systems, such as Network Operating Centre (NOC), Security Operating Centre (SOC), safety based recording, etc..
- A human factor analysis against a global operational use concept and an airworthiness evaluation of crew human performance impacts when operating over PP SWIM on-board is required.
- A stakeholder willing to deploy the Purple Profile for advisory A/G information sharing should consider an airworthiness evaluation as required by EASA AMC 20-25.

5.2.2 Recommendations for updating ATM Master Plan Level 2

No specific recommendations concerning the ATM Master Plan Level 2 have been reported in the context of the technical validation activities.

5.2.3 Recommendations on regulation and standardisation initiatives

Following regulation and standardisation needs have been identified:

- Purple Profile for advisory A/G information sharing should be standardized according to ICAO roadmap (ASBU B2-SWIM "Enabling Airborne Participation in Collaborative ATM through SWIM" [53]), and industrialization and deployments phases.
- Although what is provided by the solution is technically feasible, in order to move in operation Purple Profile enabled SWIM services and infrastructure different technical aspects should be standardized:
    - Purple Profile Enabled SWIM services. This encompasses identification and technical design (link to this solution) of SWIM services provided and consumed by the aircraft.
    - Security management encompassing regulations and standards related to the use of PKI based solutions in security controls specified in this solution.
- Applicable avionics regulations (e.g. EASA AMC 20-25) and industrial report for avionics architecture supporting SESAR/NEXGEN concepts (e.g. ARINC 660B [48]) should be updated/defined in accordance with Air/Ground SWIM activities.
- SWIM governance: as for all the SWIM related activities proper governance has to be put in place.

6 References

This section identifies the documents (name, reference, source project) this TVALR complies to or used as additional inputs.

6.1 Applicable Documents

This TVALR complies with the requirements set out in the following documents:

Content Integration

[1] B.04.01 D138 EATMA Guidance Material

[2] EATMA Community pages

[3] SESAR ATM Lexicon

Content Development

[4] B4.2 D106 Transition Concept of Operations SESAR 2020

System and Service Development

[5] 08.01.01 D52: SWIM Foundation v2

[6] 08.01.01 D49: SWIM Compliance Criteria

[7] 08.01.03 D47: AIRM v4.1.0

[8] 08.03.10 D45: ISRM Foundation v00.08.00

[9] B.04.03 D102 SESAR Working Method on Services

[10] B.04.03 D128 ADD SESAR1

[11] B.04.05 Common Service Foundation Method

Performance Management

[12] B.04.01 D108 SESAR 2020 Transition Performance Framework

[13] B.04.01 D42 SESAR2020 Transition Validation

[14] B.05 D86 Guidance on KPIs and Data Collection support to SESAR 2020 transition.

[15] 16.06.06-D68 Part 1 –SESAR Cost Benefit Analysis – Integrated Model

[16] 16.06.06-D51-SESAR_1 Business Case Consolidated_Deliverable-00.01.00 and CBA

[17] Method to assess cost of European ATM improvements and technologies, EUROCONTROL (2014)

[18]ATM Cost Breakdown Structure_ed02_2014

[19]Standard Inputs for EUROCONTROL Cost Benefit Analyses

[20]16.06.06_D26-08 ATM CBA Quality Checklist

[21]16.06.06_D26_04_Guidelines_for_Producing_Benefit_and_Impact_Mechanisms

Validation

[22]03.00 D16 WP3 Engineering methodology

[23]Transition VALS SESAR 2020 - Consolidated deliverable with contribution from Operational Federating Projects

[24]European Operational Concept Validation Methodology (E-OCVM) - 3.0 [February 2010]

System Engineering

[25]SESAR Requirements and V&V guidelines

Safety

[26]SESAR, Safety Reference Material, Edition 4.0, April 2016

[27]SESAR, Guidance to Apply the Safety Reference Material, Edition 3.0, April 2016

[28]SESAR, Final Guidance Material to Execute Proof of Concept, Ed00.04.00, August 2015

[29]SESAR, Resilience Engineering Guidance, May 2016

Human Performance

[30]16.06.05 D 27 HP Reference Material D27

[31]16.04.02 D04 e-HP Repository - Release note

Environment Assessment

[32]SESAR, Environment Reference Material, alias, “Environmental impact assessment as part of the global SESAR validation”, Project 16.06.03, Deliverable D26, 2014.

[33]ICAO CAEP – “Guidance on Environmental Assessment of Proposed Air Traffic Management Operational Changes” document, Doc 10031.

Security

[34]16.06.02 D103 SESAR Security Ref Material Level

[35]16.06.02 D137 Minimum Set of Security Controls (MSSCs).

[36]16.06.02 D131 Security Database Application (CTRL_S)

6.2 Reference Documents

The following documents were used to provide input / guidance / further information / other:

[37] Common assumptions for CBAs as maintained by Pj19 (provisionally the ones included in the 16.06.06- D68_Part 1, New CBA Model and Methods 2015, Edition 00.01.01 can be used).

[38] ED-151 - Operational Services and Environment Definition (OSED) for Aeronautical Information Services (AIS) and Meteorological (MET) Data Link Services, December 2007.

[39] PJ.17 PMP, edition 01.00.00, March 2017.

[40] PJ.17-01 D2.2.610, PJ.17-01 TRL6 Technical Specification, 00.01.00, January 2019.

[41] PJ.17-01 D2.2.611, PJ.17-01 TRL6 Security Assessment Report – Part IIA, 00.01.00, January 2019.

[42] PJ.17-01 D2.2.612, PJ.17-01 TRL6 Security Assessment Report – Part IIB, 00.01.00, January 2019.

[43] PJ.17-01 D2.2.613, PJ.17-01 TRL6 Security Assessment Report – Part IIC, 00.01.00, January 2019.

[44] PJ.17-01 D2.2.620, PJ.17-01 TRL6 Technical Validation Plan, 00.02.01, June 2019.

[45] PJ.17-01 D2.2.650, PJ.17-01 EXE1 TRL6 Availability Note, 00.01.00, July 2019.

[46] PJ.17-01 D2.2.660, PJ.17-01 EXE2 TRL6 Availability Note, 00.01.00, July 2019.

[47] PJ.17-01 D2.2.670, PJ.17-01 EXE3 TRL6 Availability Note, 00.01.00, July 2019.

[48] PJ.17-01 D2.2.680, PJ.17-01 EXE4 TRL6 Availability Note, 00.01.00, July 2019.

[49] SAE/ITC ARINC Report 660B CNS/ATM AVIONICS ARCHITECTURES SUPPORTING NEXTGEN/SESAR CONCEPTS, January 10, 2014.

[50] SAE/ITC ARINC Report 811 COMMERCIAL AIRCRAFT INFORMATION SECURITY CONCEPTS OF OPERATION AND PROCESS FRAMEWORK, December 20, 2005.

[51] SAE/ITC ARINC Report 852 GUIDANCE FOR SECURITY EVENT LOGGING IN AN IP ENVIRONMENT, June 21, 2017.

[52] PJ.17-01 D2.1.440, PJ.17-01 TRL4 Technical validation activities report, 00.01.00, June 2018.

[53] ASBU B2-SWIM “Enabling Airborne Participation in Collaborative ATM through SWIM”, ICAO Global Air Navigation Plan (Doc 9750).

Appendix A Technical Validation Exercise #01 Report

A.1 Summary of the Technical Validation Exercise #01 Plan

EXE1 TRL6 plan is described in the PJ.17-01 TRL6 TVALP §5.1 [44].

A.1.1 Technical Validation Exercise #01 description and scope

EXE1 represents the evolution of TRL4 EXE1 according to TRL6 validation activities purposes and applicable validation objectives. EXE1 has been split in two in order to take into account different validation objectives and V&VI constraints. In particular EXE-17.01-TRL6-TVALP-EXE1.0001 focus is more on operational-oriented scenarios involving Purple Profile SWIM Node prototypes (both ground and aircraft) and Purple Profile enabled SWIM services (both uplink and downlink) developed by the EXE members and interconnected in a WAN. The A/G communication network is emulated via WAN equipped with a firewall that allows introducing a specific DSCP (Differentiated Services Code Point) in the data packet. Next, EXE-17.01-TRL6-TVALP-EXE1.0002 focus is more on the technical validation of non-functional characteristics (performances, reliability, etc.) of uplink and downlink advisory information (weather, aeronautical) information sharing in technical oriented scenarios. These technical scenarios involve Purple Profile SWIM Node prototypes (both ground and aircraft), emulated only Purple Profile enabled applications (both uplink and downlink) and A/G network infrastructure (PJ.14-02) prototypes. In terms of dependencies and relationships, EXE-17.01-TRL6-TVALP-EXE1.0002 depends on EXE-17.01-TRL6-TVALP-EXE1.0001 and PJ.14.02.04 EXEs (D5.1.030 – Initial Technical Validation Plan). EXE1 prototypes and (a sub-set of) technical scenarios will be reused in EXE4.

The EXE-17.01-TRL6-TVALP-EXE1.0001 is based on the technical setup depicted in Figure 14. Both real and emulated services (ground and aircraft based) are used by the EXE. Real service means service with real service business logics and not service in operation.

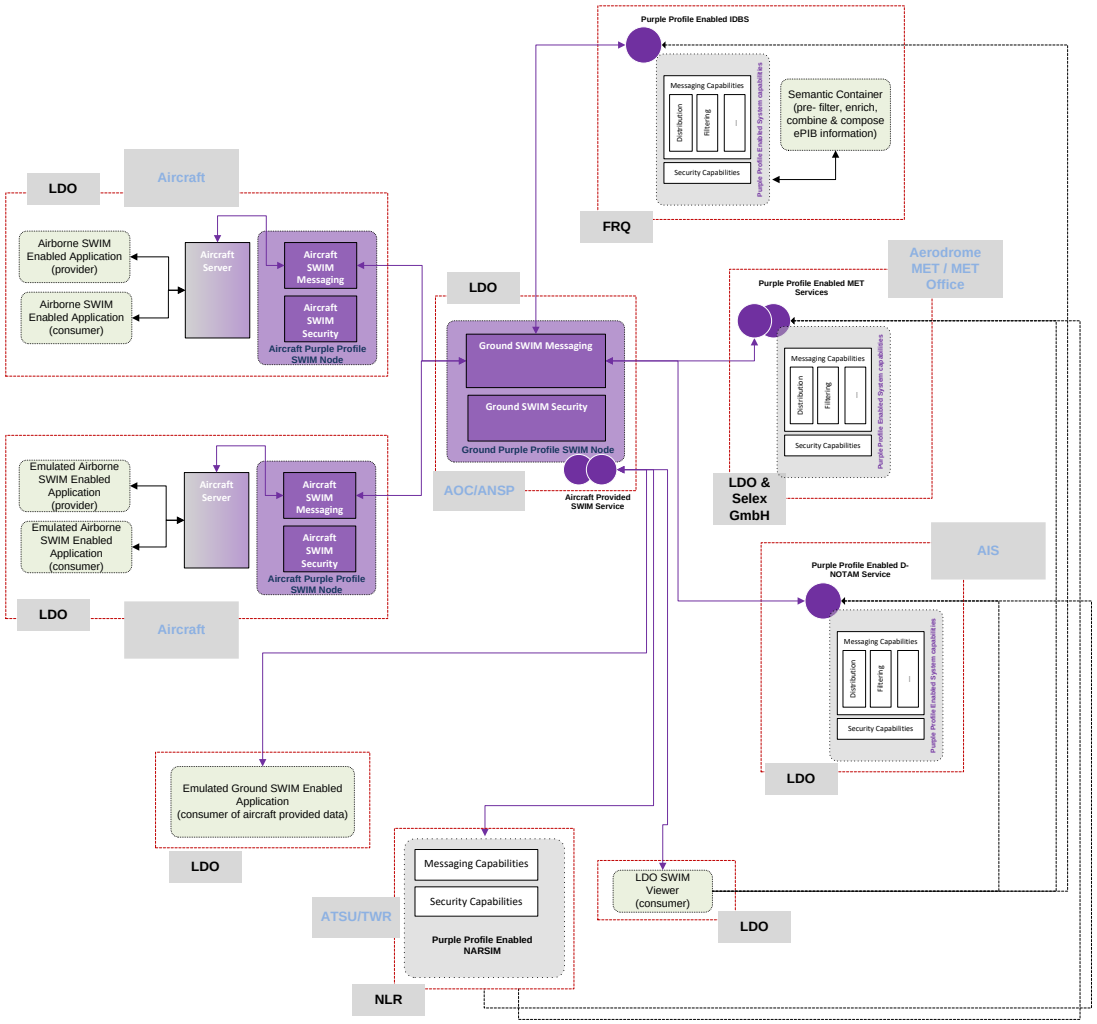


Figure 14: EXE1 Technical Setup

Though not depicted in the figure, in order to enable performance testing, the setup includes multiple instances of:

- LDO emulated aircraft applications,
- LDO emulated ground applications consuming aircraft provided data.

The EXE-17.01-TRL6-TVALP-EXE1.0001 will also include enforcement of security controls (e.g. authentication and authorisation) specified in the TRL6 TS. In accordance with the TRL6 TS these security controls are based on X.509 certificates. In Figure 15 the PKI setup used in this EXE is depicted. It is based on a CA provided and operated by LDO which issues and manages certificates valid only in the context of the EXE. Besides certificate requests and issuing and renewal process, the CA provides two CA interface bindings specified in the TRL6 TS: HTTP CDP and OCSP.

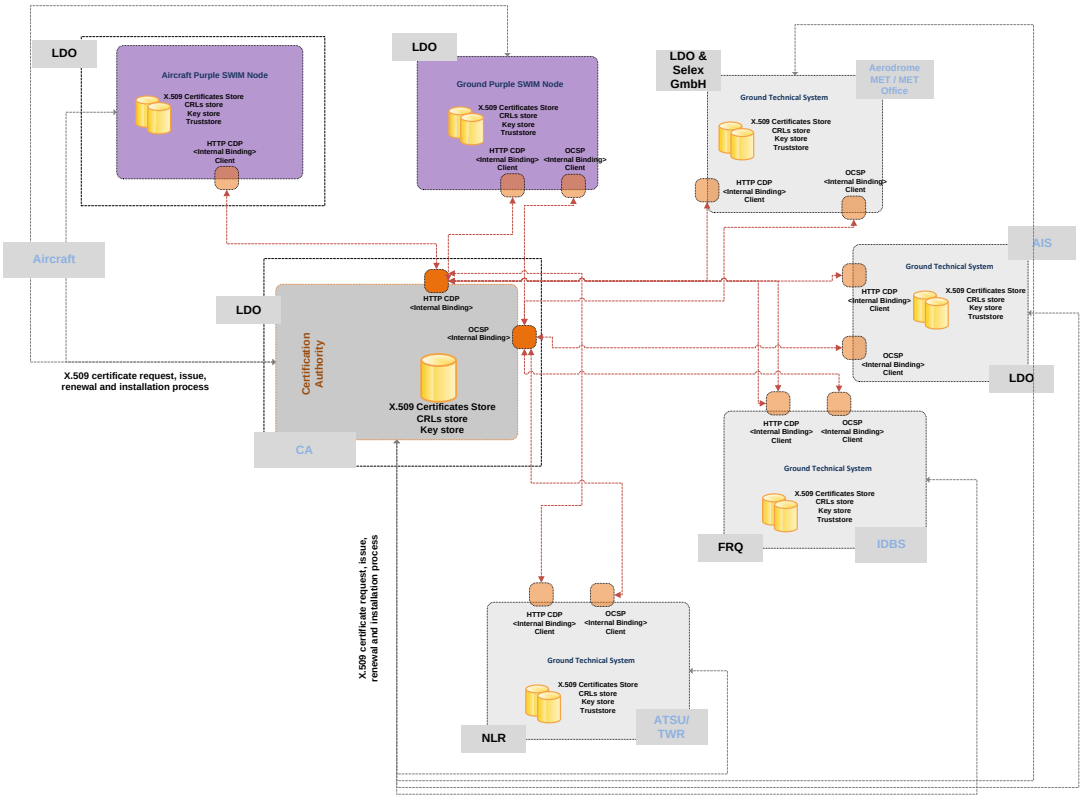


Figure 15: EXE1 PKI Technical Setup

For the EXE-17.01-TRL6-TVALP-EXE1.0002 the setups described in Figure 14 and Figure 15 is reused but considering only emulated ground and aircraft Purple Profile enabled applications.

One of the main differences between the two EXEs is the network schema (Figure 17): for EXE-17.01-TRL6-TVALP-EXE1.0002 Air/ground communication network infrastructure prototypes from PJ.14.2.4 are used.

EXE-17.01-TRL6-TVALP-EXE1.0001:

- Leonardo aircraft platform (Leonardo, Turin)

  Aircraft information network used to interconnect aircraft AISD applications (LDO EFB) and aircraft SWIM-TI capabilities (LDO Air SWIM Node) is internal to the platform.

- Leonardo aircraft platform (Leonardo, Turin) - Leonardo ground platform (Leonardo, Rome).

  A/G Communication Network Infrastructure used to interconnect LDO Air and Ground SWIM Nodes is a WAN VPN connection between the two LDO platforms.

- G/G Communication Network Infrastructure(s), used to interconnect the LDO Ground SWIM Node with ground applications:

  - Leonardo ground platform (Leonardo, Rome) LAN used to interconnect LDO Ground SWIM Node instances with locally deployed applications including:

    - LDO Emulated Ground applications.

- LDO Purple Profile enabled D-NOTAM service.
- LDO SWIM Viewer.
- Controller Working Position (CWP) supplied by NLR

- WAN VPN connection between Leonardo ground platform and Frequentis ground platform (Frequentis, Vienna).
- WAN VPN connection between Leonardo ground platform and Selex ES GmbH ground platform (Selex ES GmbH, Neuss).

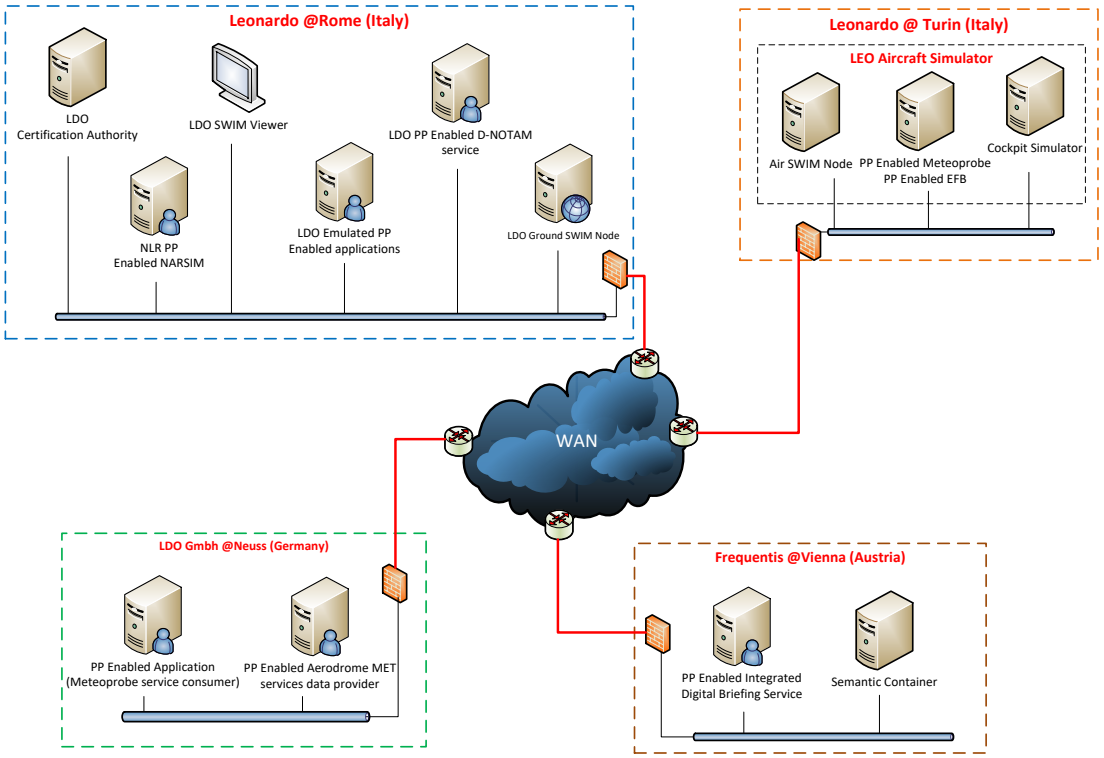


Figure 16: EXE1.0001 Networks Technical Setup

EXE-17.01-TRL6-TVALP-EXE1.0002:

- Aircraft information network interconnecting emulated aircraft applications and LDO Air SWIM Node(s) is a LAN (LDO Rome Laurentina platform).
- A/G Communication Network Infrastructure used to interconnect LDO Air and Ground SWIM Nodes is the PJ14.02.04 FCI prototype (HON Aircraft Router integrating LDO AeroMACS and INDRA SATCOM links) available as part of the LDO Rome Laurentina PJ.14.02.04 platform.
- G/G Communication Network Infrastructure used to interconnect the LDO Ground SWIM Node with ground emulated applications is a LAN (LDO Rome Laurentina platform).

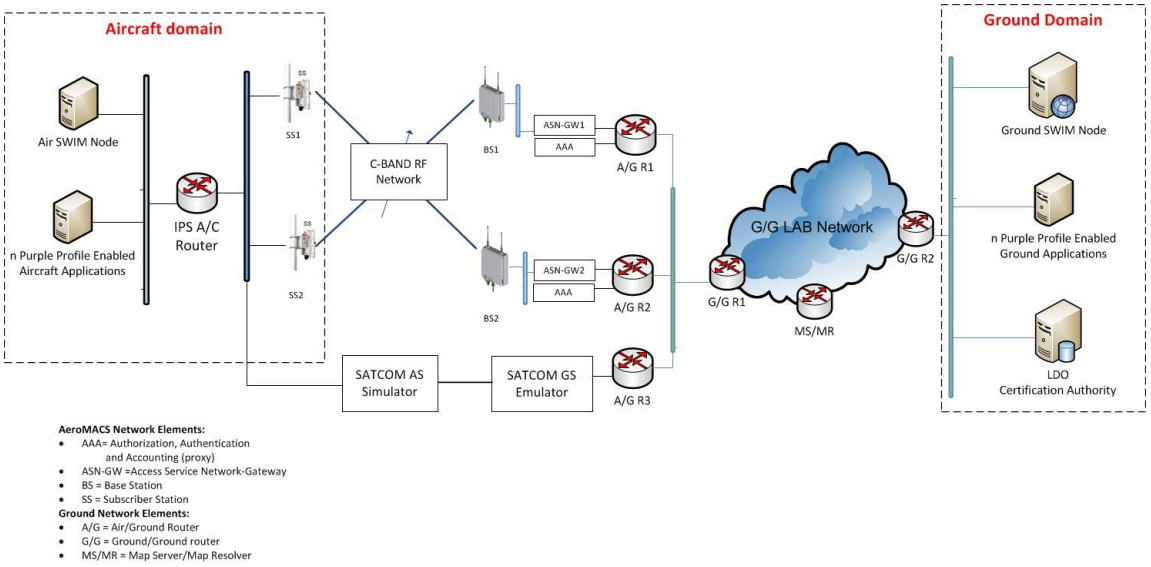


Figure 17: EXE1.0002 Networks Technical Setup

Further details are provided in PJ.17-01 TRL6 TVALP §5.1.1 [44] and EXE1 AN [45].

A.1.2 Summary of Exercise 1 Technical Validation Objectives and success criteria

EXE1 technical validation objectives and success criteria summary is provided in PJ.17-01 TRL6 TVALP §5.1.3 [44].

A.1.3 Summary of Technical Validation Exercise #01 Validation scenarios

EXE1 validation scenarios are described in PJ.17-01 TRL6 TVALP §5.1.4 [44].

A.1.4 Summary Technical Validation Exercise #01 Assumptions

In accordance with PJ.17-01 TRL6 TVALP §5.1.5 [44], no assumptions concerning the validation activities have been recorded.

A.2 Deviation from the planned activities

Table 15 and Table 16 provide the deviations in terms of EXE1.0001 and EXE1.0002 technical validation objectives coverage with respect to what was planned in the TVALP [44]. For completeness, the table includes planned coverage (refer to Table 10) and when applicable deviations are highlighted and justified.

Technical Validation Objective ID	Success Criterion ID	EXE1.0001	EXE1.0001 Justification

Technical Validation Objective ID	Success Criterion ID	EXE1.0001	EXE1.0001 Justification
OBJ-17.01-TRL6-TVALP-PERF.0001	CRT-17.01-TRL6-TVALP-PERF.0001	No deviation	N/A
OBJ-17.01-TRL6-TVALP-PERF.0002	CRT-17.01-TRL6-TVALP-PERF.0002	No deviation	N/A
OBJ-17.01-TRL6-TVALP-PERF.0003	CRT-17.01-TRL6-TVALP-PERF.0003	No deviation	N/A
OBJ-17.01-TRL6-TVALP-PERF.0004	CRT-17.01-TRL6-TVALP-PERF.0004	No deviation	N/A
OBJ-17.01-TRL6-TVALP-PERF.0005	CRT-17.01-TRL6-TVALP-PERF.0005	No deviation	N/A
OBJ-17.01-TRL6-TVALP-PERF.0005	CRT-17.01-TRL6-TVALP-PERF.0006	No deviation	N/A
OBJ-17.01-TRL6-TVALP-PERF.0006	CRT-17.01-TRL6-TVALP-PERF.0007	No deviation	N/A
OBJ-17.01-TRL6-TVALP-PERF.0006	CRT-17.01-TRL6-TVALP-PERF.0006	No deviation	N/A
OBJ-17.01-TRL6-TVALP-PERF.0007	CRT-17.01-TRL6-TVALP-PERF.0008	No deviation	N/A
OBJ-17.01-TRL6-TVALP-PERF.0007	CRT-17.01-TRL6-TVALP-PERF.0006	No deviation	N/A
OBJ-17.01-TRL6-TVALP-PERF.0008	CRT-17.01-TRL6-TVALP-PERF.0009	No deviation	N/A
OBJ-17.01-TRL6-TVALP-PERF.0008	CRT-17.01-TRL6-TVALP-PERF.0006	No deviation	N/A
OBJ-17.01-TRL6-TVALP-PERF.0009	CRT-17.01-TRL6-TVALP-PERF.0010	No deviation	N/A
OBJ-17.01-TRL6-TVALP-PERF.0010	CRT-17.01-TRL6-TVALP-PERF.0011	No deviation	N/A
OBJ-17.01-TRL6-TVALP-PERF.0011	CRT-17.01-TRL6-TVALP-PERF.0012	No deviation	N/A
OBJ-17.01-TRL6-TVALP-PERF.0012	CRT-17.01-TRL6-TVALP-PERF.0013	No deviation	N/A
OBJ-17.01-TRL6-TVALP-PERF.0013	CRT-17.01-TRL6-TVALP-PERF.0014	No deviation	N/A

Technical Validation Objective ID	Success Criterion ID	EXE1.0001	EXE1.0001 Justification
OBJ-17.01-TRL6-TVALP-PERF.0014	CRT-17.01-TRL6-TVALP-PERF.0015	No deviation	N/A
OBJ-17.01-TRL6-TVALP-PERF.0015	CRT-17.01-TRL6-TVALP-PERF.0016	No deviation	N/A
OBJ-17.01-TRL6-TVALP-PERF.0016	CRT-17.01-TRL6-TVALP-PERF.0017	No deviation	N/A
OBJ-17.01-TRL6-TVALP-PERF.0017	CRT-17.01-TRL6-TVALP-PERF.0018	No deviation	N/A
OBJ-17.01-TRL6-TVALP-PERF.0018	CRT-17.01-TRL6-TVALP-PERF.0019	No deviation	N/A
OBJ-17.01-TRL6-TVALP-PERF.0019	CRT-17.01-TRL6-TVALP-PERF.0020	No deviation	N/A
OBJ-17.01-TRL6-TVALP-PERF.0020	CRT-17.01-TRL6-TVALP-PERF.0021	No deviation	N/A
OBJ-17.01-TRL6-TVALP-PERF.0021	CRT-17.01-TRL6-TVALP-PERF.0022	No deviation	N/A
OBJ-17.01-TRL6-TVALP-PERF.0022	CRT-17.01-TRL6-TVALP-PERF.0023	No deviation	N/A
OBJ-17.01-TRL6-TVALP-PERF.0023	CRT-17.01-TRL6-TVALP-PERF.0024	No deviation	N/A
OBJ-17.01-TRL6-TVALP-PERF.0024	CRT-17.01-TRL6-TVALP-PERF.0025	No deviation	N/A
OBJ-17.01-TRL6-TVALP-PERF.0025	CRT-17.01-TRL6-TVALP-PERF.0026	No deviation	N/A
OBJ-17.01-TRL6-TVALP-PERF.0026	CRT-17.01-TRL6-TVALP-PERF.0027	No deviation	N/A
OBJ-17.01-TRL6-TVALP-REL.0001	CRT-17.01-TRL6-TVALP-REL.0001	No deviation	N/A
OBJ-17.01-TRL6-TVALP-REL.0001	CRT-17.01-TRL6-TVALP-REL.0002	No deviation	N/A
OBJ-17.01-TRL6-TVALP-REL.0001	CRT-17.01-TRL6-TVALP-REL.0026	No deviation	N/A
OBJ-17.01-TRL6-TVALP-REL.0001	CRT-17.01-TRL6-TVALP-REL.0003	No deviation	N/A

Technical Validation Objective ID	Success Criterion ID	EXE1.0001	EXE1.0001 Justification
OBJ-17.01-TRL6-TVALP-REL.0001	CRT-17.01-TRL6-TVALP-REL.0004	No deviation	N/A
OBJ-17.01-TRL6-TVALP-REL.0001	CRT-17.01-TRL6-TVALP-REL.0027	No deviation	N/A
OBJ-17.01-TRL6-TVALP-REL.0001	CRT-17.01-TRL6-TVALP-REL.0005	No deviation	N/A
OBJ-17.01-TRL6-TVALP-REL.0001	CRT-17.01-TRL6-TVALP-REL.0006	No deviation	N/A
OBJ-17.01-TRL6-TVALP-REL.0001	CRT-17.01-TRL6-TVALP-REL.0007	No deviation	N/A
OBJ-17.01-TRL6-TVALP-REL.0002	CRT-17.01-TRL6-TVALP-REL.0008	No deviation	N/A
OBJ-17.01-TRL6-TVALP-REL.0002	CRT-17.01-TRL6-TVALP-REL.0009	No deviation	N/A
OBJ-17.01-TRL6-TVALP-REL.0002	CRT-17.01-TRL6-TVALP-REL.0028	No deviation	N/A
OBJ-17.01-TRL6-TVALP-REL.0002	CRT-17.01-TRL6-TVALP-REL.0010	No deviation	N/A
OBJ-17.01-TRL6-TVALP-REL.0002	CRT-17.01-TRL6-TVALP-REL.0011	No deviation	N/A
OBJ-17.01-TRL6-TVALP-REL.0002	CRT-17.01-TRL6-TVALP-REL.0029	No deviation	N/A
OBJ-17.01-TRL6-TVALP-REL.0002	CRT-17.01-TRL6-TVALP-REL.0005	No deviation	N/A
OBJ-17.01-TRL6-TVALP-REL.0002	CRT-17.01-TRL6-TVALP-REL.0006	No deviation	N/A
OBJ-17.01-TRL6-TVALP-REL.0002	CRT-17.01-TRL6-TVALP-REL.0007	No deviation	N/A
OBJ-17.01-TRL6-TVALP-REL.0003	CRT-17.01-TRL6-TVALP-REL.0012	No deviation	N/A
OBJ-17.01-TRL6-TVALP-REL.0003	CRT-17.01-TRL6-TVALP-REL.0013	No deviation	N/A
OBJ-17.01-TRL6-TVALP-REL.0003	CRT-17.01-TRL6-TVALP-REL.0030	No deviation	N/A

Technical Validation Objective ID	Success Criterion ID	EXE1.0001	EXE1.0001 Justification
OBJ-17.01-TRL6-TVALP-REL.0003	CRT-17.01-TRL6-TVALP-REL.0005	No deviation	N/A
OBJ-17.01-TRL6-TVALP-REL.0003	CRT-17.01-TRL6-TVALP-REL.0006	No deviation	N/A
OBJ-17.01-TRL6-TVALP-REL.0003	CRT-17.01-TRL6-TVALP-REL.0007	No deviation	N/A
OBJ-17.01-TRL6-TVALP-REL.0004	CRT-17.01-TRL6-TVALP-REL.0014	No deviation	N/A
OBJ-17.01-TRL6-TVALP-REL.0004	CRT-17.01-TRL6-TVALP-REL.0015	No deviation	N/A
OBJ-17.01-TRL6-TVALP-REL.0004	CRT-17.01-TRL6-TVALP-REL.0031	No deviation	N/A
OBJ-17.01-TRL6-TVALP-REL.0004	CRT-17.01-TRL6-TVALP-REL.0005	No deviation	N/A
OBJ-17.01-TRL6-TVALP-REL.0004	CRT-17.01-TRL6-TVALP-REL.0006	No deviation	N/A
OBJ-17.01-TRL6-TVALP-REL.0004	CRT-17.01-TRL6-TVALP-REL.0007	No deviation	N/A
OBJ-17.01-TRL6-TVALP-REL.0005	CRT-17.01-TRL6-TVALP-REL.0016	No deviation	N/A
OBJ-17.01-TRL6-TVALP-REL.0005	CRT-17.01-TRL6-TVALP-REL.0017	No deviation	N/A
OBJ-17.01-TRL6-TVALP-REL.0005	CRT-17.01-TRL6-TVALP-REL.0032	No deviation	N/A
OBJ-17.01-TRL6-TVALP-REL.0005	CRT-17.01-TRL6-TVALP-REL.0018	No deviation	N/A
OBJ-17.01-TRL6-TVALP-REL.0005	CRT-17.01-TRL6-TVALP-REL.0019	No deviation	N/A
OBJ-17.01-TRL6-TVALP-REL.0005	CRT-17.01-TRL6-TVALP-REL.0033	No deviation	N/A
OBJ-17.01-TRL6-TVALP-REL.0005	CRT-17.01-TRL6-TVALP-REL.0005	No deviation	N/A
OBJ-17.01-TRL6-TVALP-REL.0005	CRT-17.01-TRL6-TVALP-REL.0006	No deviation	N/A

Technical Validation Objective ID	Success Criterion ID	EXE1.0001	EXE1.0001 Justification
OBJ-17.01-TRL6-TVALP-REL.0005	CRT-17.01-TRL6-TVALP-REL.0007	No deviation	N/A
OBJ-17.01-TRL6-TVALP-REL.0006	CRT-17.01-TRL6-TVALP-REL.0020	No deviation	N/A
OBJ-17.01-TRL6-TVALP-REL.0006	CRT-17.01-TRL6-TVALP-REL.0021	No deviation	N/A
OBJ-17.01-TRL6-TVALP-REL.0006	CRT-17.01-TRL6-TVALP-REL.0034	No deviation	N/A
OBJ-17.01-TRL6-TVALP-REL.0006	CRT-17.01-TRL6-TVALP-REL.0022	No deviation	N/A
OBJ-17.01-TRL6-TVALP-REL.0006	CRT-17.01-TRL6-TVALP-REL.0011	No deviation	N/A
OBJ-17.01-TRL6-TVALP-REL.0006	CRT-17.01-TRL6-TVALP-REL.0035	No deviation	N/A
OBJ-17.01-TRL6-TVALP-REL.0006	CRT-17.01-TRL6-TVALP-REL.0005	No deviation	N/A
OBJ-17.01-TRL6-TVALP-REL.0006	CRT-17.01-TRL6-TVALP-REL.0006	No deviation	N/A
OBJ-17.01-TRL6-TVALP-REL.0006	CRT-17.01-TRL6-TVALP-REL.0007	No deviation	N/A
OBJ-17.01-TRL6-TVALP-REL.0007	CRT-17.01-TRL6-TVALP-REL.0023	No deviation	N/A
OBJ-17.01-TRL6-TVALP-REL.0007	CRT-17.01-TRL6-TVALP-REL.0024	No deviation	N/A
OBJ-17.01-TRL6-TVALP-REL.0007	CRT-17.01-TRL6-TVALP-REL.0036	No deviation	N/A
OBJ-17.01-TRL6-TVALP-REL.0007	CRT-17.01-TRL6-TVALP-REL.0005	No deviation	N/A
OBJ-17.01-TRL6-TVALP-REL.0007	CRT-17.01-TRL6-TVALP-REL.0006	No deviation	N/A
OBJ-17.01-TRL6-TVALP-REL.0007	CRT-17.01-TRL6-TVALP-REL.0007	No deviation	N/A
OBJ-17.01-TRL6-TVALP-REL.0008	CRT-17.01-TRL6-TVALP-REL.0025	No deviation	N/A

Technical Validation Objective ID	Success Criterion ID	EXE1.0001	EXE1.0001 Justification
OBJ-17.01-TRL6-TVALP-REL.0008	CRT-17.01-TRL6-TVALP-REL.0038	No deviation	N/A
OBJ-17.01-TRL6-TVALP-REL.0008	CRT-17.01-TRL6-TVALP-REL.0037	No deviation	N/A
OBJ-17.01-TRL6-TVALP-REL.0008	CRT-17.01-TRL6-TVALP-REL.0005	No deviation	N/A
OBJ-17.01-TRL6-TVALP-REL.0008	CRT-17.01-TRL6-TVALP-REL.0006	No deviation	N/A
OBJ-17.01-TRL6-TVALP-REL.0008	CRT-17.01-TRL6-TVALP-REL.0007	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0001	CRT-17.01-TRL6-TVALP-SEC.0001	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0001	CRT-17.01-TRL6-TVALP-SEC.0002	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0001	CRT-17.01-TRL6-TVALP-SEC.0003	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0001	CRT-17.01-TRL6-TVALP-SEC.0004	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0001	CRT-17.01-TRL6-TVALP-SEC.0008	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0001	CRT-17.01-TRL6-TVALP-SEC.0009	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0002	CRT-17.01-TRL6-TVALP-SEC.0001	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0002	CRT-17.01-TRL6-TVALP-SEC.0002	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0002	CRT-17.01-TRL6-TVALP-SEC.0003	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0002	CRT-17.01-TRL6-TVALP-SEC.0005	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0002	CRT-17.01-TRL6-TVALP-SEC.0006	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0002	CRT-17.01-TRL6-TVALP-SEC.0007	No deviation	N/A

Technical Validation Objective ID	Success Criterion ID	EXE1.0001	EXE1.0001 Justification
OBJ-17.01-TRL6-TVALP-SEC.0002	CRT-17.01-TRL6-TVALP-SEC.0008	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0002	CRT-17.01-TRL6-TVALP-SEC.0009	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0003	CRT-17.01-TRL6-TVALP-SEC.0010	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0003	CRT-17.01-TRL6-TVALP-SEC.0011	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0003	CRT-17.01-TRL6-TVALP-SEC.0012	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0003	CRT-17.01-TRL6-TVALP-SEC.0004	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0003	CRT-17.01-TRL6-TVALP-SEC.0008	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0003	CRT-17.01-TRL6-TVALP-SEC.0009	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0004	CRT-17.01-TRL6-TVALP-SEC.0010	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0004	CRT-17.01-TRL6-TVALP-SEC.0011	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0004	CRT-17.01-TRL6-TVALP-SEC.0012	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0004	CRT-17.01-TRL6-TVALP-SEC.0005	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0004	CRT-17.01-TRL6-TVALP-SEC.0006	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0004	CRT-17.01-TRL6-TVALP-SEC.0007	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0004	CRT-17.01-TRL6-TVALP-SEC.0008	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0004	CRT-17.01-TRL6-TVALP-SEC.0009	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0005	CRT-17.01-TRL6-TVALP-SEC.0013	No deviation	N/A

Technical Validation Objective ID	Success Criterion ID	EXE1.0001	EXE1.0001 Justification
OBJ-17.01-TRL6-TVALP-SEC.0005	CRT-17.01-TRL6-TVALP-SEC.0014	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0005	CRT-17.01-TRL6-TVALP-SEC.0015	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0005	CRT-17.01-TRL6-TVALP-SEC.0016	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0005	CRT-17.01-TRL6-TVALP-SEC.0017	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0005	CRT-17.01-TRL6-TVALP-SEC.0018	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0005	CRT-17.01-TRL6-TVALP-SEC.0019	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0006	CRT-17.01-TRL6-TVALP-SEC.0020	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0006	CRT-17.01-TRL6-TVALP-SEC.0021	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0006	CRT-17.01-TRL6-TVALP-SEC.0022	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0006	CRT-17.01-TRL6-TVALP-SEC.0016	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0006	CRT-17.01-TRL6-TVALP-SEC.0017	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0006	CRT-17.01-TRL6-TVALP-SEC.0018	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0006	CRT-17.01-TRL6-TVALP-SEC.0019	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0007	CRT-17.01-TRL6-TVALP-SEC.0013	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0007	CRT-17.01-TRL6-TVALP-SEC.0014	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0007	CRT-17.01-TRL6-TVALP-SEC.0015	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0007	CRT-17.01-TRL6-TVALP-SEC.0016	No deviation	N/A

Technical Validation Objective ID	Success Criterion ID	EXE1.0001	EXE1.0001 Justification
OBJ-17.01-TRL6-TVALP-SEC.0007	CRT-17.01-TRL6-TVALP-SEC.0017	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0007	CRT-17.01-TRL6-TVALP-SEC.0023	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0008	CRT-17.01-TRL6-TVALP-SEC.0020	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0008	CRT-17.01-TRL6-TVALP-SEC.0021	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0008	CRT-17.01-TRL6-TVALP-SEC.0022	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0008	CRT-17.01-TRL6-TVALP-SEC.0016	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0008	CRT-17.01-TRL6-TVALP-SEC.0017	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0008	CRT-17.01-TRL6-TVALP-SEC.0024	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0009	CRT-17.01-TRL6-TVALP-SEC.0025	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0009	CRT-17.01-TRL6-TVALP-SEC.0016	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0009	CRT-17.01-TRL6-TVALP-SEC.0026	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0010	CRT-17.01-TRL6-TVALP-SEC.0027	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0010	CRT-17.01-TRL6-TVALP-SEC.0016	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0010	CRT-17.01-TRL6-TVALP-SEC.0028	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0011	CRT-17.01-TRL6-TVALP-SEC.0029	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0011	CRT-17.01-TRL6-TVALP-SEC.0030	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0011	CRT-17.01-TRL6-TVALP-SEC.0031	No deviation	N/A

Technical Validation Objective ID	Success Criterion ID	EXE1.0001	EXE1.0001 Justification
OBJ-17.01-TRL6-TVALP-SEC.0011	CRT-17.01-TRL6-TVALP-SEC.0032	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0011	CRT-17.01-TRL6-TVALP-SEC.0033	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0011	CRT-17.01-TRL6-TVALP-SEC.0034	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0011	CRT-17.01-TRL6-TVALP-SEC.0035	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0012	CRT-17.01-TRL6-TVALP-SEC.0036	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0012	CRT-17.01-TRL6-TVALP-SEC.0037	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0012	CRT-17.01-TRL6-TVALP-SEC.0038	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0013	CRT-17.01-TRL6-TVALP-SEC.0029	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0013	CRT-17.01-TRL6-TVALP-SEC.0030	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0013	CRT-17.01-TRL6-TVALP-SEC.0031	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0013	CRT-17.01-TRL6-TVALP-SEC.0032	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0013	CRT-17.01-TRL6-TVALP-SEC.0039	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0013	CRT-17.01-TRL6-TVALP-SEC.0040	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0013	CRT-17.01-TRL6-TVALP-SEC.0041	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0013	CRT-17.01-TRL6-TVALP-SEC.0042	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0014	CRT-17.01-TRL6-TVALP-SEC.0043	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0014	CRT-17.01-TRL6-TVALP-SEC.0044	No deviation	N/A

Technical Validation Objective ID	Success Criterion ID	EXE1.0001	EXE1.0001 Justification
OBJ-17.01-TRL6-TVALP-SEC.0014	CRT-17.01-TRL6-TVALP-SEC.0045	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0014	CRT-17.01-TRL6-TVALP-SEC.0046	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0014	CRT-17.01-TRL6-TVALP-SEC.0047	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0014	CRT-17.01-TRL6-TVALP-SEC.0048	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0015	CRT-17.01-TRL6-TVALP-SEC.0049	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0015	CRT-17.01-TRL6-TVALP-SEC.0050	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0015	CRT-17.01-TRL6-TVALP-SEC.0051	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0015	CRT-17.01-TRL6-TVALP-SEC.0052	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0015	CRT-17.01-TRL6-TVALP-SEC.0053	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0015	CRT-17.01-TRL6-TVALP-SEC.0054	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0015	CRT-17.01-TRL6-TVALP-SEC.0055	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0015	CRT-17.01-TRL6-TVALP-SEC.0056	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0015	CRT-17.01-TRL6-TVALP-SEC.0057	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0015	CRT-17.01-TRL6-TVALP-SEC.0058	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0016	CRT-17.01-TRL6-TVALP-SEC.0059	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0016	CRT-17.01-TRL6-TVALP-SEC.0060	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0016	CRT-17.01-TRL6-TVALP-SEC.0061	No deviation	N/A

Technical Validation Objective ID	Success Criterion ID	EXE1.0001	EXE1.0001 Justification
OBJ-17.01-TRL6-TVALP-SEC.0016	CRT-17.01-TRL6-TVALP-SEC.0062	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0016	CRT-17.01-TRL6-TVALP-SEC.0053	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0016	CRT-17.01-TRL6-TVALP-SEC.0054	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0016	CRT-17.01-TRL6-TVALP-SEC.0063	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0016	CRT-17.01-TRL6-TVALP-SEC.0064	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0016	CRT-17.01-TRL6-TVALP-SEC.0065	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0016	CRT-17.01-TRL6-TVALP-SEC.0066	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0017	CRT-17.01-TRL6-TVALP-SEC.0067	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0017	CRT-17.01-TRL6-TVALP-SEC.0068	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0017	CRT-17.01-TRL6-TVALP-SEC.0069	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0017	CRT-17.01-TRL6-TVALP-SEC.0070	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0017	CRT-17.01-TRL6-TVALP-SEC.0071	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0017	CRT-17.01-TRL6-TVALP-SEC.0072	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0017	CRT-17.01-TRL6-TVALP-SEC.0073	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0018	CRT-17.01-TRL6-TVALP-SEC.0074	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0018	CRT-17.01-TRL6-TVALP-SEC.0075	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0018	CRT-17.01-TRL6-TVALP-SEC.0076	No deviation	N/A

Technical Validation Objective ID	Success Criterion ID	EXE1.0001	EXE1.0001 Justification
OBJ-17.01-TRL6-TVALP-SEC.0018	CRT-17.01-TRL6-TVALP-SEC.0077	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0019	CRT-17.01-TRL6-TVALP-SEC.0078	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0019	CRT-17.01-TRL6-TVALP-SEC.0079	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0019	CRT-17.01-TRL6-TVALP-SEC.0080	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0019	CRT-17.01-TRL6-TVALP-SEC.0081	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0020	CRT-17.01-TRL6-TVALP-SEC.0078	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0020	CRT-17.01-TRL6-TVALP-SEC.0079	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0020	CRT-17.01-TRL6-TVALP-SEC.0080	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0020	CRT-17.01-TRL6-TVALP-SEC.0081	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0021	CRT-17.01-TRL6-TVALP-SEC.0082	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0021	CRT-17.01-TRL6-TVALP-SEC.0083	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0021	CRT-17.01-TRL6-TVALP-SEC.0084	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0021	CRT-17.01-TRL6-TVALP-SEC.0085	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0021	CRT-17.01-TRL6-TVALP-SEC.0086	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0021	CRT-17.01-TRL6-TVALP-SEC.0087	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0022	CRT-17.01-TRL6-TVALP-SEC.0088	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0022	CRT-17.01-TRL6-TVALP-SEC.0089	No deviation	N/A

Technical Validation Objective ID	Success Criterion ID	EXE1.0001	EXE1.0001 Justification
OBJ-17.01-TRL6-TVALP-SEC.0022	CRT-17.01-TRL6-TVALP-SEC.0090	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0022	CRT-17.01-TRL6-TVALP-SEC.0091	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0022	CRT-17.01-TRL6-TVALP-SEC.0092	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0023	CRT-17.01-TRL6-TVALP-SEC.0088	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0023	CRT-17.01-TRL6-TVALP-SEC.0089	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0023	CRT-17.01-TRL6-TVALP-SEC.0090	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0023	CRT-17.01-TRL6-TVALP-SEC.0091	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0023	CRT-17.01-TRL6-TVALP-SEC.0092	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0024	CRT-17.01-TRL6-TVALP-SEC.0093	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0024	CRT-17.01-TRL6-TVALP-SEC.0094	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0024	CRT-17.01-TRL6-TVALP-SEC.0095	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0025	CRT-17.01-TRL6-TVALP-SEC.0096	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0025	CRT-17.01-TRL6-TVALP-SEC.0097	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0026	CRT-17.01-TRL6-TVALP-SEC.0096	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0026	CRT-17.01-TRL6-TVALP-SEC.0097	No deviation	N/A

Table 15: Deviations in terms of PJ.17-01 TRL6 EXE1.0001 technical validation objectives coverage

Technical Validation Objective ID	Success Criterion ID	EXE1.0002	EXE1.0002 Justification

Technical Validation Objective ID	Success Criterion ID	EXE1.0002	EXE1.0002 Justification
OBJ-17.01-TRL6-TVALP-PERF.0001	CRT-17.01-TRL6-TVALP-PERF.0001	No deviation	N/A
OBJ-17.01-TRL6-TVALP-PERF.0002	CRT-17.01-TRL6-TVALP-PERF.0002	No deviation	N/A
OBJ-17.01-TRL6-TVALP-PERF.0003	CRT-17.01-TRL6-TVALP-PERF.0003	No deviation	N/A
OBJ-17.01-TRL6-TVALP-PERF.0004	CRT-17.01-TRL6-TVALP-PERF.0004	No deviation	N/A
OBJ-17.01-TRL6-TVALP-PERF.0005	CRT-17.01-TRL6-TVALP-PERF.0005	No deviation	N/A
OBJ-17.01-TRL6-TVALP-PERF.0005	CRT-17.01-TRL6-TVALP-PERF.0006	No deviation	N/A
OBJ-17.01-TRL6-TVALP-PERF.0006	CRT-17.01-TRL6-TVALP-PERF.0007	No deviation	N/A
OBJ-17.01-TRL6-TVALP-PERF.0006	CRT-17.01-TRL6-TVALP-PERF.0006	No deviation	N/A
OBJ-17.01-TRL6-TVALP-PERF.0007	CRT-17.01-TRL6-TVALP-PERF.0008	No deviation	N/A
OBJ-17.01-TRL6-TVALP-PERF.0007	CRT-17.01-TRL6-TVALP-PERF.0006	No deviation	N/A
OBJ-17.01-TRL6-TVALP-PERF.0008	CRT-17.01-TRL6-TVALP-PERF.0009	No deviation	N/A
OBJ-17.01-TRL6-TVALP-PERF.0008	CRT-17.01-TRL6-TVALP-PERF.0006	No deviation	N/A

Technical Validation Objective ID	Success Criterion ID	EXE1.0002	EXE1.0002 Justification
OBJ-17.01-TRL6-TVALP-PERF.0009	CRT-17.01-TRL6-TVALP-PERF.0010	**Not covered**	In the TVALP a partial coverage was declared because it was not yet confirmed if the V&VP allows (HW resources limits) to deploy 1000 A/C instances, as required by the consolidated load, each with minimum Purple Profile enabled applications and Air SWIM Node capabilities. During the preparation and the execution of the exercise, the V&VP was used to integrate also PJ.14-02-04 prototypes. This reduced the available HW resources allowing to emulate only two Purple Profile enabled aircraft. This was considered not really representative and the team decided to focus more on other objectives and integration with PJ.14-02-04 multilink A/G network.
OBJ-17.01-TRL6-TVALP-PERF.0010	CRT-17.01-TRL6-TVALP-PERF.0011	**Not covered**	In the TVALP a partial coverage was declared because it was not yet confirmed if the V&VP allows (HW resources limits) to deploy 1000 A/C instances, as required by the consolidated load, each with minimum Purple Profile enabled applications and Air SWIM Node capabilities. During the preparation and the execution of the exercise, the V&VP was used to integrate also PJ.14-02-04 prototypes. This reduced the available HW resources allowing to emulate only two Purple Profile enabled aircraft. This was considered not really representative and the team decided to focus more on other objectives and integration with PJ.14-02-04 multilink A/G network.

Technical Validation Objective ID	Success Criterion ID	EXE1.0002	EXE1.0002 Justification
OBJ-17.01-TRL6-TVALP-PERF.0011	CRT-17.01-TRL6-TVALP-PERF.0012	**Not covered**	In the TVALP a partial coverage was declared because it was not yet confirmed if the V&VP allows (HW resources limits) to deploy 1000 A/C instances, as required by the consolidated load, each with minimum Purple Profile enabled applications and Air SWIM Node capabilities. During the preparation and the execution of the exercise, the V&VP was used to integrate also PJ.14-02-04 prototypes. This reduced the available HW resources allowing to emulate only two Purple Profile enabled aircraft. This was considered not really representative and the team decided to focus more on other objectives and integration with PJ.14-02-04 multilink A/G network.
OBJ-17.01-TRL6-TVALP-PERF.0012	CRT-17.01-TRL6-TVALP-PERF.0013	**Not covered**	In the TVALP a partial coverage was declared because it was not yet confirmed if the V&VP allows (HW resources limits) to deploy 1000 A/C instances, as required by the consolidated load, each with minimum Purple Profile enabled applications and Air SWIM Node capabilities. During the preparation and the execution of the exercise, the V&VP was used to integrate also PJ.14-02-04 prototypes. This reduced the available HW resources allowing to emulate only two Purple Profile enabled aircraft. This was considered not really representative and the team decided to focus more on other objectives and integration with PJ.14-02-04 multilink A/G network.

Technical Validation Objective ID	Success Criterion ID	EXE1.0002	EXE1.0002 Justification
OBJ-17.01-TRL6-TVALP-PERF.0013	CRT-17.01-TRL6-TVALP-PERF.0014	**Not covered**	In the TVALP a partial coverage was declared because it was not yet confirmed if the V&VP allows (HW resources limits) to deploy 1000 A/C instances, as required by the consolidated load, each with minimum Purple Profile enabled applications and Air SWIM Node capabilities. During the preparation and the execution of the exercise, the V&VP was used to integrate also PJ.14-02-04 prototypes. This reduced the available HW resources allowing to emulate only two Purple Profile enabled aircraft. This was considered not really representative and the team decided to focus more on other objectives and integration with PJ.14-02-04 multilink A/G network.
OBJ-17.01-TRL6-TVALP-PERF.0014	CRT-17.01-TRL6-TVALP-PERF.0015	**Not covered**	In the TVALP a partial coverage was declared because it was not yet confirmed if the V&VP allows (HW resources limits) to deploy 1000 A/C instances, as required by the consolidated load, each with minimum Purple Profile enabled applications and Air SWIM Node capabilities. During the preparation and the execution of the exercise, the V&VP was used to integrate also PJ.14-02-04 prototypes. This reduced the available HW resources allowing to emulate only two Purple Profile enabled aircraft. This was considered not really representative and the team decided to focus more on other objectives and integration with PJ.14-02-04 multilink A/G network.

Technical Validation Objective ID	Success Criterion ID	EXE1.0002	EXE1.0002 Justification
OBJ-17.01-TRL6-TVALP-PERF.0015	CRT-17.01-TRL6-TVALP-PERF.0016	**Not covered**	In the TVALP a partial coverage was declared because it was not yet confirmed if the V&VP allows (HW resources limits) to deploy 1000 A/C instances, as required by the consolidated load, each with minimum Purple Profile enabled applications and Air SWIM Node capabilities. During the preparation and the execution of the exercise, the V&VP was used to integrate also PJ.14-02-04 prototypes. This reduced the available HW resources allowing to emulate only two Purple Profile enabled aircraft. This was considered not really representative and the team decided to focus more on other objectives and integration with PJ.14-02-04 multilink A/G network.
OBJ-17.01-TRL6-TVALP-PERF.0016	CRT-17.01-TRL6-TVALP-PERF.0017	**Not covered**	In the TVALP a partial coverage was declared because it was not yet confirmed if the V&VP allows (HW resources limits) to deploy 1000 A/C instances, as required by the consolidated load, each with minimum Purple Profile enabled applications and Air SWIM Node capabilities. During the preparation and the execution of the exercise, the V&VP was used to integrate also PJ.14-02-04 prototypes. This reduced the available HW resources allowing to emulate only two Purple Profile enabled aircraft. This was considered not really representative and the team decided to focus more on other objectives and integration with PJ.14-02-04 multilink A/G network.

Technical Validation Objective ID	Success Criterion ID	EXE1.0002	EXE1.0002 Justification
OBJ-17.01-TRL6-TVALP-PERF.0017	CRT-17.01-TRL6-TVALP-PERF.0018	**Not covered**	In the TVALP a partial coverage was declared because it was not yet confirmed if the V&VP allows (HW resources limits) to deploy 1000 A/C instances, as required by the consolidated load, each with minimum Purple Profile enabled applications and Air SWIM Node capabilities. During the preparation and the execution of the exercise, the V&VP was used to integrate also PJ.14-02-04 prototypes. This reduced the available HW resources allowing to emulate only two Purple Profile enabled aircraft. This was considered not really representative and the team decided to focus more on other objectives and integration with PJ.14-02-04 multilink A/G network.
OBJ-17.01-TRL6-TVALP-PERF.0018	CRT-17.01-TRL6-TVALP-PERF.0019	**Not covered**	In the TVALP a partial coverage was declared because it was not yet confirmed if the V&VP allows (HW resources limits) to deploy 1000 A/C instances, as required by the consolidated load, each with minimum Purple Profile enabled applications and Air SWIM Node capabilities. During the preparation and the execution of the exercise, the V&VP was used to integrate also PJ.14-02-04 prototypes. This reduced the available HW resources allowing to emulate only two Purple Profile enabled aircraft. This was considered not really representative and the team decided to focus more on other objectives and integration with PJ.14-02-04 multilink A/G network.

Technical Validation Objective ID	Success Criterion ID	EXE1.0002	EXE1.0002 Justification
OBJ-17.01-TRL6-TVALP-PERF.0019	CRT-17.01-TRL6-TVALP-PERF.0020	**Not covered**	In the TVALP a partial coverage was declared because it was not yet confirmed if the V&VP allows (HW resources limits) to deploy 1000 A/C instances, as required by the consolidated load, each with minimum Purple Profile enabled applications and Air SWIM Node capabilities. During the preparation and the execution of the exercise, the V&VP was used to integrate also PJ.14-02-04 prototypes. This reduced the available HW resources allowing to emulate only two Purple Profile enabled aircraft. This was considered not really representative and the team decided to focus more on other objectives and integration with PJ.14-02-04 multilink A/G network.
OBJ-17.01-TRL6-TVALP-PERF.0020	CRT-17.01-TRL6-TVALP-PERF.0021	**Not covered**	In the TVALP a partial coverage was declared because it was not yet confirmed if the V&VP allows (HW resources limits) to deploy 1000 A/C instances, as required by the consolidated load, each with minimum Purple Profile enabled applications and Air SWIM Node capabilities. During the preparation and the execution of the exercise, the V&VP was used to integrate also PJ.14-02-04 prototypes. This reduced the available HW resources allowing to emulate only two Purple Profile enabled aircraft. This was considered not really representative and the team decided to focus more on other objectives and integration with PJ.14-02-04 multilink A/G network.

Technical Validation Objective ID	Success Criterion ID	EXE1.0002	EXE1.0002 Justification
OBJ-17.01-TRL6-TVALP-PERF.0021	CRT-17.01-TRL6-TVALP-PERF.0022	**Not covered**	In the TVALP a partial coverage was declared because it was not yet confirmed if the V&VP allows (HW resources limits) to deploy 1000 A/C instances, as required by the consolidated load, each with minimum Purple Profile enabled applications and Air SWIM Node capabilities. During the preparation and the execution of the exercise, the V&VP was used to integrate also PJ.14-02-04 prototypes. This reduced the available HW resources allowing to emulate only two Purple Profile enabled aircraft. This was considered not really representative and the team decided to focus more on other objectives and integration with PJ.14-02-04 multilink A/G network.
OBJ-17.01-TRL6-TVALP-PERF.0022	CRT-17.01-TRL6-TVALP-PERF.0023	**Not covered**	In the TVALP a partial coverage was declared because it was not yet confirmed if the V&VP allows (HW resources limits) to deploy 1000 A/C instances, as required by the consolidated load, each with minimum Purple Profile enabled applications and Air SWIM Node capabilities. During the preparation and the execution of the exercise, the V&VP was used to integrate also PJ.14-02-04 prototypes. This reduced the available HW resources allowing to emulate only two Purple Profile enabled aircraft. This was considered not really representative and the team decided to focus more on other objectives and integration with PJ.14-02-04 multilink A/G network.

Technical Validation Objective ID	Success Criterion ID	EXE1.0002	EXE1.0002 Justification
OBJ-17.01-TRL6-TVALP-PERF.0023	CRT-17.01-TRL6-TVALP-PERF.0024	**Not covered**	In the TVALP a partial coverage was declared because it was not yet confirmed if the V&VP allows (HW resources limits) to deploy 1000 A/C instances, as required by the consolidated load, each with minimum Purple Profile enabled applications and Air SWIM Node capabilities. During the preparation and the execution of the exercise, the V&VP was used to integrate also PJ.14-02-04 prototypes. This reduced the available HW resources allowing to emulate only two Purple Profile enabled aircraft. This was considered not really representative and the team decided to focus more on other objectives and integration with PJ.14-02-04 multilink A/G network.
OBJ-17.01-TRL6-TVALP-PERF.0024	CRT-17.01-TRL6-TVALP-PERF.0025	**Not covered**	In the TVALP a partial coverage was declared because it was not yet confirmed if the V&VP allows (HW resources limits) to deploy 1000 A/C instances, as required by the consolidated load, each with minimum Purple Profile enabled applications and Air SWIM Node capabilities. During the preparation and the execution of the exercise, the V&VP was used to integrate also PJ.14-02-04 prototypes. This reduced the available HW resources allowing to emulate only two Purple Profile enabled aircraft. This was considered not really representative and the team decided to focus more on other objectives and integration with PJ.14-02-04 multilink A/G network.
OBJ-17.01-TRL6-TVALP-PERF.0025	CRT-17.01-TRL6-TVALP-PERF.0026	No deviation	N/A
OBJ-17.01-TRL6-TVALP-PERF.0026	CRT-17.01-TRL6-TVALP-PERF.0027	No deviation	N/A

Technical Validation Objective ID	Success Criterion ID	EXE1.0002	EXE1.0002 Justification
OBJ-17.01-TRL6-TVALP-REL.0001	CRT-17.01-TRL6-TVALP-REL.0001	No deviation	N/A
OBJ-17.01-TRL6-TVALP-REL.0001	CRT-17.01-TRL6-TVALP-REL.0002	No deviation	N/A
OBJ-17.01-TRL6-TVALP-REL.0001	CRT-17.01-TRL6-TVALP-REL.0026	No deviation	N/A
OBJ-17.01-TRL6-TVALP-REL.0001	CRT-17.01-TRL6-TVALP-REL.0003	No deviation	N/A
OBJ-17.01-TRL6-TVALP-REL.0001	CRT-17.01-TRL6-TVALP-REL.0004	No deviation	N/A
OBJ-17.01-TRL6-TVALP-REL.0001	CRT-17.01-TRL6-TVALP-REL.0027	No deviation	N/A
OBJ-17.01-TRL6-TVALP-REL.0001	CRT-17.01-TRL6-TVALP-REL.0005	No deviation	N/A
OBJ-17.01-TRL6-TVALP-REL.0001	CRT-17.01-TRL6-TVALP-REL.0006	No deviation	N/A
OBJ-17.01-TRL6-TVALP-REL.0001	CRT-17.01-TRL6-TVALP-REL.0007	No deviation	N/A
OBJ-17.01-TRL6-TVALP-REL.0002	CRT-17.01-TRL6-TVALP-REL.0008	No deviation	N/A
OBJ-17.01-TRL6-TVALP-REL.0002	CRT-17.01-TRL6-TVALP-REL.0009	No deviation	N/A
OBJ-17.01-TRL6-TVALP-REL.0002	CRT-17.01-TRL6-TVALP-REL.0028	No deviation	N/A
OBJ-17.01-TRL6-TVALP-REL.0002	CRT-17.01-TRL6-TVALP-REL.0010	No deviation	N/A
OBJ-17.01-TRL6-TVALP-REL.0002	CRT-17.01-TRL6-TVALP-REL.0011	No deviation	N/A
OBJ-17.01-TRL6-TVALP-REL.0002	CRT-17.01-TRL6-TVALP-REL.0029	No deviation	N/A
OBJ-17.01-TRL6-TVALP-REL.0002	CRT-17.01-TRL6-TVALP-REL.0005	No deviation	N/A
OBJ-17.01-TRL6-TVALP-REL.0002	CRT-17.01-TRL6-TVALP-REL.0006	No deviation	N/A

Technical Validation Objective ID	Success Criterion ID	EXE1.0002	EXE1.0002 Justification
OBJ-17.01-TRL6-TVALP-REL.0002	CRT-17.01-TRL6-TVALP-REL.0007	No deviation	N/A
OBJ-17.01-TRL6-TVALP-REL.0003	CRT-17.01-TRL6-TVALP-REL.0012	No deviation	N/A
OBJ-17.01-TRL6-TVALP-REL.0003	CRT-17.01-TRL6-TVALP-REL.0013	No deviation	N/A
OBJ-17.01-TRL6-TVALP-REL.0003	CRT-17.01-TRL6-TVALP-REL.0030	No deviation	N/A
OBJ-17.01-TRL6-TVALP-REL.0003	CRT-17.01-TRL6-TVALP-REL.0005	No deviation	N/A
OBJ-17.01-TRL6-TVALP-REL.0003	CRT-17.01-TRL6-TVALP-REL.0006	No deviation	N/A
OBJ-17.01-TRL6-TVALP-REL.0003	CRT-17.01-TRL6-TVALP-REL.0007	No deviation	N/A
OBJ-17.01-TRL6-TVALP-REL.0004	CRT-17.01-TRL6-TVALP-REL.0014	No deviation	N/A
OBJ-17.01-TRL6-TVALP-REL.0004	CRT-17.01-TRL6-TVALP-REL.0015	No deviation	N/A
OBJ-17.01-TRL6-TVALP-REL.0004	CRT-17.01-TRL6-TVALP-REL.0031	No deviation	N/A
OBJ-17.01-TRL6-TVALP-REL.0004	CRT-17.01-TRL6-TVALP-REL.0005	No deviation	N/A
OBJ-17.01-TRL6-TVALP-REL.0004	CRT-17.01-TRL6-TVALP-REL.0006	No deviation	N/A
OBJ-17.01-TRL6-TVALP-REL.0004	CRT-17.01-TRL6-TVALP-REL.0007	No deviation	N/A
OBJ-17.01-TRL6-TVALP-REL.0005	CRT-17.01-TRL6-TVALP-REL.0016	No deviation	N/A
OBJ-17.01-TRL6-TVALP-REL.0005	CRT-17.01-TRL6-TVALP-REL.0017	No deviation	N/A
OBJ-17.01-TRL6-TVALP-REL.0005	CRT-17.01-TRL6-TVALP-REL.0032	No deviation	N/A
OBJ-17.01-TRL6-TVALP-REL.0005	CRT-17.01-TRL6-TVALP-REL.0018	No deviation	N/A

Technical Validation Objective ID	Success Criterion ID	EXE1.0002	EXE1.0002 Justification
OBJ-17.01-TRL6-TVALP-REL.0005	CRT-17.01-TRL6-TVALP-REL.0019	No deviation	N/A
OBJ-17.01-TRL6-TVALP-REL.0005	CRT-17.01-TRL6-TVALP-REL.0033	No deviation	N/A
OBJ-17.01-TRL6-TVALP-REL.0005	CRT-17.01-TRL6-TVALP-REL.0005	No deviation	N/A
OBJ-17.01-TRL6-TVALP-REL.0005	CRT-17.01-TRL6-TVALP-REL.0006	No deviation	N/A
OBJ-17.01-TRL6-TVALP-REL.0005	CRT-17.01-TRL6-TVALP-REL.0007	No deviation	N/A
OBJ-17.01-TRL6-TVALP-REL.0006	CRT-17.01-TRL6-TVALP-REL.0020	No deviation	N/A
OBJ-17.01-TRL6-TVALP-REL.0006	CRT-17.01-TRL6-TVALP-REL.0021	No deviation	N/A
OBJ-17.01-TRL6-TVALP-REL.0006	CRT-17.01-TRL6-TVALP-REL.0034	No deviation	N/A
OBJ-17.01-TRL6-TVALP-REL.0006	CRT-17.01-TRL6-TVALP-REL.0022	No deviation	N/A
OBJ-17.01-TRL6-TVALP-REL.0006	CRT-17.01-TRL6-TVALP-REL.0011	No deviation	N/A
OBJ-17.01-TRL6-TVALP-REL.0006	CRT-17.01-TRL6-TVALP-REL.0035	No deviation	N/A
OBJ-17.01-TRL6-TVALP-REL.0006	CRT-17.01-TRL6-TVALP-REL.0005	No deviation	N/A
OBJ-17.01-TRL6-TVALP-REL.0006	CRT-17.01-TRL6-TVALP-REL.0006	No deviation	N/A
OBJ-17.01-TRL6-TVALP-REL.0006	CRT-17.01-TRL6-TVALP-REL.0007	No deviation	N/A
OBJ-17.01-TRL6-TVALP-REL.0007	CRT-17.01-TRL6-TVALP-REL.0023	No deviation	N/A
OBJ-17.01-TRL6-TVALP-REL.0007	CRT-17.01-TRL6-TVALP-REL.0024	No deviation	N/A
OBJ-17.01-TRL6-TVALP-REL.0007	CRT-17.01-TRL6-TVALP-REL.0036	No deviation	N/A

Technical Validation Objective ID	Success Criterion ID	EXE1.0002	EXE1.0002 Justification
OBJ-17.01-TRL6-TVALP-REL.0007	CRT-17.01-TRL6-TVALP-REL.0005	No deviation	N/A
OBJ-17.01-TRL6-TVALP-REL.0007	CRT-17.01-TRL6-TVALP-REL.0006	No deviation	N/A
OBJ-17.01-TRL6-TVALP-REL.0007	CRT-17.01-TRL6-TVALP-REL.0007	No deviation	N/A
OBJ-17.01-TRL6-TVALP-REL.0008	CRT-17.01-TRL6-TVALP-REL.0025	No deviation	N/A
OBJ-17.01-TRL6-TVALP-REL.0008	CRT-17.01-TRL6-TVALP-REL.0038	No deviation	N/A
OBJ-17.01-TRL6-TVALP-REL.0008	CRT-17.01-TRL6-TVALP-REL.0037	No deviation	N/A
OBJ-17.01-TRL6-TVALP-REL.0008	CRT-17.01-TRL6-TVALP-REL.0005	No deviation	N/A
OBJ-17.01-TRL6-TVALP-REL.0008	CRT-17.01-TRL6-TVALP-REL.0006	No deviation	N/A
OBJ-17.01-TRL6-TVALP-REL.0008	CRT-17.01-TRL6-TVALP-REL.0007	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0001	CRT-17.01-TRL6-TVALP-SEC.0001	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0001	CRT-17.01-TRL6-TVALP-SEC.0002	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0001	CRT-17.01-TRL6-TVALP-SEC.0003	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0001	CRT-17.01-TRL6-TVALP-SEC.0004	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0001	CRT-17.01-TRL6-TVALP-SEC.0008	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0001	CRT-17.01-TRL6-TVALP-SEC.0009	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0002	CRT-17.01-TRL6-TVALP-SEC.0001	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0002	CRT-17.01-TRL6-TVALP-SEC.0002	No deviation	N/A

Technical Validation Objective ID	Success Criterion ID	EXE1.0002	EXE1.0002 Justification
OBJ-17.01-TRL6-TVALP-SEC.0002	CRT-17.01-TRL6-TVALP-SEC.0003	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0002	CRT-17.01-TRL6-TVALP-SEC.0005	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0002	CRT-17.01-TRL6-TVALP-SEC.0006	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0002	CRT-17.01-TRL6-TVALP-SEC.0007	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0002	CRT-17.01-TRL6-TVALP-SEC.0008	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0002	CRT-17.01-TRL6-TVALP-SEC.0009	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0003	CRT-17.01-TRL6-TVALP-SEC.0010	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0003	CRT-17.01-TRL6-TVALP-SEC.0011	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0003	CRT-17.01-TRL6-TVALP-SEC.0012	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0003	CRT-17.01-TRL6-TVALP-SEC.0004	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0003	CRT-17.01-TRL6-TVALP-SEC.0008	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0003	CRT-17.01-TRL6-TVALP-SEC.0009	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0004	CRT-17.01-TRL6-TVALP-SEC.0010	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0004	CRT-17.01-TRL6-TVALP-SEC.0011	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0004	CRT-17.01-TRL6-TVALP-SEC.0012	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0004	CRT-17.01-TRL6-TVALP-SEC.0005	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0004	CRT-17.01-TRL6-TVALP-SEC.0006	No deviation	N/A

Technical Validation Objective ID	Success Criterion ID	EXE1.0002	EXE1.0002 Justification
OBJ-17.01-TRL6-TVALP-SEC.0004	CRT-17.01-TRL6-TVALP-SEC.0007	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0004	CRT-17.01-TRL6-TVALP-SEC.0008	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0004	CRT-17.01-TRL6-TVALP-SEC.0009	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0005	CRT-17.01-TRL6-TVALP-SEC.0013	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0005	CRT-17.01-TRL6-TVALP-SEC.0014	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0005	CRT-17.01-TRL6-TVALP-SEC.0015	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0005	CRT-17.01-TRL6-TVALP-SEC.0016	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0005	CRT-17.01-TRL6-TVALP-SEC.0017	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0005	CRT-17.01-TRL6-TVALP-SEC.0018	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0005	CRT-17.01-TRL6-TVALP-SEC.0019	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0006	CRT-17.01-TRL6-TVALP-SEC.0020	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0006	CRT-17.01-TRL6-TVALP-SEC.0021	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0006	CRT-17.01-TRL6-TVALP-SEC.0022	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0006	CRT-17.01-TRL6-TVALP-SEC.0016	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0006	CRT-17.01-TRL6-TVALP-SEC.0017	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0006	CRT-17.01-TRL6-TVALP-SEC.0018	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0006	CRT-17.01-TRL6-TVALP-SEC.0019	No deviation	N/A

Technical Validation Objective ID	Success Criterion ID	EXE1.0002	EXE1.0002 Justification
OBJ-17.01-TRL6-TVALP-SEC.0007	CRT-17.01-TRL6-TVALP-SEC.0013	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0007	CRT-17.01-TRL6-TVALP-SEC.0014	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0007	CRT-17.01-TRL6-TVALP-SEC.0015	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0007	CRT-17.01-TRL6-TVALP-SEC.0016	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0007	CRT-17.01-TRL6-TVALP-SEC.0017	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0007	CRT-17.01-TRL6-TVALP-SEC.0023	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0008	CRT-17.01-TRL6-TVALP-SEC.0020	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0008	CRT-17.01-TRL6-TVALP-SEC.0021	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0008	CRT-17.01-TRL6-TVALP-SEC.0022	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0008	CRT-17.01-TRL6-TVALP-SEC.0016	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0008	CRT-17.01-TRL6-TVALP-SEC.0017	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0008	CRT-17.01-TRL6-TVALP-SEC.0024	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0009	CRT-17.01-TRL6-TVALP-SEC.0025	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0009	CRT-17.01-TRL6-TVALP-SEC.0016	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0009	CRT-17.01-TRL6-TVALP-SEC.0026	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0010	CRT-17.01-TRL6-TVALP-SEC.0027	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0010	CRT-17.01-TRL6-TVALP-SEC.0016	No deviation	N/A

Technical Validation Objective ID	Success Criterion ID	EXE1.0002	EXE1.0002 Justification
OBJ-17.01-TRL6-TVALP-SEC.0010	CRT-17.01-TRL6-TVALP-SEC.0028	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0011	CRT-17.01-TRL6-TVALP-SEC.0029	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0011	CRT-17.01-TRL6-TVALP-SEC.0030	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0011	CRT-17.01-TRL6-TVALP-SEC.0031	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0011	CRT-17.01-TRL6-TVALP-SEC.0032	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0011	CRT-17.01-TRL6-TVALP-SEC.0033	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0011	CRT-17.01-TRL6-TVALP-SEC.0034	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0011	CRT-17.01-TRL6-TVALP-SEC.0035	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0012	CRT-17.01-TRL6-TVALP-SEC.0036	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0012	CRT-17.01-TRL6-TVALP-SEC.0037	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0012	CRT-17.01-TRL6-TVALP-SEC.0038	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0013	CRT-17.01-TRL6-TVALP-SEC.0029	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0013	CRT-17.01-TRL6-TVALP-SEC.0030	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0013	CRT-17.01-TRL6-TVALP-SEC.0031	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0013	CRT-17.01-TRL6-TVALP-SEC.0032	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0013	CRT-17.01-TRL6-TVALP-SEC.0039	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0013	CRT-17.01-TRL6-TVALP-SEC.0040	No deviation	N/A

Technical Validation Objective ID	Success Criterion ID	EXE1.0002	EXE1.0002 Justification
OBJ-17.01-TRL6-TVALP-SEC.0013	CRT-17.01-TRL6-TVALP-SEC.0041	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0013	CRT-17.01-TRL6-TVALP-SEC.0042	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0014	CRT-17.01-TRL6-TVALP-SEC.0043	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0014	CRT-17.01-TRL6-TVALP-SEC.0044	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0014	CRT-17.01-TRL6-TVALP-SEC.0045	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0014	CRT-17.01-TRL6-TVALP-SEC.0046	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0014	CRT-17.01-TRL6-TVALP-SEC.0047	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0014	CRT-17.01-TRL6-TVALP-SEC.0048	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0015	CRT-17.01-TRL6-TVALP-SEC.0049	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0015	CRT-17.01-TRL6-TVALP-SEC.0050	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0015	CRT-17.01-TRL6-TVALP-SEC.0051	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0015	CRT-17.01-TRL6-TVALP-SEC.0052	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0015	CRT-17.01-TRL6-TVALP-SEC.0053	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0015	CRT-17.01-TRL6-TVALP-SEC.0054	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0015	CRT-17.01-TRL6-TVALP-SEC.0055	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0015	CRT-17.01-TRL6-TVALP-SEC.0056	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0015	CRT-17.01-TRL6-TVALP-SEC.0057	No deviation	N/A

Technical Validation Objective ID	Success Criterion ID	EXE1.0002	EXE1.0002 Justification
OBJ-17.01-TRL6-TVALP-SEC.0015	CRT-17.01-TRL6-TVALP-SEC.0058	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0016	CRT-17.01-TRL6-TVALP-SEC.0059	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0016	CRT-17.01-TRL6-TVALP-SEC.0060	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0016	CRT-17.01-TRL6-TVALP-SEC.0061	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0016	CRT-17.01-TRL6-TVALP-SEC.0062	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0016	CRT-17.01-TRL6-TVALP-SEC.0053	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0016	CRT-17.01-TRL6-TVALP-SEC.0054	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0016	CRT-17.01-TRL6-TVALP-SEC.0063	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0016	CRT-17.01-TRL6-TVALP-SEC.0064	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0016	CRT-17.01-TRL6-TVALP-SEC.0065	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0016	CRT-17.01-TRL6-TVALP-SEC.0066	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0017	CRT-17.01-TRL6-TVALP-SEC.0067	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0017	CRT-17.01-TRL6-TVALP-SEC.0068	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0017	CRT-17.01-TRL6-TVALP-SEC.0069	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0017	CRT-17.01-TRL6-TVALP-SEC.0070	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0017	CRT-17.01-TRL6-TVALP-SEC.0071	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0017	CRT-17.01-TRL6-TVALP-SEC.0072	No deviation	N/A

Technical Validation Objective ID	Success Criterion ID	EXE1.0002	EXE1.0002 Justification
OBJ-17.01-TRL6-TVALP-SEC.0017	CRT-17.01-TRL6-TVALP-SEC.0073	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0018	CRT-17.01-TRL6-TVALP-SEC.0074	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0018	CRT-17.01-TRL6-TVALP-SEC.0075	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0018	CRT-17.01-TRL6-TVALP-SEC.0076	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0018	CRT-17.01-TRL6-TVALP-SEC.0077	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0019	CRT-17.01-TRL6-TVALP-SEC.0078	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0019	CRT-17.01-TRL6-TVALP-SEC.0079	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0019	CRT-17.01-TRL6-TVALP-SEC.0080	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0019	CRT-17.01-TRL6-TVALP-SEC.0081	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0020	CRT-17.01-TRL6-TVALP-SEC.0078	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0020	CRT-17.01-TRL6-TVALP-SEC.0079	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0020	CRT-17.01-TRL6-TVALP-SEC.0080	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0020	CRT-17.01-TRL6-TVALP-SEC.0081	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0021	CRT-17.01-TRL6-TVALP-SEC.0082	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0021	CRT-17.01-TRL6-TVALP-SEC.0083	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0021	CRT-17.01-TRL6-TVALP-SEC.0084	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0021	CRT-17.01-TRL6-TVALP-SEC.0085	No deviation	N/A

Technical Validation Objective ID	Success Criterion ID	EXE1.0002	EXE1.0002 Justification
OBJ-17.01-TRL6-TVALP-SEC.0021	CRT-17.01-TRL6-TVALP-SEC.0086	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0021	CRT-17.01-TRL6-TVALP-SEC.0087	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0022	CRT-17.01-TRL6-TVALP-SEC.0088	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0022	CRT-17.01-TRL6-TVALP-SEC.0089	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0022	CRT-17.01-TRL6-TVALP-SEC.0090	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0022	CRT-17.01-TRL6-TVALP-SEC.0091	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0022	CRT-17.01-TRL6-TVALP-SEC.0092	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0023	CRT-17.01-TRL6-TVALP-SEC.0088	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0023	CRT-17.01-TRL6-TVALP-SEC.0089	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0023	CRT-17.01-TRL6-TVALP-SEC.0090	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0023	CRT-17.01-TRL6-TVALP-SEC.0091	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0023	CRT-17.01-TRL6-TVALP-SEC.0092	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0024	CRT-17.01-TRL6-TVALP-SEC.0093	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0024	CRT-17.01-TRL6-TVALP-SEC.0094	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0024	CRT-17.01-TRL6-TVALP-SEC.0095	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0025	CRT-17.01-TRL6-TVALP-SEC.0096	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0025	CRT-17.01-TRL6-TVALP-SEC.0097	No deviation	N/A

Technical Validation Objective ID	Success Criterion ID	EXE1.0002	EXE1.0002 Justification
OBJ-17.01-TRL6-TVALP-SEC.0026	CRT-17.01-TRL6-TVALP-SEC.0096	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0026	CRT-17.01-TRL6-TVALP-SEC.0097	No deviation	N/A

Table 16: Deviations in terms of PJ.17-01 TRL6 EXE1.0002 technical validation objectives coverage

More details about deviations and validation results are provided in A.3.

A.3 Technical Validation Exercise #01 Validation Results

A.3.1 Summary of Technical Validation Exercise #01 Results

Technical validation results summarized in this section represent the consolidation of the results from both EXE1.0001 and EXE1.0002. The two tables in §A.2 provide per-EXE summary.

Taking into account that the main purpose was to assess and refine the Purple Profile TS, the approach applied during planning, prototyping, integration and validation phases, could be characterized as follows:

- To try to maximize the coverage of validation objectives and requirements (also in terms of technical options described in the TS).
- To maximize the conformance with the TS.
- To recording any candidate TS updates.

Furthermore, when designing and developing the implementation of the requirements, the following must-to-have principles have been applied:

- Configurability: all the key capabilities have to be high configurable in terms of:
  - Concerned Purple Profile enabled SWIM services/ Class of services.
  - Parameters and options.
  - Status (enabled/disabled).
  - Monitoring (events).
  - QoSs.
  - Off-line and on-line update of the configuration.
- Flexibility/extensibility: all the key capabilities are Purple Profile enabled SWIM service agnostic. This improve the level of flexibility/extensibility in terms of adding/configuring/removing/disabling/enabling Purple Profile SWIM services.

Finally, in the context of EXE1, the integration with PJ.14-02-04 multilink prototype was successfully validated:

- IPv6 based.

- Multilink transparent to Purple Profile SWIM Nodes.
- Use of network level class of services (all the IPv6 packets exchanged by two peers are marked with the CoS selected at TCP/IP connection establishment phase).

EXE1 successfully validated additional "network setups":

- IPv4 only (not part of the integration with the PJ.14-02-04 multilink prototype).
- IPv4 and IPv6 (e.g. Application – SWIM Node over IPv4 and Air SWIM Node – Ground SWIM Node over IPv6).

Although some refinements are needed at TS level, overall EXE1 demonstrated good level of completeness and correctness of the TS. The same applies to Purple Profile technical feasibility and suitability for the purpose (flexible, reliable and secure integration of the aircraft in the "SWIM network").

Hereafter, further high level considerations are provided in terms of requirements and validation objectives coverage. Further details are provided in §A.3.4.

EXE1 requirements coverage is provided in Appendix J.

Requirements (further details are provided in Appendix J):

- On top of 358 requirements, 300 requirements have been fully implemented and the remaining 58 are distributed as follows:
    - 47 requirements have not been implemented.
    - 11 requirements have been partially implemented.
- On top of these 58 requirements:
    - 10 (6 not implemented and 4 partially implemented) are related to the audit capabilities and policies. No audit policies have been implemented because it depends on the overall security management solution for the target platform (industrialization, operational) where the SWIM nodes are deployed/operated. These requirements are out of scope of technical validation activities).
    - 22 (not implemented) can be only implemented in the target platform (industrialization, operational) where the SWIM nodes are deployed/operated. These requirements are out of scope of technical validation activities).
    - 15 are allocated to Network / EXE V&V platform.
    - 4 are related to continuous unavailability and availability out of scope of technical validation activities.
    - 7 not implemented because limitations of the V&VP.

Validation objectives:

- Performance efficiency characteristic Technical Validation Objectives: all the success criteria have been validated with "OK" status except those related to validation objectives OBJ-17.01-TRL6-TVALP-PERF.0009 to OBJ-17.01-TRL6-TVALP-PERF.0024. These objectives have not been covered (in the TVALP they were planned as partially covered) due to software and hardware limitations of the V&VP. In particular, due to also the integration of PJ.14-02-04 prototypes, the available HW resources allowed to emulate only two Purple Profile enabled aircraft. This was considered not really representative and the team decided to focus more on other objectives and integration with PJ.14-02-04 multilink A/G network.
- Reliability efficiency Technical Validation Objectives: all the success criteria have been validated with "OK" status.
- Security characteristic Technical Validation Objectives: all the success criteria have been validated with "OK" status except CRT-17.01-TRL6-TVALP-SEC.0017 (NOK status) and CRT-17.01-TRL6-TVALP-SEC.0008, CRT-17.01-TRL6-TVALP-SEC.0016, CRT-17.01-TRL6-TVALP-SEC.0032, CRT-17.01-TRL6-TVALP-SEC.0053 (Partially OK status).

Table 17~~Table 17~~ and Table 18~~Table 18~~ provide a summary of the EXE1.0001 and EXE1.0002 validation results per validation objective.

- OK: technical validation objective achieves the expectations (exercise results achieve success criteria).
- NOK: technical validation objective does not achieve the expectations (exercise results do not achieve success criteria).
- Partially OK: technical validation objective achieves the expectations to a certain extent. The reasons why the technical validation objective is not fully achieved have been recorded in table below.

Technical Validation Exercise #01 Technical Validation Objective ID	Technical Validation Exercise #01 Technical Validation Objective Title	Technical Validation Exercise #01 Success Criterion ID	Technical Validation Exercise #01 Success Criterion	Technical Validation Exercise #01 Validation Results	Technical Validation Exercise #01 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-PERF.0001	FIFO message queue level ordering guarantees QoS for uplink service	CRT-17.01-TRL6-TVALP-PERF.0001	Messages sent by the ground sender are received in the same FIFO order by the aircraft application.	End to end FIFO message queue level ordering guarantees QoS for uplink Purple Profile enabled SWIM services has been successfully validated.	OK
OBJ-17.01-TRL6-TVALP-PERF.0002	FIFO message queue level ordering guarantees QoS for downlink service	CRT-17.01-TRL6-TVALP-PERF.0002	Messages sent by the air sender are received in the same FIFO order by the ground application.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-PERF.0003	FIFO message topic level ordering guarantees QoS for uplink service	CRT-17.01-TRL6-TVALP-PERF.0003	Messages published by the ground publisher are received in the same FIFO order by the aircraft application(s).	End to end FIFO message queue level ordering guarantees QoS for uplink Purple Profile enabled SWIM services has been successfully validated.	OK
OBJ-17.01-TRL6-TVALP-PERF.0004	FIFO message topic level ordering guarantees QoS for downlink service	CRT-17.01-TRL6-TVALP-PERF.0004	Messages published by the air publisher(s) are received in the same FIFO order by the ground application(s).	End to end FIFO message queue level ordering guarantees QoS for downlink Purple Profile enabled SWIM services has been successfully validated.	OK
OBJ-17.01-TRL6-TVALP-PERF.0005	Message priority message queue level ordering guarantees QoS for uplink service	CRT-17.01-TRL6-TVALP-PERF.0005	The ground sender sends messages with different priorities and the aircraft application receives them ordered according to the priority (best effort).	Not planned	N/A

Technical Validation Exercise #01 Technical Validation Objective ID	Technical Validation Exercise #01 Technical Validation Objective Title	Technical Validation Exercise #01 Success Criterion ID	Technical Validation Exercise #01 Success Criterion	Technical Validation Exercise #01 Validation Results	Technical Validation Exercise #01 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-PERF.0005	Message priority message queue level ordering guarantees QoS for uplink service	CRT-17.01-TRL6-TVALP-PERF.0006	Messages with the same priority are received with FIFO ordering.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-PERF.0006	Message priority message queue level ordering guarantees QoS for downlink service	CRT-17.01-TRL6-TVALP-PERF.0007	The air sender sends messages with different priorities and the ground application receives them ordered according to the priority (best effort).	Not planned	N/A
OBJ-17.01-TRL6-TVALP-PERF.0006	Message priority message queue level ordering guarantees QoS for downlink service	CRT-17.01-TRL6-TVALP-PERF.0006	Messages with the same priority are received with FIFO ordering.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-PERF.0007	Message priority topic level ordering guarantees QoS for uplink service	CRT-17.01-TRL6-TVALP-PERF.0008	The ground publisher publishes messages with different priorities and the aircraft applications receive them ordered according to the priority (best effort).	Not planned	N/A

Technical Validation Exercise #01 Technical Validation Objective ID	Technical Validation Exercise #01 Technical Validation Objective Title	Technical Validation Exercise #01 Success Criterion ID	Technical Validation Exercise #01 Success Criterion	Technical Validation Exercise #01 Validation Results	Technical Validation Exercise #01 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-PERF.0007	Message priority topic level ordering guarantees QoS for uplink service	CRT-17.01-TRL6-TVALP-PERF.0006	Messages with the same priority are received with FIFO ordering.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-PERF.0008	Message priority message topic level ordering guarantees QoS for downlink service	CRT-17.01-TRL6-TVALP-PERF.0009	The air publisher publishes messages with different priorities and the ground applications receive them ordered according to the priority (best effort).	Not planned	N/A
OBJ-17.01-TRL6-TVALP-PERF.0008	Message priority message topic level ordering guarantees QoS for downlink service	CRT-17.01-TRL6-TVALP-PERF.0006	Messages with the same priority are received with FIFO ordering.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-PERF.0009	End to end message latency for Category A uplink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-PERF.0010	The measured end to end message latency for Category A uplink Request/Response Purple Profile enabled SWIM services is <= 20s for 95% of the messages and <= 40s for 98% of the messages in the reference measurement conditions.	Not planned	N/A

Technical Validation Exercise #01 Technical Validation Objective ID	Technical Validation Exercise #01 Technical Validation Objective Title	Technical Validation Exercise #01 Success Criterion ID	Technical Validation Exercise #01 Success Criterion	Technical Validation Exercise #01 Validation Results	Technical Validation Exercise #01 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-PERF.0010	End to end message latency for Category A downlink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-PERF.0011	The measured end to end message latency for Category A downlink Request/Response Purple Profile enabled SWIM services is <= 20s for 95% of the messages and <= 40s for 98% of the messages in the reference measurement conditions.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-PERF.0011	End to end message latency for Category B uplink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-PERF.0012	The measured end to end message latency for Category B uplink Request/Response Purple Profile enabled SWIM services is <= 30s for 95% of the messages and <= 60s for 98% of the messages in the reference measurement conditions.	Not planned	N/A

Technical Validation Exercise #01 Technical Validation Objective ID	Technical Validation Exercise #01 Technical Validation Objective Title	Technical Validation Exercise #01 Success Criterion ID	Technical Validation Exercise #01 Success Criterion	Technical Validation Exercise #01 Validation Results	Technical Validation Exercise #01 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-PERF.0012	End to end message latency for Category B downlink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-PERF.0013	The measured end to end message latency for Category B downlink Request/Response Purple Profile enabled SWIM services is <= 30s for 95% of the messages and <= 60s for 98% of the messages in the reference measurement conditions.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-PERF.0013	End to end message latency for Category C uplink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-PERF.0014	The measured end to end message latency for Category C uplink Request/Response Purple Profile enabled SWIM services is <= 50s for 95% of the messages and <= 100s for 98% of the messages in the reference measurement conditions.	Not planned	N/A

Technical Validation Exercise #01 Technical Validation Objective ID	Technical Validation Exercise #01 Technical Validation Objective Title	Technical Validation Exercise #01 Success Criterion ID	Technical Validation Exercise #01 Success Criterion	Technical Validation Exercise #01 Validation Results	Technical Validation Exercise #01 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-PERF.0014	End to end message latency for Category C downlink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-PERF.0015	The measured end to end message latency for Category C downlink Request/Response Purple Profile enabled SWIM services is <= 50s for 95% of the messages and <= 100s for 98% of the messages in the reference measurement conditions.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-PERF.0015	End to end message latency for Category D uplink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-PERF.0016	The measured end to end message latency for Category D uplink Request/Response Purple Profile enabled SWIM services is <= 60s for 95% of the messages and <= 120s for 98% of the messages in the reference measurement conditions.	Not planned	N/A

Technical Validation Exercise #01 Technical Validation Objective ID	Technical Validation Exercise #01 Technical Validation Objective Title	Technical Validation Exercise #01 Success Criterion ID	Technical Validation Exercise #01 Success Criterion	Technical Validation Exercise #01 Validation Results	Technical Validation Exercise #01 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-PERF.0016	End to end message latency for Category D downlink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-PERF.0017	The measured end to end message latency for Category D downlink Request/Response Purple Profile enabled SWIM services is <= 60s for 95% of the messages and <= 120s for 98% of the messages in the reference measurement conditions.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-PERF.0017	End to end message latency for Category A uplink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-PERF.0018	The measured end to end message latency for Category A uplink Publish/Subscribe Purple Profile enabled SWIM services is <= 20s for 95% of the messages and <= 40s for 98% of the messages in the reference measurement conditions.	Not planned	N/A

Technical Validation Exercise #01 Technical Validation Objective ID	Technical Validation Exercise #01 Technical Validation Objective Title	Technical Validation Exercise #01 Success Criterion ID	Technical Validation Exercise #01 Success Criterion	Technical Validation Exercise #01 Validation Results	Technical Validation Exercise #01 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-PERF.0018	End to end message latency for Category A downlink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-PERF.0019	The measured end to end message latency for Category A downlink Publish/Subscribe Purple Profile enabled SWIM services is <= 20s for 95% of the messages and <= 40s for 98% of the messages in the reference measurement conditions.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-PERF.0019	End to end message latency for Category B uplink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-PERF.0020	The measured end to end message latency for Category B uplink Publish/Subscribe Purple Profile enabled SWIM services is <= 30s for 95% of the messages and <= 60s for 98% of the messages in the reference measurement conditions.	Not planned	N/A

Technical Validation Exercise #01 Technical Validation Objective ID	Technical Validation Exercise #01 Technical Validation Objective Title	Technical Validation Exercise #01 Success Criterion ID	Technical Validation Exercise #01 Success Criterion	Technical Validation Exercise #01 Validation Results	Technical Validation Exercise #01 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-PERF.0020	End to end message latency for Category B downlink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-PERF.0021	The measured end to end message latency for Category B downlink Publish/Subscribe Purple Profile enabled SWIM services is <= 30s for 95% of the messages and <= 60s for 98% of the messages in the reference measurement conditions.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-PERF.0021	End to end message latency for Category C uplink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-PERF.0022	The measured end to end message latency for Category C uplink Publish/Subscribe Purple Profile enabled SWIM services is <= 50s for 95% of the messages and <= 100s for 98% of the messages in the reference measurement conditions.	Not planned	N/A

Technical Validation Exercise #01 Technical Validation Objective ID	Technical Validation Exercise #01 Technical Validation Objective Title	Technical Validation Exercise #01 Success Criterion ID	Technical Validation Exercise #01 Success Criterion	Technical Validation Exercise #01 Validation Results	Technical Validation Exercise #01 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-PERF.0022	End to end message latency for Category C downlink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-PERF.0023	The measured end to end message latency for Category C downlink Publish/Subscribe Purple Profile enabled SWIM services is <= 50s for 95% of the messages and <= 100s for 98% of the messages in the reference measurement conditions.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-PERF.0023	End to end message latency for Category D uplink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-PERF.0024	The measured end to end message latency for Category D uplink Publish/Subscribe Purple Profile enabled SWIM services is <= 60s for 95% of the messages and <= 120s for 98% of the messages in the reference measurement conditions.	Not planned	N/A

Technical Validation Exercise #01 Technical Validation Objective ID	Technical Validation Exercise #01 Technical Validation Objective Title	Technical Validation Exercise #01 Success Criterion ID	Technical Validation Exercise #01 Success Criterion	Technical Validation Exercise #01 Validation Results	Technical Validation Exercise #01 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-PERF.0024	End to end message latency for Category D downlink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-PERF.0025	The measured end to end message latency for Category C downlink Publish/Subscribe Purple Profile enabled SWIM services is <= 60s for 95% of the messages and <= 120s for 98% of the messages in the reference measurement conditions.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-PERF.0025	On-the-fly compression QoS for uplink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-PERF.0026	Response messages sent by the ground responder are compressed and uncompressed on-the-fly by the Ground-Air SWIM Nodes pair, without violating message integrity, and received by the aircraft application.	On-the-fly Purple Profile capability has been successfully validated. It has been demonstrated that it reduces the A/G network bandwidth consumption and it transparent to Purple Profile enabled application. Furthermore, it has been considered valuable for ground services providing data for both ground and air consumers. For instance the D-NOTAM publisher is just publishing D-NOTAMs without taking care of extra "optimizations" (e.g. compression) that may be required for air side subscribers.	OK

Technical Validation Exercise #01 Technical Validation Objective ID	Technical Validation Exercise #01 Technical Validation Objective Title	Technical Validation Exercise #01 Success Criterion ID	Technical Validation Exercise #01 Success Criterion	Technical Validation Exercise #01 Validation Results	Technical Validation Exercise #01 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-PERF.0026	On-the-fly compression QoS for uplink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-PERF.0027	Publication messages sent by the ground publisher are compressed and uncompressed on-the-fly by the Ground-Air SWIM Nodes pair, without violating message integrity, and received by the aircraft application.	On-the-fly Purple Profile capability has been successfully validated. It has been demonstrated that it reduces the A/G network bandwidth consumption and it transparent to Purple Profile enabled application. Furthermore, it has been considered valuable for ground services providing data for both ground and air consumers. For instance the D-NOTAM publisher is just publishing D-NOTAMs without taking care of extra "optimizations" (e.g. compression) that may be required for air side subscribers.	OK
OBJ-17.01-TRL6-TVALP-REL.0001	End-to-end at-least-once delivery guarantees QoS for uplink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0001	A request message from aircraft requestor is received at least once by the ground responder although, while routing the request message, a connection establishment failure event (successfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	Not planned	N/A

Technical Validation Exercise #01 Technical Validation Objective ID	Technical Validation Exercise #01 Technical Validation Objective Title	Technical Validation Exercise #01 Success Criterion ID	Technical Validation Exercise #01 Success Criterion	Technical Validation Exercise #01 Validation Results	Technical Validation Exercise #01 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-REL.0001	End-to-end at-least-once delivery guarantees QoS for uplink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0002	A request message from aircraft requestor is received at least once by the ground responder although, while routing the request message, an abnormal disconnection event due to transient network error (successfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-REL.0001	End-to-end at-least-once delivery guarantees QoS for uplink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0026	A request message from aircraft requestor is received at least once by the ground responder although, while routing the request message, an abnormal disconnection event due to ground peer restart (successfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	Not planned	N/A

Technical Validation Exercise #01 Technical Validation Objective ID	Technical Validation Exercise #01 Technical Validation Objective Title	Technical Validation Exercise #01 Success Criterion ID	Technical Validation Exercise #01 Success Criterion	Technical Validation Exercise #01 Validation Results	Technical Validation Exercise #01 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-REL.0001	End-to-end at-least-once delivery guarantees QoS for uplink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0003	A response message from the ground responder is received at least once by the aircraft requestor although, while routing the response message, a connection establishment failure event (successfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-REL.0001	End-to-end at-least-once delivery guarantees QoS for uplink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0004	A response message from the ground responder is received at least once by the aircraft requestor although, while routing the response message, an abnormal disconnection event due to transient network error (successfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	Not planned	N/A

Technical Validation Exercise #01 Technical Validation Objective ID	Technical Validation Exercise #01 Technical Validation Objective Title	Technical Validation Exercise #01 Success Criterion ID	Technical Validation Exercise #01 Success Criterion	Technical Validation Exercise #01 Validation Results	Technical Validation Exercise #01 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-REL.0001	End-to-end at-least-once delivery guarantees QoS for uplink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0027	A response message from the ground responder is received at least once by the aircraft requestor although, while routing the response message, an abnormal disconnection event due to ground peer restart (successfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-REL.0001	End-to-end at-least-once delivery guarantees QoS for uplink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0005	Message not delivered failure event is logged and traced because, while routing the message, a connection establishment failure event (unsuccessfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	Not planned	N/A

Technical Validation Exercise #01 Technical Validation Objective ID	Technical Validation Exercise #01 Technical Validation Objective Title	Technical Validation Exercise #01 Success Criterion ID	Technical Validation Exercise #01 Success Criterion	Technical Validation Exercise #01 Validation Results	Technical Validation Exercise #01 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-REL.0001	End-to-end at-least-once delivery guarantees QoS for uplink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0006	Message not delivered failure event is logged and traced because, while routing the message, an abnormal disconnection event (unsuccessfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-REL.0001	End-to-end at-least-once delivery guarantees QoS for uplink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0007	Message not delivered failure event is logged and traced because, while handling abnormal disconnection or connection establishment failure events at Air-Ground SWIM Nodes connection level, the message expires.	Not planned	N/A

Technical Validation Exercise #01 Technical Validation Objective ID	Technical Validation Exercise #01 Technical Validation Objective Title	Technical Validation Exercise #01 Success Criterion ID	Technical Validation Exercise #01 Success Criterion	Technical Validation Exercise #01 Validation Results	Technical Validation Exercise #01 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-REL.0002	End-to-end at-least-once delivery guarantees QoS for downlink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0008	A request message from ground requestor is received at least once by the aircraft responder although, while routing the request message, a connection establishment failure event (successfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-REL.0002	End-to-end at-least-once delivery guarantees QoS for downlink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0009	A request message from ground requestor is received at least once by the aircraft responder although, while routing the request message, an abnormal disconnection event due to transient network error (successfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	Not planned	N/A

Technical Validation Exercise #01 Technical Validation Objective ID	Technical Validation Exercise #01 Technical Validation Objective Title	Technical Validation Exercise #01 Success Criterion ID	Technical Validation Exercise #01 Success Criterion	Technical Validation Exercise #01 Validation Results	Technical Validation Exercise #01 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-REL.0002	End-to-end at-least-once delivery guarantees QoS for downlink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0028	A request message from ground requestor is received at least once by the aircraft responder although, while routing the request message, an abnormal disconnection event due to ground peer restart (successfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-REL.0002	End-to-end at-least-once delivery guarantees QoS for downlink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0010	A response message from the aircraft responder is received at least once by the ground requestor although, while routing the response message, a connection establishment failure event (successfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	Not planned	N/A

Technical Validation Exercise #01 Technical Validation Objective ID	Technical Validation Exercise #01 Technical Validation Objective Title	Technical Validation Exercise #01 Success Criterion ID	Technical Validation Exercise #01 Success Criterion	Technical Validation Exercise #01 Validation Results	Technical Validation Exercise #01 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-REL.0002	End-to-end at-least-once delivery guarantees QoS for downlink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0011	A response message from the aircraft responder is received at least once by the ground requestor although, while routing the response message, an abnormal disconnection event due to transient network error (successfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-REL.0002	End-to-end at-least-once delivery guarantees QoS for downlink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0029	A response message from the aircraft responder is received at least once by the ground requestor although, while routing the response message, an abnormal disconnection event due to ground peer restart (successfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	Not planned	N/A

Technical Validation Exercise #01 Technical Validation Objective ID	Technical Validation Exercise #01 Technical Validation Objective Title	Technical Validation Exercise #01 Success Criterion ID	Technical Validation Exercise #01 Success Criterion	Technical Validation Exercise #01 Validation Results	Technical Validation Exercise #01 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-REL.0002	End-to-end at-least-once delivery guarantees QoS for downlink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0005	Message not delivered failure event is logged and traced because, while routing the message, a connection establishment failure event (unsuccessfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-REL.0002	End-to-end at-least-once delivery guarantees QoS for downlink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0006	Message not delivered failure event is logged and traced because, while routing the message, an abnormal disconnection event (unsuccessfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	Not planned	N/A

Technical Validation Exercise #01 Technical Validation Objective ID	Technical Validation Exercise #01 Technical Validation Objective Title	Technical Validation Exercise #01 Success Criterion ID	Technical Validation Exercise #01 Success Criterion	Technical Validation Exercise #01 Validation Results	Technical Validation Exercise #01 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-REL.0002	End-to-end at-least-once delivery guarantees QoS for downlink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0007	Message not delivered failure event is logged and traced because, while handling abnormal disconnection or connection establishment failure events at Air-Ground SWIM Nodes connection level, the message expires.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-REL.0003	End-to-end at-least-once delivery guarantees QoS for uplink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0012	A publication message from ground publisher is received at least once by the aircraft subscriber although, while routing the message, a connection establishment failure event (successfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	Not planned	N/A

Technical Validation Exercise #01 Technical Validation Objective ID	Technical Validation Exercise #01 Technical Validation Objective Title	Technical Validation Exercise #01 Success Criterion ID	Technical Validation Exercise #01 Success Criterion	Technical Validation Exercise #01 Validation Results	Technical Validation Exercise #01 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-REL.0003	End-to-end at-least-once delivery guarantees QoS for uplink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0013	A publication message from ground publisher is received at least once by the aircraft subscriber although, while routing the message, an abnormal disconnection event due to transient network error (successfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-REL.0003	End-to-end at-least-once delivery guarantees QoS for uplink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0030	A publication message from ground publisher is received at least once by the aircraft subscriber although, while routing the message, an abnormal disconnection event due to ground peer restart (successfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	Not planned	N/A

Technical Validation Exercise #01 Technical Validation Objective ID	Technical Validation Exercise #01 Technical Validation Objective Title	Technical Validation Exercise #01 Success Criterion ID	Technical Validation Exercise #01 Success Criterion	Technical Validation Exercise #01 Validation Results	Technical Validation Exercise #01 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-REL.0003	End-to-end at-least-once delivery guarantees QoS for uplink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0005	Message not delivered failure event is logged and traced because, while routing the message, a connection establishment failure event (unsuccessfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-REL.0003	End-to-end at-least-once delivery guarantees QoS for uplink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0006	Message not delivered failure event is logged and traced because, while routing the message, an abnormal disconnection event (unsuccessfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	Not planned	N/A

Technical Validation Exercise #01 Technical Validation Objective ID	Technical Validation Exercise #01 Technical Validation Objective Title	Technical Validation Exercise #01 Success Criterion ID	Technical Validation Exercise #01 Success Criterion	Technical Validation Exercise #01 Validation Results	Technical Validation Exercise #01 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-REL.0003	End-to-end at-least-once delivery guarantees QoS for uplink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0007	Message not delivered failure event is logged and traced because, while handling abnormal disconnection or connection establishment failure events at Air-Ground SWIM Nodes connection level, the message expires.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-REL.0004	End-to-end at-least-once delivery guarantees QoS for downlink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0014	A publication message from aircraft publisher is received at least once by the ground subscriber although, while routing the message, a connection establishment failure event (successfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	Not planned	N/A

Technical Validation Exercise #01 Technical Validation Objective ID	Technical Validation Exercise #01 Technical Validation Objective Title	Technical Validation Exercise #01 Success Criterion ID	Technical Validation Exercise #01 Success Criterion	Technical Validation Exercise #01 Validation Results	Technical Validation Exercise #01 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-REL.0004	End-to-end at-least-once delivery guarantees QoS for downlink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0015	A publication message from aircraft publisher is received at least once by the ground subscriber although, while routing the message, an abnormal disconnection event due to transient network error (successfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-REL.0004	End-to-end at-least-once delivery guarantees QoS for downlink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0031	A publication message from aircraft publisher is received at least once by the ground subscriber although, while routing the message, an abnormal disconnection event due to ground peer restart (successfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	Not planned	N/A

Technical Validation Exercise #01 Technical Validation Objective ID	Technical Validation Exercise #01 Technical Validation Objective Title	Technical Validation Exercise #01 Success Criterion ID	Technical Validation Exercise #01 Success Criterion	Technical Validation Exercise #01 Validation Results	Technical Validation Exercise #01 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-REL.0004	End-to-end at-least-once delivery guarantees QoS for downlink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0005	Message not delivered failure event is logged and traced because, while routing the message, a connection establishment failure event (unsuccessfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-REL.0004	End-to-end at-least-once delivery guarantees QoS for downlink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0006	Message not delivered failure event is logged and traced because, while routing the message, an abnormal disconnection event (unsuccessfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	Not planned	N/A

Technical Validation Exercise #01 Technical Validation Objective ID	Technical Validation Exercise #01 Technical Validation Objective Title	Technical Validation Exercise #01 Success Criterion ID	Technical Validation Exercise #01 Success Criterion	Technical Validation Exercise #01 Validation Results	Technical Validation Exercise #01 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-REL.0004	End-to-end at-least-once delivery guarantees QoS for downlink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0007	Message not delivered failure event is logged and traced because, while handling abnormal disconnection or connection establishment failure events at Air-Ground SWIM Nodes connection level, the message expires.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-REL.0005	End-to-end exactly-once delivery guarantees QoS for uplink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0016	A request message from aircraft requestor is received exactly once by the ground responder although, while routing the request message, a connection establishment failure event (successfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	Not planned	N/A

Technical Validation Exercise #01 Technical Validation Objective ID	Technical Validation Exercise #01 Technical Validation Objective Title	Technical Validation Exercise #01 Success Criterion ID	Technical Validation Exercise #01 Success Criterion	Technical Validation Exercise #01 Validation Results	Technical Validation Exercise #01 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-REL.0005	End-to-end exactly-once delivery guarantees QoS for uplink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0017	A request message from aircraft requestor is received exactly once by the ground responder although, while routing the request message, an abnormal disconnection event due to transient network error (successfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-REL.0005	End-to-end exactly-once delivery guarantees QoS for uplink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0032	A request message from aircraft requestor is received exactly once by the ground responder although, while routing the request message, an abnormal disconnection event due to ground peer restart (successfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	Not planned	N/A

Technical Validation Exercise #01 Technical Validation Objective ID	Technical Validation Exercise #01 Technical Validation Objective Title	Technical Validation Exercise #01 Success Criterion ID	Technical Validation Exercise #01 Success Criterion	Technical Validation Exercise #01 Validation Results	Technical Validation Exercise #01 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-REL.0005	End-to-end exactly-once delivery guarantees QoS for uplink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0018	A response message from the ground responder is received exactly once by the aircraft requestor although, while routing the response message, a connection establishment failure event (successfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-REL.0005	End-to-end exactly-once delivery guarantees QoS for uplink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0019	A response message from the ground responder is received exactly once by the aircraft requestor although, while routing the response message, an abnormal disconnection event due to transient network error (successfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	Not planned	N/A

Technical Validation Exercise #01 Technical Validation Objective ID	Technical Validation Exercise #01 Technical Validation Objective Title	Technical Validation Exercise #01 Success Criterion ID	Technical Validation Exercise #01 Success Criterion	Technical Validation Exercise #01 Validation Results	Technical Validation Exercise #01 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-REL.0005	End-to-end exactly-once delivery guarantees QoS for uplink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0033	A response message from the ground responder is received exactly once by the aircraft requestor although, while routing the response message, an abnormal disconnection event due to ground peer restart (successfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-REL.0005	End-to-end exactly-once delivery guarantees QoS for uplink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0005	Message not delivered failure event is logged and traced because, while routing the message, a connection establishment failure event (unsuccessfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	Not planned	N/A

Technical Validation Exercise #01 Technical Validation Objective ID	Technical Validation Exercise #01 Technical Validation Objective Title	Technical Validation Exercise #01 Success Criterion ID	Technical Validation Exercise #01 Success Criterion	Technical Validation Exercise #01 Validation Results	Technical Validation Exercise #01 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-REL.0005	End-to-end exactly-once delivery guarantees QoS for uplink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0006	Message not delivered failure event is logged and traced because, while routing the message, an abnormal disconnection event (unsuccessfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-REL.0005	End-to-end exactly-once delivery guarantees QoS for uplink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0007	Message not delivered failure event is logged and traced because, while handling abnormal disconnection or connection establishment failure events at Air-Ground SWIM Nodes connection level, the message expires.	Not planned	N/A

Technical Validation Exercise #01 Technical Validation Objective ID	Technical Validation Exercise #01 Technical Validation Objective Title	Technical Validation Exercise #01 Success Criterion ID	Technical Validation Exercise #01 Success Criterion	Technical Validation Exercise #01 Validation Results	Technical Validation Exercise #01 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-REL.0006	End-to-end exactly-once delivery guarantees QoS for downlink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0020	A request message from ground requestor is received exactly once by the aircraft responder although, while routing the request message, a connection establishment failure event (successfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-REL.0006	End-to-end exactly-once delivery guarantees QoS for downlink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0021	A request message from ground requestor is received exactly once by the aircraft responder although, while routing the request message, an abnormal disconnection event due to transient network error (successfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	Not planned	N/A

Technical Validation Exercise #01 Technical Validation Objective ID	Technical Validation Exercise #01 Technical Validation Objective Title	Technical Validation Exercise #01 Success Criterion ID	Technical Validation Exercise #01 Success Criterion	Technical Validation Exercise #01 Validation Results	Technical Validation Exercise #01 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-REL.0006	End-to-end exactly-once delivery guarantees QoS for downlink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0034	A request message from ground requestor is received exactly once by the aircraft responder although, while routing the request message, an abnormal disconnection event due to ground peer restart (successfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-REL.0006	End-to-end exactly-once delivery guarantees QoS for downlink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0022	A response message from the aircraft responder is received exactly once by the ground requestor although, while routing the response message, a connection establishment failure event (successfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	Not planned	N/A

Technical Validation Exercise #01 Technical Validation Objective ID	Technical Validation Exercise #01 Technical Validation Objective Title	Technical Validation Exercise #01 Success Criterion ID	Technical Validation Exercise #01 Success Criterion	Technical Validation Exercise #01 Validation Results	Technical Validation Exercise #01 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-REL.0006	End-to-end exactly-once delivery guarantees QoS for downlink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0011	A response message from the aircraft responder is received exactly once by the ground requestor although, while routing the response message, an abnormal disconnection event due to transient network error (successfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-REL.0006	End-to-end exactly-once delivery guarantees QoS for downlink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0035	A response message from the aircraft responder is received exactly once by the ground requestor although, while routing the response message, an abnormal disconnection event due to ground peer restart (successfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	Not planned	N/A

Technical Validation Exercise #01 Technical Validation Objective ID	Technical Validation Exercise #01 Technical Validation Objective Title	Technical Validation Exercise #01 Success Criterion ID	Technical Validation Exercise #01 Success Criterion	Technical Validation Exercise #01 Validation Results	Technical Validation Exercise #01 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-REL.0006	End-to-end exactly-once delivery guarantees QoS for downlink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0005	Message not delivered failure event is logged and traced because, while routing the message, a connection establishment failure event (unsuccessfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-REL.0006	End-to-end exactly-once delivery guarantees QoS for downlink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0006	Message not delivered failure event is logged and traced because, while routing the message, an abnormal disconnection event (unsuccessfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	Not planned	N/A

Technical Validation Exercise #01 Technical Validation Objective ID	Technical Validation Exercise #01 Technical Validation Objective Title	Technical Validation Exercise #01 Success Criterion ID	Technical Validation Exercise #01 Success Criterion	Technical Validation Exercise #01 Validation Results	Technical Validation Exercise #01 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-REL.0006	End-to-end exactly-once delivery guarantees QoS for downlink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0007	Message not delivered failure event is logged and traced because, while handling abnormal disconnection or connection establishment failure events at Air-Ground SWIM Nodes connection level, the message expires.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-REL.0007	End-to-end exactly-once delivery guarantees QoS for uplink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0023	A publication message from ground publisher is received exactly once by the aircraft subscriber although, while routing the message, a connection establishment failure event (successfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	Not planned	N/A

Technical Validation Exercise #01 Technical Validation Objective ID	Technical Validation Exercise #01 Technical Validation Objective Title	Technical Validation Exercise #01 Success Criterion ID	Technical Validation Exercise #01 Success Criterion	Technical Validation Exercise #01 Validation Results	Technical Validation Exercise #01 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-REL.0007	End-to-end exactly-once delivery guarantees QoS for uplink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0024	A publication message from ground publisher is received exactly once by the aircraft subscriber although, while routing the message, an abnormal disconnection event due to transient network error (successfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-REL.0007	End-to-end exactly-once delivery guarantees QoS for uplink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0036	A publication message from ground publisher is received exactly once by the aircraft subscriber although, while routing the message, an abnormal disconnection event due to ground peer restart (successfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	Not planned	N/A

Technical Validation Exercise #01 Technical Validation Objective ID	Technical Validation Exercise #01 Technical Validation Objective Title	Technical Validation Exercise #01 Success Criterion ID	Technical Validation Exercise #01 Success Criterion	Technical Validation Exercise #01 Validation Results	Technical Validation Exercise #01 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-REL.0007	End-to-end exactly-once delivery guarantees QoS for uplink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0005	Message not delivered failure event is logged and traced because, while routing the message, a connection establishment failure event (unsuccessfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-REL.0007	End-to-end exactly-once delivery guarantees QoS for uplink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0006	Message not delivered failure event is logged and traced because, while routing the message, an abnormal disconnection event (unsuccessfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	Not planned	N/A

Technical Validation Exercise #01 Technical Validation Objective ID	Technical Validation Exercise #01 Technical Validation Objective Title	Technical Validation Exercise #01 Success Criterion ID	Technical Validation Exercise #01 Success Criterion	Technical Validation Exercise #01 Validation Results	Technical Validation Exercise #01 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-REL.0007	End-to-end exactly-once delivery guarantees QoS for uplink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0007	Message not delivered failure event is logged and traced because, while handling abnormal disconnection or connection establishment failure events at Air-Ground SWIM Nodes connection level, the message expires.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-REL.0008	End-to-end exactly-once delivery guarantees QoS for downlink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0025	A publication message from aircraft publisher is received exactly once by the ground subscriber although, while routing the message, a connection establishment failure event (successfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	Not planned	N/A

Technical Validation Exercise #01 Technical Validation Objective ID	Technical Validation Exercise #01 Technical Validation Objective Title	Technical Validation Exercise #01 Success Criterion ID	Technical Validation Exercise #01 Success Criterion	Technical Validation Exercise #01 Validation Results	Technical Validation Exercise #01 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-REL.0008	End-to-end exactly-once delivery guarantees QoS for downlink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0038	A publication message from aircraft publisher is received exactly once by the ground subscriber although, while routing the message, an abnormal disconnection event due to transient network error (successfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-REL.0008	End-to-end exactly-once delivery guarantees QoS for downlink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0037	A publication message from aircraft publisher is received exactly once by the ground subscriber although, while routing the message, an abnormal disconnection event due to ground peer restart (successfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	Not planned	N/A

Technical Validation Exercise #01 Technical Validation Objective ID	Technical Validation Exercise #01 Technical Validation Objective Title	Technical Validation Exercise #01 Success Criterion ID	Technical Validation Exercise #01 Success Criterion	Technical Validation Exercise #01 Validation Results	Technical Validation Exercise #01 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-REL.0008	End-to-end exactly-once delivery guarantees QoS for downlink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0005	Message not delivered failure event is logged and traced because, while routing the message, a connection establishment failure event (unsuccessfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-REL.0008	End-to-end exactly-once delivery guarantees QoS for downlink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0006	Message not delivered failure event is logged and traced because, while routing the message, an abnormal disconnection event (unsuccessfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	Not planned	N/A

Technical Validation Exercise #01 Technical Validation Objective ID	Technical Validation Exercise #01 Technical Validation Objective Title	Technical Validation Exercise #01 Success Criterion ID	Technical Validation Exercise #01 Success Criterion	Technical Validation Exercise #01 Validation Results	Technical Validation Exercise #01 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-REL.0008	End-to-end exactly-once delivery guarantees QoS for downlink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0007	Message not delivered failure event is logged and traced because, while handling abnormal disconnection or connection establishment failure events at Air-Ground SWIM Nodes connection level, the message expires.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-SEC.0001	Basic message screening security controls for message queue based information exchange	CRT-17.01-TRL6-TVALP-SEC.0001	Different message screening policies are successfully configured for two or more message queues.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-SEC.0001	Basic message screening security controls for message queue based information exchange	CRT-17.01-TRL6-TVALP-SEC.0002	Message screening policies are enforced on message queues used by Purple Profile enabled sender applications.	Not planned	N/A

Technical Validation Exercise #01 Technical Validation Objective ID	Technical Validation Exercise #01 Technical Validation Objective Title	Technical Validation Exercise #01 Success Criterion ID	Technical Validation Exercise #01 Success Criterion	Technical Validation Exercise #01 Validation Results	Technical Validation Exercise #01 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-SEC.0001	Basic message screening security controls for message queue based information exchange	CRT-17.01-TRL6-TVALP-SEC.0003	Message screening policies are enforced on Ground SWIM Node side message queues used by Air SWIM Nodes to send/consume messages.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-SEC.0001	Basic message screening security controls for message queue based information exchange	CRT-17.01-TRL6-TVALP-SEC.0004	A malformed AMQP 1.0 annotated message with uncomplete or invalid message properties is filtered out by enforcing the message screening policy.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-SEC.0001	Basic message screening security controls for message queue based information exchange	CRT-17.01-TRL6-TVALP-SEC.0008	Events concerning the message screening policies enforcement are logged in accordance with applicable audit policy.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-SEC.0001	Basic message screening security controls for message queue based information exchange	CRT-17.01-TRL6-TVALP-SEC.0009	A message screening policy is successfully updated at run-time without restarting the Ground SWIM Node.	Not planned	N/A

Technical Validation Exercise #01 Technical Validation Objective ID	Technical Validation Exercise #01 Technical Validation Objective Title	Technical Validation Exercise #01 Success Criterion ID	Technical Validation Exercise #01 Success Criterion	Technical Validation Exercise #01 Validation Results	Technical Validation Exercise #01 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-SEC.0002	Advanced message screening security controls for message queue based information exchange	CRT-17.01-TRL6-TVALP-SEC.0001	Different message screening policies are successfully configured for two or more message queues.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-SEC.0002	Advanced message screening security controls for message queue based information exchange	CRT-17.01-TRL6-TVALP-SEC.0002	Message screening policies are enforced on message queues used by Purple Profile enabled sender applications.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-SEC.0002	Advanced message screening security controls for message queue based information exchange	CRT-17.01-TRL6-TVALP-SEC.0003	Message screening policies are enforced on Ground SWIM Node side message queues used by Air SWIM Nodes to send/consume messages.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-SEC.0002	Advanced message screening security controls for message queue based information exchange	CRT-17.01-TRL6-TVALP-SEC.0005	A malformed AMQP 1.0 annotated message with syntactically invalid message payload is filtered out by enforcing the message screening policy.	Not planned	N/A

Technical Validation Exercise #01 Technical Validation Objective ID	Technical Validation Exercise #01 Technical Validation Objective Title	Technical Validation Exercise #01 Success Criterion ID	Technical Validation Exercise #01 Success Criterion	Technical Validation Exercise #01 Validation Results	Technical Validation Exercise #01 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-SEC.0002	Advanced message screening security controls for message queue based information exchange	CRT-17.01-TRL6-TVALP-SEC.0006	A malformed AMQP 1.0 annotated message with unexpected message payload is filtered out by enforcing the message screening policy.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-SEC.0002	Advanced message screening security controls for message queue based information exchange	CRT-17.01-TRL6-TVALP-SEC.0007	A malicious AMQP 1.0 annotated message with malicious property/payload is filtered out by enforcing the message screening policy.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-SEC.0002	Advanced message screening security controls for message queue based information exchange	CRT-17.01-TRL6-TVALP-SEC.0008	Events concerning the message screening policies enforcement are logged in accordance with applicable audit policy.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-SEC.0002	Advanced message screening security controls for message queue based information exchange	CRT-17.01-TRL6-TVALP-SEC.0009	A message screening policy is successfully updated at run-time without restarting the Ground SWIM Node.	Not planned	N/A

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OBJ-17.01-TRL6-TVALP-SEC.0003	Basic message screening security controls for message topic based information exchange	CRT-17.01-TRL6-TVALP-SEC.0010	Different message screening policies are successfully configured for two or more message topics.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-SEC.0003	Basic message screening security controls for message topic based information exchange	CRT-17.01-TRL6-TVALP-SEC.0011	Message screening policies are enforced on message topics used by Purple Profile enabled publisher applications.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-SEC.0003	Basic message screening security controls for message topic based information exchange	CRT-17.01-TRL6-TVALP-SEC.0012	Message screening policies are enforced on Ground SWIM Node side message topics used by Air SWIM Nodes to publish/consume messages.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-SEC.0003	Basic message screening security controls for message topic based information exchange	CRT-17.01-TRL6-TVALP-SEC.0004	A malformed AMQP 1.0 annotated message with uncomplete or invalid message properties is filtered out by enforcing the message screening policy.	Not planned	N/A

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OBJ-17.01-TRL6-TVALP-SEC.0003	Basic message screening security controls for message topic based information exchange	CRT-17.01-TRL6-TVALP-SEC.0008	Events concerning the message screening policies enforcement are logged in accordance with applicable audit policy.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-SEC.0003	Basic message screening security controls for message topic based information exchange	CRT-17.01-TRL6-TVALP-SEC.0009	A message screening policy is successfully updated at run-time without restarting the Ground SWIM Node.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-SEC.0004	Advanced message screening security controls for message topic based information exchange	CRT-17.01-TRL6-TVALP-SEC.0010	Different message screening policies are successfully configured for two or more message topics.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-SEC.0004	Advanced message screening security controls for message topic based information exchange	CRT-17.01-TRL6-TVALP-SEC.0011	Message screening policies are enforced on message topics used by Purple Profile enabled publisher applications.	Not planned	N/A

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OBJ-17.01-TRL6-TVALP-SEC.0004	Advanced message screening security controls for message topic based information exchange	CRT-17.01-TRL6-TVALP-SEC.0012	Message screening policies are enforced on Ground SWIM Node side message topics used by Air SWIM Nodes to publish/consume messages.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-SEC.0004	Advanced message screening security controls for message topic based information exchange	CRT-17.01-TRL6-TVALP-SEC.0005	A malformed AMQP 1.0 annotated message with syntactically invalid message payload is filtered out by enforcing the message screening policy.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-SEC.0004	Advanced message screening security controls for message topic based information exchange	CRT-17.01-TRL6-TVALP-SEC.0006	A malformed AMQP 1.0 annotated message with unexpected message payload is filtered out by enforcing the message screening policy.	Not planned	N/A

Technical Validation Exercise #01 Technical Validation Objective ID	Technical Validation Exercise #01 Technical Validation Objective Title	Technical Validation Exercise #01 Success Criterion ID	Technical Validation Exercise #01 Success Criterion	Technical Validation Exercise #01 Validation Results	Technical Validation Exercise #01 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-SEC.0004	Advanced message screening security controls for message topic based information exchange	CRT-17.01-TRL6-TVALP-SEC.0007	A malicious AMQP 1.0 annotated message with malicious property/payload is filtered out by enforcing the message screening policy.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-SEC.0004	Advanced message screening security controls for message topic based information exchange	CRT-17.01-TRL6-TVALP-SEC.0008	Events concerning the message screening policies enforcement are logged in accordance with applicable audit policy.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-SEC.0004	Advanced message screening security controls for message topic based information exchange	CRT-17.01-TRL6-TVALP-SEC.0009	A message screening policy is successfully updated at run-time without restarting the Ground SWIM Node.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-SEC.0005	Maximum message size overload protection security controls for message queue based information exchange	CRT-17.01-TRL6-TVALP-SEC.0013	Different overload protection policies are successfully configured for two or more message queues.	Configurability of overload protection capabilities via policies has been successfully validated.	OK

Technical Validation Exercise #01 Technical Validation Objective ID	Technical Validation Exercise #01 Technical Validation Objective Title	Technical Validation Exercise #01 Success Criterion ID	Technical Validation Exercise #01 Success Criterion	Technical Validation Exercise #01 Validation Results	Technical Validation Exercise #01 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-SEC.0005	Maximum message size overload protection security controls for message queue based information exchange	CRT-17.01-TRL6-TVALP-SEC.0014	Overload protection policies are enforced on message queues used by Purple Profile enabled sender applications.	Air and Ground SWIM Node side overload protection policies enforcement has been successfully validated.	OK
OBJ-17.01-TRL6-TVALP-SEC.0005	Maximum message size overload protection security controls for message queue based information exchange	CRT-17.01-TRL6-TVALP-SEC.0015	Overload protection policies are enforced on Ground SWIM Node side message queues used by Air SWIM Nodes to send/consume messages.	Ground SWIM Node side overload protection policies enforcement has been successfully validated.	OK
OBJ-17.01-TRL6-TVALP-SEC.0005	Maximum message size overload protection security controls for message queue based information exchange	CRT-17.01-TRL6-TVALP-SEC.0016	Events concerning the overload protection policies enforcement are logged in accordance with applicable audit policy.	Current audit solution is based on logging capabilities without dedicated audit policies. In other words, the solution supports a simplified implementation of audit policies based on logging.	Partially OK
OBJ-17.01-TRL6-TVALP-SEC.0005	Maximum message size overload protection security controls for message queue based information exchange	CRT-17.01-TRL6-TVALP-SEC.0017	An overload protection policy is successfully updated at run-time without restarting the Ground SWIM Node.	Current implementation does not allow to update overload protection policy at run-time without restarting the SWIM Node.	NOK

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OBJ-17.01-TRL6-TVALP-SEC.0005	Maximum message size overload protection security controls for message queue based information exchange	CRT-17.01-TRL6-TVALP-SEC.0018	An AMQP 1.0 annotated message exceeding maximum message size is rejected by enforcing the overload protection policy, the sender is notified and the event routed according to the applicable context-based routing monitoring policy.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-SEC.0005	Maximum message size overload protection security controls for message queue based information exchange	CRT-17.01-TRL6-TVALP-SEC.0019	An AMQP 1.0 annotated message exceeding maximum message size is dropped by enforcing the overload protection policy and the event routed according to the applicable context-based routing monitoring policy.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-SEC.0006	Maximum message size overload protection security controls for message topic based information exchange	CRT-17.01-TRL6-TVALP-SEC.0020	Different overload protection policies are successfully configured for two or more message topics.	Configurability of overload protection capabilities via policies has been successfully validated.	OK

Technical Validation Exercise #01 Technical Validation Objective ID	Technical Validation Exercise #01 Technical Validation Objective Title	Technical Validation Exercise #01 Success Criterion ID	Technical Validation Exercise #01 Success Criterion	Technical Validation Exercise #01 Validation Results	Technical Validation Exercise #01 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-SEC.0006	Maximum message size overload protection security controls for message topic based information exchange	CRT-17.01-TRL6-TVALP-SEC.0021	Overload protection policies are enforced on message topics used by Purple Profile enabled publisher applications.	Air and Ground SWIM Node side overload protection policies enforcement has been successfully validated.	OK
OBJ-17.01-TRL6-TVALP-SEC.0006	Maximum message size overload protection security controls for message topic based information exchange	CRT-17.01-TRL6-TVALP-SEC.0022	Overload protection policies are enforced on Ground SWIM Node side message topics used by Air SWIM Nodes to publish/consume messages.	Ground SWIM Node side overload protection policies enforcement has been successfully validated.	OK
OBJ-17.01-TRL6-TVALP-SEC.0006	Maximum message size overload protection security controls for message topic based information exchange	CRT-17.01-TRL6-TVALP-SEC.0016	Events concerning the overload protection policies enforcement are logged in accordance with applicable audit policy.	Current audit solution is based on logging capabilities without dedicated audit policies. In other words, the solution supports a simplified implementation of audit policies based on logging.	Partially OK
OBJ-17.01-TRL6-TVALP-SEC.0006	Maximum message size overload protection security controls for message topic based information exchange	CRT-17.01-TRL6-TVALP-SEC.0017	An overload protection policy is successfully updated at run-time without restarting the Ground SWIM Node.	Current implementation does not allow to update overload protection policy at run-time without restarting the SWIM Node.	NOK

Technical Validation Exercise #01 Technical Validation Objective ID	Technical Validation Exercise #01 Technical Validation Objective Title	Technical Validation Exercise #01 Success Criterion ID	Technical Validation Exercise #01 Success Criterion	Technical Validation Exercise #01 Validation Results	Technical Validation Exercise #01 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-SEC.0006	Maximum message size overload protection security controls for message topic based information exchange	CRT-17.01-TRL6-TVALP-SEC.0018	An AMQP 1.0 annotated message exceeding maximum message size is rejected by enforcing the overload protection policy, the sender is notified and the event routed according to the applicable context-based routing monitoring policy.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-SEC.0006	Maximum message size overload protection security controls for message topic based information exchange	CRT-17.01-TRL6-TVALP-SEC.0019	An AMQP 1.0 annotated message exceeding maximum message size is dropped by enforcing the overload protection policy and the event routed according to the applicable context-based routing monitoring policy.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-SEC.0007	Maximum message queue capacity overload protection security controls	CRT-17.01-TRL6-TVALP-SEC.0013	Different overload protection policies are successfully configured for two or more message queues.	Configurability of overload protection capabilities via policies has been successfully validated.	OK

Technical Validation Exercise #01 Technical Validation Objective ID	Technical Validation Exercise #01 Technical Validation Objective Title	Technical Validation Exercise #01 Success Criterion ID	Technical Validation Exercise #01 Success Criterion	Technical Validation Exercise #01 Validation Results	Technical Validation Exercise #01 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-SEC.0007	Maximum message queue capacity overload protection security controls	CRT-17.01-TRL6-TVALP-SEC.0014	Overload protection policies are enforced on message queues used by Purple Profile enabled sender applications.	Air and Ground SWIM Node side overload protection policies enforcement has been successfully validated.	OK
OBJ-17.01-TRL6-TVALP-SEC.0007	Maximum message queue capacity overload protection security controls	CRT-17.01-TRL6-TVALP-SEC.0015	Overload protection policies are enforced on Ground SWIM Node side message queues used by Air SWIM Nodes to send/consume messages.	Ground SWIM Node side overload protection policies enforcement has been successfully validated.	OK
OBJ-17.01-TRL6-TVALP-SEC.0007	Maximum message queue capacity overload protection security controls	CRT-17.01-TRL6-TVALP-SEC.0016	Events concerning the overload protection policies enforcement are logged in accordance with applicable audit policy.	Current audit solution is based on logging capabilities without dedicated audit policies. In other words, the solution supports a simplified implementation of audit policies based on logging.	Partially OK
OBJ-17.01-TRL6-TVALP-SEC.0007	Maximum message queue capacity overload protection security controls	CRT-17.01-TRL6-TVALP-SEC.0017	An overload protection policy is successfully updated at run-time without restarting the Ground SWIM Node.	Current implementation does not allow to update overload protection policy at run-time without restarting the SWIM Node.	NOK

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OBJ-17.01-TRL6-TVALP-SEC.0007	Maximum message queue capacity overload protection security controls	CRT-17.01-TRL6-TVALP-SEC.0023	An attempt to send an AMQP 1.0 annotated message is rejected because maximum message queue capacity is exceeded.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-SEC.0008	Maximum message topic capacity overload protection security controls	CRT-17.01-TRL6-TVALP-SEC.0020	Different overload protection policies are successfully configured for two or more message topics.	Configurability of overload protection capabilities via policies has been successfully validated.	OK
OBJ-17.01-TRL6-TVALP-SEC.0008	Maximum message topic capacity overload protection security controls	CRT-17.01-TRL6-TVALP-SEC.0021	Overload protection policies are enforced on message topics used by Purple Profile enabled publisher applications.	Air and Ground SWIM Node side overload protection policies enforcement has been successfully validated.	OK
OBJ-17.01-TRL6-TVALP-SEC.0008	Maximum message topic capacity overload protection security controls	CRT-17.01-TRL6-TVALP-SEC.0022	Overload protection policies are enforced on Ground SWIM Node side message topics used by Air SWIM Nodes to publish/consume messages.	Ground SWIM Node side overload protection policies enforcement has been successfully validated.	OK

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OBJ-17.01-TRL6-TVALP-SEC.0008	Maximum message topic capacity overload protection security controls	CRT-17.01-TRL6-TVALP-SEC.0016	Events concerning the overload protection policies enforcement are logged in accordance with applicable audit policy.	Current audit solution is based on logging capabilities without dedicated audit policies. In other words, the solution supports a simplified implementation of audit policies based on logging.	Partially OK
OBJ-17.01-TRL6-TVALP-SEC.0008	Maximum message topic capacity overload protection security controls	CRT-17.01-TRL6-TVALP-SEC.0017	An overload protection policy is successfully updated at run-time without restarting the Ground SWIM Node.	Current implementation does not allow to update overload protection policy at run-time without restarting the SWIM Node.	NOK
OBJ-17.01-TRL6-TVALP-SEC.0008	Maximum message topic capacity overload protection security controls	CRT-17.01-TRL6-TVALP-SEC.0024	An attempt to publish an AMQP 1.0 annotated message is rejected because maximum message topic capacity is exceeded.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-SEC.0009	Consolidated connections limits overload protection security controls	CRT-17.01-TRL6-TVALP-SEC.0025	Maximum number of consolidated connections is successfully configured.	Air and Ground SWIM Node side overload protection policies enforcement has been successfully validated.	OK
OBJ-17.01-TRL6-TVALP-SEC.0009	Consolidated connections limits overload protection security controls	CRT-17.01-TRL6-TVALP-SEC.0016	Events concerning the overload protection policies enforcement are logged in accordance with applicable audit policy.	Current audit solution is based on logging capabilities without dedicated audit policies. In other words, the solution supports a simplified implementation of audit policies based on logging.	Partially OK

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OBJ-17.01-TRL6-TVALP-SEC.0009	Consolidated connections limits overload protection security controls	CRT-17.01-TRL6-TVALP-SEC.0026	An attempt to establish an AMQP 1.0 connection is rejected because the maximum number of consolidated connections is exceeded.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-SEC.0010	Concurrent connections limits per connecting entity overload protection security controls	CRT-17.01-TRL6-TVALP-SEC.0027	Maximum number of concurrent connections per connecting entity is successfully configured.	Air and Ground SWIM Node side overload protection policies enforcement has been successfully validated.	OK
OBJ-17.01-TRL6-TVALP-SEC.0010	Concurrent connections limits per connecting entity overload protection security controls	CRT-17.01-TRL6-TVALP-SEC.0016	Events concerning the overload protection policies enforcement are logged in accordance with applicable audit policy.	Current audit solution is based on logging capabilities without dedicated audit policies. In other words, the solution supports a simplified implementation of audit policies based on logging.	Partially OK
OBJ-17.01-TRL6-TVALP-SEC.0010	Concurrent connections limits per connecting entity overload protection security controls	CRT-17.01-TRL6-TVALP-SEC.0028	An attempt to establish an AMQP 1.0 connection is rejected because the maximum number of concurrent connections for the connecting entity is exceeded.	Not planned	N/A

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OBJ-17.01-TRL6-TVALP-SEC.0011	Mutual authentication and basic certificate revocation status check security controls	CRT-17.01-TRL6-TVALP-SEC.0029	Amqps mutual authentication is enforced between aircraft application and Air SWIM Node.	Amqps mutual authentication has been successfully validated. It should be evaluated the possibility to allow SASL PLAIN with server peer TLS (no mutual TLS) for aircraft application. For instance a pilot using an EFB may login using his/her username and password and these credentials are also used to authenticate the user against the Air SWIM Node but still using secure transport (TLS).	OK
OBJ-17.01-TRL6-TVALP-SEC.0011	Mutual authentication and basic certificate revocation status check security controls	CRT-17.01-TRL6-TVALP-SEC.0030	Amqps mutual authentication is enforced between Air and Ground SWIM Node.	Amqps mutual authentication has been successfully validated.	OK
OBJ-17.01-TRL6-TVALP-SEC.0011	Mutual authentication and basic certificate revocation status check security controls	CRT-17.01-TRL6-TVALP-SEC.0031	Amqps mutual authentication is enforced between Ground SWIM Node and ground application.	Amqps mutual authentication has been successfully validated.	OK
OBJ-17.01-TRL6-TVALP-SEC.0011	Mutual authentication and basic certificate revocation status check security controls	CRT-17.01-TRL6-TVALP-SEC.0032	Events concerning mutual authentication enforcement are logged in accordance with applicable audit policy.	Current audit solution is based on logging capabilities without dedicated audit policies. In other words, the solution supports a simplified implementation of audit policies based on logging.	Partially OK

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OBJ-17.01-TRL6-TVALP-SEC.0011	Mutual authentication and basic certificate revocation status check security controls	CRT-17.01-TRL6-TVALP-SEC.0033	Amqps peers successfully mutual authenticate although one of the peer requires the fallback to TLS 1.2.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-SEC.0011	Mutual authentication and basic certificate revocation status check security controls	CRT-17.01-TRL6-TVALP-SEC.0034	Mutual authentication between amqps peers fails in all the following cases:- one of the peer requires the fallback to a TLS version lower than TLS 1.2.- peer's X.509v3 certificate is not trusted.- peer's X.509v3 certificate is expired.- peer's X.509v3 certificate has been revoked (it is included in the local CRL).- the local CRL is not the current CRL or the CRL scope is not appropriate and the authentication policy does not allow potentially revoked or compromised certificates.	Not planned	N/A

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OBJ-17.01-TRL6-TVALP-SEC.0011	Mutual authentication and basic certificate revocation status check security controls	CRT-17.01-TRL6-TVALP-SEC.0035	Amqps peers successfully mutual authenticate although the local CRL is not the current CRL or the CRL scope is not appropriate because the authentication policy allows potentially revoked or compromised certificate.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-SEC.0012	CRL update mechanisms	CRT-17.01-TRL6-TVALP-SEC.0036	The CRL used by SWIM Node is successfully updated via administrative interface.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-SEC.0012	CRL update mechanisms	CRT-17.01-TRL6-TVALP-SEC.0037	The CRL used by SWIM Node is not the current CRL and it is successfully updated on-the-fly via the HTTP CDP.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-SEC.0012	CRL update mechanisms	CRT-17.01-TRL6-TVALP-SEC.0038	A delta-CRL is used to successfully update the CRL used by SWIM Node.	Not planned	N/A

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OBJ-17.01-TRL6-TVALP-SEC.0013	Mutual authentication with OCSP certificate revocation status check security controls	CRT-17.01-TRL6-TVALP-SEC.0029	Amqps mutual authentication is enforced between aircraft application and Air SWIM Node.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-SEC.0013	Mutual authentication with OCSP certificate revocation status check security controls	CRT-17.01-TRL6-TVALP-SEC.0030	Amqps mutual authentication is enforced between Air and Ground SWIM Node.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-SEC.0013	Mutual authentication with OCSP certificate revocation status check security controls	CRT-17.01-TRL6-TVALP-SEC.0031	Amqps mutual authentication is enforced between Ground SWIM Node and ground application.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-SEC.0013	Mutual authentication with OCSP certificate revocation status check security controls	CRT-17.01-TRL6-TVALP-SEC.0032	Events concerning mutual authentication enforcement are logged in accordance with applicable audit policy.	Not planned	N/A

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OBJ-17.01-TRL6-TVALP-SEC.0013	Mutual authentication with OCSP certificate revocation status check security controls	CRT-17.01-TRL6-TVALP-SEC.0039	Amqps peer's certificate revocation status is retrieved from the OCSP response, and the authentication is successfully completed because the certificate is not revoked.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-SEC.0013	Mutual authentication with OCSP certificate revocation status check security controls	CRT-17.01-TRL6-TVALP-SEC.0040	Amqps peer's certificate revocation status is retrieved from the OCSP response, and the authentication fails because the certificate has been revoked.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-SEC.0013	Mutual authentication with OCSP certificate revocation status check security controls	CRT-17.01-TRL6-TVALP-SEC.0041	OCSP responder URL is retrieved from pre-configured local resources.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-SEC.0013	Mutual authentication with OCSP certificate revocation status check security controls	CRT-17.01-TRL6-TVALP-SEC.0042	OCSP responder URL is retrieved from location identified in the OCSP field in the Authority Information Access extension in the peer's certificate.	Not planned	N/A

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OBJ-17.01-TRL6-TVALP-SEC.0014	Mutual authentication with combined OCSP and CRL based certificate revocation status check security controls	CRT-17.01-TRL6-TVALP-SEC.0043	OCSP is configured and used as preferred certificate revocation status check mechanism disabling the fallback to CRL.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-SEC.0014	Mutual authentication with combined OCSP and CRL based certificate revocation status check security controls	CRT-17.01-TRL6-TVALP-SEC.0044	OCSP is configured as preferred certificate revocation status check mechanism but because the responder is not available and the fallback is enabled, the CRL is successfully used.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-SEC.0014	Mutual authentication with combined OCSP and CRL based certificate revocation status check security controls	CRT-17.01-TRL6-TVALP-SEC.0045	CRL is configured and used as preferred certificate revocation status check mechanism disabling the fallback to OCSP.	Not planned	N/A

Technical Validation Exercise #01 Technical Validation Objective ID	Technical Validation Exercise #01 Technical Validation Objective Title	Technical Validation Exercise #01 Success Criterion ID	Technical Validation Exercise #01 Success Criterion	Technical Validation Exercise #01 Validation Results	Technical Validation Exercise #01 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-SEC.0014	Mutual authentication with combined OCSP and CRL based certificate revocation status check security controls	CRT-17.01-TRL6-TVALP-SEC.0046	CRL is configured as preferred certificate revocation status check mechanism but because the CRL is not available/valid and the fallback is enabled, the OCSP is successfully used.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-SEC.0014	Mutual authentication with combined OCSP and CRL based certificate revocation status check security controls	CRT-17.01-TRL6-TVALP-SEC.0047	Amqps peers successfully mutual authenticate although none of the combined certificate revocation status mechanisms are available but the authentication policy allows potentially revoked or compromised certificate.	Not planned	N/A

Technical Validation Exercise #01 Technical Validation Objective ID	Technical Validation Exercise #01 Technical Validation Objective Title	Technical Validation Exercise #01 Success Criterion ID	Technical Validation Exercise #01 Success Criterion	Technical Validation Exercise #01 Validation Results	Technical Validation Exercise #01 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-SEC.0014	Mutual authentication with combined OCSP and CRL based certificate revocation status check security controls	CRT-17.01-TRL6-TVALP-SEC.0048	Mutual authentication between amqps peers fails because none of the combined certificate revocation status mechanisms are available and the authentication policy does not allow potentially revoked or compromised certificate.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-SEC.0015	Authorization security controls for message queue based information exchange	CRT-17.01-TRL6-TVALP-SEC.0049	Different authorization policies are successfully configured for two or more message queues.	Air and Ground SWIM Node side authorization policies configurability and enforcement have been successfully validated.	OK
OBJ-17.01-TRL6-TVALP-SEC.0015	Authorization security controls for message queue based information exchange	CRT-17.01-TRL6-TVALP-SEC.0050	Authorization policies are enforced on message queue used by Purple Profile enabled sender applications.	Air and Ground SWIM Node side authorization policies configurability and enforcement have been successfully validated.	OK
OBJ-17.01-TRL6-TVALP-SEC.0015	Authorization security controls for message queue based information exchange	CRT-17.01-TRL6-TVALP-SEC.0051	Authorization policies are enforced on message queue used by Purple Profile enabled receiver applications.	Air and Ground SWIM Node side authorization policies configurability and enforcement have been successfully validated.	OK

Technical Validation Exercise #01 Technical Validation Objective ID	Technical Validation Exercise #01 Technical Validation Objective Title	Technical Validation Exercise #01 Success Criterion ID	Technical Validation Exercise #01 Success Criterion	Technical Validation Exercise #01 Validation Results	Technical Validation Exercise #01 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-SEC.0015	Authorization security controls for message queue based information exchange	CRT-17.01-TRL6-TVALP-SEC.0052	Authorization policies are enforced on Ground SWIM Node side message queue used by Air SWIM Nodes to send/receive messages.	Air and Ground SWIM Node side authorization policies configurability and enforcement have been successfully validated.	OK
OBJ-17.01-TRL6-TVALP-SEC.0015	Authorization security controls for message queue based information exchange	CRT-17.01-TRL6-TVALP-SEC.0053	Events concerning the authorization policies enforcement are logged in accordance with applicable audit policy.	Current audit solution is based on logging capabilities without dedicated audit policies. In other words, the solution supports a simplified implementation of audit policies based on logging.	Partially OK
OBJ-17.01-TRL6-TVALP-SEC.0015	Authorization security controls for message queue based information exchange	CRT-17.01-TRL6-TVALP-SEC.0054	An authorization policy is successfully updated at run-time without restarting the Ground SWIM Node.	Air and Ground SWIM Node side authorization policies configurability without restarting the SWIM Node. has been successfully validated.	OK
OBJ-17.01-TRL6-TVALP-SEC.0015	Authorization security controls for message queue based information exchange	CRT-17.01-TRL6-TVALP-SEC.0055	An attempt to send a message to a queue is authorized because the sending entity is successfully authenticated with sender role for that queue.	Air and Ground SWIM Node side authorization policies configurability and enforcement have been successfully validated.	OK

Technical Validation Exercise #01 Technical Validation Objective ID	Technical Validation Exercise #01 Technical Validation Objective Title	Technical Validation Exercise #01 Success Criterion ID	Technical Validation Exercise #01 Success Criterion	Technical Validation Exercise #01 Validation Results	Technical Validation Exercise #01 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-SEC.0015	Authorization security controls for message queue based information exchange	CRT-17.01-TRL6-TVALP-SEC.0056	An attempt to send a message to a queue is not authorized because the authenticated sending entity has not assigned the sender role for that queue.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-SEC.0015	Authorization security controls for message queue based information exchange	CRT-17.01-TRL6-TVALP-SEC.0057	An attempt to receive a message from a queue is authorized because the receiving entity is successfully authenticated with receiver role for that queue.	Air and Ground SWIM Node side authorization policies configurability and enforcement have been successfully validated.	OK
OBJ-17.01-TRL6-TVALP-SEC.0015	Authorization security controls for message queue based information exchange	CRT-17.01-TRL6-TVALP-SEC.0058	An attempt to receive a message from a queue is not authorized because the authenticated receiving entity has not assigned the receiver role for that queue.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-SEC.0016	Authorization security controls for message topic based information exchange	CRT-17.01-TRL6-TVALP-SEC.0059	Different authorization policies are successfully configured for two or more message topics.	Air and Ground SWIM Node side authorization policies configurability and enforcement have been successfully validated.	OK

Technical Validation Exercise #01 Technical Validation Objective ID	Technical Validation Exercise #01 Technical Validation Objective Title	Technical Validation Exercise #01 Success Criterion ID	Technical Validation Exercise #01 Success Criterion	Technical Validation Exercise #01 Validation Results	Technical Validation Exercise #01 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-SEC.0016	Authorization security controls for message topic based information exchange	CRT-17.01-TRL6-TVALP-SEC.0060	Authorization policies are enforced on message topic used by Purple Profile enabled publisher applications.	Air and Ground SWIM Node side authorization policies configurability and enforcement have been successfully validated.	OK
OBJ-17.01-TRL6-TVALP-SEC.0016	Authorization security controls for message topic based information exchange	CRT-17.01-TRL6-TVALP-SEC.0061	Authorization policies are enforced on message topic used by Purple Profile enabled subscriber applications.	Air and Ground SWIM Node side authorization policies configurability and enforcement have been successfully validated.	OK
OBJ-17.01-TRL6-TVALP-SEC.0016	Authorization security controls for message topic based information exchange	CRT-17.01-TRL6-TVALP-SEC.0062	Authorization policies are enforced on Ground SWIM Node side message topic used by Air SWIM Nodes to publish/consume messages.	Air and Ground SWIM Node side authorization policies configurability and enforcement have been successfully validated.	OK
OBJ-17.01-TRL6-TVALP-SEC.0016	Authorization security controls for message topic based information exchange	CRT-17.01-TRL6-TVALP-SEC.0053	Events concerning the authorization policies enforcement are logged in accordance with applicable audit policy.	Current audit solution is based on logging capabilities without dedicated audit policies. In other words, the solution supports a simplified implementation of audit policies based on logging.	Partially OK

Technical Validation Exercise #01 Technical Validation Objective ID	Technical Validation Exercise #01 Technical Validation Objective Title	Technical Validation Exercise #01 Success Criterion ID	Technical Validation Exercise #01 Success Criterion	Technical Validation Exercise #01 Validation Results	Technical Validation Exercise #01 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-SEC.0016	Authorization security controls for message topic based information exchange	CRT-17.01-TRL6-TVALP-SEC.0054	An authorization policy is successfully updated at run-time without restarting the Ground SWIM Node.	Air and Ground SWIM Node side authorization policies configurability without restarting the SWIM Node. has been successfully validated.	OK
OBJ-17.01-TRL6-TVALP-SEC.0016	Authorization security controls for message topic based information exchange	CRT-17.01-TRL6-TVALP-SEC.0063	An attempt to publish a message to a topic is authorized because the publishing entity is successfully authenticated with publisher role for that topic.	Air and Ground SWIM Node side authorization policies configurability and enforcement have been successfully validated.	OK
OBJ-17.01-TRL6-TVALP-SEC.0016	Authorization security controls for message topic based information exchange	CRT-17.01-TRL6-TVALP-SEC.0064	An attempt to publish a message to a topic is not authorized because the authenticated publishing entity has not assigned the publisher role for that topic.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-SEC.0016	Authorization security controls for message topic based information exchange	CRT-17.01-TRL6-TVALP-SEC.0065	An attempt to subscribe to a topic is authorized because the subscribing entity is successfully authenticated with subscriber role for that topic.	Air and Ground SWIM Node side authorization and subscription policies configurability and enforcement have been successfully validated.	OK

Technical Validation Exercise #01 Technical Validation Objective ID	Technical Validation Exercise #01 Technical Validation Objective Title	Technical Validation Exercise #01 Success Criterion ID	Technical Validation Exercise #01 Success Criterion	Technical Validation Exercise #01 Validation Results	Technical Validation Exercise #01 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-SEC.0016	Authorization security controls for message topic based information exchange	CRT-17.01-TRL6-TVALP-SEC.0066	An attempt to subscribe to a topic is not authorized because the authenticated subscribing entity has not assigned the subscriber role for that topic.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-SEC.0017	Authorization security controls for message queue and topic lifecycle management	CRT-17.01-TRL6-TVALP-SEC.0067	An entity fails to connect to a message queue because the queue does not exist and the messaging resources lifecycle management is only authorized via administrative interfaces.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-SEC.0017	Authorization security controls for message queue and topic lifecycle management	CRT-17.01-TRL6-TVALP-SEC.0068	An entity fails to connect to a message topic because the topic does not exist and the messaging resources lifecycle management is only authorized via administrative interfaces.	Not planned	N/A

Technical Validation Exercise #01 Technical Validation Objective ID	Technical Validation Exercise #01 Technical Validation Objective Title	Technical Validation Exercise #01 Success Criterion ID	Technical Validation Exercise #01 Success Criterion	Technical Validation Exercise #01 Validation Results	Technical Validation Exercise #01 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-SEC.0017	Authorization security controls for message queue and topic lifecycle management	CRT-17.01-TRL6-TVALP-SEC.0069	A message queue is successfully created via administrative interface by an user with administrator role.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-SEC.0017	Authorization security controls for message queue and topic lifecycle management	CRT-17.01-TRL6-TVALP-SEC.0070	A message topic is successfully created via administrative interface by an user with administrator role.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-SEC.0017	Authorization security controls for message queue and topic lifecycle management	CRT-17.01-TRL6-TVALP-SEC.0071	A message queue is successfully deleted via administrative interface by an user with administrator role.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-SEC.0017	Authorization security controls for message queue and topic lifecycle management	CRT-17.01-TRL6-TVALP-SEC.0072	A message topic is successfully deleted via administrative interface by an user with administrator role.	Not planned	N/A

Technical Validation Exercise #01 Technical Validation Objective ID	Technical Validation Exercise #01 Technical Validation Objective Title	Technical Validation Exercise #01 Success Criterion ID	Technical Validation Exercise #01 Success Criterion	Technical Validation Exercise #01 Validation Results	Technical Validation Exercise #01 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-SEC.0017	Authorization security controls for message queue and topic lifecycle management	CRT-17.01-TRL6-TVALP-SEC.0073	An user without administrator role fails to create/delete message queue/topic via administrative interface.	Not planned	N/A

Technical Validation Exercise #01 Technical Validation Objective ID	Technical Validation Exercise #01 Technical Validation Objective Title	Technical Validation Exercise #01 Success Criterion ID	Technical Validation Exercise #01 Success Criterion	Technical Validation Exercise #01 Validation Results	Technical Validation Exercise #01 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-SEC.0018	End-to-end confidentiality for uplink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-SEC.0074	Following steps are successfully completed:- The requestor creates and sends an AMQP 1.0 annotated request message with application-data section containing encrypted data and ENPT AMQP footer with value containing both Encryption-Algorithm and Encryption-Secret for the intender responder.- While the request message is in transit at SWIM nodes level, it is not possible to access/visualize sensitive information because both application data and shared secret are encrypted- The request message is delivered to the intended responder that successfully decrypts it relying on delivered ENPT AMQP footer.	Not planned	N/A

Technical Validation Exercise #01 Technical Validation Objective ID	Technical Validation Exercise #01 Technical Validation Objective Title	Technical Validation Exercise #01 Success Criterion ID	Technical Validation Exercise #01 Success Criterion	Technical Validation Exercise #01 Validation Results	Technical Validation Exercise #01 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-SEC.0018	End-to-end confidentiality for uplink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-SEC.0075	Following steps are successfully completed: -The responder creates and sends an AMQP 1.0 annotated response message with application-data section containing encrypted data and ENPT AMQP footer with value containing both Encryption-Algorithm and Encryption-Secret for the requestor.- While the response message is in transit at SWIM nodes level, it is not possible to access request/visualize sensitive information because both application data and shared secret are encrypted.- The response message is delivered to the intended requestor that successfully decrypts it relying on delivered ENPT AMQP footer.	Not planned	N/A

Technical Validation Exercise #01 Technical Validation Objective ID	Technical Validation Exercise #01 Technical Validation Objective Title	Technical Validation Exercise #01 Success Criterion ID	Technical Validation Exercise #01 Success Criterion	Technical Validation Exercise #01 Validation Results	Technical Validation Exercise #01 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-SEC.0018	End-to-end confidentiality for uplink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-SEC.0076	Following steps are successfully completed:- The requestor creates and sends an additional AMQP 1.0 annotated request message for the same responder with application-data section containing encrypted data and ENPT AMQP footer containing only the Encryption-Algorithm.- The request message is delivered to the intended responder that successfully decrypts it relying on delivered ENPT AMQP footer and cached Encryption-Secret from previous request messages.	Not planned	N/A

Technical Validation Exercise #01 Technical Validation Objective ID	Technical Validation Exercise #01 Technical Validation Objective Title	Technical Validation Exercise #01 Success Criterion ID	Technical Validation Exercise #01 Success Criterion	Technical Validation Exercise #01 Validation Results	Technical Validation Exercise #01 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-SEC.0018	End-to-end confidentiality for uplink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-SEC.0077	Following steps are successfully completed:- The requestor creates and sends an additional AMQP 1.0 annotated request message for the same responder with application-data section containing encrypted data and ENPT AMQP footer containing also a new Encryption-Secret.- The request message is delivered to the intended responder that successfully decrypts it relying on delivered ENPT AMQP footer replacing cached Encryption-Secret.	Not planned	N/A

Technical Validation Exercise #01 Technical Validation Objective ID	Technical Validation Exercise #01 Technical Validation Objective Title	Technical Validation Exercise #01 Success Criterion ID	Technical Validation Exercise #01 Success Criterion	Technical Validation Exercise #01 Validation Results	Technical Validation Exercise #01 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-SEC.0019	End-to-end confidentiality for uplink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-SEC.0078	Following steps are successfully completed:- The publisher creates and publishes an AMQP 1.0 annotated publication message with application-data section containing encrypted data and ENPT AMQP footer with value containing both Encryption-Algorithm and Encryption-Secret for two or more subscribers.- While the publication message is in transit at SWIM nodes level, it is not possible to access/visualize sensitive information because both application data and shared secret are encrypted.- The publication message is delivered to the intended subscribers that successfully decrypt it relying on delivered ENPT AMQP footer.	Not planned	N/A

Technical Validation Exercise #01 Technical Validation Objective ID	Technical Validation Exercise #01 Technical Validation Objective Title	Technical Validation Exercise #01 Success Criterion ID	Technical Validation Exercise #01 Success Criterion	Technical Validation Exercise #01 Validation Results	Technical Validation Exercise #01 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-SEC.0019	End-to-end confidentiality for uplink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-SEC.0079	Following steps are successfully completed:- The publisher creates and publishes an additional AMQP 1.0 annotated publication message for the same subscribers with application-data section containing encrypted data and ENPT AMQP footer containing only the Encryption-Algorithm.- The publication message is delivered to the intended subscribers that successfully decrypt it relying on delivered ENPT AMQP footer and cached Encryption-Secret from previous messages.	Not planned	N/A

Technical Validation Exercise #01 Technical Validation Objective ID	Technical Validation Exercise #01 Technical Validation Objective Title	Technical Validation Exercise #01 Success Criterion ID	Technical Validation Exercise #01 Success Criterion	Technical Validation Exercise #01 Validation Results	Technical Validation Exercise #01 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-SEC.0019	End-to-end confidentiality for uplink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-SEC.0080	Following steps are successfully completed:- An additional subscriber ("new_sub") successfully subscribes to the topic.- The publisher creates and publishes an additional AMQP 1.0 annotated publication message with application-data section containing encrypted data and ENPT AMQP footer containing the Encryption-Algorithm and only the Encryption-Secret for the new subscriber.- The publication message is delivered to all the subscribers and in particular to the new one that successfully decrypts the message relying on delivered ENPT AMQP footer.- The other subscribers successfully decrypt the message relying on delivered ENPT AMQP footer and cached Encryption-Secret from previous messages.	Not planned	N/A

Technical Validation Exercise #01 Technical Validation Objective ID	Technical Validation Exercise #01 Technical Validation Objective Title	Technical Validation Exercise #01 Success Criterion ID	Technical Validation Exercise #01 Success Criterion	Technical Validation Exercise #01 Validation Results	Technical Validation Exercise #01 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-SEC.0019	End-to-end confidentiality for uplink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-SEC.0081	Following steps are successfully completed:- The publisher creates and publishes an additional AMQP 1.0 annotated publication message with application-data section containing encrypted data and ENPT AMQP footer containing also a new Encryption-Secret.- The publication message is delivered to the intended subscribers that successfully decrypt it relying on delivered ENPT AMQP footer and replacing cached Encryption-Secret.	Not planned	N/A

Technical Validation Exercise #01 Technical Validation Objective ID	Technical Validation Exercise #01 Technical Validation Objective Title	Technical Validation Exercise #01 Success Criterion ID	Technical Validation Exercise #01 Success Criterion	Technical Validation Exercise #01 Validation Results	Technical Validation Exercise #01 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-SEC.0020	End-to-end confidentiality for downlink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-SEC.0078	Following steps are successfully completed:- The publisher creates and publishes an AMQP 1.0 annotated publication message with application-data section containing encrypted data and ENPT AMQP footer with value containing both Encryption-Algorithm and Encryption-Secret for two or more subscribers.- While the publication message is in transit at SWIM nodes level, it is not possible to access/visualize sensitive information because both application data and shared secret are encrypted.- The publication message is delivered to the intended subscribers that successfully decrypt it relying on delivered ENPT AMQP footer.	Not planned	N/A

Technical Validation Exercise #01 Technical Validation Objective ID	Technical Validation Exercise #01 Technical Validation Objective Title	Technical Validation Exercise #01 Success Criterion ID	Technical Validation Exercise #01 Success Criterion	Technical Validation Exercise #01 Validation Results	Technical Validation Exercise #01 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-SEC.0020	End-to-end confidentiality for downlink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-SEC.0079	Following steps are successfully completed:- The publisher creates and publishes an additional AMQP 1.0 annotated publication message for the same subscribers with application-data section containing encrypted data and ENPT AMQP footer containing only the Encryption-Algorithm.- The publication message is delivered to the intended subscribers that successfully decrypt it relying on delivered ENPT AMQP footer and cached eEncryption-Secret from previous messages.	Not planned	N/A

Technical Validation Exercise #01 Technical Validation Objective ID	Technical Validation Exercise #01 Technical Validation Objective Title	Technical Validation Exercise #01 Success Criterion ID	Technical Validation Exercise #01 Success Criterion	Technical Validation Exercise #01 Validation Results	Technical Validation Exercise #01 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-SEC.0020	End-to-end confidentiality for downlink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-SEC.0080	Following steps are successfully completed:- An additional subscriber ("new_sub") successfully subscribes to the topic.- The publisher creates and publishes an additional AMQP 1.0 annotated publication message with application-data section containing encrypted data and ENPT AMQP footer containing the Encryption-Algorithm and only the Encryption-Secret for the new subscriber.- The publication message is delivered to all the subscribers and in particular to the new one that successfully decrypts the message relying on delivered ENPT AMQP footer.- The other subscribers successfully decrypt the message relying on delivered ENPT AMQP footer and cached Encryption-Secret from previous messages.	Not planned	N/A

Technical Validation Exercise #01 Technical Validation Objective ID	Technical Validation Exercise #01 Technical Validation Objective Title	Technical Validation Exercise #01 Success Criterion ID	Technical Validation Exercise #01 Success Criterion	Technical Validation Exercise #01 Validation Results	Technical Validation Exercise #01 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-SEC.0020	End-to-end confidentiality for downlink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-SEC.0081	Following steps are successfully completed:- The publisher creates and publishes an additional AMQP 1.0 annotated publication message with application-data section containing encrypted data and ENPT AMQP footer containing also a new Encryption-Secret.- The publication message is delivered to the intended subscribers that successfully decrypt it relying on delivered ENPT AMQP footer and replacing cached Encryption-Secret.	Not planned	N/A

Technical Validation Exercise #01 Technical Validation Objective ID	Technical Validation Exercise #01 Technical Validation Objective Title	Technical Validation Exercise #01 Success Criterion ID	Technical Validation Exercise #01 Success Criterion	Technical Validation Exercise #01 Validation Results	Technical Validation Exercise #01 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-SEC.0021	End-to-end HMAC based message level integrity and authenticity for uplink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-SEC.0082	Following steps are successfully completed:- The requestor creates and sends an AMQP 1.0 annotated request message with HMAC AMQP footer with value containing HMAC-Algorithm, HMAC-Target, HMAC-Digest and HMAC-Secret for the intender responder.- The request message is delivered to the intended responder that successfully validates the authenticity and integrity of the message relying on delivered HMAC AMQP footer.	Not planned	N/A

Technical Validation Exercise #01 Technical Validation Objective ID	Technical Validation Exercise #01 Technical Validation Objective Title	Technical Validation Exercise #01 Success Criterion ID	Technical Validation Exercise #01 Success Criterion	Technical Validation Exercise #01 Validation Results	Technical Validation Exercise #01 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-SEC.0021	End-to-end HMAC based message level integrity and authenticity for uplink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-SEC.0083	Following steps are successfully completed: - The responder creates and sends an AMQP 1.0 annotated response message with HMAC AMQP footer with value containing HMAC-Algorithm, HMAC-Target, HMAC-Digest and HMAC-Secret for the requestor.- The response message is delivered to the intended requestor that successfully validates the authenticity and integrity of the message relying on delivered HMAC AMQP footer.	Not planned	N/A

Technical Validation Exercise #01 Technical Validation Objective ID	Technical Validation Exercise #01 Technical Validation Objective Title	Technical Validation Exercise #01 Success Criterion ID	Technical Validation Exercise #01 Success Criterion	Technical Validation Exercise #01 Validation Results	Technical Validation Exercise #01 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-SEC.0021	End-to-end HMAC based message level integrity and authenticity for uplink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-SEC.0084	Following steps are successfully completed:- The requestor creates and sends an additional AMQP 1.0 annotated request message for the same responder with HMAC AMQP footer containing only HMAC-Algorithm, HMAC-Target and HMAC-Digest.- The request message is delivered to the intended responder that successfully validates the authenticity and integrity of the message relying on delivered HMAC AMQP footer and cached HMAC-Secret from previous request messages.	Not planned	N/A

Technical Validation Exercise #01 Technical Validation Objective ID	Technical Validation Exercise #01 Technical Validation Objective Title	Technical Validation Exercise #01 Success Criterion ID	Technical Validation Exercise #01 Success Criterion	Technical Validation Exercise #01 Validation Results	Technical Validation Exercise #01 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-SEC.0021	End-to-end HMAC based message level integrity and authenticity for uplink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-SEC.0085	Following steps are successfully completed:- The responder creates and sends an additional AMQP 1.0 annotated response message for the same requestor with HMAC AMQP footer containing only HMAC-Algorithm, HMAC-Target and HMAC-Digest.- The response message is delivered to the intended requestor that successfully validates the authenticity and integrity of the message relying on delivered HMAC AMQP footer and cached HMAC-Secret from previous response messages.	Not planned	N/A

Technical Validation Exercise #01 Technical Validation Objective ID	Technical Validation Exercise #01 Technical Validation Objective Title	Technical Validation Exercise #01 Success Criterion ID	Technical Validation Exercise #01 Success Criterion	Technical Validation Exercise #01 Validation Results	Technical Validation Exercise #01 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-SEC.0021	End-to-end HMAC based message level integrity and authenticity for uplink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-SEC.0086	Following steps are successfully completed:- The requestor creates and sends an additional AMQP 1.0 annotated request message for the same responder with HMAC AMQP footer containing HMAC-Algorithm, HMAC-Target, HMAC-Digest and the new shared secret.- The request message is delivered to the intended responder that successfully validates the authenticity and integrity of the message relying on delivered HMAC AMQP footer replacing cached HMAC-Secret.	Not planned	N/A

Technical Validation Exercise #01 Technical Validation Objective ID	Technical Validation Exercise #01 Technical Validation Objective Title	Technical Validation Exercise #01 Success Criterion ID	Technical Validation Exercise #01 Success Criterion	Technical Validation Exercise #01 Validation Results	Technical Validation Exercise #01 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-SEC.0021	End-to-end HMAC based message level integrity and authenticity for uplink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-SEC.0087	Following steps are successfully completed: - The responder creates and sends an AMQP 1.0 annotated response message with HMAC AMQP footer with value containing HMAC-Algorithm, HMAC-Target, HMAC-Digest and HMAC-Secret for the requestor.- While in transit the response message data section is modified.- The response message is delivered to the intended requestor that, relying on delivered HMAC AMQP footer, recognizes that the authenticity and integrity of the message have been violated.- The requestor discards the message and the event is logged in accordance with the applicable audit policy.	Not planned	N/A

Technical Validation Exercise #01 Technical Validation Objective ID	Technical Validation Exercise #01 Technical Validation Objective Title	Technical Validation Exercise #01 Success Criterion ID	Technical Validation Exercise #01 Success Criterion	Technical Validation Exercise #01 Validation Results	Technical Validation Exercise #01 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-SEC.0022	End-to-end HMAC based message level integrity and authenticity for uplink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-SEC.0088	Following steps are successfully completed:- The publisher creates and publishes an AMQP 1.0 annotated publication message with HMAC AMQP footer with value containing HMAC-Algorithm, HMAC-Target, HMAC-Digest and HMAC-Secret for two or more subscribers.- The publication message is delivered to the intended subscribers validate the authenticity and integrity of the message relying on delivered HMAC AMQP footer.	Not planned	N/A

Technical Validation Exercise #01 Technical Validation Objective ID	Technical Validation Exercise #01 Technical Validation Objective Title	Technical Validation Exercise #01 Success Criterion ID	Technical Validation Exercise #01 Success Criterion	Technical Validation Exercise #01 Validation Results	Technical Validation Exercise #01 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-SEC.0022	End-to-end HMAC based message level integrity and authenticity for uplink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-SEC.0089	Following steps are successfully completed:- The publisher creates and publishes an additional AMQP 1.0 annotated publication message for the same subscribers with HMAC AMQP footer containing only HMAC-Algorithm, HMAC-Target and HMAC-Digest.- The publication message is delivered to the intended subscribers that successfully validate the authenticity and integrity of the message relying on delivered HMAC AMQP footer and cached HMAC-Secret from previous messages.	Not planned	N/A

Technical Validation Exercise #01 Technical Validation Objective ID	Technical Validation Exercise #01 Technical Validation Objective Title	Technical Validation Exercise #01 Success Criterion ID	Technical Validation Exercise #01 Success Criterion	Technical Validation Exercise #01 Validation Results	Technical Validation Exercise #01 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-SEC.0022	End-to-end HMAC based message level integrity and authenticity for uplink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-SEC.0090	Following steps are successfully completed:- An additional subscriber ("new_sub") successfully subscribes to the topic.- The publisher creates and publishes an additional AMQP 1.0 annotated publication message with HMAC AMQP footer containing HMAC-Algorithm, HMAC-Target, HMAC-Digest and only the HMAC-Secret for the new subscriber.- The publication message is delivered to all the subscribers and in particular to the new one that successfully validates the authenticity and integrity of the message relying on delivered HMAC AMQP footer.- The other subscribers successfully validate the authenticity and integrity of the message relying on delivered HMAC AMQP footer and cached HMAC-Secret from previous messages.	Not planned	N/A

Technical Validation Exercise #01 Technical Validation Objective ID	Technical Validation Exercise #01 Technical Validation Objective Title	Technical Validation Exercise #01 Success Criterion ID	Technical Validation Exercise #01 Success Criterion	Technical Validation Exercise #01 Validation Results	Technical Validation Exercise #01 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-SEC.0022	End-to-end HMAC based message level integrity and authenticity for uplink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-SEC.0091	Following steps are successfully completed:- The publisher creates and publishes an additional AMQP 1.0 annotated publication message with HMAC AMQP footer containing also the new shared secret.- The publication message is delivered to the intended subscribers that successfully validate the authenticity and integrity of the message relying on delivered HMAC AMQP footer and replacing the cached HMAC-Secret.	Not planned	N/A

Technical Validation Exercise #01 Technical Validation Objective ID	Technical Validation Exercise #01 Technical Validation Objective Title	Technical Validation Exercise #01 Success Criterion ID	Technical Validation Exercise #01 Success Criterion	Technical Validation Exercise #01 Validation Results	Technical Validation Exercise #01 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-SEC.0022	End-to-end HMAC based message level integrity and authenticity for uplink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-SEC.0092	Following steps are successfully completed: -The publisher creates and publishes an additional AMQP 1.0 annotated publication message for the same subscribers with HMAC AMQP footer containing HMAC-Algorithm, HMAC-Target, HMAC-Digest and HMAC-Secret.- While in transit the publication message data section is modified.- The publication message is delivered to the intended subscribers that, relying on delivered HMAC AMQP footer, recognize that the authenticity and integrity of the message have been violated.- The subscribers discards the message and the event is logged in accordance with the applicable audit policy.	Not planned	N/A

Technical Validation Exercise #01 Technical Validation Objective ID	Technical Validation Exercise #01 Technical Validation Objective Title	Technical Validation Exercise #01 Success Criterion ID	Technical Validation Exercise #01 Success Criterion	Technical Validation Exercise #01 Validation Results	Technical Validation Exercise #01 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-SEC.0023	End-to-end HMAC based message level integrity and authenticity for downlink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-SEC.0088	Following steps are successfully completed:- The publisher creates and publishes an AMQP 1.0 annotated publication message with HMAC AMQP footer with value containing HMAC-Algorithm, HMAC-Target, HMAC-Digest and HMAC-Secret for two or more subscribers.- The publication message is delivered to the intended subscribers validate the authenticity and integrity of the message relying on delivered HMAC AMQP footer.	Not planned	N/A

Technical Validation Exercise #01 Technical Validation Objective ID	Technical Validation Exercise #01 Technical Validation Objective Title	Technical Validation Exercise #01 Success Criterion ID	Technical Validation Exercise #01 Success Criterion	Technical Validation Exercise #01 Validation Results	Technical Validation Exercise #01 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-SEC.0023	End-to-end HMAC based message level integrity and authenticity for downlink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-SEC.0089	Following steps are successfully completed:- The publisher creates and publishes an additional AMQP 1.0 annotated publication message for the same subscribers with HMAC AMQP footer containing only HMAC-Algorithm, HMAC-Target and HMAC-Digest.- The publication message is delivered to the intended subscribers that successfully validate the authenticity and integrity of the message relying on delivered HMAC AMQP footer and cached HMAC-Secret from previous messages.	Not planned	N/A

Technical Validation Exercise #01 Technical Validation Objective ID	Technical Validation Exercise #01 Technical Validation Objective Title	Technical Validation Exercise #01 Success Criterion ID	Technical Validation Exercise #01 Success Criterion	Technical Validation Exercise #01 Validation Results	Technical Validation Exercise #01 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-SEC.0023	End-to-end HMAC based message level integrity and authenticity for downlink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-SEC.0090	Following steps are successfully completed:- An additional subscriber ("new_sub") successfully subscribes to the topic.- The publisher creates and publishes an additional AMQP 1.0 annotated publication message with HMAC AMQP footer containing HMAC-Algorithm, HMAC-Target, HMAC-Digest and only the HMAC-Secret for the new subscriber.- The publication message is delivered to all the subscribers and in particular to the new one that successfully validates the authenticity and integrity of the message relying on delivered HMAC AMQP footer.- The other subscribers successfully validate the authenticity and integrity of the message relying on delivered HMAC AMQP footer and cached HMAC-Secret from previous messages.	Not planned	N/A

Technical Validation Exercise #01 Technical Validation Objective ID	Technical Validation Exercise #01 Technical Validation Objective Title	Technical Validation Exercise #01 Success Criterion ID	Technical Validation Exercise #01 Success Criterion	Technical Validation Exercise #01 Validation Results	Technical Validation Exercise #01 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-SEC.0023	End-to-end HMAC based message level integrity and authenticity for downlink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-SEC.0091	Following steps are successfully completed:- The publisher creates and publishes an additional AMQP 1.0 annotated publication message with HMAC AMQP footer containing also the new shared secret.- The publication message is delivered to the intended subscribers that successfully validate the authenticity and integrity of the message relying on delivered HMAC AMQP footer and replacing the cached HMAC-Secret.	Not planned	N/A

Technical Validation Exercise #01 Technical Validation Objective ID	Technical Validation Exercise #01 Technical Validation Objective Title	Technical Validation Exercise #01 Success Criterion ID	Technical Validation Exercise #01 Success Criterion	Technical Validation Exercise #01 Validation Results	Technical Validation Exercise #01 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-SEC.0023	End-to-end HMAC based message level integrity and authenticity for downlink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-SEC.0092	Following steps are successfully completed: -The publisher creates and publishes an additional AMQP 1.0 annotated publication message for the same subscribers with HMAC AMQP footer containing HMAC-Algorithm, HMAC-Target, HMAC-Digest and HMAC-Secret.- While in transit the publication message data section is modified.- The publication message is delivered to the intended subscribers that, relying on delivered HMAC AMQP footer, recognize that the authenticity and integrity of the message have been violated.- The subscribers discards the message and the event is logged in accordance with the applicable audit policy.	Not planned	N/A

Technical Validation Exercise #01 Technical Validation Objective ID	Technical Validation Exercise #01 Technical Validation Objective Title	Technical Validation Exercise #01 Success Criterion ID	Technical Validation Exercise #01 Success Criterion	Technical Validation Exercise #01 Validation Results	Technical Validation Exercise #01 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-SEC.0024	End-to-end digital signature based message level integrity and authenticity for uplink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-SEC.0093	Following steps are successfully completed:- The requestor creates and sends an AMQP 1.0 annotated request message with DSGN AMQP footer with value containing DSGN-Algorithm, DSGN-Target and DSGN-Signature.- The request message is delivered to the intended responder that successfully validates the authenticity and integrity of the message relying on delivered DSGN AMQP footer.	Not planned	N/A

Technical Validation Exercise #01 Technical Validation Objective ID	Technical Validation Exercise #01 Technical Validation Objective Title	Technical Validation Exercise #01 Success Criterion ID	Technical Validation Exercise #01 Success Criterion	Technical Validation Exercise #01 Validation Results	Technical Validation Exercise #01 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-SEC.0024	End-to-end digital signature based message level integrity and authenticity for uplink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-SEC.0094	Following steps are successfully completed: - The responder creates and sends an AMQP 1.0 annotated response message with DSGN AMQP footer with value containing DSGN-Algorithm, DSGN-Target and DSGN-Signature.- The response message is delivered to the intended requestor that successfully validates the authenticity and integrity of the message relying on delivered DSGN AMQP footer.	Not planned	N/A

Technical Validation Exercise #01 Technical Validation Objective ID	Technical Validation Exercise #01 Technical Validation Objective Title	Technical Validation Exercise #01 Success Criterion ID	Technical Validation Exercise #01 Success Criterion	Technical Validation Exercise #01 Validation Results	Technical Validation Exercise #01 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-SEC.0024	End-to-end digital signature based message level integrity and authenticity for uplink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-SEC.0095	Following steps are successfully completed: - The responder creates and sends an AMQP 1.0 annotated response message with DSGN AMQP footer with value containing DSGN-Algorithm, DSGN-Target and DSGN-Signature.- While in transit the response message data section is modified.- The response message is delivered to the intended requestor that, relying on delivered DSGN AMQP footer, recognizes that the authenticity and integrity of the message have been violated.- The requestor discards the message and the event is logged in accordance with the applicable audit policy.	Not planned	N/A

Technical Validation Exercise #01 Technical Validation Objective ID	Technical Validation Exercise #01 Technical Validation Objective Title	Technical Validation Exercise #01 Success Criterion ID	Technical Validation Exercise #01 Success Criterion	Technical Validation Exercise #01 Validation Results	Technical Validation Exercise #01 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-SEC.0025	End-to-end digital signature based message level integrity and authenticity for uplink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-SEC.0096	Following steps are successfully completed:- The publisher creates and publishes an AMQP 1.0 annotated publication message with DSGN AMQP footer with value containing DSGN-Algorithm, DSGN-Target and DSGN-Signature.- The publication message is delivered to the intended subscribers that successfully validate the authenticity and integrity of the message relying on delivered DSGN AMQP footer.	Air and Ground SWIM Nodes are able to transfer message level security information using the AMQP footer.	OK

Technical Validation Exercise #01 Technical Validation Objective ID	Technical Validation Exercise #01 Technical Validation Objective Title	Technical Validation Exercise #01 Success Criterion ID	Technical Validation Exercise #01 Success Criterion	Technical Validation Exercise #01 Validation Results	Technical Validation Exercise #01 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-SEC.0025	End-to-end digital signature based message level integrity and authenticity for uplink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-SEC.0097	Following steps are successfully completed: - The publisher creates and publishes an AMQP 1.0 annotated publication message with DSGN AMQP footer with value containing DSGN-Algorithm, DSGN-Target and DSGN-Signature.- While in transit the publication message data section is modified.- The publication message is delivered to the intended subscribers that, relying on delivered DSGN AMQP footer, recognize that the authenticity and integrity of the message have been violated.- The subscribers discard the message and the event is logged in accordance with the applicable audit policy.	Not planned	N/A

Technical Validation Exercise #01 Technical Validation Objective ID	Technical Validation Exercise #01 Technical Validation Objective Title	Technical Validation Exercise #01 Success Criterion ID	Technical Validation Exercise #01 Success Criterion	Technical Validation Exercise #01 Validation Results	Technical Validation Exercise #01 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-SEC.0026	End-to-end digital signature based message level integrity and authenticity for downlink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-SEC.0096	Following steps are successfully completed:- The publisher creates and publishes an AMQP 1.0 annotated publication message with DSGN AMQP footer with value containing DSGN-Algorithm, DSGN-Target and DSGN-Signature.- The publication message is delivered to the intended subscribers that successfully validate the authenticity and integrity of the message relying on delivered DSGN AMQP footer.	Not planned	N/A

Technical Validation Exercise #01 Technical Validation Objective ID	Technical Validation Exercise #01 Technical Validation Objective Title	Technical Validation Exercise #01 Success Criterion ID	Technical Validation Exercise #01 Success Criterion	Technical Validation Exercise #01 Validation Results	Technical Validation Exercise #01 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-SEC.0026	End-to-end digital signature based message level integrity and authenticity for downlink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-SEC.0097	Following steps are successfully completed: - The publisher creates and publishes an AMQP 1.0 annotated publication message with DSGN AMQP footer with value containing DSGN-Algorithm, DSGN-Target and DSGN-Signature.- While in transit the publication message data section is modified.- The publication message is delivered to the intended subscribers that, relying on delivered DSGN AMQP footer, recognize that the authenticity and integrity of the message have been violated.- The subscribers discard the message and the event is logged in accordance with the applicable audit policy.	Not planned	N/A

Table 17: Technical Validation Results Exercise 1 (EXE1.0001)

Technical Validation Exercise #01 Technical Validation Objective ID	Technical Validation Exercise #01 Technical Validation Objective Title	Technical Validation Exercise #01 Success Criterion ID	Technical Validation Exercise #01 Success Criterion	Technical Validation Exercise #01 Validation Results	Technical Validation Exercise #01 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-PERF.0001	FIFO message queue level ordering guarantees QoS for uplink service	CRT-17.01-TRL6-TVALP-PERF.0001	Messages sent by the ground sender are received in the same FIFO order by the aircraft application.	End to end FIFO message queue level ordering guarantees QoS for uplink Purple Profile enabled SWIM services has been successfully validated.	OK
OBJ-17.01-TRL6-TVALP-PERF.0002	FIFO message queue level ordering guarantees QoS for downlink service	CRT-17.01-TRL6-TVALP-PERF.0002	Messages sent by the air sender are received in the same FIFO order by the ground application.	End to end FIFO message queue level ordering guarantees QoS for downlink Purple Profile enabled SWIM services has been successfully validated.	OK
OBJ-17.01-TRL6-TVALP-PERF.0003	FIFO message topic level ordering guarantees QoS for uplink service	CRT-17.01-TRL6-TVALP-PERF.0003	Messages published by the ground publisher are received in the same FIFO order by the aircraft application(s).	End to end FIFO message queue level ordering guarantees QoS for uplink Purple Profile enabled SWIM services has been successfully validated.	OK
OBJ-17.01-TRL6-TVALP-PERF.0004	FIFO message topic level ordering guarantees QoS for downlink service	CRT-17.01-TRL6-TVALP-PERF.0004	Messages published by the air publisher(s) are received in the same FIFO order by the ground application(s).	End to end FIFO message queue level ordering guarantees QoS for downlink Purple Profile enabled SWIM services has been successfully validated.	OK

Technical Validation Exercise #01 Technical Validation Objective ID	Technical Validation Exercise #01 Technical Validation Objective Title	Technical Validation Exercise #01 Success Criterion ID	Technical Validation Exercise #01 Success Criterion	Technical Validation Exercise #01 Validation Results	Technical Validation Exercise #01 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-PERF.0005	Message priority message queue level ordering guarantees QoS for uplink service	CRT-17.01-TRL6-TVALP-PERF.0005	The ground sender sends messages with different priorities and the aircraft application receives them ordered according to the priority (best effort).	End to end message priority ordering guarantees for downlink and uplink, request/response and publish/subscribe Purple Profile enabled SWIM services has been successfully validated. Furthermore, it was also validated that LDO implementation is highly configurable allowing per-service strictness configuration. In other words, there are service specific characteristics (e.g. message expiration, message rate, etc.) that can be used to improve the strictness of the ordering.	OK
OBJ-17.01-TRL6-TVALP-PERF.0005	Message priority message queue level ordering guarantees QoS for uplink service	CRT-17.01-TRL6-TVALP-PERF.0006	Messages with the same priority are received with FIFO ordering.	End to end message priority ordering guarantees for downlink and uplink, request/response and publish/subscribe Purple Profile enabled SWIM services has been successfully validated. Furthermore, it was also validated that LDO implementation is highly configurable allowing per-service strictness configuration. In other words, there are service specific characteristics (e.g. message expiration, message rate, etc.) that can be used to improve the strictness of the ordering.	OK

Technical Validation Exercise #01 Technical Validation Objective ID	Technical Validation Exercise #01 Technical Validation Objective Title	Technical Validation Exercise #01 Success Criterion ID	Technical Validation Exercise #01 Success Criterion	Technical Validation Exercise #01 Validation Results	Technical Validation Exercise #01 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-PERF.0006	Message priority message queue level ordering guarantees QoS for downlink service	CRT-17.01-TRL6-TVALP-PERF.0007	The air sender sends messages with different priorities and the ground application receives them ordered according to the priority (best effort).	End to end message priority ordering guarantees for downlink and uplink, request/response and publish/subscribe Purple Profile enabled SWIM services has been successfully validated. Furthermore, it was also validated that LDO implementation is highly configurable allowing per-service strictness configuration. In other words, there are service specific characteristics (e.g. message expiration, message rate, etc.) that can be used to improve the strictness of the ordering.	OK
OBJ-17.01-TRL6-TVALP-PERF.0006	Message priority message queue level ordering guarantees QoS for downlink service	CRT-17.01-TRL6-TVALP-PERF.0006	Messages with the same priority are received with FIFO ordering.	End to end message priority ordering guarantees for downlink and uplink, request/response and publish/subscribe Purple Profile enabled SWIM services has been successfully validated. Furthermore, it was also validated that LDO implementation is highly configurable allowing per-service strictness configuration. In other words, there are service specific characteristics (e.g. message expiration, message rate, etc.) that can be used to improve the strictness of the ordering.	OK

Technical Validation Exercise #01 Technical Validation Objective ID	Technical Validation Exercise #01 Technical Validation Objective Title	Technical Validation Exercise #01 Success Criterion ID	Technical Validation Exercise #01 Success Criterion	Technical Validation Exercise #01 Validation Results	Technical Validation Exercise #01 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-PERF.0007	Message priority topic level ordering guarantees QoS for uplink service	CRT-17.01-TRL6-TVALP-PERF.0008	The ground publisher publishes messages with different priorities and the aircraft applications receive them ordered according to the priority (best effort).	End to end message priority ordering guarantees for downlink and uplink, request/response and publish/subscribe Purple Profile enabled SWIM services has been successfully validated. Furthermore, it was also validated that LDO implementation is highly configurable allowing per-service strictness configuration. In other words, there are service specific characteristics (e.g. message expiration, message rate, etc.) that can be used to improve the strictness of the ordering.	OK
OBJ-17.01-TRL6-TVALP-PERF.0007	Message priority topic level ordering guarantees QoS for uplink service	CRT-17.01-TRL6-TVALP-PERF.0006	Messages with the same priority are received with FIFO ordering.	End to end message priority ordering guarantees for downlink and uplink, request/response and publish/subscribe Purple Profile enabled SWIM services has been successfully validated. Furthermore, it was also validated that LDO implementation is highly configurable allowing per-service strictness configuration. In other words, there are service specific characteristics (e.g. message expiration, message rate, etc.) that can be used to improve the strictness of the ordering.	OK

Technical Validation Exercise #01 Technical Validation Objective ID	Technical Validation Exercise #01 Technical Validation Objective Title	Technical Validation Exercise #01 Success Criterion ID	Technical Validation Exercise #01 Success Criterion	Technical Validation Exercise #01 Validation Results	Technical Validation Exercise #01 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-PERF.0008	Message priority message topic level ordering guarantees QoS for downlink service	CRT-17.01-TRL6-TVALP-PERF.0009	The air publisher publishes messages with different priorities and the ground applications receive them ordered according to the priority (best effort).	End to end message priority ordering guarantees for downlink and uplink, request/response and publish/subscribe Purple Profile enabled SWIM services has been successfully validated. Furthermore, it was also validated that LDO implementation is highly configurable allowing per-service strictness configuration. In other words, there are service specific characteristics (e.g. message expiration, message rate, etc.) that can be used to improve the strictness of the ordering.	OK
OBJ-17.01-TRL6-TVALP-PERF.0008	Message priority message topic level ordering guarantees QoS for downlink service	CRT-17.01-TRL6-TVALP-PERF.0006	Messages with the same priority are received with FIFO ordering.	End to end message priority ordering guarantees for downlink and uplink, request/response and publish/subscribe Purple Profile enabled SWIM services has been successfully validated. Furthermore, it was also validated that LDO implementation is highly configurable allowing per-service strictness configuration. In other words, there are service specific characteristics (e.g. message expiration, message rate, etc.) that can be used to improve the strictness of the ordering.	OK

Technical Validation Exercise #01 Technical Validation Objective ID	Technical Validation Exercise #01 Technical Validation Objective Title	Technical Validation Exercise #01 Success Criterion ID	Technical Validation Exercise #01 Success Criterion	Technical Validation Exercise #01 Validation Results	Technical Validation Exercise #01 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-PERF.0009	End to end message latency for Category A uplink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-PERF.0010	The measured end to end message latency for Category A uplink Request/Response Purple Profile enabled SWIM services is <= 20s for 95% of the messages and <= 40s for 98% of the messages in the reference measurement conditions.	N/A	N/A
OBJ-17.01-TRL6-TVALP-PERF.0010	End to end message latency for Category A downlink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-PERF.0011	The measured end to end message latency for Category A downlink Request/Response Purple Profile enabled SWIM services is <= 20s for 95% of the messages and <= 40s for 98% of the messages in the reference measurement conditions.	N/A	N/A

Technical Validation Exercise #01 Technical Validation Objective ID	Technical Validation Exercise #01 Technical Validation Objective Title	Technical Validation Exercise #01 Success Criterion ID	Technical Validation Exercise #01 Success Criterion	Technical Validation Exercise #01 Validation Results	Technical Validation Exercise #01 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-PERF.0011	End to end message latency for Category B uplink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-PERF.0012	The measured end to end message latency for Category B uplink Request/Response Purple Profile enabled SWIM services is <= 30s for 95% of the messages and <= 60s for 98% of the messages in the reference measurement conditions.	N/A	N/A
OBJ-17.01-TRL6-TVALP-PERF.0012	End to end message latency for Category B downlink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-PERF.0013	The measured end to end message latency for Category B downlink Request/Response Purple Profile enabled SWIM services is <= 30s for 95% of the messages and <= 60s for 98% of the messages in the reference measurement conditions.	N/A	N/A

Technical Validation Exercise #01 Technical Validation Objective ID	Technical Validation Exercise #01 Technical Validation Objective Title	Technical Validation Exercise #01 Success Criterion ID	Technical Validation Exercise #01 Success Criterion	Technical Validation Exercise #01 Validation Results	Technical Validation Exercise #01 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-PERF.0013	End to end message latency for Category C uplink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-PERF.0014	The measured end to end message latency for Category C uplink Request/Response Purple Profile enabled SWIM services is <= 50s for 95% of the messages and <= 100s for 98% of the messages in the reference measurement conditions.	N/A	N/A
OBJ-17.01-TRL6-TVALP-PERF.0014	End to end message latency for Category C downlink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-PERF.0015	The measured end to end message latency for Category C downlink Request/Response Purple Profile enabled SWIM services is <= 50s for 95% of the messages and <= 100s for 98% of the messages in the reference measurement conditions.	N/A	N/A

Technical Validation Exercise #01 Technical Validation Objective ID	Technical Validation Exercise #01 Technical Validation Objective Title	Technical Validation Exercise #01 Success Criterion ID	Technical Validation Exercise #01 Success Criterion	Technical Validation Exercise #01 Validation Results	Technical Validation Exercise #01 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-PERF.0015	End to end message latency for Category D uplink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-PERF.0016	The measured end to end message latency for Category D uplink Request/Response Purple Profile enabled SWIM services is <= 60s for 95% of the messages and <= 120s for 98% of the messages in the reference measurement conditions.	N/A	N/A
OBJ-17.01-TRL6-TVALP-PERF.0016	End to end message latency for Category D downlink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-PERF.0017	The measured end to end message latency for Category D downlink Request/Response Purple Profile enabled SWIM services is <= 60s for 95% of the messages and <= 120s for 98% of the messages in the reference measurement conditions.	N/A	N/A

Technical Validation Exercise #01 Technical Validation Objective ID	Technical Validation Exercise #01 Technical Validation Objective Title	Technical Validation Exercise #01 Success Criterion ID	Technical Validation Exercise #01 Success Criterion	Technical Validation Exercise #01 Validation Results	Technical Validation Exercise #01 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-PERF.0017	End to end message latency for Category A uplink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-PERF.0018	The measured end to end message latency for Category A uplink Publish/Subscribe Purple Profile enabled SWIM services is <= 20s for 95% of the messages and <= 40s for 98% of the messages in the reference measurement conditions.	N/A	N/A
OBJ-17.01-TRL6-TVALP-PERF.0018	End to end message latency for Category A downlink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-PERF.0019	The measured end to end message latency for Category A downlink Publish/Subscribe Purple Profile enabled SWIM services is <= 20s for 95% of the messages and <= 40s for 98% of the messages in the reference measurement conditions.	N/A	N/A

Technical Validation Exercise #01 Technical Validation Objective ID	Technical Validation Exercise #01 Technical Validation Objective Title	Technical Validation Exercise #01 Success Criterion ID	Technical Validation Exercise #01 Success Criterion	Technical Validation Exercise #01 Validation Results	Technical Validation Exercise #01 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-PERF.0019	End to end message latency for Category B uplink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-PERF.0020	The measured end to end message latency for Category B uplink Publish/Subscribe Purple Profile enabled SWIM services is <= 30s for 95% of the messages and <= 60s for 98% of the messages in the reference measurement conditions.	N/A	N/A
OBJ-17.01-TRL6-TVALP-PERF.0020	End to end message latency for Category B downlink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-PERF.0021	The measured end to end message latency for Category B downlink Publish/Subscribe Purple Profile enabled SWIM services is <= 30s for 95% of the messages and <= 60s for 98% of the messages in the reference measurement conditions.	N/A	N/A

Technical Validation Exercise #01 Technical Validation Objective ID	Technical Validation Exercise #01 Technical Validation Objective Title	Technical Validation Exercise #01 Success Criterion ID	Technical Validation Exercise #01 Success Criterion	Technical Validation Exercise #01 Validation Results	Technical Validation Exercise #01 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-PERF.0021	End to end message latency for Category C uplink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-PERF.0022	The measured end to end message latency for Category C uplink Publish/Subscribe Purple Profile enabled SWIM services is <= 50s for 95% of the messages and <= 100s for 98% of the messages in the reference measurement conditions.	N/A	N/A
OBJ-17.01-TRL6-TVALP-PERF.0022	End to end message latency for Category C downlink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-PERF.0023	The measured end to end message latency for Category C downlink Publish/Subscribe Purple Profile enabled SWIM services is <= 50s for 95% of the messages and <= 100s for 98% of the messages in the reference measurement conditions.	N/A	N/A

Technical Validation Exercise #01 Technical Validation Objective ID	Technical Validation Exercise #01 Technical Validation Objective Title	Technical Validation Exercise #01 Success Criterion ID	Technical Validation Exercise #01 Success Criterion	Technical Validation Exercise #01 Validation Results	Technical Validation Exercise #01 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-PERF.0023	End to end message latency for Category D uplink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-PERF.0024	The measured end to end message latency for Category D uplink Publish/Subscribe Purple Profile enabled SWIM services is <= 60s for 95% of the messages and <= 120s for 98% of the messages in the reference measurement conditions.	N/A	N/A
OBJ-17.01-TRL6-TVALP-PERF.0024	End to end message latency for Category D downlink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-PERF.0025	The measured end to end message latency for Category C downlink Publish/Subscribe Purple Profile enabled SWIM services is <= 60s for 95% of the messages and <= 120s for 98% of the messages in the reference measurement conditions.	N/A	N/A

Technical Validation Exercise #01 Technical Validation Objective ID	Technical Validation Exercise #01 Technical Validation Objective Title	Technical Validation Exercise #01 Success Criterion ID	Technical Validation Exercise #01 Success Criterion	Technical Validation Exercise #01 Validation Results	Technical Validation Exercise #01 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-PERF.0025	On-the-fly compression QoS for uplink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-PERF.0026	Response messages sent by the ground responder are compressed and uncompressed on-the-fly by the Ground-Air SWIM Nodes pair, without violating message integrity, and received by the aircraft application.	On-the-fly Purple Profile capability has been successfully validated. It has been demonstrated that it reduces the A/G network bandwidth consumption and it transparent to Purple Profile enabled application. Furthermore, it has been considered valuable for ground services providing data for both ground and air consumers. For instance the D-NOTAM publisher is just publishing D-NOTAMs without taking care of extra "optimizations" (e.g. compression) that may be required for air side subscribers.	OK
OBJ-17.01-TRL6-TVALP-PERF.0026	On-the-fly compression QoS for uplink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-PERF.0027	Publication messages sent by the ground publisher are compressed and uncompressed on-the-fly by the Ground-Air SWIM Nodes pair, without violating message integrity, and received by the aircraft application.	On-the-fly Purple Profile capability has been successfully validated. It has been demonstrated that it reduces the A/G network bandwidth consumption and it transparent to Purple Profile enabled application. Furthermore, it has been considered valuable for ground services providing data for both ground and air consumers. For instance the D-NOTAM publisher is just publishing D-NOTAMs without taking care of extra "optimizations" (e.g. compression) that may be required for air side subscribers.	OK

Technical Validation Exercise #01 Technical Validation Objective ID	Technical Validation Exercise #01 Technical Validation Objective Title	Technical Validation Exercise #01 Success Criterion ID	Technical Validation Exercise #01 Success Criterion	Technical Validation Exercise #01 Validation Results	Technical Validation Exercise #01 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-REL.0001	End-to-end at-least-once delivery guarantees QoS for uplink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0001	A request message from aircraft requestor is received at least once by the ground responder although, while routing the request message, a connection establishment failure event (successfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	End-to-end delivery guarantees QoSs for both uplink and downlink Request/Response and Publish/Subscribe Purple Profile enabled SWIM services have been successfully validated when transient connection establishment failure event occurs. Expected delivery guarantees QoS is configured at application (requestor, responder, publisher, subscriber), Air SWIM node, and Ground SWIM Node levels. Furthermore, both Air and Ground SWIM Node allow to configure the delivery guarantees at SWIM Node level and per SWIM service.	OK

Technical Validation Exercise #01 Technical Validation Objective ID	Technical Validation Exercise #01 Technical Validation Objective Title	Technical Validation Exercise #01 Success Criterion ID	Technical Validation Exercise #01 Success Criterion	Technical Validation Exercise #01 Validation Results	Technical Validation Exercise #01 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-REL.0001	End-to-end at-least-once delivery guarantees QoS for uplink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0002	A request message from aircraft requestor is received at least once by the ground responder although, while routing the request message, an abnormal disconnection event due to transient network error (successfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	End-to-end delivery guarantees QoSs for both uplink and downlink Request/Response and Publish/Subscribe Purple Profile enabled SWIM services have been successfully validated when abnormal disconnection event due to transient network error occurs. This was also validated when no A/G datalink were temporary available. Expected delivery guarantees QoS is configured at application (requestor, responder, publisher, subscriber), Air SWIM node, and Ground SWIM Node levels. Furthermore, both Air and Ground SWIM Node allow to configure the delivery guarantees at SWIM Node level and per SWIM service.	OK

Technical Validation Exercise #01 Technical Validation Objective ID	Technical Validation Exercise #01 Technical Validation Objective Title	Technical Validation Exercise #01 Success Criterion ID	Technical Validation Exercise #01 Success Criterion	Technical Validation Exercise #01 Validation Results	Technical Validation Exercise #01 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-REL.0001	End-to-end at-least-once delivery guarantees QoS for uplink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0026	A request message from aircraft requestor is received at least once by the ground responder although, while routing the request message, an abnormal disconnection event due to ground peer restart (successfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	End-to-end delivery guarantees QoSs for both uplink and downlink Request/Response and Publish/Subscribe Purple Profile enabled SWIM services have been successfully validated when abnormal disconnection event due to ground peer restart occurs. Expected delivery guarantees QoS is configured at application (requestor, responder, publisher, subscriber), Air SWIM node, and Ground SWIM Node levels. Furthermore, both Air and Ground SWIM Node allow to configure the delivery guarantees at SWIM Node level and per SWIM service.	OK
OBJ-17.01-TRL6-TVALP-REL.0001	End-to-end at-least-once delivery guarantees QoS for uplink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0003	A response message from the ground responder is received at least once by the aircraft requestor although, while routing the response message, a connection establishment failure event (successfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	End-to-end delivery guarantees QoSs for both uplink and downlink Request/Response and Publish/Subscribe Purple Profile enabled SWIM services have been successfully validated when transient connection establishment failure event occurs. Expected delivery guarantees QoS is configured at application (requestor, responder, publisher, subscriber), Air SWIM node, and Ground SWIM Node levels. Furthermore, both Air and Ground SWIM Node allow to configure the delivery guarantees at SWIM Node level and per SWIM service.	OK

Technical Validation Exercise #01 Technical Validation Objective ID	Technical Validation Exercise #01 Technical Validation Objective Title	Technical Validation Exercise #01 Success Criterion ID	Technical Validation Exercise #01 Success Criterion	Technical Validation Exercise #01 Validation Results	Technical Validation Exercise #01 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-REL.0001	End-to-end at-least-once delivery guarantees QoS for uplink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0004	A response message from the ground responder is received at least once by the aircraft requestor although, while routing the response message, an abnormal disconnection event due to transient network error (successfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	End-to-end delivery guarantees QoSs for both uplink and downlink Request/Response and Publish/Subscribe Purple Profile enabled SWIM services have been successfully validated when abnormal disconnection event due to transient network error occurs. This was also validated when no A/G datalink were temporary available. Expected delivery guarantees QoS is configured at application (requestor, responder, publisher, subscriber), Air SWIM node, and Ground SWIM Node levels. Furthermore, both Air and Ground SWIM Node allow to configure the delivery guarantees at SWIM Node level and per SWIM service.	OK

Technical Validation Exercise #01 Technical Validation Objective ID	Technical Validation Exercise #01 Technical Validation Objective Title	Technical Validation Exercise #01 Success Criterion ID	Technical Validation Exercise #01 Success Criterion	Technical Validation Exercise #01 Validation Results	Technical Validation Exercise #01 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-REL.0001	End-to-end at-least-once delivery guarantees QoS for uplink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0027	A response message from the ground responder is received at least once by the aircraft requestor although, while routing the response message, an abnormal disconnection event due to ground peer restart (successfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	End-to-end delivery guarantees QoSs for both uplink and downlink Request/Response and Publish/Subscribe Purple Profile enabled SWIM services have been successfully validated when abnormal disconnection event due to ground peer restart occurs. Expected delivery guarantees QoS is configured at application (requestor, responder, publisher, subscriber), Air SWIM node, and Ground SWIM Node levels. Furthermore, both Air and Ground SWIM Node allow to configure the delivery guarantees at SWIM Node level and per SWIM service.	OK
OBJ-17.01-TRL6-TVALP-REL.0001	End-to-end at-least-once delivery guarantees QoS for uplink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0005	Message not delivered failure event is logged and traced because, while routing the message, a connection establishment failure event (unsuccessfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	Logging, tracing and reporting (monitoring capabilities) of message not delivered event have been successfully validated.	OK

Technical Validation Exercise #01 Technical Validation Objective ID	Technical Validation Exercise #01 Technical Validation Objective Title	Technical Validation Exercise #01 Success Criterion ID	Technical Validation Exercise #01 Success Criterion	Technical Validation Exercise #01 Validation Results	Technical Validation Exercise #01 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-REL.0001	End-to-end at-least-once delivery guarantees QoS for uplink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0006	Message not delivered failure event is logged and traced because, while routing the message, an abnormal disconnection event (unsuccessfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	Logging, tracing and reporting (monitoring capabilities) of message not delivered event have been successfully validated.	OK
OBJ-17.01-TRL6-TVALP-REL.0001	End-to-end at-least-once delivery guarantees QoS for uplink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0007	Message not delivered failure event is logged and traced because, while handling abnormal disconnection or connection establishment failure events at Air-Ground SWIM Nodes connection level, the message expires.	Logging, tracing and reporting (monitoring capabilities) of message not delivered event have been successfully validated.	OK

Technical Validation Exercise #01 Technical Validation Objective ID	Technical Validation Exercise #01 Technical Validation Objective Title	Technical Validation Exercise #01 Success Criterion ID	Technical Validation Exercise #01 Success Criterion	Technical Validation Exercise #01 Validation Results	Technical Validation Exercise #01 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-REL.0002	End-to-end at-least-once delivery guarantees QoS for downlink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0008	A request message from ground requestor is received at least once by the aircraft responder although, while routing the request message, a connection establishment failure event (successfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	End-to-end delivery guarantees QoSs for both uplink and downlink Request/Response and Publish/Subscribe Purple Profile enabled SWIM services have been successfully validated when transient connection establishment failure event occurs. Expected delivery guarantees QoS is configured at application (requestor, responder, publisher, subscriber), Air SWIM node, and Ground SWIM Node levels. Furthermore, both Air and Ground SWIM Node allow to configure the delivery guarantees at SWIM Node level and per SWIM service.	OK

Technical Validation Exercise #01 Technical Validation Objective ID	Technical Validation Exercise #01 Technical Validation Objective Title	Technical Validation Exercise #01 Success Criterion ID	Technical Validation Exercise #01 Success Criterion	Technical Validation Exercise #01 Validation Results	Technical Validation Exercise #01 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-REL.0002	End-to-end at-least-once delivery guarantees QoS for downlink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0009	A request message from ground requestor is received at least once by the aircraft responder although, while routing the request message, an abnormal disconnection event due to transient network error (successfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	End-to-end delivery guarantees QoSs for both uplink and downlink Request/Response and Publish/Subscribe Purple Profile enabled SWIM services have been successfully validated when abnormal disconnection event due to transient network error occurs. This was also validated when no A/G datalink were temporary available. Expected delivery guarantees QoS is configured at application (requestor, responder, publisher, subscriber), Air SWIM node, and Ground SWIM Node levels. Furthermore, both Air and Ground SWIM Node allow to configure the delivery guarantees at SWIM Node level and per SWIM service.	OK

Technical Validation Exercise #01 Technical Validation Objective ID	Technical Validation Exercise #01 Technical Validation Objective Title	Technical Validation Exercise #01 Success Criterion ID	Technical Validation Exercise #01 Success Criterion	Technical Validation Exercise #01 Validation Results	Technical Validation Exercise #01 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-REL.0002	End-to-end at-least-once delivery guarantees QoS for downlink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0028	A request message from ground requestor is received at least once by the aircraft responder although, while routing the request message, an abnormal disconnection event due to ground peer restart (successfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	End-to-end delivery guarantees QoSs for both uplink and downlink Request/Response and Publish/Subscribe Purple Profile enabled SWIM services have been successfully validated when abnormal disconnection event due to ground peer restart occurs. Expected delivery guarantees QoS is configured at application (requestor, responder, publisher, subscriber), Air SWIM node, and Ground SWIM Node levels. Furthermore, both Air and Ground SWIM Node allow to configure the delivery guarantees at SWIM Node level and per SWIM service.	OK
OBJ-17.01-TRL6-TVALP-REL.0002	End-to-end at-least-once delivery guarantees QoS for downlink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0010	A response message from the aircraft responder is received at least once by the ground requestor although, while routing the response message, a connection establishment failure event (successfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	End-to-end delivery guarantees QoSs for both uplink and downlink Request/Response and Publish/Subscribe Purple Profile enabled SWIM services have been successfully validated when transient connection establishment failure event occurs. Expected delivery guarantees QoS is configured at application (requestor, responder, publisher, subscriber), Air SWIM node, and Ground SWIM Node levels. Furthermore, both Air and Ground SWIM Node allow to configure the delivery guarantees at SWIM Node level and per SWIM service.	OK

Technical Validation Exercise #01 Technical Validation Objective ID	Technical Validation Exercise #01 Technical Validation Objective Title	Technical Validation Exercise #01 Success Criterion ID	Technical Validation Exercise #01 Success Criterion	Technical Validation Exercise #01 Validation Results	Technical Validation Exercise #01 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-REL.0002	End-to-end at-least-once delivery guarantees QoS for downlink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0011	A response message from the aircraft responder is received at least once by the ground requestor although, while routing the response message, an abnormal disconnection event due to transient network error (successfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	End-to-end delivery guarantees QoSs for both uplink and downlink Request/Response and Publish/Subscribe Purple Profile enabled SWIM services have been successfully validated when abnormal disconnection event due to transient network error occurs. This was also validated when no A/G datalink were temporary available. Expected delivery guarantees QoS is configured at application (requestor, responder, publisher, subscriber), Air SWIM node, and Ground SWIM Node levels. Furthermore, both Air and Ground SWIM Node allow to configure the delivery guarantees at SWIM Node level and per SWIM service.	OK

Technical Validation Exercise #01 Technical Validation Objective ID	Technical Validation Exercise #01 Technical Validation Objective Title	Technical Validation Exercise #01 Success Criterion ID	Technical Validation Exercise #01 Success Criterion	Technical Validation Exercise #01 Validation Results	Technical Validation Exercise #01 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-REL.0002	End-to-end at-least-once delivery guarantees QoS for downlink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0029	A response message from the aircraft responder is received at least once by the ground requestor although, while routing the response message, an abnormal disconnection event due to ground peer restart (successfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	End-to-end delivery guarantees QoSs for both uplink and downlink Request/Response and Publish/Subscribe Purple Profile enabled SWIM services have been successfully validated when abnormal disconnection event due to ground peer restart occurs. Expected delivery guarantees QoS is configured at application (requestor, responder, publisher, subscriber), Air SWIM node, and Ground SWIM Node levels. Furthermore, both Air and Ground SWIM Node allow to configure the delivery guarantees at SWIM Node level and per SWIM service.	OK
OBJ-17.01-TRL6-TVALP-REL.0002	End-to-end at-least-once delivery guarantees QoS for downlink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0005	Message not delivered failure event is logged and traced because, while routing the message, a connection establishment failure event (unsuccessfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	Logging, tracing and reporting (monitoring capabilities) of message not delivered event have been successfully validated.	OK

Technical Validation Exercise #01 Technical Validation Objective ID	Technical Validation Exercise #01 Technical Validation Objective Title	Technical Validation Exercise #01 Success Criterion ID	Technical Validation Exercise #01 Success Criterion	Technical Validation Exercise #01 Validation Results	Technical Validation Exercise #01 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-REL.0002	End-to-end at-least-once delivery guarantees QoS for downlink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0006	Message not delivered failure event is logged and traced because, while routing the message, an abnormal disconnection event (unsuccessfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	Logging, tracing and reporting (monitoring capabilities) of message not delivered event have been successfully validated.	OK
OBJ-17.01-TRL6-TVALP-REL.0002	End-to-end at-least-once delivery guarantees QoS for downlink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0007	Message not delivered failure event is logged and traced because, while handling abnormal disconnection or connection establishment failure events at Air-Ground SWIM Nodes connection level, the message expires.	Logging, tracing and reporting (monitoring capabilities) of message not delivered event have been successfully validated.	OK

Technical Validation Exercise #01 Technical Validation Objective ID	Technical Validation Exercise #01 Technical Validation Objective Title	Technical Validation Exercise #01 Success Criterion ID	Technical Validation Exercise #01 Success Criterion	Technical Validation Exercise #01 Validation Results	Technical Validation Exercise #01 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-REL.0003	End-to-end at-least-once delivery guarantees QoS for uplink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0012	A publication message from ground publisher is received at least once by the aircraft subscriber although, while routing the message, a connection establishment failure event (successfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	End-to-end delivery guarantees QoSs for both uplink and downlink Request/Response and Publish/Subscribe Purple Profile enabled SWIM services have been successfully validated when transient connection establishment failure event occurs. Expected delivery guarantees QoS is configured at application (requestor, responder, publisher, subscriber), Air SWIM node, and Ground SWIM Node levels. Furthermore, both Air and Ground SWIM Node allow to configure the delivery guarantees at SWIM Node level and per SWIM service.	OK

Technical Validation Exercise #01 Technical Validation Objective ID	Technical Validation Exercise #01 Technical Validation Objective Title	Technical Validation Exercise #01 Success Criterion ID	Technical Validation Exercise #01 Success Criterion	Technical Validation Exercise #01 Validation Results	Technical Validation Exercise #01 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-REL.0003	End-to-end at-least-once delivery guarantees QoS for uplink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0013	A publication message from ground publisher is received at least once by the aircraft subscriber although, while routing the message, an abnormal disconnection event due to transient network error (successfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	End-to-end delivery guarantees QoSs for both uplink and downlink Request/Response and Publish/Subscribe Purple Profile enabled SWIM services have been successfully validated when abnormal disconnection event due to transient network error occurs. This was also validated when no A/G datalink were temporary available. Expected delivery guarantees QoS is configured at application (requestor, responder, publisher, subscriber), Air SWIM node, and Ground SWIM Node levels. Furthermore, both Air and Ground SWIM Node allow to configure the delivery guarantees at SWIM Node level and per SWIM service.	OK

Technical Validation Exercise #01 Technical Validation Objective ID	Technical Validation Exercise #01 Technical Validation Objective Title	Technical Validation Exercise #01 Success Criterion ID	Technical Validation Exercise #01 Success Criterion	Technical Validation Exercise #01 Validation Results	Technical Validation Exercise #01 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-REL.0003	End-to-end at-least-once delivery guarantees QoS for uplink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0030	A publication message from ground publisher is received at least once by the aircraft subscriber although, while routing the message, an abnormal disconnection event due to ground peer restart (successfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	End-to-end delivery guarantees QoSs for both uplink and downlink Request/Response and Publish/Subscribe Purple Profile enabled SWIM services have been successfully validated when abnormal disconnection event due to ground peer restart occurs. Expected delivery guarantees QoS is configured at application (requestor, responder, publisher, subscriber), Air SWIM node, and Ground SWIM Node levels. Furthermore, both Air and Ground SWIM Node allow to configure the delivery guarantees at SWIM Node level and per SWIM service.	OK
OBJ-17.01-TRL6-TVALP-REL.0003	End-to-end at-least-once delivery guarantees QoS for uplink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0005	Message not delivered failure event is logged and traced because, while routing the message, a connection establishment failure event (unsuccessfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	Logging, tracing and reporting (monitoring capabilities) of message not delivered event have been successfully validated.	OK

Technical Validation Exercise #01 Technical Validation Objective ID	Technical Validation Exercise #01 Technical Validation Objective Title	Technical Validation Exercise #01 Success Criterion ID	Technical Validation Exercise #01 Success Criterion	Technical Validation Exercise #01 Validation Results	Technical Validation Exercise #01 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-REL.0003	End-to-end at-least-once delivery guarantees QoS for uplink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0006	Message not delivered failure event is logged and traced because, while routing the message, an abnormal disconnection event (unsuccessfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	Logging, tracing and reporting (monitoring capabilities) of message not delivered event have been successfully validated.	OK
OBJ-17.01-TRL6-TVALP-REL.0003	End-to-end at-least-once delivery guarantees QoS for uplink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0007	Message not delivered failure event is logged and traced because, while handling abnormal disconnection or connection establishment failure events at Air-Ground SWIM Nodes connection level, the message expires.	Logging, tracing and reporting (monitoring capabilities) of message not delivered event have been successfully validated.	OK

Technical Validation Exercise #01 Technical Validation Objective ID	Technical Validation Exercise #01 Technical Validation Objective Title	Technical Validation Exercise #01 Success Criterion ID	Technical Validation Exercise #01 Success Criterion	Technical Validation Exercise #01 Validation Results	Technical Validation Exercise #01 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-REL.0004	End-to-end at-least-once delivery guarantees QoS for downlink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0014	A publication message from aircraft publisher is received at least once by the ground subscriber although, while routing the message, a connection establishment failure event (successfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	End-to-end delivery guarantees QoSs for both uplink and downlink Request/Response and Publish/Subscribe Purple Profile enabled SWIM services have been successfully validated when transient connection establishment failure event occurs. Expected delivery guarantees QoS is configured at application (requestor, responder, publisher, subscriber), Air SWIM node, and Ground SWIM Node levels. Furthermore, both Air and Ground SWIM Node allow to configure the delivery guarantees at SWIM Node level and per SWIM service.	OK

Technical Validation Exercise #01 Technical Validation Objective ID	Technical Validation Exercise #01 Technical Validation Objective Title	Technical Validation Exercise #01 Success Criterion ID	Technical Validation Exercise #01 Success Criterion	Technical Validation Exercise #01 Validation Results	Technical Validation Exercise #01 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-REL.0004	End-to-end at-least-once delivery guarantees QoS for downlink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0015	A publication message from aircraft publisher is received at least once by the ground subscriber although, while routing the message, an abnormal disconnection event due to transient network error (successfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	End-to-end delivery guarantees QoSs for both uplink and downlink Request/Response and Publish/Subscribe Purple Profile enabled SWIM services have been successfully validated when abnormal disconnection event due to transient network error occurs. This was also validated when no A/G datalink were temporary available. Expected delivery guarantees QoS is configured at application (requestor, responder, publisher, subscriber), Air SWIM node, and Ground SWIM Node levels. Furthermore, both Air and Ground SWIM Node allow to configure the delivery guarantees at SWIM Node level and per SWIM service.	OK

Technical Validation Exercise #01 Technical Validation Objective ID	Technical Validation Exercise #01 Technical Validation Objective Title	Technical Validation Exercise #01 Success Criterion ID	Technical Validation Exercise #01 Success Criterion	Technical Validation Exercise #01 Validation Results	Technical Validation Exercise #01 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-REL.0004	End-to-end at-least-once delivery guarantees QoS for downlink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0031	A publication message from aircraft publisher is received at least once by the ground subscriber although, while routing the message, an abnormal disconnection event due to ground peer restart (successfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	End-to-end delivery guarantees QoSs for both uplink and downlink Request/Response and Publish/Subscribe Purple Profile enabled SWIM services have been successfully validated when abnormal disconnection event due to ground peer restart occurs. Expected delivery guarantees QoS is configured at application (requestor, responder, publisher, subscriber), Air SWIM node, and Ground SWIM Node levels. Furthermore, both Air and Ground SWIM Node allow to configure the delivery guarantees at SWIM Node level and per SWIM service.	OK
OBJ-17.01-TRL6-TVALP-REL.0004	End-to-end at-least-once delivery guarantees QoS for downlink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0005	Message not delivered failure event is logged and traced because, while routing the message, a connection establishment failure event (unsuccessfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	Logging, tracing and reporting (monitoring capabilities) of message not delivered event have been successfully validated.	OK

Technical Validation Exercise #01 Technical Validation Objective ID	Technical Validation Exercise #01 Technical Validation Objective Title	Technical Validation Exercise #01 Success Criterion ID	Technical Validation Exercise #01 Success Criterion	Technical Validation Exercise #01 Validation Results	Technical Validation Exercise #01 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-REL.0004	End-to-end at-least-once delivery guarantees QoS for downlink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0006	Message not delivered failure event is logged and traced because, while routing the message, an abnormal disconnection event (unsuccessfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	Logging, tracing and reporting (monitoring capabilities) of message not delivered event have been successfully validated.	OK
OBJ-17.01-TRL6-TVALP-REL.0004	End-to-end at-least-once delivery guarantees QoS for downlink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0007	Message not delivered failure event is logged and traced because, while handling abnormal disconnection or connection establishment failure events at Air-Ground SWIM Nodes connection level, the message expires.	Logging, tracing and reporting (monitoring capabilities) of message not delivered event have been successfully validated.	OK

Technical Validation Exercise #01 Technical Validation Objective ID	Technical Validation Exercise #01 Technical Validation Objective Title	Technical Validation Exercise #01 Success Criterion ID	Technical Validation Exercise #01 Success Criterion	Technical Validation Exercise #01 Validation Results	Technical Validation Exercise #01 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-REL.0005	End-to-end exactly-once delivery guarantees QoS for uplink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0016	A request message from aircraft requestor is received exactly once by the ground responder although, while routing the request message, a connection establishment failure event (successfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	End-to-end delivery guarantees QoSs for both uplink and downlink Request/Response and Publish/Subscribe Purple Profile enabled SWIM services have been successfully validated when transient connection establishment failure event occurs. Expected delivery guarantees QoS is configured at application (requestor, responder, publisher, subscriber), Air SWIM node, and Ground SWIM Node levels. Furthermore, both Air and Ground SWIM Node allow to configure the delivery guarantees at SWIM Node level and per SWIM service.	OK

Technical Validation Exercise #01 Technical Validation Objective ID	Technical Validation Exercise #01 Technical Validation Objective Title	Technical Validation Exercise #01 Success Criterion ID	Technical Validation Exercise #01 Success Criterion	Technical Validation Exercise #01 Validation Results	Technical Validation Exercise #01 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-REL.0005	End-to-end exactly-once delivery guarantees QoS for uplink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0017	A request message from aircraft requestor is received exactly once by the ground responder although, while routing the request message, an abnormal disconnection event due to transient network error (successfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	End-to-end delivery guarantees QoSs for both uplink and downlink Request/Response and Publish/Subscribe Purple Profile enabled SWIM services have been successfully validated when abnormal disconnection event due to transient network error occurs. This was also validated when no A/G datalink were temporary available. Expected delivery guarantees QoS is configured at application (requestor, responder, publisher, subscriber), Air SWIM node, and Ground SWIM Node levels. Furthermore, both Air and Ground SWIM Node allow to configure the delivery guarantees at SWIM Node level and per SWIM service.	OK

Technical Validation Exercise #01 Technical Validation Objective ID	Technical Validation Exercise #01 Technical Validation Objective Title	Technical Validation Exercise #01 Success Criterion ID	Technical Validation Exercise #01 Success Criterion	Technical Validation Exercise #01 Validation Results	Technical Validation Exercise #01 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-REL.0005	End-to-end exactly-once delivery guarantees QoS for uplink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0032	A request message from aircraft requestor is received exactly once by the ground responder although, while routing the request message, an abnormal disconnection event due to ground peer restart (successfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	End-to-end delivery guarantees QoSs for both uplink and downlink Request/Response and Publish/Subscribe Purple Profile enabled SWIM services have been successfully validated when abnormal disconnection event due to ground peer restart occurs. Expected delivery guarantees QoS is configured at application (requestor, responder, publisher, subscriber), Air SWIM node, and Ground SWIM Node levels. Furthermore, both Air and Ground SWIM Node allow to configure the delivery guarantees at SWIM Node level and per SWIM service.	OK
OBJ-17.01-TRL6-TVALP-REL.0005	End-to-end exactly-once delivery guarantees QoS for uplink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0018	A response message from the ground responder is received exactly once by the aircraft requestor although, while routing the response message, a connection establishment failure event (successfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	End-to-end delivery guarantees QoSs for both uplink and downlink Request/Response and Publish/Subscribe Purple Profile enabled SWIM services have been successfully validated when transient connection establishment failure event occurs. Expected delivery guarantees QoS is configured at application (requestor, responder, publisher, subscriber), Air SWIM node, and Ground SWIM Node levels. Furthermore, both Air and Ground SWIM Node allow to configure the delivery guarantees at SWIM Node level and per SWIM service.	OK

Technical Validation Exercise #01 Technical Validation Objective ID	Technical Validation Exercise #01 Technical Validation Objective Title	Technical Validation Exercise #01 Success Criterion ID	Technical Validation Exercise #01 Success Criterion	Technical Validation Exercise #01 Validation Results	Technical Validation Exercise #01 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-REL.0005	End-to-end exactly-once delivery guarantees QoS for uplink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0019	A response message from the ground responder is received exactly once by the aircraft requestor although, while routing the response message, an abnormal disconnection event due to transient network error (successfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	End-to-end delivery guarantees QoSs for both uplink and downlink Request/Response and Publish/Subscribe Purple Profile enabled SWIM services have been successfully validated when abnormal disconnection event due to transient network error occurs. This was also validated when no A/G datalink were temporary available. Expected delivery guarantees QoS is configured at application (requestor, responder, publisher, subscriber), Air SWIM node, and Ground SWIM Node levels. Furthermore, both Air and Ground SWIM Node allow to configure the delivery guarantees at SWIM Node level and per SWIM service.	OK

Technical Validation Exercise #01 Technical Validation Objective ID	Technical Validation Exercise #01 Technical Validation Objective Title	Technical Validation Exercise #01 Success Criterion ID	Technical Validation Exercise #01 Success Criterion	Technical Validation Exercise #01 Validation Results	Technical Validation Exercise #01 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-REL.0005	End-to-end exactly-once delivery guarantees QoS for uplink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0033	A response message from the ground responder is received exactly once by the aircraft requestor although, while routing the response message, an abnormal disconnection event due to ground peer restart (successfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	End-to-end delivery guarantees QoSs for both uplink and downlink Request/Response and Publish/Subscribe Purple Profile enabled SWIM services have been successfully validated when abnormal disconnection event due to ground peer restart occurs. Expected delivery guarantees QoS is configured at application (requestor, responder, publisher, subscriber), Air SWIM node, and Ground SWIM Node levels. Furthermore, both Air and Ground SWIM Node allow to configure the delivery guarantees at SWIM Node level and per SWIM service.	OK
OBJ-17.01-TRL6-TVALP-REL.0005	End-to-end exactly-once delivery guarantees QoS for uplink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0005	Message not delivered failure event is logged and traced because, while routing the message, a connection establishment failure event (unsuccessfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	Logging, tracing and reporting (monitoring capabilities) of message not delivered event have been successfully validated.	OK

Technical Validation Exercise #01 Technical Validation Objective ID	Technical Validation Exercise #01 Technical Validation Objective Title	Technical Validation Exercise #01 Success Criterion ID	Technical Validation Exercise #01 Success Criterion	Technical Validation Exercise #01 Validation Results	Technical Validation Exercise #01 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-REL.0005	End-to-end exactly-once delivery guarantees QoS for uplink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0006	Message not delivered failure event is logged and traced because, while routing the message, an abnormal disconnection event (unsuccessfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	Logging, tracing and reporting (monitoring capabilities) of message not delivered event have been successfully validated.	OK
OBJ-17.01-TRL6-TVALP-REL.0005	End-to-end exactly-once delivery guarantees QoS for uplink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0007	Message not delivered failure event is logged and traced because, while handling abnormal disconnection or connection establishment failure events at Air-Ground SWIM Nodes connection level, the message expires.	Logging, tracing and reporting (monitoring capabilities) of message not delivered event have been successfully validated.	OK

Technical Validation Exercise #01 Technical Validation Objective ID	Technical Validation Exercise #01 Technical Validation Objective Title	Technical Validation Exercise #01 Success Criterion ID	Technical Validation Exercise #01 Success Criterion	Technical Validation Exercise #01 Validation Results	Technical Validation Exercise #01 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-REL.0006	End-to-end exactly-once delivery guarantees QoS for downlink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0020	A request message from ground requestor is received exactly once by the aircraft responder although, while routing the request message, a connection establishment failure event (successfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	End-to-end delivery guarantees QoSs for both uplink and downlink Request/Response and Publish/Subscribe Purple Profile enabled SWIM services have been successfully validated when transient connection establishment failure event occurs. Expected delivery guarantees QoS is configured at application (requestor, responder, publisher, subscriber), Air SWIM node, and Ground SWIM Node levels. Furthermore, both Air and Ground SWIM Node allow to configure the delivery guarantees at SWIM Node level and per SWIM service.	OK

Technical Validation Exercise #01 Technical Validation Objective ID	Technical Validation Exercise #01 Technical Validation Objective Title	Technical Validation Exercise #01 Success Criterion ID	Technical Validation Exercise #01 Success Criterion	Technical Validation Exercise #01 Validation Results	Technical Validation Exercise #01 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-REL.0006	End-to-end exactly-once delivery guarantees QoS for downlink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0021	A request message from ground requestor is received exactly once by the aircraft responder although, while routing the request message, an abnormal disconnection event due to transient network error (successfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	End-to-end delivery guarantees QoSs for both uplink and downlink Request/Response and Publish/Subscribe Purple Profile enabled SWIM services have been successfully validated when abnormal disconnection event due to transient network error occurs. This was also validated when no A/G datalink were temporary available. Expected delivery guarantees QoS is configured at application (requestor, responder, publisher, subscriber), Air SWIM node, and Ground SWIM Node levels. Furthermore, both Air and Ground SWIM Node allow to configure the delivery guarantees at SWIM Node level and per SWIM service.	OK

Technical Validation Exercise #01 Technical Validation Objective ID	Technical Validation Exercise #01 Technical Validation Objective Title	Technical Validation Exercise #01 Success Criterion ID	Technical Validation Exercise #01 Success Criterion	Technical Validation Exercise #01 Validation Results	Technical Validation Exercise #01 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-REL.0006	End-to-end exactly-once delivery guarantees QoS for downlink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0034	A request message from ground requestor is received exactly once by the aircraft responder although, while routing the request message, an abnormal disconnection event due to ground peer restart (successfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	End-to-end delivery guarantees QoSs for both uplink and downlink Request/Response and Publish/Subscribe Purple Profile enabled SWIM services have been successfully validated when abnormal disconnection event due to ground peer restart occurs. Expected delivery guarantees QoS is configured at application (requestor, responder, publisher, subscriber), Air SWIM node, and Ground SWIM Node levels. Furthermore, both Air and Ground SWIM Node allow to configure the delivery guarantees at SWIM Node level and per SWIM service.	OK
OBJ-17.01-TRL6-TVALP-REL.0006	End-to-end exactly-once delivery guarantees QoS for downlink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0022	A response message from the aircraft responder is received exactly once by the ground requestor although, while routing the response message, a connection establishment failure event (successfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	End-to-end delivery guarantees QoSs for both uplink and downlink Request/Response and Publish/Subscribe Purple Profile enabled SWIM services have been successfully validated when transient connection establishment failure event occurs. Expected delivery guarantees QoS is configured at application (requestor, responder, publisher, subscriber), Air SWIM node, and Ground SWIM Node levels. Furthermore, both Air and Ground SWIM Node allow to configure the delivery guarantees at SWIM Node level and per SWIM service.	OK

Technical Validation Exercise #01 Technical Validation Objective ID	Technical Validation Exercise #01 Technical Validation Objective Title	Technical Validation Exercise #01 Success Criterion ID	Technical Validation Exercise #01 Success Criterion	Technical Validation Exercise #01 Validation Results	Technical Validation Exercise #01 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-REL.0006	End-to-end exactly-once delivery guarantees QoS for downlink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0011	A response message from the aircraft responder is received exactly once by the ground requestor although, while routing the response message, an abnormal disconnection event due to transient network error (successfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	End-to-end delivery guarantees QoSs for both uplink and downlink Request/Response and Publish/Subscribe Purple Profile enabled SWIM services have been successfully validated when abnormal disconnection event due to transient network error occurs. This was also validated when no A/G datalink were temporary available. Expected delivery guarantees QoS is configured at application (requestor, responder, publisher, subscriber), Air SWIM node, and Ground SWIM Node levels. Furthermore, both Air and Ground SWIM Node allow to configure the delivery guarantees at SWIM Node level and per SWIM service.	OK

Technical Validation Exercise #01 Technical Validation Objective ID	Technical Validation Exercise #01 Technical Validation Objective Title	Technical Validation Exercise #01 Success Criterion ID	Technical Validation Exercise #01 Success Criterion	Technical Validation Exercise #01 Validation Results	Technical Validation Exercise #01 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-REL.0006	End-to-end exactly-once delivery guarantees QoS for downlink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0035	A response message from the aircraft responder is received exactly once by the ground requestor although, while routing the response message, an abnormal disconnection event due to ground peer restart (successfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	End-to-end delivery guarantees QoSs for both uplink and downlink Request/Response and Publish/Subscribe Purple Profile enabled SWIM services have been successfully validated when abnormal disconnection event due to ground peer restart occurs. Expected delivery guarantees QoS is configured at application (requestor, responder, publisher, subscriber), Air SWIM node, and Ground SWIM Node levels. Furthermore, both Air and Ground SWIM Node allow to configure the delivery guarantees at SWIM Node level and per SWIM service.	OK
OBJ-17.01-TRL6-TVALP-REL.0006	End-to-end exactly-once delivery guarantees QoS for downlink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0005	Message not delivered failure event is logged and traced because, while routing the message, a connection establishment failure event (unsuccessfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	Logging, tracing and reporting (monitoring capabilities) of message not delivered event have been successfully validated.	OK

Technical Validation Exercise #01 Technical Validation Objective ID	Technical Validation Exercise #01 Technical Validation Objective Title	Technical Validation Exercise #01 Success Criterion ID	Technical Validation Exercise #01 Success Criterion	Technical Validation Exercise #01 Validation Results	Technical Validation Exercise #01 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-REL.0006	End-to-end exactly-once delivery guarantees QoS for downlink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0006	Message not delivered failure event is logged and traced because, while routing the message, an abnormal disconnection event (unsuccessfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	Logging, tracing and reporting (monitoring capabilities) of message not delivered event have been successfully validated.	OK
OBJ-17.01-TRL6-TVALP-REL.0006	End-to-end exactly-once delivery guarantees QoS for downlink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0007	Message not delivered failure event is logged and traced because, while handling abnormal disconnection or connection establishment failure events at Air-Ground SWIM Nodes connection level, the message expires.	Logging, tracing and reporting (monitoring capabilities) of message not delivered event have been successfully validated.	OK

Technical Validation Exercise #01 Technical Validation Objective ID	Technical Validation Exercise #01 Technical Validation Objective Title	Technical Validation Exercise #01 Success Criterion ID	Technical Validation Exercise #01 Success Criterion	Technical Validation Exercise #01 Validation Results	Technical Validation Exercise #01 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-REL.0007	End-to-end exactly-once delivery guarantees QoS for uplink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0023	A publication message from ground publisher is received exactly once by the aircraft subscriber although, while routing the message, a connection establishment failure event (successfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	End-to-end delivery guarantees QoSs for both uplink and downlink Request/Response and Publish/Subscribe Purple Profile enabled SWIM services have been successfully validated when transient connection establishment failure event occurs. Expected delivery guarantees QoS is configured at application (requestor, responder, publisher, subscriber), Air SWIM node, and Ground SWIM Node levels. Furthermore, both Air and Ground SWIM Node allow to configure the delivery guarantees at SWIM Node level and per SWIM service.	OK

Technical Validation Exercise #01 Technical Validation Objective ID	Technical Validation Exercise #01 Technical Validation Objective Title	Technical Validation Exercise #01 Success Criterion ID	Technical Validation Exercise #01 Success Criterion	Technical Validation Exercise #01 Validation Results	Technical Validation Exercise #01 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-REL.0007	End-to-end exactly-once delivery guarantees QoS for uplink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0024	A publication message from ground publisher is received exactly once by the aircraft subscriber although, while routing the message, an abnormal disconnection event due to transient network error (successfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	End-to-end delivery guarantees QoSs for both uplink and downlink Request/Response and Publish/Subscribe Purple Profile enabled SWIM services have been successfully validated when abnormal disconnection event due to transient network error occurs. This was also validated when no A/G datalink were temporary available. Expected delivery guarantees QoS is configured at application (requestor, responder, publisher, subscriber), Air SWIM node, and Ground SWIM Node levels. Furthermore, both Air and Ground SWIM Node allow to configure the delivery guarantees at SWIM Node level and per SWIM service.	OK

Technical Validation Exercise #01 Technical Validation Objective ID	Technical Validation Exercise #01 Technical Validation Objective Title	Technical Validation Exercise #01 Success Criterion ID	Technical Validation Exercise #01 Success Criterion	Technical Validation Exercise #01 Validation Results	Technical Validation Exercise #01 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-REL.0007	End-to-end exactly-once delivery guarantees QoS for uplink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0036	A publication message from ground publisher is received exactly once by the aircraft subscriber although, while routing the message, an abnormal disconnection event due to ground peer restart (successfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	End-to-end delivery guarantees QoSs for both uplink and downlink Request/Response and Publish/Subscribe Purple Profile enabled SWIM services have been successfully validated when abnormal disconnection event due to ground peer restart occurs. Expected delivery guarantees QoS is configured at application (requestor, responder, publisher, subscriber), Air SWIM node, and Ground SWIM Node levels. Furthermore, both Air and Ground SWIM Node allow to configure the delivery guarantees at SWIM Node level and per SWIM service.	OK
OBJ-17.01-TRL6-TVALP-REL.0007	End-to-end exactly-once delivery guarantees QoS for uplink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0005	Message not delivered failure event is logged and traced because, while routing the message, a connection establishment failure event (unsuccessfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	Logging, tracing and reporting (monitoring capabilities) of message not delivered event have been successfully validated.	OK

Technical Validation Exercise #01 Technical Validation Objective ID	Technical Validation Exercise #01 Technical Validation Objective Title	Technical Validation Exercise #01 Success Criterion ID	Technical Validation Exercise #01 Success Criterion	Technical Validation Exercise #01 Validation Results	Technical Validation Exercise #01 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-REL.0007	End-to-end exactly-once delivery guarantees QoS for uplink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0006	Message not delivered failure event is logged and traced because, while routing the message, an abnormal disconnection event (unsuccessfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	Logging, tracing and reporting (monitoring capabilities) of message not delivered event have been successfully validated.	OK
OBJ-17.01-TRL6-TVALP-REL.0007	End-to-end exactly-once delivery guarantees QoS for uplink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0007	Message not delivered failure event is logged and traced because, while handling abnormal disconnection or connection establishment failure events at Air-Ground SWIM Nodes connection level, the message expires.	Logging, tracing and reporting (monitoring capabilities) of message not delivered event have been successfully validated.	OK

Technical Validation Exercise #01 Technical Validation Objective ID	Technical Validation Exercise #01 Technical Validation Objective Title	Technical Validation Exercise #01 Success Criterion ID	Technical Validation Exercise #01 Success Criterion	Technical Validation Exercise #01 Validation Results	Technical Validation Exercise #01 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-REL.0008	End-to-end exactly-once delivery guarantees QoS for downlink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0025	A publication message from aircraft publisher is received exactly once by the ground subscriber although, while routing the message, a connection establishment failure event (successfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	End-to-end delivery guarantees QoSs for both uplink and downlink Request/Response and Publish/Subscribe Purple Profile enabled SWIM services have been successfully validated when transient connection establishment failure event occurs. Expected delivery guarantees QoS is configured at application (requestor, responder, publisher, subscriber), Air SWIM node, and Ground SWIM Node levels. Furthermore, both Air and Ground SWIM Node allow to configure the delivery guarantees at SWIM Node level and per SWIM service.	OK

Technical Validation Exercise #01 Technical Validation Objective ID	Technical Validation Exercise #01 Technical Validation Objective Title	Technical Validation Exercise #01 Success Criterion ID	Technical Validation Exercise #01 Success Criterion	Technical Validation Exercise #01 Validation Results	Technical Validation Exercise #01 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-REL.0008	End-to-end exactly-once delivery guarantees QoS for downlink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0038	A publication message from aircraft publisher is received exactly once by the ground subscriber although, while routing the message, an abnormal disconnection event due to transient network error (successfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	End-to-end delivery guarantees QoSs for both uplink and downlink Request/Response and Publish/Subscribe Purple Profile enabled SWIM services have been successfully validated when abnormal disconnection event due to transient network error occurs. This was also validated when no A/G datalink were temporary available. Expected delivery guarantees QoS is configured at application (requestor, responder, publisher, subscriber), Air SWIM node, and Ground SWIM Node levels. Furthermore, both Air and Ground SWIM Node allow to configure the delivery guarantees at SWIM Node level and per SWIM service.	OK

Technical Validation Exercise #01 Technical Validation Objective ID	Technical Validation Exercise #01 Technical Validation Objective Title	Technical Validation Exercise #01 Success Criterion ID	Technical Validation Exercise #01 Success Criterion	Technical Validation Exercise #01 Validation Results	Technical Validation Exercise #01 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-REL.0008	End-to-end exactly-once delivery guarantees QoS for downlink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0037	A publication message from aircraft publisher is received exactly once by the ground subscriber although, while routing the message, an abnormal disconnection event due to ground peer restart (successfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	End-to-end delivery guarantees QoSs for both uplink and downlink Request/Response and Publish/Subscribe Purple Profile enabled SWIM services have been successfully validated when abnormal disconnection event due to ground peer restart occurs. Expected delivery guarantees QoS is configured at application (requestor, responder, publisher, subscriber), Air SWIM node, and Ground SWIM Node levels. Furthermore, both Air and Ground SWIM Node allow to configure the delivery guarantees at SWIM Node level and per SWIM service.	OK
OBJ-17.01-TRL6-TVALP-REL.0008	End-to-end exactly-once delivery guarantees QoS for downlink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0005	Message not delivered failure event is logged and traced because, while routing the message, a connection establishment failure event (unsuccessfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	Logging, tracing and reporting (monitoring capabilities) of message not delivered event have been successfully validated.	OK

Technical Validation Exercise #01 Technical Validation Objective ID	Technical Validation Exercise #01 Technical Validation Objective Title	Technical Validation Exercise #01 Success Criterion ID	Technical Validation Exercise #01 Success Criterion	Technical Validation Exercise #01 Validation Results	Technical Validation Exercise #01 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-REL.0008	End-to-end exactly-once delivery guarantees QoS for downlink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0006	Message not delivered failure event is logged and traced because, while routing the message, an abnormal disconnection event (unsuccessfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	Logging, tracing and reporting (monitoring capabilities) of message not delivered event have been successfully validated.	OK
OBJ-17.01-TRL6-TVALP-REL.0008	End-to-end exactly-once delivery guarantees QoS for downlink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0007	Message not delivered failure event is logged and traced because, while handling abnormal disconnection or connection establishment failure events at Air-Ground SWIM Nodes connection level, the message expires.	Logging, tracing and reporting (monitoring capabilities) of message not delivered event have been successfully validated.	OK

Technical Validation Exercise #01 Technical Validation Objective ID	Technical Validation Exercise #01 Technical Validation Objective Title	Technical Validation Exercise #01 Success Criterion ID	Technical Validation Exercise #01 Success Criterion	Technical Validation Exercise #01 Validation Results	Technical Validation Exercise #01 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-SEC.0001	Basic message screening security controls for message queue based information exchange	CRT-17.01-TRL6-TVALP-SEC.0001	Different message screening policies are successfully configured for two or more message queues.	Message screening is configurable per SWIM service (i.e. messaging resources allocated to that service) and enforced on the messaging resource side used by requestor/publisher/responder/sender messaging entities (producers of the messages). Message screening has been configured also for subscription management messages.	OK
OBJ-17.01-TRL6-TVALP-SEC.0001	Basic message screening security controls for message queue based information exchange	CRT-17.01-TRL6-TVALP-SEC.0002	Message screening policies are enforced on message queues used by Purple Profile enabled sender applications.	Message screening is configurable per SWIM service (i.e. messaging resources allocated to that service) and enforced on the messaging resource side used by requestor/publisher/responder/sender messaging entities (producers of the messages). Message screening has been configured also for subscription management messages.	OK
OBJ-17.01-TRL6-TVALP-SEC.0001	Basic message screening security controls for message queue based information exchange	CRT-17.01-TRL6-TVALP-SEC.0003	Message screening policies are enforced on Ground SWIM Node side message queues used by Air SWIM Nodes to send/consume messages.	Message screening is configurable per SWIM service (i.e. messaging resources allocated to that service) and enforced on the messaging resource side used by requestor/publisher/responder/sender messaging entities (producers of the messages). Message screening has been configured also for subscription management messages.	OK

Technical Validation Exercise #01 Technical Validation Objective ID	Technical Validation Exercise #01 Technical Validation Objective Title	Technical Validation Exercise #01 Success Criterion ID	Technical Validation Exercise #01 Success Criterion	Technical Validation Exercise #01 Validation Results	Technical Validation Exercise #01 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-SEC.0001	Basic message screening security controls for message queue based information exchange	CRT-17.01-TRL6-TVALP-SEC.0004	A malformed AMQP 1.0 annotated message with uncomplete or invalid message properties is filtered out by enforcing the message screening policy.	Message screening is configurable per SWIM service (i.e. messaging resources allocated to that service) and enforced on the messaging resource side used by requestor/publisher/responder/sender messaging entities (producers of the messages). Message screening has been configured also for subscription management messages.	OK
OBJ-17.01-TRL6-TVALP-SEC.0001	Basic message screening security controls for message queue based information exchange	CRT-17.01-TRL6-TVALP-SEC.0008	Events concerning the message screening policies enforcement are logged in accordance with applicable audit policy.	Logging, tracing and reporting (monitoring capabilities) of events concerning the message screening policies enforcement have been successfully validated. However, current audit solution is based on logging capabilities without dedicated audit policies. In other words, the solution supports a simplified implementation of audit policies based on logging.	Partially OK

Technical Validation Exercise #01 Technical Validation Objective ID	Technical Validation Exercise #01 Technical Validation Objective Title	Technical Validation Exercise #01 Success Criterion ID	Technical Validation Exercise #01 Success Criterion	Technical Validation Exercise #01 Validation Results	Technical Validation Exercise #01 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-SEC.0001	Basic message screening security controls for message queue based information exchange	CRT-17.01-TRL6-TVALP-SEC.0009	A message screening policy is successfully updated at run-time without restarting the Ground SWIM Node.	Message screening is configurable per SWIM service (i.e. messaging resources allocated to that service) and enforced on the messaging resource side used by requestor/publisher/responder/sender messaging entities (producers of the messages). It has been validated that message screening policies for publish/subscriber SWIM services can be updated at runtime without restarting the SWIM Node. Message screening has been configured also for subscription management messages.	OK
OBJ-17.01-TRL6-TVALP-SEC.0002	Advanced message screening security controls for message queue based information exchange	CRT-17.01-TRL6-TVALP-SEC.0001	Different message screening policies are successfully configured for two or more message queues.	Message screening is configurable per SWIM service (i.e. messaging resources allocated to that service) and enforced on the messaging resource side used by requestor/publisher/responder/sender messaging entities (producers of the messages). Message screening has been configured also for subscription management messages.	OK

Technical Validation Exercise #01 Technical Validation Objective ID	Technical Validation Exercise #01 Technical Validation Objective Title	Technical Validation Exercise #01 Success Criterion ID	Technical Validation Exercise #01 Success Criterion	Technical Validation Exercise #01 Validation Results	Technical Validation Exercise #01 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-SEC.0002	Advanced message screening security controls for message queue based information exchange	CRT-17.01-TRL6-TVALP-SEC.0002	Message screening policies are enforced on message queues used by Purple Profile enabled sender applications.	Message screening is configurable per SWIM service (i.e. messaging resources allocated to that service) and enforced on the messaging resource side used by requestor/publisher/responder/sender messaging entities (producers of the messages). Message screening has been configured also for subscription management messages.	OK
OBJ-17.01-TRL6-TVALP-SEC.0002	Advanced message screening security controls for message queue based information exchange	CRT-17.01-TRL6-TVALP-SEC.0003	Message screening policies are enforced on Ground SWIM Node side message queues used by Air SWIM Nodes to send/consume messages.	Message screening is configurable per SWIM service (i.e. messaging resources allocated to that service) and enforced on the messaging resource side used by requestor/publisher/responder/sender messaging entities (producers of the messages). Message screening has been configured also for subscription management messages.	OK
OBJ-17.01-TRL6-TVALP-SEC.0002	Advanced message screening security controls for message queue based information exchange	CRT-17.01-TRL6-TVALP-SEC.0005	A malformed AMQP 1.0 annotated message with syntactically invalid message payload is filtered out by enforcing the message screening policy.	Message screening is configurable per SWIM service (i.e. messaging resources allocated to that service) and enforced on the messaging resource side used by requestor/publisher/responder/sender messaging entities (producers of the messages). Message screening has been configured also for subscription management messages.	OK

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OBJ-17.01-TRL6-TVALP-SEC.0002	Advanced message screening security controls for message queue based information exchange	CRT-17.01-TRL6-TVALP-SEC.0006	A malformed AMQP 1.0 annotated message with unexpected message payload is filtered out by enforcing the message screening policy.	Message screening is configurable per SWIM service (i.e. messaging resources allocated to that service) and enforced on the messaging resource side used by requestor/publisher/responder/sender messaging entities (producers of the messages). Message screening has been configured also for subscription management messages.	OK
OBJ-17.01-TRL6-TVALP-SEC.0002	Advanced message screening security controls for message queue based information exchange	CRT-17.01-TRL6-TVALP-SEC.0007	A malicious AMQP 1.0 annotated message with malicious property/payload is filtered out by enforcing the message screening policy.	Message screening is configurable per SWIM service (i.e. messaging resources allocated to that service) and enforced on the messaging resource side used by requestor/publisher/responder/sender messaging entities (producers of the messages). It has been validated that messages with malicious payload are filtered out. In particular this screening policies are based on safe (XXE protected) XML message validator. Message screening has been configured also for subscription management messages.	OK

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OBJ-17.01-TRL6-TVALP-SEC.0002	Advanced message screening security controls for message queue based information exchange	CRT-17.01-TRL6-TVALP-SEC.0008	Events concerning the message screening policies enforcement are logged in accordance with applicable audit policy.	Logging, tracing and reporting (monitoring capabilities) of events concerning the message screening policies enforcement have been successfully validated. However, current audit solution is based on logging capabilities without dedicated audit policies. In other words, the solution supports a simplified implementation of audit policies based on logging.	Partially OK
OBJ-17.01-TRL6-TVALP-SEC.0002	Advanced message screening security controls for message queue based information exchange	CRT-17.01-TRL6-TVALP-SEC.0009	A message screening policy is successfully updated at run-time without restarting the Ground SWIM Node.	Message screening is configurable per SWIM service (i.e. messaging resources allocated to that service) and enforced on the messaging resource side used by requestor/publisher/responder/sender messaging entities (producers of the messages). It has been validated that message screening policies for publish/subscriber SWIM services can be updated at runtime without restarting the SWIM Node. Message screening has been configured also for subscription management messages.	OK

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OBJ-17.01-TRL6-TVALP-SEC.0003	Basic message screening security controls for message topic based information exchange	CRT-17.01-TRL6-TVALP-SEC.0010	Different message screening policies are successfully configured for two or more message topics.	Message screening is configurable per SWIM service (i.e. messaging resources allocated to that service) and enforced on the messaging resource side used by requestor/publisher/responder/sender messaging entities (producers of the messages). Message screening has been configured also for subscription management messages.	OK
OBJ-17.01-TRL6-TVALP-SEC.0003	Basic message screening security controls for message topic based information exchange	CRT-17.01-TRL6-TVALP-SEC.0011	Message screening policies are enforced on message topics used by Purple Profile enabled publisher applications.	Message screening is configurable per SWIM service (i.e. messaging resources allocated to that service) and enforced on the messaging resource side used by requestor/publisher/responder/sender messaging entities (producers of the messages). Message screening has been configured also for subscription management messages.	OK
OBJ-17.01-TRL6-TVALP-SEC.0003	Basic message screening security controls for message topic based information exchange	CRT-17.01-TRL6-TVALP-SEC.0012	Message screening policies are enforced on Ground SWIM Node side message topics used by Air SWIM Nodes to publish/consume messages.	Message screening is configurable per SWIM service (i.e. messaging resources allocated to that service) and enforced on the messaging resource side used by requestor/publisher/responder/sender messaging entities (producers of the messages). Message screening has been configured also for subscription management messages.	OK

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OBJ-17.01-TRL6-TVALP-SEC.0003	Basic message screening security controls for message topic based information exchange	CRT-17.01-TRL6-TVALP-SEC.0004	A malformed AMQP 1.0 annotated message with uncomplete or invalid message properties is filtered out by enforcing the message screening policy.	Message screening is configurable per SWIM service (i.e. messaging resources allocated to that service) and enforced on the messaging resource side used by requestor/publisher/responder/sender messaging entities (producers of the messages). Message screening has been configured also for subscription management messages.	OK
OBJ-17.01-TRL6-TVALP-SEC.0003	Basic message screening security controls for message topic based information exchange	CRT-17.01-TRL6-TVALP-SEC.0008	Events concerning the message screening policies enforcement are logged in accordance with applicable audit policy.	Logging, tracing and reporting (monitoring capabilities) of events concerning the message screening policies enforcement have been successfully validated. However, current audit solution is based on logging capabilities without dedicated audit policies. In other words, the solution supports a simplified implementation of audit policies based on logging.	Partially OK

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OBJ-17.01-TRL6-TVALP-SEC.0003	Basic message screening security controls for message topic based information exchange	CRT-17.01-TRL6-TVALP-SEC.0009	A message screening policy is successfully updated at run-time without restarting the Ground SWIM Node.	Message screening is configurable per SWIM service (i.e. messaging resources allocated to that service) and enforced on the messaging resource side used by requestor/publisher/responder/sender messaging entities (producers of the messages). It has been validated that message screening policies for publish/subscriber SWIM services can be updated at runtime without restarting the SWIM Node. Message screening has been configured also for subscription management messages.	OK
OBJ-17.01-TRL6-TVALP-SEC.0004	Advanced message screening security controls for message topic based information exchange	CRT-17.01-TRL6-TVALP-SEC.0010	Different message screening policies are successfully configured for two or more message topics.	Message screening is configurable per SWIM service (i.e. messaging resources allocated to that service) and enforced on the messaging resource side used by requestor/publisher/responder/sender messaging entities (producers of the messages). Message screening has been configured also for subscription management messages.	OK

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OBJ-17.01-TRL6-TVALP-SEC.0004	Advanced message screening security controls for message topic based information exchange	CRT-17.01-TRL6-TVALP-SEC.0011	Message screening policies are enforced on message topics used by Purple Profile enabled publisher applications.	Message screening is configurable per SWIM service (i.e. messaging resources allocated to that service) and enforced on the messaging resource side used by requestor/publisher/responder/sender messaging entities (producers of the messages). Message screening has been configured also for subscription management messages.	OK
OBJ-17.01-TRL6-TVALP-SEC.0004	Advanced message screening security controls for message topic based information exchange	CRT-17.01-TRL6-TVALP-SEC.0012	Message screening policies are enforced on Ground SWIM Node side message topics used by Air SWIM Nodes to publish/consume messages.	Message screening is configurable per SWIM service (i.e. messaging resources allocated to that service) and enforced on the messaging resource side used by requestor/publisher/responder/sender messaging entities (producers of the messages). Message screening has been configured also for subscription management messages.	OK
OBJ-17.01-TRL6-TVALP-SEC.0004	Advanced message screening security controls for message topic based information exchange	CRT-17.01-TRL6-TVALP-SEC.0005	A malformed AMQP 1.0 annotated message with syntactically invalid message payload is filtered out by enforcing the message screening policy.	Message screening is configurable per SWIM service (i.e. messaging resources allocated to that service) and enforced on the messaging resource side used by requestor/publisher/responder/sender messaging entities (producers of the messages). Message screening has been configured also for subscription management messages.	OK

Technical Validation Exercise #01 Technical Validation Objective ID	Technical Validation Exercise #01 Technical Validation Objective Title	Technical Validation Exercise #01 Success Criterion ID	Technical Validation Exercise #01 Success Criterion	Technical Validation Exercise #01 Validation Results	Technical Validation Exercise #01 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-SEC.0004	Advanced message screening security controls for message topic based information exchange	CRT-17.01-TRL6-TVALP-SEC.0006	A malformed AMQP 1.0 annotated message with unexpected message payload is filtered out by enforcing the message screening policy.	Message screening is configurable per SWIM service (i.e. messaging resources allocated to that service) and enforced on the messaging resource side used by requestor/publisher/responder/sender messaging entities (producers of the messages). Message screening has been configured also for subscription management messages.	OK
OBJ-17.01-TRL6-TVALP-SEC.0004	Advanced message screening security controls for message topic based information exchange	CRT-17.01-TRL6-TVALP-SEC.0007	A malicious AMQP 1.0 annotated message with malicious property/payload is filtered out by enforcing the message screening policy.	Message screening is configurable per SWIM service (i.e. messaging resources allocated to that service) and enforced on the messaging resource side used by requestor/publisher/responder/sender messaging entities (producers of the messages). It has been validated that messages with malicious payload are filtered out. In particular this screening policies are based on safe (XXE protected) XML message validator. Message screening has been configured also for subscription management messages.	OK

Technical Validation Exercise #01 Technical Validation Objective ID	Technical Validation Exercise #01 Technical Validation Objective Title	Technical Validation Exercise #01 Success Criterion ID	Technical Validation Exercise #01 Success Criterion	Technical Validation Exercise #01 Validation Results	Technical Validation Exercise #01 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-SEC.0004	Advanced message screening security controls for message topic based information exchange	CRT-17.01-TRL6-TVALP-SEC.0008	Events concerning the message screening policies enforcement are logged in accordance with applicable audit policy.	Logging, tracing and reporting (monitoring capabilities) of events concerning the message screening policies enforcement have been successfully validated. However, current audit solution is based on logging capabilities without dedicated audit policies. In other words, the solution supports a simplified implementation of audit policies based on logging.	Partially OK
OBJ-17.01-TRL6-TVALP-SEC.0004	Advanced message screening security controls for message topic based information exchange	CRT-17.01-TRL6-TVALP-SEC.0009	A message screening policy is successfully updated at run-time without restarting the Ground SWIM Node.	Message screening is configurable per SWIM service (i.e. messaging resources allocated to that service) and enforced on the messaging resource side used by requestor/publisher/responder/sender messaging entities (producers of the messages). It has been validated that message screening policies for publish/subscriber SWIM services can be updated at runtime without restarting the SWIM Node. Message screening has been configured also for subscription management messages.	OK
OBJ-17.01-TRL6-TVALP-SEC.0005	Maximum message size overload protection security controls for message queue based information exchange	CRT-17.01-TRL6-TVALP-SEC.0013	Different overload protection policies are successfully configured for two or more message queues.	Configurability of overload protection capabilities via policies has been successfully validated.	OK

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OBJ-17.01-TRL6-TVALP-SEC.0005	Maximum message size overload protection security controls for message queue based information exchange	CRT-17.01-TRL6-TVALP-SEC.0014	Overload protection policies are enforced on message queues used by Purple Profile enabled sender applications.	Air and Ground SWIM Node side overload protection policies enforcement has been successfully validated.	OK
OBJ-17.01-TRL6-TVALP-SEC.0005	Maximum message size overload protection security controls for message queue based information exchange	CRT-17.01-TRL6-TVALP-SEC.0015	Overload protection policies are enforced on Ground SWIM Node side message queues used by Air SWIM Nodes to send/consume messages.	Ground SWIM Node side overload protection policies enforcement has been successfully validated.	OK
OBJ-17.01-TRL6-TVALP-SEC.0005	Maximum message size overload protection security controls for message queue based information exchange	CRT-17.01-TRL6-TVALP-SEC.0016	Events concerning the overload protection policies enforcement are logged in accordance with applicable audit policy.	Current audit solution is based on logging capabilities without dedicated audit policies. In other words, the solution supports a simplified implementation of audit policies based on logging.	Partially OK
OBJ-17.01-TRL6-TVALP-SEC.0005	Maximum message size overload protection security controls for message queue based information exchange	CRT-17.01-TRL6-TVALP-SEC.0017	An overload protection policy is successfully updated at run-time without restarting the Ground SWIM Node.	Current implementation does not allow to update overload protection policy at run-time without restarting the SWIM Node.	NOK

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OBJ-17.01-TRL6-TVALP-SEC.0005	Maximum message size overload protection security controls for message queue based information exchange	CRT-17.01-TRL6-TVALP-SEC.0018	An AMQP 1.0 annotated message exceeding maximum message size is rejected by enforcing the overload protection policy, the sender is notified and the event routed according to the applicable context-based routing monitoring policy.	Overload protection capabilities have been successful validated including logging and reporting (monitoring capabilities) of events concerning the policies enforcement.	OK
OBJ-17.01-TRL6-TVALP-SEC.0005	Maximum message size overload protection security controls for message queue based information exchange	CRT-17.01-TRL6-TVALP-SEC.0019	An AMQP 1.0 annotated message exceeding maximum message size is dropped by enforcing the overload protection policy and the event routed according to the applicable context-based routing monitoring policy.	Overload protection capabilities have been successful validated including logging and reporting (monitoring capabilities) of events concerning the policies enforcement.	OK
OBJ-17.01-TRL6-TVALP-SEC.0006	Maximum message size overload protection security controls for message topic based information exchange	CRT-17.01-TRL6-TVALP-SEC.0020	Different overload protection policies are successfully configured for two or more message topics.	Configurability of overload protection capabilities via policies has been successfully validated.	OK

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OBJ-17.01-TRL6-TVALP-SEC.0006	Maximum message size overload protection security controls for message topic based information exchange	CRT-17.01-TRL6-TVALP-SEC.0021	Overload protection policies are enforced on message topics used by Purple Profile enabled publisher applications.	Air and Ground SWIM Node side overload protection policies enforcement has been successfully validated.	OK
OBJ-17.01-TRL6-TVALP-SEC.0006	Maximum message size overload protection security controls for message topic based information exchange	CRT-17.01-TRL6-TVALP-SEC.0022	Overload protection policies are enforced on Ground SWIM Node side message topics used by Air SWIM Nodes to publish/consume messages.	Ground SWIM Node side overload protection policies enforcement has been successfully validated.	OK
OBJ-17.01-TRL6-TVALP-SEC.0006	Maximum message size overload protection security controls for message topic based information exchange	CRT-17.01-TRL6-TVALP-SEC.0016	Events concerning the overload protection policies enforcement are logged in accordance with applicable audit policy.	Current audit solution is based on logging capabilities without dedicated audit policies. In other words, the solution supports a simplified implementation of audit policies based on logging.	Partially OK
OBJ-17.01-TRL6-TVALP-SEC.0006	Maximum message size overload protection security controls for message topic based information exchange	CRT-17.01-TRL6-TVALP-SEC.0017	An overload protection policy is successfully updated at run-time without restarting the Ground SWIM Node.	Current implementation does not allow to update overload protection policy at run-time without restarting the SWIM Node.	NOK

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OBJ-17.01-TRL6-TVALP-SEC.0006	Maximum message size overload protection security controls for message topic based information exchange	CRT-17.01-TRL6-TVALP-SEC.0018	An AMQP 1.0 annotated message exceeding maximum message size is rejected by enforcing the overload protection policy, the sender is notified and the event routed according to the applicable context-based routing monitoring policy.	Overload protection capabilities have been successful validated including logging and reporting (monitoring capabilities) of events concerning the policies enforcement.	OK
OBJ-17.01-TRL6-TVALP-SEC.0006	Maximum message size overload protection security controls for message topic based information exchange	CRT-17.01-TRL6-TVALP-SEC.0019	An AMQP 1.0 annotated message exceeding maximum message size is dropped by enforcing the overload protection policy and the event routed according to the applicable context-based routing monitoring policy.	Overload protection capabilities have been successful validated including logging and reporting (monitoring capabilities) of events concerning the policies enforcement.	OK
OBJ-17.01-TRL6-TVALP-SEC.0007	Maximum message queue capacity overload protection security controls	CRT-17.01-TRL6-TVALP-SEC.0013	Different overload protection policies are successfully configured for two or more message queues.	Configurability of overload protection capabilities via policies has been successfully validated.	OK

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OBJ-17.01-TRL6-TVALP-SEC.0007	Maximum message queue capacity overload protection security controls	CRT-17.01-TRL6-TVALP-SEC.0014	Overload protection policies are enforced on message queues used by Purple Profile enabled sender applications.	Air and Ground SWIM Node side overload protection policies enforcement has been successfully validated.	OK
OBJ-17.01-TRL6-TVALP-SEC.0007	Maximum message queue capacity overload protection security controls	CRT-17.01-TRL6-TVALP-SEC.0015	Overload protection policies are enforced on Ground SWIM Node side message queues used by Air SWIM Nodes to send/consume messages.	Ground SWIM Node side overload protection policies enforcement has been successfully validated.	OK
OBJ-17.01-TRL6-TVALP-SEC.0007	Maximum message queue capacity overload protection security controls	CRT-17.01-TRL6-TVALP-SEC.0016	Events concerning the overload protection policies enforcement are logged in accordance with applicable audit policy.	Current audit solution is based on logging capabilities without dedicated audit policies. In other words, the solution supports a simplified implementation of audit policies based on logging.	Partially OK
OBJ-17.01-TRL6-TVALP-SEC.0007	Maximum message queue capacity overload protection security controls	CRT-17.01-TRL6-TVALP-SEC.0017	An overload protection policy is successfully updated at run-time without restarting the Ground SWIM Node.	Current implementation does not allow to update overload protection policy at run-time without restarting the SWIM Node.	NOK

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OBJ-17.01-TRL6-TVALP-SEC.0007	Maximum message queue capacity overload protection security controls	CRT-17.01-TRL6-TVALP-SEC.0023	An attempt to send an AMQP 1.0 annotated message is rejected because maximum message queue capacity is exceeded.	Overload protection capabilities have been successful validated including logging and reporting (monitoring capabilities) of events concerning the policies enforcement. Maximum message queue capacity is configured in accordance with the TS (both maximum size in bytes and maximum number of messages).	OK
OBJ-17.01-TRL6-TVALP-SEC.0008	Maximum message topic capacity overload protection security controls	CRT-17.01-TRL6-TVALP-SEC.0020	Different overload protection policies are successfully configured for two or more message topics.	Configurability of overload protection capabilities via policies has been successfully validated.	OK
OBJ-17.01-TRL6-TVALP-SEC.0008	Maximum message topic capacity overload protection security controls	CRT-17.01-TRL6-TVALP-SEC.0021	Overload protection policies are enforced on message topics used by Purple Profile enabled publisher applications.	Air and Ground SWIM Node side overload protection policies enforcement has been successfully validated.	OK
OBJ-17.01-TRL6-TVALP-SEC.0008	Maximum message topic capacity overload protection security controls	CRT-17.01-TRL6-TVALP-SEC.0022	Overload protection policies are enforced on Ground SWIM Node side message topics used by Air SWIM Nodes to publish/consume messages.	Ground SWIM Node side overload protection policies enforcement has been successfully validated.	OK

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OBJ-17.01-TRL6-TVALP-SEC.0008	Maximum message topic capacity overload protection security controls	CRT-17.01-TRL6-TVALP-SEC.0016	Events concerning the overload protection policies enforcement are logged in accordance with applicable audit policy.	Current audit solution is based on logging capabilities without dedicated audit policies. In other words, the solution supports a simplified implementation of audit policies based on logging.	Partially OK
OBJ-17.01-TRL6-TVALP-SEC.0008	Maximum message topic capacity overload protection security controls	CRT-17.01-TRL6-TVALP-SEC.0017	An overload protection policy is successfully updated at run-time without restarting the Ground SWIM Node.	Current implementation does not allow to update overload protection policy at run-time without restarting the SWIM Node.	NOK
OBJ-17.01-TRL6-TVALP-SEC.0008	Maximum message topic capacity overload protection security controls	CRT-17.01-TRL6-TVALP-SEC.0024	An attempt to publish an AMQP 1.0 annotated message is rejected because maximum message topic capacity is exceeded.	Overload protection capabilities have been successful validated including logging and reporting (monitoring capabilities) of events concerning the policies enforcement. Maximum message topic capacity is configured in accordance with the TS (both maximum size in bytes and maximum number of messages).	OK
OBJ-17.01-TRL6-TVALP-SEC.0009	Consolidated connections limits overload protection security controls	CRT-17.01-TRL6-TVALP-SEC.0025	Maximum number of consolidated connections is successfully configured.	Air and Ground SWIM Node side overload protection policies enforcement has been successfully validated.	OK

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OBJ-17.01-TRL6-TVALP-SEC.0009	Consolidated connections limits overload protection security controls	CRT-17.01-TRL6-TVALP-SEC.0016	Events concerning the overload protection policies enforcement are logged in accordance with applicable audit policy.	Current audit solution is based on logging capabilities without dedicated audit policies. In other words, the solution supports a simplified implementation of audit policies based on logging.	Partially OK
OBJ-17.01-TRL6-TVALP-SEC.0009	Consolidated connections limits overload protection security controls	CRT-17.01-TRL6-TVALP-SEC.0026	An attempt to establish an AMQP 1.0 connection is rejected because the maximum number of consolidated connections is exceeded.	Overload protection capabilities have been successful validated including logging and reporting (monitoring capabilities) of events concerning the policies enforcement.	OK
OBJ-17.01-TRL6-TVALP-SEC.0010	Concurrent connections limits per connecting entity overload protection security controls	CRT-17.01-TRL6-TVALP-SEC.0027	Maximum number of concurrent connections per connecting entity is successfully configured.	Air and Ground SWIM Node side overload protection policies enforcement has been successfully validated.	OK
OBJ-17.01-TRL6-TVALP-SEC.0010	Concurrent connections limits per connecting entity overload protection security controls	CRT-17.01-TRL6-TVALP-SEC.0016	Events concerning the overload protection policies enforcement are logged in accordance with applicable audit policy.	Current audit solution is based on logging capabilities without dedicated audit policies. In other words, the solution supports a simplified implementation of audit policies based on logging.	Partially OK

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OBJ-17.01-TRL6-TVALP-SEC.0010	Concurrent connections limits per connecting entity overload protection security controls	CRT-17.01-TRL6-TVALP-SEC.0028	An attempt to establish an AMQP 1.0 connection is rejected because the maximum number of concurrent connections for the connecting entity is exceeded.	Overload protection capabilities have been successful validated including logging and reporting (monitoring capabilities) of events concerning the policies enforcement.	OK
OBJ-17.01-TRL6-TVALP-SEC.0011	Mutual authentication and basic certificate revocation status check security controls	CRT-17.01-TRL6-TVALP-SEC.0029	Amqps mutual authentication is enforced between aircraft application and Air SWIM Node.	Amqps peers mutual authentication and certificate revocation status check have been successfully validated at both application - SWIM Node and Air SWIM Node - Ground SWIM Node connection levels. It should be evaluated the possibility to allow SASL PLAIN with server peer TLS (no mutual TLS) for aircraft application. For instance a pilot using an EFB may login using his/her username and password and these credentials are also used to authenticate the user against the Air SWIM Node but still using secure transport (TLS).	OK
OBJ-17.01-TRL6-TVALP-SEC.0011	Mutual authentication and basic certificate revocation status check security controls	CRT-17.01-TRL6-TVALP-SEC.0030	Amqps mutual authentication is enforced between Air and Ground SWIM Node.	Amqps peers mutual authentication and certificate revocation status check have been successfully validated at both application - SWIM Node and Air SWIM Node - Ground SWIM Node connection levels.	OK

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OBJ-17.01-TRL6-TVALP-SEC.0011	Mutual authentication and basic certificate revocation status check security controls	CRT-17.01-TRL6-TVALP-SEC.0031	Amqps mutual authentication is enforced between Ground SWIM Node and ground application.	Amqps peers mutual authentication and certificate revocation status check have been successfully validated at both application - SWIM Node and Air SWIM Node - Ground SWIM Node connection levels.	OK
OBJ-17.01-TRL6-TVALP-SEC.0011	Mutual authentication and basic certificate revocation status check security controls	CRT-17.01-TRL6-TVALP-SEC.0032	Events concerning mutual authentication enforcement are logged in accordance with applicable audit policy.	Current audit solution is based on logging capabilities without dedicated audit policies. In other words, the solution supports a simplified implementation of audit policies based on logging.	Partially OK
OBJ-17.01-TRL6-TVALP-SEC.0011	Mutual authentication and basic certificate revocation status check security controls	CRT-17.01-TRL6-TVALP-SEC.0033	Amqps peers successfully mutual authenticate although one of the peer requires the fallback to TLS 1.2.	Amqps peers mutual authentication and certificate revocation status check have been successfully validated at both application - SWIM Node and Air SWIM Node - Ground SWIM Node connection levels.	OK

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OBJ-17.01-TRL6-TVALP-SEC.0011	Mutual authentication and basic certificate revocation status check security controls	CRT-17.01-TRL6-TVALP-SEC.0034	Mutual authentication between amqps peers fails in all the following cases:- one of the peer requires the fallback to a TLS version lower than TLS 1.2.- peer's X.509v3 certificate is not trusted.- peer's X.509v3 certificate is expired.- peer's X.509v3 certificate has been revoked (it is included in the local CRL).- the local CRL is not the current CRL or the CRL scope is not appropriate and the authentication policy does not allow potentially revoked or compromised certificates.	Amqps peers mutual authentication and certificate revocation status check have been successfully validated at both application - SWIM Node and Air SWIM Node - Ground SWIM Node connection levels.	OK

Technical Validation Exercise #01 Technical Validation Objective ID	Technical Validation Exercise #01 Technical Validation Objective Title	Technical Validation Exercise #01 Success Criterion ID	Technical Validation Exercise #01 Success Criterion	Technical Validation Exercise #01 Validation Results	Technical Validation Exercise #01 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-SEC.0011	Mutual authentication and basic certificate revocation status check security controls	CRT-17.01-TRL6-TVALP-SEC.0035	Amqps peers successfully mutual authenticate although the local CRL is not the current CRL or the CRL scope is not appropriate because the authentication policy allows potentially revoked or compromised certificate.	Amqps peers mutual authentication and certificate revocation status check have been successfully validated at both application - SWIM Node and Air SWIM Node - Ground SWIM Node connection levels.	OK
OBJ-17.01-TRL6-TVALP-SEC.0012	CRL update mechanisms	CRT-17.01-TRL6-TVALP-SEC.0036	The CRL used by SWIM Node is successfully updated via administrative interface.	CRL update has been successfully validated.	OK
OBJ-17.01-TRL6-TVALP-SEC.0012	CRL update mechanisms	CRT-17.01-TRL6-TVALP-SEC.0037	The CRL used by SWIM Node is not the current CRL and it is successfully updated on-the-fly via the HTTP CDP.	CRL update has been successfully validated.	OK
OBJ-17.01-TRL6-TVALP-SEC.0012	CRL update mechanisms	CRT-17.01-TRL6-TVALP-SEC.0038	A delta-CRL is used to successfully update the CRL used by SWIM Node.	CRL update has been successfully validated.	OK

Technical Validation Exercise #01 Technical Validation Objective ID	Technical Validation Exercise #01 Technical Validation Objective Title	Technical Validation Exercise #01 Success Criterion ID	Technical Validation Exercise #01 Success Criterion	Technical Validation Exercise #01 Validation Results	Technical Validation Exercise #01 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-SEC.0013	Mutual authentication with OCSP certificate revocation status check security controls	CRT-17.01-TRL6-TVALP-SEC.0029	Amqps mutual authentication is enforced between aircraft application and Air SWIM Node.	Amqps peers mutual authentication and certificate revocation status check have been successfully validated at both application - SWIM Node and Air SWIM Node - Ground SWIM Node connection levels. It should be evaluated the possibility to allow SASL PLAIN with server peer TLS (no mutual TLS) for aircraft application. For instance a pilot using an EFB may login using his/her username and password and these credentials are also used to authenticate the user against the Air SWIM Node but still using secure transport (TLS).	OK
OBJ-17.01-TRL6-TVALP-SEC.0013	Mutual authentication with OCSP certificate revocation status check security controls	CRT-17.01-TRL6-TVALP-SEC.0030	Amqps mutual authentication is enforced between Air and Ground SWIM Node.	Amqps peers mutual authentication and certificate revocation status check have been successfully validated at both application - SWIM Node and Air SWIM Node - Ground SWIM Node connection levels.	OK
OBJ-17.01-TRL6-TVALP-SEC.0013	Mutual authentication with OCSP certificate revocation status check security controls	CRT-17.01-TRL6-TVALP-SEC.0031	Amqps mutual authentication is enforced between Ground SWIM Node and ground application.	Amqps peers mutual authentication and certificate revocation status check have been successfully validated at both application - SWIM Node and Air SWIM Node - Ground SWIM Node connection levels.	OK

Technical Validation Exercise #01 Technical Validation Objective ID	Technical Validation Exercise #01 Technical Validation Objective Title	Technical Validation Exercise #01 Success Criterion ID	Technical Validation Exercise #01 Success Criterion	Technical Validation Exercise #01 Validation Results	Technical Validation Exercise #01 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-SEC.0013	Mutual authentication with OCSP certificate revocation status check security controls	CRT-17.01-TRL6-TVALP-SEC.0032	Events concerning mutual authentication enforcement are logged in accordance with applicable audit policy.	Current audit solution is based on logging capabilities without dedicated audit policies. In other words, the solution supports a simplified implementation of audit policies based on logging.	Partially OK
OBJ-17.01-TRL6-TVALP-SEC.0013	Mutual authentication with OCSP certificate revocation status check security controls	CRT-17.01-TRL6-TVALP-SEC.0039	Amqps peer's certificate revocation status is retrieved from the OCSP response, and the authentication is successfully completed because the certificate is not revoked.	Amqps peers mutual authentication and certificate revocation status check have been successfully validated at both application - SWIM Node and Air SWIM Node - Ground SWIM Node connection levels.	OK
OBJ-17.01-TRL6-TVALP-SEC.0013	Mutual authentication with OCSP certificate revocation status check security controls	CRT-17.01-TRL6-TVALP-SEC.0040	Amqps peer's certificate revocation status is retrieved from the OCSP response, and the authentication fails because the certificate has been revoked.	Amqps peers mutual authentication and certificate revocation status check have been successfully validated at both application - SWIM Node and Air SWIM Node - Ground SWIM Node connection levels.	OK
OBJ-17.01-TRL6-TVALP-SEC.0013	Mutual authentication with OCSP certificate revocation status check security controls	CRT-17.01-TRL6-TVALP-SEC.0041	OCSP responder URL is retrieved from pre-configured local resources.	Amqps peers mutual authentication and certificate revocation status check have been successfully validated at both application - SWIM Node and Air SWIM Node - Ground SWIM Node connection levels.	OK

Technical Validation Exercise #01 Technical Validation Objective ID	Technical Validation Exercise #01 Technical Validation Objective Title	Technical Validation Exercise #01 Success Criterion ID	Technical Validation Exercise #01 Success Criterion	Technical Validation Exercise #01 Validation Results	Technical Validation Exercise #01 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-SEC.0013	Mutual authentication with OCSP certificate revocation status check security controls	CRT-17.01-TRL6-TVALP-SEC.0042	OCSP responder URL is retrieved from location identified in the OCSP field in the Authority Information Access extension in the peer's certificate.	Amqps peers mutual authentication and certificate revocation status check have been successfully validated at both application - SWIM Node and Air SWIM Node - Ground SWIM Node connection levels.	OK
OBJ-17.01-TRL6-TVALP-SEC.0014	Mutual authentication with combined OCSP and CRL based certificate revocation status check security controls	CRT-17.01-TRL6-TVALP-SEC.0043	OCSP is configured and used as preferred certificate revocation status check mechanism disabling the fallback to CRL.	Amqps peers mutual authentication and certificate revocation status check have been successfully validated at both application - SWIM Node and Air SWIM Node - Ground SWIM Node connection levels.	OK
OBJ-17.01-TRL6-TVALP-SEC.0014	Mutual authentication with combined OCSP and CRL based certificate revocation status check security controls	CRT-17.01-TRL6-TVALP-SEC.0044	OCSP is configured as preferred certificate revocation status check mechanism but because the responder is not available and the fallback is enabled, the CRL is successfully used.	Amqps peers mutual authentication and certificate revocation status check have been successfully validated at both application - SWIM Node and Air SWIM Node - Ground SWIM Node connection levels.	OK
OBJ-17.01-TRL6-TVALP-SEC.0014	Mutual authentication with combined OCSP and CRL based certificate revocation status check security controls	CRT-17.01-TRL6-TVALP-SEC.0045	CRL is configured and used as preferred certificate revocation status check mechanism disabling the fallback to OCSP.	Amqps peers mutual authentication and certificate revocation status check have been successfully validated at both application - SWIM Node and Air SWIM Node - Ground SWIM Node connection levels.	OK

Technical Validation Exercise #01 Technical Validation Objective ID	Technical Validation Exercise #01 Technical Validation Objective Title	Technical Validation Exercise #01 Success Criterion ID	Technical Validation Exercise #01 Success Criterion	Technical Validation Exercise #01 Validation Results	Technical Validation Exercise #01 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-SEC.0014	Mutual authentication with combined OCSP and CRL based certificate revocation status check security controls	CRT-17.01-TRL6-TVALP-SEC.0046	CRL is configured as preferred certificate revocation status check mechanism but because the CRL is not available/valid and the fallback is enabled, the OCSP is successfully used.	Amqps peers mutual authentication and certificate revocation status check have been successfully validated at both application - SWIM Node and Air SWIM Node - Ground SWIM Node connection levels.	OK
OBJ-17.01-TRL6-TVALP-SEC.0014	Mutual authentication with combined OCSP and CRL based certificate revocation status check security controls	CRT-17.01-TRL6-TVALP-SEC.0047	Amqps peers successfully mutual authenticate although none of the combined certificate revocation status mechanisms are available but the authentication policy allows potentially revoked or compromised certificate.	Amqps peers mutual authentication and certificate revocation status check have been successfully validated at both application - SWIM Node and Air SWIM Node - Ground SWIM Node connection levels. The authentication policy allows to accept potentially revoked or compromised certificate only if the OCSP is not reachable over the network.	OK

Technical Validation Exercise #01 Technical Validation Objective ID	Technical Validation Exercise #01 Technical Validation Objective Title	Technical Validation Exercise #01 Success Criterion ID	Technical Validation Exercise #01 Success Criterion	Technical Validation Exercise #01 Validation Results	Technical Validation Exercise #01 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-SEC.0014	Mutual authentication with combined OCSP and CRL based certificate revocation status check security controls	CRT-17.01-TRL6-TVALP-SEC.0048	Mutual authentication between amqps peers fails because none of the combined certificate revocation status mechanisms are available and the authentication policy does not allow potentially revoked or compromised certificate.	Amqps peers mutual authentication and certificate revocation status check have been successfully validated at both application - SWIM Node and Air SWIM Node - Ground SWIM Node connection levels. The authentication policy allows to do not accept potentially revoked or compromised certificate only if the OCSP is not reachable over the network.	OK
OBJ-17.01-TRL6-TVALP-SEC.0015	Authorization security controls for message queue based information exchange	CRT-17.01-TRL6-TVALP-SEC.0049	Different authorization policies are successfully configured for two or more message queues.	Air and Ground SWIM Node side authorization policies configurability and enforcement have been successfully validated.	OK
OBJ-17.01-TRL6-TVALP-SEC.0015	Authorization security controls for message queue based information exchange	CRT-17.01-TRL6-TVALP-SEC.0050	Authorization policies are enforced on message queue used by Purple Profile enabled sender applications.	Air and Ground SWIM Node side authorization policies configurability and enforcement have been successfully validated.	OK
OBJ-17.01-TRL6-TVALP-SEC.0015	Authorization security controls for message queue based information exchange	CRT-17.01-TRL6-TVALP-SEC.0051	Authorization policies are enforced on message queue used by Purple Profile enabled receiver applications.	Air and Ground SWIM Node side authorization policies configurability and enforcement have been successfully validated.	OK

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OBJ-17.01-TRL6-TVALP-SEC.0015	Authorization security controls for message queue based information exchange	CRT-17.01-TRL6-TVALP-SEC.0052	Authorization policies are enforced on Ground SWIM Node side message queue used by Air SWIM Nodes to send/receive messages.	Air and Ground SWIM Node side authorization policies configurability and enforcement have been successfully validated.	OK
OBJ-17.01-TRL6-TVALP-SEC.0015	Authorization security controls for message queue based information exchange	CRT-17.01-TRL6-TVALP-SEC.0053	Events concerning the authorization policies enforcement are logged in accordance with applicable audit policy.	Current audit solution is based on logging capabilities without dedicated audit policies. In other words, the solution supports a simplified implementation of audit policies based on logging.	Partially OK
OBJ-17.01-TRL6-TVALP-SEC.0015	Authorization security controls for message queue based information exchange	CRT-17.01-TRL6-TVALP-SEC.0054	An authorization policy is successfully updated at run-time without restarting the Ground SWIM Node.	Air and Ground SWIM Node side authorization policies configurability without restarting the SWIM Node. has been successfully validated.	OK
OBJ-17.01-TRL6-TVALP-SEC.0015	Authorization security controls for message queue based information exchange	CRT-17.01-TRL6-TVALP-SEC.0055	An attempt to send a message to a queue is authorized because the sending entity is successfully authenticated with sender role for that queue.	Air and Ground SWIM Node side authorization policies configurability and enforcement have been successfully validated.	OK

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OBJ-17.01-TRL6-TVALP-SEC.0015	Authorization security controls for message queue based information exchange	CRT-17.01-TRL6-TVALP-SEC.0056	An attempt to send a message to a queue is not authorized because the authenticated sending entity has not assigned the sender role for that queue.	Air and Ground SWIM Node side authorization policies configurability and enforcement have been successfully validated.	OK
OBJ-17.01-TRL6-TVALP-SEC.0015	Authorization security controls for message queue based information exchange	CRT-17.01-TRL6-TVALP-SEC.0057	An attempt to receive a message from a queue is authorized because the receiving entity is successfully authenticated with receiver role for that queue.	Air and Ground SWIM Node side authorization policies configurability and enforcement have been successfully validated.	OK
OBJ-17.01-TRL6-TVALP-SEC.0015	Authorization security controls for message queue based information exchange	CRT-17.01-TRL6-TVALP-SEC.0058	An attempt to receive a message from a queue is not authorized because the authenticated receiving entity has not assigned the receiver role for that queue.	Air and Ground SWIM Node side authorization policies configurability and enforcement have been successfully validated.	OK
OBJ-17.01-TRL6-TVALP-SEC.0016	Authorization security controls for message topic based information exchange	CRT-17.01-TRL6-TVALP-SEC.0059	Different authorization policies are successfully configured for two or more message topics.	Air and Ground SWIM Node side authorization policies configurability and enforcement have been successfully validated.	OK

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OBJ-17.01-TRL6-TVALP-SEC.0016	Authorization security controls for message topic based information exchange	CRT-17.01-TRL6-TVALP-SEC.0060	Authorization policies are enforced on message topic used by Purple Profile enabled publisher applications.	Air and Ground SWIM Node side authorization policies configurability and enforcement have been successfully validated.	OK
OBJ-17.01-TRL6-TVALP-SEC.0016	Authorization security controls for message topic based information exchange	CRT-17.01-TRL6-TVALP-SEC.0061	Authorization policies are enforced on message topic used by Purple Profile enabled subscriber applications.	Air and Ground SWIM Node side authorization policies configurability and enforcement have been successfully validated.	OK
OBJ-17.01-TRL6-TVALP-SEC.0016	Authorization security controls for message topic based information exchange	CRT-17.01-TRL6-TVALP-SEC.0062	Authorization policies are enforced on Ground SWIM Node side message topic used by Air SWIM Nodes to publish/consume messages.	Air and Ground SWIM Node side authorization policies configurability and enforcement have been successfully validated.	OK
OBJ-17.01-TRL6-TVALP-SEC.0016	Authorization security controls for message topic based information exchange	CRT-17.01-TRL6-TVALP-SEC.0053	Events concerning the authorization policies enforcement are logged in accordance with applicable audit policy.	Current audit solution is based on logging capabilities without dedicated audit policies. In other words, the solution supports a simplified implementation of audit policies based on logging.	Partially OK

Technical Validation Exercise #01 Technical Validation Objective ID	Technical Validation Exercise #01 Technical Validation Objective Title	Technical Validation Exercise #01 Success Criterion ID	Technical Validation Exercise #01 Success Criterion	Technical Validation Exercise #01 Validation Results	Technical Validation Exercise #01 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-SEC.0016	Authorization security controls for message topic based information exchange	CRT-17.01-TRL6-TVALP-SEC.0054	An authorization policy is successfully updated at run-time without restarting the Ground SWIM Node.	Air and Ground SWIM Node side authorization policies configurability without restarting the SWIM Node. has been successfully validated.	OK
OBJ-17.01-TRL6-TVALP-SEC.0016	Authorization security controls for message topic based information exchange	CRT-17.01-TRL6-TVALP-SEC.0063	An attempt to publish a message to a topic is authorized because the publishing entity is successfully authenticated with publisher role for that topic.	Air and Ground SWIM Node side authorization policies configurability and enforcement have been successfully validated.	OK
OBJ-17.01-TRL6-TVALP-SEC.0016	Authorization security controls for message topic based information exchange	CRT-17.01-TRL6-TVALP-SEC.0064	An attempt to publish a message to a topic is not authorized because the authenticated publishing entity has not assigned the publisher role for that topic.	Air and Ground SWIM Node side authorization policies configurability and enforcement have been successfully validated.	OK
OBJ-17.01-TRL6-TVALP-SEC.0016	Authorization security controls for message topic based information exchange	CRT-17.01-TRL6-TVALP-SEC.0065	An attempt to subscribe to a topic is authorized because the subscribing entity is successfully authenticated with subscriber role for that topic.	Air and Ground SWIM Node side authorization and subscription policies configurability and enforcement have been successfully validated.	OK

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OBJ-17.01-TRL6-TVALP-SEC.0016	Authorization security controls for message topic based information exchange	CRT-17.01-TRL6-TVALP-SEC.0066	An attempt to subscribe to a topic is not authorized because the authenticated subscribing entity has not assigned the subscriber role for that topic.	Air and Ground SWIM Node side authorization and subscription policies configurability and enforcement have been successfully validated.	OK
OBJ-17.01-TRL6-TVALP-SEC.0017	Authorization security controls for message queue and topic lifecycle management	CRT-17.01-TRL6-TVALP-SEC.0067	An entity fails to connect to a message queue because the queue does not exist and the messaging resources lifecycle management is only authorized via administrative interfaces.	Air and Ground SWIM Node side authorization and subscription policies configurability and enforcement have been successfully validated.	OK
OBJ-17.01-TRL6-TVALP-SEC.0017	Authorization security controls for message queue and topic lifecycle management	CRT-17.01-TRL6-TVALP-SEC.0068	An entity fails to connect to a message topic because the topic does not exist and the messaging resources lifecycle management is only authorized via administrative interfaces.	Air and Ground SWIM Node side authorization and subscription policies configurability and enforcement have been successfully validated.	OK

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OBJ-17.01-TRL6-TVALP-SEC.0017	Authorization security controls for message queue and topic lifecycle management	CRT-17.01-TRL6-TVALP-SEC.0069	A message queue is successfully created via administrative interface by an user with administrator role.	Messaging configuration via administrative interface has been successfully validated.	OK
OBJ-17.01-TRL6-TVALP-SEC.0017	Authorization security controls for message queue and topic lifecycle management	CRT-17.01-TRL6-TVALP-SEC.0070	A message topic is successfully created via administrative interface by an user with administrator role.	Messaging configuration via administrative interface has been successfully validated.	OK
OBJ-17.01-TRL6-TVALP-SEC.0017	Authorization security controls for message queue and topic lifecycle management	CRT-17.01-TRL6-TVALP-SEC.0071	A message queue is successfully deleted via administrative interface by an user with administrator role.	Messaging configuration via administrative interface has been successfully validated.	OK
OBJ-17.01-TRL6-TVALP-SEC.0017	Authorization security controls for message queue and topic lifecycle management	CRT-17.01-TRL6-TVALP-SEC.0072	A message topic is successfully deleted via administrative interface by an user with administrator role.	Messaging configuration via administrative interface has been successfully validated.	OK

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OBJ-17.01-TRL6-TVALP-SEC.0017	Authorization security controls for message queue and topic lifecycle management	CRT-17.01-TRL6-TVALP-SEC.0073	An user without administrator role fails to create/delete message queue/topic via administrative interface.	Messaging configuration via administrative interface has been successfully validated.	OK

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OBJ-17.01-TRL6-TVALP-SEC.0018	End-to-end confidentiality for uplink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-SEC.0074	Following steps are successfully completed:- The requestor creates and sends an AMQP 1.0 annotated request message with application-data section containing encrypted data and ENPT AMQP footer with value containing both Encryption-Algorithm and Encryption-Secret for the intender responder.- While the request message is in transit at SWIM nodes level, it is not possible to access/visualize sensitive information because both application data and shared secret are encrypted- The request message is delivered to the intended responder that successfully decrypts it relying on delivered ENPT AMQP footer.	Successfully validated by implementing few must to have improvements identified during the design and prototyping phases. Furthermore, LDO implementation is able to send, receive and route message level security information using both AMQP footer and AMQP application-property (same key and value as specified for the AMQP footer). This allows to handle cases where non-LDO application/SWIM Node are not able to send/receive such data using the AMQP footer.	OK

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OBJ-17.01-TRL6-TVALP-SEC.0018	End-to-end confidentiality for uplink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-SEC.0075	Following steps are successfully completed: -The responder creates and sends an AMQP 1.0 annotated response message with application-data section containing encrypted data and ENPT AMQP footer with value containing both Encryption-Algorithm and Encryption-Secret for the requestor.- While the response message is in transit at SWIM nodes level, it is not possible to access request/visualize sensitive information because both application data and shared secret are encrypted.- The response message is delivered to the intended requestor that successfully decrypts it relying on delivered ENPT AMQP footer.	Successfully validated by implementing few must to have improvements identified during the design and prototyping phases. Furthermore, LDO implementation is able to send, receive and route message level security information using both AMQP footer and AMQP application-property (same key and value as specified for the AMQP footer). This allows to handle cases where non-LDO application/SWIM Node are not able to send/receive such data using the AMQP footer.	OK

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OBJ-17.01-TRL6-TVALP-SEC.0018	End-to-end confidentiality for uplink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-SEC.0076	Following steps are successfully completed:- The requestor creates and sends an additional AMQP 1.0 annotated request message for the same responder with application-data section containing encrypted data and ENPT AMQP footer containing only the Encryption-Algorithm.- The request message is delivered to the intended responder that successfully decrypts it relying on delivered ENPT AMQP footer and cached Encryption-Secret from previous request messages.	Successfully validated by implementing few must to have improvements identified during the design and prototyping phases. Furthermore, LDO implementation is able to send, receive and route message level security information using both AMQP footer and AMQP application-property (same key and value as specified for the AMQP footer). This allows to handle cases where non-LDO application/SWIM Node are not able to send/receive such data using the AMQP footer.	OK

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OBJ-17.01-TRL6-TVALP-SEC.0018	End-to-end confidentiality for uplink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-SEC.0077	Following steps are successfully completed:- The requestor creates and sends an additional AMQP 1.0 annotated request message for the same responder with application-data section containing encrypted data and ENPT AMQP footer containing also a new Encryption-Secret.- The request message is delivered to the intended responder that successfully decrypts it relying on delivered ENPT AMQP footer replacing cached Encryption-Secret.	Successfully validated by implementing few must to have improvements identified during the design and prototyping phases. Furthermore, LDO implementation is able to send, receive and route message level security information using both AMQP footer and AMQP application-property (same key and value as specified for the AMQP footer). This allows to handle cases where non-LDO application/SWIM Node are not able to send/receive such data using the AMQP footer.	OK

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OBJ-17.01-TRL6-TVALP-SEC.0019	End-to-end confidentiality for uplink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-SEC.0078	Following steps are successfully completed:- The publisher creates and publishes an AMQP 1.0 annotated publication message with application-data section containing encrypted data and ENPT AMQP footer with value containing both Encryption-Algorithm and Encryption-Secret for two or more subscribers.- While the publication message is in transit at SWIM nodes level, it is not possible to access/visualize sensitive information because both application data and shared secret are encrypted.- The publication message is delivered to the intended subscribers that successfully decrypt it relying on delivered ENPT AMQP footer.	Successfully validated by implementing few must to have improvements identified during the design and prototyping phases. Furthermore, LDO implementation is able to send, receive and route message level security information using both AMQP footer and AMQP application-property (same key and value as specified for the AMQP footer). This allows to handle cases where non-LDO application/SWIM Node are not able to send/receive such data using the AMQP footer.	OK

Technical Validation Exercise #01 Technical Validation Objective ID	Technical Validation Exercise #01 Technical Validation Objective Title	Technical Validation Exercise #01 Success Criterion ID	Technical Validation Exercise #01 Success Criterion	Technical Validation Exercise #01 Validation Results	Technical Validation Exercise #01 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-SEC.0019	End-to-end confidentiality for uplink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-SEC.0079	Following steps are successfully completed:- The publisher creates and publishes an additional AMQP 1.0 annotated publication message for the same subscribers with application-data section containing encrypted data and ENPT AMQP footer containing only the Encryption-Algorithm.- The publication message is delivered to the intended subscribers that successfully decrypt it relying on delivered ENPT AMQP footer and cached Encryption-Secret from previous messages.	Successfully validated by implementing few must to have improvements identified during the design and prototyping phases. Furthermore, LDO implementation is able to send, receive and route message level security information using both AMQP footer and AMQP application-property (same key and value as specified for the AMQP footer). This allows to handle cases where non-LDO application/SWIM Node are not able to send/receive such data using the AMQP footer.	OK

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OBJ-17.01-TRL6-TVALP-SEC.0019	End-to-end confidentiality for uplink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-SEC.0080	Following steps are successfully completed:- An additional subscriber ("new_sub") successfully subscribes to the topic.- The publisher creates and publishes an additional AMQP 1.0 annotated publication message with application-data section containing encrypted data and ENPT AMQP footer containing the Encryption-Algorithm and only the Encryption-Secret for the new subscriber.- The publication message is delivered to all the subscribers and in particular to the new one that successfully decrypts the message relying on delivered ENPT AMQP footer.- The other subscribers successfully decrypt the message relying on delivered ENPT AMQP footer and cached Encryption-Secret from previous messages.	Successfully validated by implementing few must to have improvements identified during the design and prototyping phases. Furthermore, LDO implementation is able to send, receive and route message level security information using both AMQP footer and AMQP application-property (same key and value as specified for the AMQP footer). This allows to handle cases where non-LDO application/SWIM Node are not able to send/receive such data using the AMQP footer.	OK

Technical Validation Exercise #01 Technical Validation Objective ID	Technical Validation Exercise #01 Technical Validation Objective Title	Technical Validation Exercise #01 Success Criterion ID	Technical Validation Exercise #01 Success Criterion	Technical Validation Exercise #01 Validation Results	Technical Validation Exercise #01 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-SEC.0019	End-to-end confidentiality for uplink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-SEC.0081	Following steps are successfully completed:- The publisher creates and publishes an additional AMQP 1.0 annotated publication message with application-data section containing encrypted data and ENPT AMQP footer containing also a new Encryption-Secret.- The publication message is delivered to the intended subscribers that successfully decrypt it relying on delivered ENPT AMQP footer and replacing cached Encryption-Secret.	Successfully validated by implementing few must to have improvements identified during the design and prototyping phases. Furthermore, LDO implementation is able to send, receive and route message level security information using both AMQP footer and AMQP application-property (same key and value as specified for the AMQP footer). This allows to handle cases where non-LDO application/SWIM Node are not able to send/receive such data using the AMQP footer.	OK

Technical Validation Exercise #01 Technical Validation Objective ID	Technical Validation Exercise #01 Technical Validation Objective Title	Technical Validation Exercise #01 Success Criterion ID	Technical Validation Exercise #01 Success Criterion	Technical Validation Exercise #01 Validation Results	Technical Validation Exercise #01 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-SEC.0020	End-to-end confidentiality for downlink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-SEC.0078	Following steps are successfully completed:- The publisher creates and publishes an AMQP 1.0 annotated publication message with application-data section containing encrypted data and ENPT AMQP footer with value containing both Encryption-Algorithm and Encryption-Secret for two or more subscribers.- While the publication message is in transit at SWIM nodes level, it is not possible to access/visualize sensitive information because both application data and shared secret are encrypted.- The publication message is delivered to the intended subscribers that successfully decrypt it relying on delivered ENPT AMQP footer.	Successfully validated by implementing few must to have improvements identified during the design and prototyping phases. Furthermore, LDO implementation is able to send, receive and route message level security information using both AMQP footer and AMQP application-property (same key and value as specified for the AMQP footer). This allows to handle cases where non-LDO application/SWIM Node are not able to send/receive such data using the AMQP footer.	OK

Technical Validation Exercise #01 Technical Validation Objective ID	Technical Validation Exercise #01 Technical Validation Objective Title	Technical Validation Exercise #01 Success Criterion ID	Technical Validation Exercise #01 Success Criterion	Technical Validation Exercise #01 Validation Results	Technical Validation Exercise #01 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-SEC.0020	End-to-end confidentiality for downlink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-SEC.0079	Following steps are successfully completed:- The publisher creates and publishes an additional AMQP 1.0 annotated publication message for the same subscribers with application-data section containing encrypted data and ENPT AMQP footer containing only the Encryption-Algorithm.- The publication message is delivered to the intended subscribers that successfully decrypt it relying on delivered ENPT AMQP footer and cached eEncryption-Secret from previous messages.	Successfully validated by implementing few must to have improvements identified during the design and prototyping phases. Furthermore, LDO implementation is able to send, receive and route message level security information using both AMQP footer and AMQP application-property (same key and value as specified for the AMQP footer). This allows to handle cases where non-LDO application/SWIM Node are not able to send/receive such data using the AMQP footer.	OK

Technical Validation Exercise #01 Technical Validation Objective ID	Technical Validation Exercise #01 Technical Validation Objective Title	Technical Validation Exercise #01 Success Criterion ID	Technical Validation Exercise #01 Success Criterion	Technical Validation Exercise #01 Validation Results	Technical Validation Exercise #01 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-SEC.0020	End-to-end confidentiality for downlink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-SEC.0080	Following steps are successfully completed:- An additional subscriber ("new_sub") successfully subscribes to the topic.- The publisher creates and publishes an additional AMQP 1.0 annotated publication message with application-data section containing encrypted data and ENPT AMQP footer containing the Encryption-Algorithm and only the Encryption-Secret for the new subscriber.- The publication message is delivered to all the subscribers and in particular to the new one that successfully decrypts the message relying on delivered ENPT AMQP footer.- The other subscribers successfully decrypt the message relying on delivered ENPT AMQP footer and cached Encryption-Secret from previous messages.	Successfully validated by implementing few must to have improvements identified during the design and prototyping phases. Furthermore, LDO implementation is able to send, receive and route message level security information using both AMQP footer and AMQP application-property (same key and value as specified for the AMQP footer). This allows to handle cases where non-LDO application/SWIM Node are not able to send/receive such data using the AMQP footer.	OK

Technical Validation Exercise #01 Technical Validation Objective ID	Technical Validation Exercise #01 Technical Validation Objective Title	Technical Validation Exercise #01 Success Criterion ID	Technical Validation Exercise #01 Success Criterion	Technical Validation Exercise #01 Validation Results	Technical Validation Exercise #01 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-SEC.0020	End-to-end confidentiality for downlink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-SEC.0081	Following steps are successfully completed:- The publisher creates and publishes an additional AMQP 1.0 annotated publication message with application-data section containing encrypted data and ENPT AMQP footer containing also a new Encryption-Secret.- The publication message is delivered to the intended subscribers that successfully decrypt it relying on delivered ENPT AMQP footer and replacing cached Encryption-Secret.	Successfully validated by implementing few must to have improvements identified during the design and prototyping phases. Furthermore, LDO implementation is able to send, receive and route message level security information using both AMQP footer and AMQP application-property (same key and value as specified for the AMQP footer). This allows to handle cases where non-LDO application/SWIM Node are not able to send/receive such data using the AMQP footer.	OK

Technical Validation Exercise #01 Technical Validation Objective ID	Technical Validation Exercise #01 Technical Validation Objective Title	Technical Validation Exercise #01 Success Criterion ID	Technical Validation Exercise #01 Success Criterion	Technical Validation Exercise #01 Validation Results	Technical Validation Exercise #01 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-SEC.0021	End-to-end HMAC based message level integrity and authenticity for uplink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-SEC.0082	Following steps are successfully completed:- The requestor creates and sends an AMQP 1.0 annotated request message with HMAC AMQP footer with value containing HMAC-Algorithm, HMAC-Target, HMAC-Digest and HMAC-Secret for the intender responder.- The request message is delivered to the intended responder that successfully validates the authenticity and integrity of the message relying on delivered HMAC AMQP footer.	Successfully validated by implementing few must to have improvements identified during the design and prototyping phases. Furthermore, LDO implementation is able to send, receive and route message level security information using both AMQP footer and AMQP application-property (same key and value as specified for the AMQP footer). This allows to handle cases where non-LDO application/SWIM Node are not able to send/receive such data using the AMQP footer.	OK

Technical Validation Exercise #01 Technical Validation Objective ID	Technical Validation Exercise #01 Technical Validation Objective Title	Technical Validation Exercise #01 Success Criterion ID	Technical Validation Exercise #01 Success Criterion	Technical Validation Exercise #01 Validation Results	Technical Validation Exercise #01 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-SEC.0021	End-to-end HMAC based message level integrity and authenticity for uplink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-SEC.0083	Following steps are successfully completed: - The responder creates and sends an AMQP 1.0 annotated response message with HMAC AMQP footer with value containing HMAC-Algorithm, HMAC-Target, HMAC-Digest and HMAC-Secret for the requestor.- The response message is delivered to the intended requestor that successfully validates the authenticity and integrity of the message relying on delivered HMAC AMQP footer.	Successfully validated by implementing few must to have improvements identified during the design and prototyping phases. Furthermore, LDO implementation is able to send, receive and route message level security information using both AMQP footer and AMQP application-property (same key and value as specified for the AMQP footer). This allows to handle cases where non-LDO application/SWIM Node are not able to send/receive such data using the AMQP footer.	OK

Technical Validation Exercise #01 Technical Validation Objective ID	Technical Validation Exercise #01 Technical Validation Objective Title	Technical Validation Exercise #01 Success Criterion ID	Technical Validation Exercise #01 Success Criterion	Technical Validation Exercise #01 Validation Results	Technical Validation Exercise #01 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-SEC.0021	End-to-end HMAC based message level integrity and authenticity for uplink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-SEC.0084	Following steps are successfully completed:- The requestor creates and sends an additional AMQP 1.0 annotated request message for the same responder with HMAC AMQP footer containing only HMAC-Algorithm, HMAC-Target and HMAC-Digest.- The request message is delivered to the intended responder that successfully validates the authenticity and integrity of the message relying on delivered HMAC AMQP footer and cached HMAC-Secret from previous request messages.	Successfully validated by implementing few must to have improvements identified during the design and prototyping phases. Furthermore, LDO implementation is able to send, receive and route message level security information using both AMQP footer and AMQP application-property (same key and value as specified for the AMQP footer). This allows to handle cases where non-LDO application/SWIM Node are not able to send/receive such data using the AMQP footer.	OK

Technical Validation Exercise #01 Technical Validation Objective ID	Technical Validation Exercise #01 Technical Validation Objective Title	Technical Validation Exercise #01 Success Criterion ID	Technical Validation Exercise #01 Success Criterion	Technical Validation Exercise #01 Validation Results	Technical Validation Exercise #01 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-SEC.0021	End-to-end HMAC based message level integrity and authenticity for uplink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-SEC.0085	Following steps are successfully completed:- The responder creates and sends an additional AMQP 1.0 annotated response message for the same requestor with HMAC AMQP footer containing only HMAC-Algorithm, HMAC-Target and HMAC-Digest.- The response message is delivered to the intended requestor that successfully validates the authenticity and integrity of the message relying on delivered HMAC AMQP footer and cached HMAC-Secret from previous response messages.	Successfully validated by implementing few must to have improvements identified during the design and prototyping phases. Furthermore, LDO implementation is able to send, receive and route message level security information using both AMQP footer and AMQP application-property (same key and value as specified for the AMQP footer). This allows to handle cases where non-LDO application/SWIM Node are not able to send/receive such data using the AMQP footer.	OK

Technical Validation Exercise #01 Technical Validation Objective ID	Technical Validation Exercise #01 Technical Validation Objective Title	Technical Validation Exercise #01 Success Criterion ID	Technical Validation Exercise #01 Success Criterion	Technical Validation Exercise #01 Validation Results	Technical Validation Exercise #01 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-SEC.0021	End-to-end HMAC based message level integrity and authenticity for uplink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-SEC.0086	Following steps are successfully completed:- The requestor creates and sends an additional AMQP 1.0 annotated request message for the same responder with HMAC AMQP footer containing HMAC-Algorithm, HMAC-Target, HMAC-Digest and the new shared secret.- The request message is delivered to the intended responder that successfully validates the authenticity and integrity of the message relying on delivered HMAC AMQP footer replacing cached HMAC-Secret.	Successfully validated by implementing few must to have improvements identified during the design and prototyping phases. Furthermore, LDO implementation is able to send, receive and route message level security information using both AMQP footer and AMQP application-property (same key and value as specified for the AMQP footer). This allows to handle cases where non-LDO application/SWIM Node are not able to send/receive such data using the AMQP footer.	OK

Technical Validation Exercise #01 Technical Validation Objective ID	Technical Validation Exercise #01 Technical Validation Objective Title	Technical Validation Exercise #01 Success Criterion ID	Technical Validation Exercise #01 Success Criterion	Technical Validation Exercise #01 Validation Results	Technical Validation Exercise #01 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-SEC.0021	End-to-end HMAC based message level integrity and authenticity for uplink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-SEC.0087	Following steps are successfully completed: - The responder creates and sends an AMQP 1.0 annotated response message with HMAC AMQP footer with value containing HMAC-Algorithm, HMAC-Target, HMAC-Digest and HMAC-Secret for the requestor.- While in transit the response message data section is modified.- The response message is delivered to the intended requestor that, relying on delivered HMAC AMQP footer, recognizes that the authenticity and integrity of the message have been violated.- The requestor discards the message and the event is logged in accordance with the applicable audit policy.	Successfully validated by implementing few must to have improvements identified during the design and prototyping phases. Furthermore, LDO implementation is able to send, receive and route message level security information using both AMQP footer and AMQP application-property (same key and value as specified for the AMQP footer). This allows to handle cases where non-LDO application/SWIM Node are not able to send/receive such data using the AMQP footer.	OK

Technical Validation Exercise #01 Technical Validation Objective ID	Technical Validation Exercise #01 Technical Validation Objective Title	Technical Validation Exercise #01 Success Criterion ID	Technical Validation Exercise #01 Success Criterion	Technical Validation Exercise #01 Validation Results	Technical Validation Exercise #01 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-SEC.0022	End-to-end HMAC based message level integrity and authenticity for uplink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-SEC.0088	Following steps are successfully completed:- The publisher creates and publishes an AMQP 1.0 annotated publication message with HMAC AMQP footer with value containing HMAC-Algorithm, HMAC-Target, HMAC-Digest and HMAC-Secret for two or more subscribers.- The publication message is delivered to the intended subscribers validate the authenticity and integrity of the message relying on delivered HMAC AMQP footer.	Successfully validated by implementing few must to have improvements identified during the design and prototyping phases. Furthermore, LDO implementation is able to send, receive and route message level security information using both AMQP footer and AMQP application-property (same key and value as specified for the AMQP footer). This allows to handle cases where non-LDO application/SWIM Node are not able to send/receive such data using the AMQP footer.	OK

Technical Validation Exercise #01 Technical Validation Objective ID	Technical Validation Exercise #01 Technical Validation Objective Title	Technical Validation Exercise #01 Success Criterion ID	Technical Validation Exercise #01 Success Criterion	Technical Validation Exercise #01 Validation Results	Technical Validation Exercise #01 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-SEC.0022	End-to-end HMAC based message level integrity and authenticity for uplink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-SEC.0089	Following steps are successfully completed:- The publisher creates and publishes an additional AMQP 1.0 annotated publication message for the same subscribers with HMAC AMQP footer containing only HMAC-Algorithm, HMAC-Target and HMAC-Digest.- The publication message is delivered to the intended subscribers that successfully validate the authenticity and integrity of the message relying on delivered HMAC AMQP footer and cached HMAC-Secret from previous messages.	Successfully validated by implementing few must to have improvements identified during the design and prototyping phases. Furthermore, LDO implementation is able to send, receive and route message level security information using both AMQP footer and AMQP application-property (same key and value as specified for the AMQP footer). This allows to handle cases where non-LDO application/SWIM Node are not able to send/receive such data using the AMQP footer.	OK

Technical Validation Exercise #01 Technical Validation Objective ID	Technical Validation Exercise #01 Technical Validation Objective Title	Technical Validation Exercise #01 Success Criterion ID	Technical Validation Exercise #01 Success Criterion	Technical Validation Exercise #01 Validation Results	Technical Validation Exercise #01 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-SEC.0022	End-to-end HMAC based message level integrity and authenticity for uplink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-SEC.0090	Following steps are successfully completed:- An additional subscriber ("new_sub") successfully subscribes to the topic.- The publisher creates and publishes an additional AMQP 1.0 annotated publication message with HMAC AMQP footer containing HMAC-Algorithm, HMAC-Target, HMAC-Digest and only the HMAC-Secret for the new subscriber.- The publication message is delivered to all the subscribers and in particular to the new one that successfully validates the authenticity and integrity of the message relying on delivered HMAC AMQP footer.- The other subscribers successfully validate the authenticity and integrity of the message relying on delivered HMAC AMQP footer and cached HMAC-Secret from previous messages.	Successfully validated by implementing few must to have improvements identified during the design and prototyping phases. Furthermore, LDO implementation is able to send, receive and route message level security information using both AMQP footer and AMQP application-property (same key and value as specified for the AMQP footer). This allows to handle cases where non-LDO application/SWIM Node are not able to send/receive such data using the AMQP footer.	OK

Technical Validation Exercise #01 Technical Validation Objective ID	Technical Validation Exercise #01 Technical Validation Objective Title	Technical Validation Exercise #01 Success Criterion ID	Technical Validation Exercise #01 Success Criterion	Technical Validation Exercise #01 Validation Results	Technical Validation Exercise #01 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-SEC.0022	End-to-end HMAC based message level integrity and authenticity for uplink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-SEC.0091	Following steps are successfully completed:- The publisher creates and publishes an additional AMQP 1.0 annotated publication message with HMAC AMQP footer containing also the new shared secret.- The publication message is delivered to the intended subscribers that successfully validate the authenticity and integrity of the message relying on delivered HMAC AMQP footer and replacing the cached HMAC-Secret.	Successfully validated by implementing few must to have improvements identified during the design and prototyping phases. Furthermore, LDO implementation is able to send, receive and route message level security information using both AMQP footer and AMQP application-property (same key and value as specified for the AMQP footer). This allows to handle cases where non-LDO application/SWIM Node are not able to send/receive such data using the AMQP footer.	OK

Technical Validation Exercise #01 Technical Validation Objective ID	Technical Validation Exercise #01 Technical Validation Objective Title	Technical Validation Exercise #01 Success Criterion ID	Technical Validation Exercise #01 Success Criterion	Technical Validation Exercise #01 Validation Results	Technical Validation Exercise #01 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-SEC.0022	End-to-end HMAC based message level integrity and authenticity for uplink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-SEC.0092	Following steps are successfully completed: -The publisher creates and publishes an additional AMQP 1.0 annotated publication message for the same subscribers with HMAC AMQP footer containing HMAC-Algorithm, HMAC-Target, HMAC-Digest and HMAC-Secret.- While in transit the publication message data section is modified.- The publication message is delivered to the intended subscribers that, relying on delivered HMAC AMQP footer, recognize that the authenticity and integrity of the message have been violated.- The subscribers discards the message and the event is logged in accordance with the applicable audit policy.	Successfully validated by implementing few must to have improvements identified during the design and prototyping phases. Furthermore, LDO implementation is able to send, receive and route message level security information using both AMQP footer and AMQP application-property (same key and value as specified for the AMQP footer). This allows to handle cases where non-LDO application/SWIM Node are not able to send/receive such data using the AMQP footer.	OK

Technical Validation Exercise #01 Technical Validation Objective ID	Technical Validation Exercise #01 Technical Validation Objective Title	Technical Validation Exercise #01 Success Criterion ID	Technical Validation Exercise #01 Success Criterion	Technical Validation Exercise #01 Validation Results	Technical Validation Exercise #01 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-SEC.0023	End-to-end HMAC based message level integrity and authenticity for downlink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-SEC.0088	Following steps are successfully completed:- The publisher creates and publishes an AMQP 1.0 annotated publication message with HMAC AMQP footer with value containing HMAC-Algorithm, HMAC-Target, HMAC-Digest and HMAC-Secret for two or more subscribers.- The publication message is delivered to the intended subscribers validate the authenticity and integrity of the message relying on delivered HMAC AMQP footer.	Successfully validated by implementing few must to have improvements identified during the design and prototyping phases. Furthermore, LDO implementation is able to send, receive and route message level security information using both AMQP footer and AMQP application-property (same key and value as specified for the AMQP footer). This allows to handle cases where non-LDO application/SWIM Node are not able to send/receive such data using the AMQP footer.	OK

Technical Validation Exercise #01 Technical Validation Objective ID	Technical Validation Exercise #01 Technical Validation Objective Title	Technical Validation Exercise #01 Success Criterion ID	Technical Validation Exercise #01 Success Criterion	Technical Validation Exercise #01 Validation Results	Technical Validation Exercise #01 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-SEC.0023	End-to-end HMAC based message level integrity and authenticity for downlink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-SEC.0089	Following steps are successfully completed:- The publisher creates and publishes an additional AMQP 1.0 annotated publication message for the same subscribers with HMAC AMQP footer containing only HMAC-Algorithm, HMAC-Target and HMAC-Digest.- The publication message is delivered to the intended subscribers that successfully validate the authenticity and integrity of the message relying on delivered HMAC AMQP footer and cached HMAC-Secret from previous messages.	Successfully validated by implementing few must to have improvements identified during the design and prototyping phases. Furthermore, LDO implementation is able to send, receive and route message level security information using both AMQP footer and AMQP application-property (same key and value as specified for the AMQP footer). This allows to handle cases where non-LDO application/SWIM Node are not able to send/receive such data using the AMQP footer.	OK

Technical Validation Exercise #01 Technical Validation Objective ID	Technical Validation Exercise #01 Technical Validation Objective Title	Technical Validation Exercise #01 Success Criterion ID	Technical Validation Exercise #01 Success Criterion	Technical Validation Exercise #01 Validation Results	Technical Validation Exercise #01 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-SEC.0023	End-to-end HMAC based message level integrity and authenticity for downlink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-SEC.0090	Following steps are successfully completed:- An additional subscriber ("new_sub") successfully subscribes to the topic.- The publisher creates and publishes an additional AMQP 1.0 annotated publication message with HMAC AMQP footer containing HMAC-Algorithm, HMAC-Target, HMAC-Digest and only the HMAC-Secret for the new subscriber.- The publication message is delivered to all the subscribers and in particular to the new one that successfully validates the authenticity and integrity of the message relying on delivered HMAC AMQP footer.- The other subscribers successfully validate the authenticity and integrity of the message relying on delivered HMAC AMQP footer and cached HMAC-Secret from previous messages.	Successfully validated by implementing few must to have improvements identified during the design and prototyping phases. Furthermore, LDO implementation is able to send, receive and route message level security information using both AMQP footer and AMQP application-property (same key and value as specified for the AMQP footer). This allows to handle cases where non-LDO application/SWIM Node are not able to send/receive such data using the AMQP footer.	OK

Technical Validation Exercise #01 Technical Validation Objective ID	Technical Validation Exercise #01 Technical Validation Objective Title	Technical Validation Exercise #01 Success Criterion ID	Technical Validation Exercise #01 Success Criterion	Technical Validation Exercise #01 Validation Results	Technical Validation Exercise #01 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-SEC.0023	End-to-end HMAC based message level integrity and authenticity for downlink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-SEC.0091	Following steps are successfully completed:- The publisher creates and publishes an additional AMQP 1.0 annotated publication message with HMAC AMQP footer containing also the new shared secret.- The publication message is delivered to the intended subscribers that successfully validate the authenticity and integrity of the message relying on delivered HMAC AMQP footer and replacing the cached HMAC-Secret.	Successfully validated by implementing few must to have improvements identified during the design and prototyping phases. Furthermore, LDO implementation is able to send, receive and route message level security information using both AMQP footer and AMQP application-property (same key and value as specified for the AMQP footer). This allows to handle cases where non-LDO application/SWIM Node are not able to send/receive such data using the AMQP footer.	OK

Technical Validation Exercise #01 Technical Validation Objective ID	Technical Validation Exercise #01 Technical Validation Objective Title	Technical Validation Exercise #01 Success Criterion ID	Technical Validation Exercise #01 Success Criterion	Technical Validation Exercise #01 Validation Results	Technical Validation Exercise #01 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-SEC.0023	End-to-end HMAC based message level integrity and authenticity for downlink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-SEC.0092	Following steps are successfully completed: -The publisher creates and publishes an additional AMQP 1.0 annotated publication message for the same subscribers with HMAC AMQP footer containing HMAC-Algorithm, HMAC-Target, HMAC-Digest and HMAC-Secret.- While in transit the publication message data section is modified.- The publication message is delivered to the intended subscribers that, relying on delivered HMAC AMQP footer, recognize that the authenticity and integrity of the message have been violated.- The subscribers discards the message and the event is logged in accordance with the applicable audit policy.	Successfully validated by implementing few must to have improvements identified during the design and prototyping phases. Furthermore, LDO implementation is able to send, receive and route message level security information using both AMQP footer and AMQP application-property (same key and value as specified for the AMQP footer). This allows to handle cases where non-LDO application/SWIM Node are not able to send/receive such data using the AMQP footer.	OK

Technical Validation Exercise #01 Technical Validation Objective ID	Technical Validation Exercise #01 Technical Validation Objective Title	Technical Validation Exercise #01 Success Criterion ID	Technical Validation Exercise #01 Success Criterion	Technical Validation Exercise #01 Validation Results	Technical Validation Exercise #01 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-SEC.0024	End-to-end digital signature based message level integrity and authenticity for uplink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-SEC.0093	Following steps are successfully completed:- The requestor creates and sends an AMQP 1.0 annotated request message with DSGN AMQP footer with value containing DSGN-Algorithm, DSGN-Target and DSGN-Signature.- The request message is delivered to the intended responder that successfully validates the authenticity and integrity of the message relying on delivered DSGN AMQP footer.	Successfully validated by implementing few must to have improvements identified during the design and prototyping phases. Furthermore, LDO implementation is able to send, receive and route message level security information using both AMQP footer and AMQP application-property (same key and value as specified for the AMQP footer). This allows to handle cases where non-LDO application/SWIM Node are not able to send/receive such data using the AMQP footer. In accordance with the TS, this success criteria has been validated also for subscription management FDRR-MEP.	OK

Technical Validation Exercise #01 Technical Validation Objective ID	Technical Validation Exercise #01 Technical Validation Objective Title	Technical Validation Exercise #01 Success Criterion ID	Technical Validation Exercise #01 Success Criterion	Technical Validation Exercise #01 Validation Results	Technical Validation Exercise #01 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-SEC.0024	End-to-end digital signature based message level integrity and authenticity for uplink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-SEC.0094	Following steps are successfully completed: - The responder creates and sends an AMQP 1.0 annotated response message with DSGN AMQP footer with value containing DSGN-Algorithm, DSGN-Target and DSGN-Signature.- The response message is delivered to the intended requestor that successfully validates the authenticity and integrity of the message relying on delivered DSGN AMQP footer.	Successfully validated by implementing few must to have improvements identified during the design and prototyping phases. Furthermore, LDO implementation is able to send, receive and route message level security information using both AMQP footer and AMQP application-property (same key and value as specified for the AMQP footer). This allows to handle cases where non-LDO application/SWIM Node are not able to send/receive such data using the AMQP footer. In accordance with the TS, this success criteria has been validated also for subscription management FDRR-MEP.	OK

Technical Validation Exercise #01 Technical Validation Objective ID	Technical Validation Exercise #01 Technical Validation Objective Title	Technical Validation Exercise #01 Success Criterion ID	Technical Validation Exercise #01 Success Criterion	Technical Validation Exercise #01 Validation Results	Technical Validation Exercise #01 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-SEC.0024	End-to-end digital signature based message level integrity and authenticity for uplink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-SEC.0095	Following steps are successfully completed: - The responder creates and sends an AMQP 1.0 annotated response message with DSGN AMQP footer with value containing DSGN-Algorithm, DSGN-Target and DSGN-Signature.- While in transit the response message data section is modified.- The response message is delivered to the intended requestor that, relying on delivered DSGN AMQP footer, recognizes that the authenticity and integrity of the message have been violated.- The requestor discards the message and the event is logged in accordance with the applicable audit policy.	Successfully validated by implementing few must to have improvements identified during the design and prototyping phases. Furthermore, LDO implementation is able to send, receive and route message level security information using both AMQP footer and AMQP application-property (same key and value as specified for the AMQP footer). This allows to handle cases where non-LDO application/SWIM Node are not able to send/receive such data using the AMQP footer. In accordance with the TS, this success criteria has been validated also for subscription management FDRR-MEP.	OK

Technical Validation Exercise #01 Technical Validation Objective ID	Technical Validation Exercise #01 Technical Validation Objective Title	Technical Validation Exercise #01 Success Criterion ID	Technical Validation Exercise #01 Success Criterion	Technical Validation Exercise #01 Validation Results	Technical Validation Exercise #01 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-SEC.0025	End-to-end digital signature based message level integrity and authenticity for uplink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-SEC.0096	Following steps are successfully completed:- The publisher creates and publishes an AMQP 1.0 annotated publication message with DSGN AMQP footer with value containing DSGN-Algorithm, DSGN-Target and DSGN-Signature.- The publication message is delivered to the intended subscribers that successfully validate the authenticity and integrity of the message relying on delivered DSGN AMQP footer.	Successfully validated by implementing few must to have improvements identified during the design and prototyping phases. Furthermore, LDO implementation is able to send, receive and route message level security information using both AMQP footer and AMQP application-property (same key and value as specified for the AMQP footer). This allows to handle cases where non-LDO application/SWIM Node are not able to send/receive such data using the AMQP footer. In accordance with the TS, this success criteria has been validated also for subscription management FDRR-MEP.	OK

Technical Validation Exercise #01 Technical Validation Objective ID	Technical Validation Exercise #01 Technical Validation Objective Title	Technical Validation Exercise #01 Success Criterion ID	Technical Validation Exercise #01 Success Criterion	Technical Validation Exercise #01 Validation Results	Technical Validation Exercise #01 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-SEC.0025	End-to-end digital signature based message level integrity and authenticity for uplink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-SEC.0097	Following steps are successfully completed: - The publisher creates and publishes an AMQP 1.0 annotated publication message with DSGN AMQP footer with value containing DSGN-Algorithm, DSGN-Target and DSGN-Signature.- While in transit the publication message data section is modified.- The publication message is delivered to the intended subscribers that, relying on delivered DSGN AMQP footer, recognize that the authenticity and integrity of the message have been violated.- The subscribers discard the message and the event is logged in accordance with the applicable audit policy.	Successfully validated by implementing few must to have improvements identified during the design and prototyping phases. Furthermore, LDO implementation is able to send, receive and route message level security information using both AMQP footer and AMQP application-property (same key and value as specified for the AMQP footer). This allows to handle cases where non-LDO application/SWIM Node are not able to send/receive such data using the AMQP footer.	OK

Technical Validation Exercise #01 Technical Validation Objective ID	Technical Validation Exercise #01 Technical Validation Objective Title	Technical Validation Exercise #01 Success Criterion ID	Technical Validation Exercise #01 Success Criterion	Technical Validation Exercise #01 Validation Results	Technical Validation Exercise #01 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-SEC.0026	End-to-end digital signature based message level integrity and authenticity for downlink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-SEC.0096	Following steps are successfully completed:- The publisher creates and publishes an AMQP 1.0 annotated publication message with DSGN AMQP footer with value containing DSGN-Algorithm, DSGN-Target and DSGN-Signature.- The publication message is delivered to the intended subscribers that successfully validate the authenticity and integrity of the message relying on delivered DSGN AMQP footer.	Successfully validated by implementing few must to have improvements identified during the design and prototyping phases. Furthermore, LDO implementation is able to send, receive and route message level security information using both AMQP footer and AMQP application-property (same key and value as specified for the AMQP footer). This allows to handle cases where non-LDO application/SWIM Node are not able to send/receive such data using the AMQP footer.	OK

Technical Validation Exercise #01 Technical Validation Objective ID	Technical Validation Exercise #01 Technical Validation Objective Title	Technical Validation Exercise #01 Success Criterion ID	Technical Validation Exercise #01 Success Criterion	Technical Validation Exercise #01 Validation Results	Technical Validation Exercise #01 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-SEC.0026	End-to-end digital signature based message level integrity and authenticity for downlink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-SEC.0097	Following steps are successfully completed: - The publisher creates and publishes an AMQP 1.0 annotated publication message with DSGN AMQP footer with value containing DSGN-Algorithm, DSGN-Target and DSGN-Signature.- While in transit the publication message data section is modified.- The publication message is delivered to the intended subscribers that, relying on delivered DSGN AMQP footer, recognize that the authenticity and integrity of the message have been violated.- The subscribers discard the message and the event is logged in accordance with the applicable audit policy.	Successfully validated by implementing few must to have improvements identified during the design and prototyping phases. Furthermore, LDO implementation is able to send, receive and route message level security information using both AMQP footer and AMQP application-property (same key and value as specified for the AMQP footer). This allows to handle cases where non-LDO application/SWIM Node are not able to send/receive such data using the AMQP footer.	OK

Table 18: Technical Validation Results Exercise 1 (EXE1.0002)


SWIM
TI


SESAR
JOINT UNDERTAKING

A.3.2 Results on technical feasibility

Primary purpose of technical validation activities is to validate the technical feasibility of the designed solution. The approach applied during planning, prototyping, integration and validation phases, could be characterized as follows:

- To try to maximize the coverage of validation objectives and requirements (also in terms of technical options described in the TS).
- To maximize the conformance with the TS.
- To recording any candidate TS updates.

EXE1 implemented and tested almost all the requirements in scope of technical validation activities including integration with FCI A/G network infrastructure (multilink).

Although there are some details to be refined in the final TS, overall the solution for the Purple Profile for Air/Ground advisory information sharing is considered technically feasible.

A.3.3 Results per KPA

In accordance with TRL6 TVALP §4.3.1 [44] and taking into account the scope and perimeter of the technical validation activities, two main KPAs have been addressed at solution level in term of technical validation activities: **Security** and **Global Interoperability**.

- **Security KPA**: design and validation activities carried out by PJ.17-01 concern more the "Implementation measures" focus area. EXE1 successfully implemented and validated almost all the solution level requirements and objectives concerning this focus area. In addition to the technical feasibility of these measures, EXE1 demonstrated that solution contributes positively to this KPA. Further details about security KPA are provided in §A.3.4.3 where results about security technical validation objectives are described.
- **Global Interoperability**: taking into account that in the context of this exercise i) software prototypes (application/service, Air/Ground SWM infrastructure and Network layers) from different solution members have been successfully integrated (technical interoperability), and ii) completeness and technical feasibility of the TS have been validated, EXE1 demonstrated that this solution contributes positively to this KPA.

A.3.4 Analysis of Exercise 1 Results per Technical Validation objective

This section provides the EXE1 analysis of the validation results per validation objective group.

A.3.4.1.Performance efficiency characteristic Technical Validation Objectives

Performance efficiency characteristic validation objectives and requirements can be grouped as follows:

- Time behaviour (end to end message latency): technical validation objectives from OBJ-17.01-TRL6-TVALP-PERF.0009 to OBJ-17.01-TRL6-TVALP-PERF.0024 (**all not covered, deviation**).
- Ordering delivery guarantees (FIFO, message priority): technical validation objectives OBJ-17.01-TRL6-TVALP-PERF.0001, OBJ-17.01-TRL6-TVALP-PERF.0002, OBJ-17.01-TRL6-TVALP-PERF.0003, OBJ-17.01-TRL6-TVALP-PERF.0004, OBJ-17.01-TRL6-TVALP-PERF.0005, OBJ-17.01-TRL6-TVALP-PERF.0006, OBJ-17.01-TRL6-TVALP-PERF.0007 and OBJ-17.01-TRL6-TVALP-PERF.0008 (**all fully covered with OK validation status**).
- On-the-fly compression: technical validation objectives OBJ-17.01-TRL6-TVALP-PERF.0025 and OBJ-17.01-TRL6-TVALP-PERF.0026 (**all fully covered with OK validation status**).

Time behaviour (end to end message latency)

In the TVALP a partial coverage was declared because it was not yet confirmed if the V&VP allows (HW resources limits) to deploy 1000 A/C instances, as required by the consolidated load, each with minimum Purple Profile enabled applications and Air SWIM Node capabilities. During the preparation and the execution of the exercise, the V&VP was used to integrate also PJ.14-02-04 prototypes. This reduced the available HW resources allowing to emulate only two Purple Profile enabled aircraft. This was considered not really representative and the team decided to focus more on other objectives and integration with PJ.14-02-04 multilink A/G network.

However, the key capability concerning the composition of Purple Profile level and network level class of services was designed, implemented and successfully validated.

Ordering delivery guarantees (FIFO, message priority)

End to end FIFO message queue level ordering guarantees QoS for uplink, downlink, request/response and publish/subscribe Purple Profile enabled SWIM services has been successfully validated.

End to end message priority ordering guarantees for downlink and uplink, request/response and publish/subscribe Purple Profile enabled SWIM services has been successfully validated. It was also validated that the implementation is highly configurable allowing per-service strictness configuration. In other words, there are service specific characteristics (e.g. message expiration, message rate, etc.) that can be used to improve the strictness of the ordering.

Furthermore, in accordance with the TS, the implementation is based on composition of class of services at SWIM Node level and class of services at network level (both IPv4 and IPv6). In particular, assigning a CoS to a SWIM service consists in assigning that CoS to concerned messaging resources (e.g. message queue). Two or more CoSs at SWIM Node level may be assigned to the same CoS at network level (this is configurable). In this case the prioritization between the two SWIM Node level CoSs is enforced at SWIM Node level. This has been successfully validated integrating also PJ.14-02-04 multilink A/G network prototypes.

On-the-fly compression

On-the-fly Purple Profile capability has been successfully validated for both uplink and downlink Purple Profile enabled SWIM services. It has been demonstrated that it reduces the A/G network

bandwidth consumption and it is transparent to Purple Profile enabled application. Furthermore, it has been considered valuable for ground services providing data for both ground and air consumers. For instance the D-NOTAM publisher just publishes D-NOTAMs without taking care of extra "optimizations" (e.g. compression) that may be required for air side subscribers.

Of course, in accordance with the TS, this capability:

- Is only applicable to SWIM services that do not provide compression at application level.
- Is only applicable to SWIM services that do not encrypt data section at application level.
- Is not violating end to end message integrity and authenticity.

A.3.4.2.Reliability efficiency Technical Validation Objectives

Reliability efficiency characteristic validation objectives, success criteria and requirements concerns end to end delivery guarantees. All the related validation objectives (OBJ-17.01-TRL6-TVALP-REL.0001, OBJ-17.01-TRL6-TVALP-REL.0002, OBJ-17.01-TRL6-TVALP-REL.0003, OBJ-17.01-TRL6-TVALP-REL.0004, OBJ-17.01-TRL6-TVALP-REL.0005, OBJ-17.01-TRL6-TVALP-REL.0006, OBJ-17.01-TRL6-TVALP-REL.0007 and OBJ-17.01-TRL6-TVALP-REL.0008) and success criteria have been **fully covered with OK validation status**.

In particular, end-to-end at-most-once (message loss), at-least-Once (message duplication), and exactly-once (message duplicates detection) delivery guarantees QoSs for both uplink and downlink request/response and publish/subscribe Purple Profile enabled SWIM services have been successfully validated when (in accordance with the success criteria):

- transient connection establishment failure event occurs.
- abnormal disconnection event due to transient network error occurs.
- abnormal disconnection event due to ground peer restart occurs.

These events have been injected:

- at Purple Profile enabled application - (Air or Ground) SWIM Node connection level.
- at Air SWIM Node – Ground SWIM Node(s) connection level.
- at both of the above.

The delivery guarantees have been implemented relying on reconnection, retry/redelivery and message duplication detection (end to end) capabilities. Logging, tracing and reporting (monitoring capabilities) of message not delivered event have been successfully validated (no transient error, message expired while in transit because reconnection/redelivery, etc.).

Expected delivery guarantees QoS is configured at application (requestor, responder, publisher, subscriber), Air SWIM node, and Ground SWIM Node levels. Both Air and Ground SWIM Nodes allow to configure the expected delivery guarantees at SWIM Node level and per Purple Profile enabled SWIM service.

Finally, the delivery guarantees QoSs have also been successfully validated in deployment scenarios involving PJ.14-02-04 multilink A/G network prototypes.

A.3.4.3.Security characteristic Technical Validation Objectives

Security characteristic validation objectives and requirements can be grouped as follows:

- Message screening security controls: technical validation objectives OBJ-17.01-TRL6-TVALP-SEC.0001, OBJ-17.01-TRL6-TVALP-SEC.0002, OBJ-17.01-TRL6-TVALP-SEC.0003 and OBJ-17.01-TRL6-TVALP-SEC.0004 (**all objectives and success criteria fully covered, almost all the success criteria with OK validation status**).
- Overload protection security controls: technical validation objectives OBJ-17.01-TRL6-TVALP-SEC.0005, OBJ-17.01-TRL6-TVALP-SEC.0006, OBJ-17.01-TRL6-TVALP-SEC.0007, OBJ-17.01-TRL6-TVALP-SEC.0008, OBJ-17.01-TRL6-TVALP-SEC.0009, OBJ-17.01-TRL6-TVALP-SEC.0010 (**all objectives and success criteria fully covered, almost all the success criteria with OK validation status**).
- Point to point mutual authentication and certificate revocation status check security controls: technical validation objectives OBJ-17.01-TRL6-TVALP-SEC.0011, OBJ-17.01-TRL6-TVALP-SEC.0012, OBJ-17.01-TRL6-TVALP-SEC.0013, OBJ-17.01-TRL6-TVALP-SEC.0014 (**all objectives and success criteria fully covered, almost all the success criteria with OK validation status**).
- Point to point authorization security controls: technical validation objectives OBJ-17.01-TRL6-TVALP-SEC.0015, OBJ-17.01-TRL6-TVALP-SEC.0016, and OBJ-17.01-TRL6-TVALP-SEC.0017 (**all objectives and success criteria fully covered, almost all the success criteria with OK validation status**).
- End to end integrity, authenticity and encryption: technical validation objectives OBJ-17.01-TRL6-TVALP-SEC.0018, OBJ-17.01-TRL6-TVALP-SEC.0019, OBJ-17.01-TRL6-TVALP-SEC.0020, OBJ-17.01-TRL6-TVALP-SEC.0021, OBJ-17.01-TRL6-TVALP-SEC.0022, OBJ-17.01-TRL6-TVALP-SEC.0023, OBJ-17.01-TRL6-TVALP-SEC.0024, OBJ-17.01-TRL6-TVALP-SEC.0025, OBJ-17.01-TRL6-TVALP-SEC.0026 (**all objectives and success criteria fully covered, all the success criteria with OK validation status**).

Message screening

Message screening success criteria and requirements have been successfully implemented and validated.

Message screening implementation is configurable per SWIM service (i.e. messaging resources allocated to that service) and enforced on the messaging resource side used by requestor/publisher/responder/sender messaging entities (producers of the messages). Message screening has been also configured for subscription management messages (screening of the messages against Purple Profile defined properties and XML schema for subscription management request and response messages.

Message screening policies can be configured off-line but also It has been validated that, for publish/subscribe SWIM services, they can be updated at runtime without restarting the SWIM Node.

As part of overall SWIM Node logging and monitoring (highly configurable in terms of what has to be monitored, reported, etc.), also events concerning message screening policies enforcement can be logged and/or reported.

For what concerns malicious payload screening, policies based on safe (XXE protected) XML message validator have been successfully validated (malicious XML payload are filtered out).

Few success criteria have partially ok validation result status because, although logging, tracing and reporting (monitoring capabilities) of events concerning the message screening policies enforcement have been successfully validated, current audit solution is based on logging capabilities without dedicated audit policies. In other words, the solution supports a simplified implementation of audit policies based on logging.

Overload protection

Overload protection success criteria and requirements have been successfully implemented and validated.

Overload protection implementation is configurable per SWIM service (i.e. messaging resources allocated to that service) and enforced on the messaging resource side used by requestor/publisher/responder/sender messaging entities (producers of the messages).

As part of overall SWIM Node logging and monitoring (highly configurable in terms of what has to be monitored, reported, etc.), also events concerning overload protection policies enforcement can be logged and/or reported.

Few success criteria have partially ok validation result status because, although logging, tracing and reporting (monitoring capabilities) of events concerning the policies enforcement have been successfully validated, current audit solution is based on logging capabilities without dedicated audit policies. In other words, the solution supports a simplified implementation of audit policies based on logging.

One success criteria has NOK validation result status because message screening policies can be only configured off-line (current implementation does not allow to update overload protection policy at run-time without restarting the SWIM Node).

Point to point mutual authentication and certificate revocation status check

Amqps peers mutual authentication and certificate revocation status check success criteria and requirements have been successfully validated at both application - SWIM Node and Air SWIM Node - Ground SWIM Node connection levels.

The authentication policy allows:

- to accept potentially revoked or compromised certificate only if the OCSP is not reachable over the network.

- to do not accept potentially revoked or compromised certificate only if the OCSP is not reachable over the network.

Currently, the Purple Profile allows only X.509v3 "client" authentication: it should be evaluated the possibility to allow SASL PLAIN with server peer TLS (no mutual TLS) for aircraft application. For instance a pilot using an EFB may login using his/her username and password and these credentials are also used to authenticate the user against the Air SWIM Node but still using secure transport (TLS).

Few success criteria have partially ok validation result status because, although logging, tracing and reporting (monitoring capabilities) of authentication events have been successfully validated, current audit solution is based on logging capabilities without dedicated audit policies. In other words, the solution supports a simplified implementation of audit policies based on logging.

Point to point authorization

Air and Ground SWIM Node side authorization success criteria and requirements have been successfully validated.

Authorization policies configurability (via administrative interface) and enforcement have been successfully validated: policies can be configured offline but also at runtime (e.g. adding a new authorized entity) without restarting the SWIM Node.

Few success criteria have partially ok validation result status because, although logging, tracing and reporting (monitoring capabilities) of events concerning the authorisation policies enforcement have been successfully validated, current audit solution is based on logging capabilities without dedicated audit policies. In other words, the solution supports a simplified implementation of audit policies based on logging.

End to end integrity, authenticity and encryption

End to end message level security mechanism (detached from the data) success criteria and requirements have been successfully validated. In end to end integrity and authenticity (both HMAC and digital signature) and confidentially have been validated for uplink, downlink, request/response and publish/subscribe Purple Profile enabled services. In accordance with the TS, end-to-end digital signature based message level integrity and authenticity success criteria have been validated also for subscription management FDRR-MEP.

While designing and implementing the solution few must to have improvements concerning the TS have been identified. Exercise level design has been adopted and candidate improvements suggested as final TRL6 TS task. In particular:

- In the TS Table 63, for both HMAC footer and Encrypted application-data section footer entries, the sentence "[…]*comma separated "uuid" and "secret" pairs. For each intended recipient a dedicated "uuid" and "secret" pair is provided*[…]" is not complete because it is not stated how uuid and secret are separated. Exercise design was to use ":".

- In the TS Table 63, for both HMAC footer and Encrypted application-data section footer entries, there is no way to provide the encryption algorithm used when encrypting the "secret" with recipient's public key. Exercise design was to configure off-line the target algorithm.

- For Encrypted application-data section footer entry in the TS Table 63, it is recommended to use only symmetric encryption.
- For Digital Signature footer entry in the TS Table 63, the sender's public key lookup is based on sender's uuid. Taking into account that this AMQP header is not always propagated end to end, a fallback option should be specified. Exercise design was to a) configure offline a list of known "senders" and b) to transfer that information using also a dedicated application property.
- In the TS a more complete list/references for algorithm names/identifier should be provided.
- In the TS Table 63, for both HMAC footer and Encrypted application-data section footer entries, it should be stated how the sender is notified about the new recipient (this is of interest only for the P/S MEP).

Furthermore, taking into account limitations of some available OTS/libraries, current implementation is able to send, receive and route message level security information using both AMQP footer and AMQP application-property (same key and value as specified for the AMQP footer). This allows to handle cases where non-fully AMQP "ready" application/SWIM Node are not able to send/receive such data using the AMQP footer.

A.3.5 Unexpected Behaviours/Results

The exercise was performed according to expected results and behaviour. Nothing to add.

A.3.6 Confidence in Results of Validation Exercise 1

A.3.6.1. Level of significance/limitations of Technical Validation Exercise Results

EXE1 technical validation activities are considered representative and valuable from different perspectives:

- Architecture and capabilities: during design, prototyping and validation activities EXE1 tried to be conformant to what is designed and specified in the TS in terms of technical architecture.
- Technical validation objectives coverage: EXE1 covered all the technical validation objectives trying to provide the solution with concrete and complete validation results.
- Requirements coverage: almost all the requirements in scope of technical validation activities have been implemented.
- Network: EXE1 V&VI is composed by distributed IBPs around the Europe. This is considered really important especially for what concern the interaction between the ground SWIM Nodes and Services and the aircraft SWIM Nodes. In particular. Furthermore, in EXE1.0002 deployment, also P14.02 prototypes (FCI) have been integrated.
- Purple Profile Enabled SWIM Service: special focus was on the technical design of all the ground and aircraft provided services in order to adhere to the applicable requirements (functional requirements, interface requirements, etc.). EXE1 covered both uplink (request/response and publish/subscribe) and downlink (request/response and

publish/subscribe) information exchange (EXE1 AN [45]), and international standards were used for aeronautical (AIXM 5.1), weather (iWXXM 1.1) and flight (FIXM 4.1.0) data.

- EXE1.0001 scenario (successfully validated) involves Purple Profile enabled applications, SWIM services and SWIM Nodes from different solution members.

In terms of limitations:

- EXE1.0001 scenario has been designed considering a short period of time for running the exercise. So that, scenario has been composed including major information and simplified details. These details were considered less important and low impacting the consistency of the exercise results and their significance. In particular, by fulfilling time constraints, scenario was created as much compact as possible in order to include every factors (METAR, NOTAM, Meteoprobe) useful to run the exercise in a reasonable time
- More complete real-life technical and operational deployment (workload, number of services, number of A/C, etc.). This is an aspect to be further evaluated as part of industrialization.

A.3.6.2.Quality of Technical Validation Exercises Results

Overall the quality of the results is good in terms of planned vs achieved results and feedback about Purple Profile technical feasibility.

A.3.6.3.Significance of Technical Validation Exercises Results

From a technical point of view, the significance of EXE1 results is proven by the relevance described above in terms of architecture, objectives and requirements coverage, network and Purple Profile enabled SWIM services. From the operational point of view, although it not the primary objective for technological solutions, EXE1 descried, realized and successfully validated 3 “operational oriented” scenarios (TRL6 TVALP §5.1.4 [40]). For each scenario it was also tried to describe the difference between what is happening today in operation and what may happen in future thanks to SWIM.

The scenarios from TRL4 have been extended and improved in TRL6. For instance, in TRL6 also downlink of A/C provided trajectory (FIXM) over Purple Profile enabled SWIM service has been validated. It has demonstrated that data downlinked using the SWIM Purple Profile can provide useful information to an Air Traffic Controller.

A.3.7 Conclusions

This section provides a summary of the conclusions raised by EXE1 validation activities results detailed in §A.3.4.

A.3.7.1.Conclusions on technical feasibility

EXE1 technical validation activities results successfully demonstrated the technical feasibility of what in the TS is designed and specified in terms of technical architecture, technical use cases, point to point and end to end security and QoS.

The SWIM architecture tested during the exercise demonstrated its flexibility and consistency. This type of SWIM architecture is versatile, making possible to implement different services in a simple way. In this concept, some additional services can be integrated easily with a coherent level of data security in terms of end-to-end, protocol and infrastructural matter.

A SWIM Purple Profile connection between air and ground participants can certainly provide useful information interchange.

A.3.7.2.Conclusions on performance assessments

Some initial considerations have been provided in §A.3.3. As anticipated, it is possible to conclude that identified and validated security controls successfully reduce the risks as documented in the SAR.

For what concerns global interoperability and taking into account that in the context of this exercise i) software prototypes (application/service, Air/Ground SWM infrastructure and Network layers) from different solution members have been successfully integrated (technical interoperability), and ii) completeness and technical feasibility of the TS have been validated, EXE1 demonstrated that this solution contributes positively to this KPA.

However, as described in the TRL6 TVALP §4.3.1 [44], there are additional KPAs indirectly impacted by this solution. Those KPAs should be evaluated during next maturity phase in a real-life technical and operational deployment.

A.3.8 Recommendations

Following recommendation for the next maturity phase has been envisaged:

- Performance (KPAs, and technical measures like latency) assessment should be done in a real-life technical and operational deployment.
- Taking into account performance and reliability results, it is recommended to do not adopt the “single Ground SWIM Node” deployment option. If mandated by specific deployment, multiple replica should be available.

Following recommendation for the final TRL6 TS:

- Discuss and implement all the comments and refinements identified during prototyping activities.
- To discuss the possibility to specify the AMQP based protocol to be used to synchronized federated Ground SWIM Nodes replica.

Finally, EXE1 members recognized that building applications that make use of SWIM technology can be a complex undertaking. Deep and up-to-date knowledge is required of the AMQP protocol and of the APIs of the associated libraries. The same goes for incorporating encryption into the

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communication protocol. It is therefore advisable for users of SWIM to invest time and effort in building up this expertise, so as to have a dedicated core of knowledgeable engineers who can create and troubleshoot these applications.

Appendix B Technical Validation Exercise #02 Report

B.1 Summary of the Technical Validation Exercise #02 Plan

EXE2 TRL6 plan is described in the PJ.17-01 TRL6 TVALP §5.2 [44].

B.1.1 Technical Validation Exercise #02 description and scope

EXE2 represents the evolution of TRL4 EXE2 according to TRL6 validation activities purposes and applicable validation objectives. Ground System was connected to several simulated Aircraft Systems in order to test the correct performance of the entities in a one-to-many Purple Profile SWIM nodes. The number of SWIM Nodes was defined for each test, according to the different validation objectives. Ground and Air systems interchanged meteorological and aeronautical data through specific MEPs that supported those scenarios. ICARO, a real data provider system, was connected to Ground node in order to distribute any necessary information requested from any aircraft through a Request/Response or Publish/Subscribe MEP. Communication between nodes was performed through SATCOM a (WAN emulator). During TRL4, EXE2 focused on the functional and technical aspect. EXE2 evolution was focused on Performance, Reliability, Security and non-nominal cases. In terms of dependencies and relationships, EXE2 does not depend on any EXE. EXE2 prototypes were reused in EXE4. Communications were transferred through SATCOM, a WAN Emulator developed by Indra which provides an environment with errors, delays, bottlenecks and/or overhead. This configuration allowed to test the proper communication between systems in a non-ideal environment and setting the different conditions to validate Performance objectives.

The EXE2 evolution was complete by the integration of the real system named ICARO as Data Provider. ICARO (Integrated COM/AIS/AIP & Reporting Office Automated System) manages airport NOTAM data along with flight plans and weather information, and it is used by ENAIRE in the daily operation. The above-mentioned Data provision was performed on TRL4 simulations by using ad-hoc developed tools.

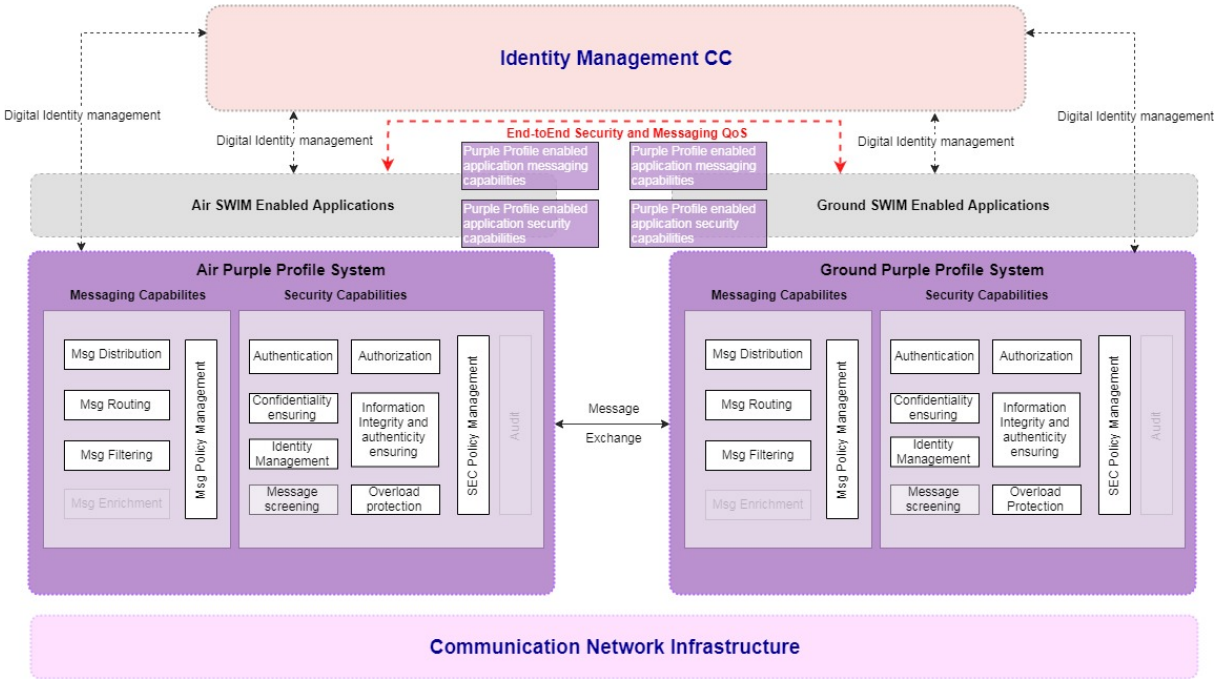


Figure 18: EXE2 General Schema

Further details are provided in PJ.17-01 TRL6 TVALP §5.2.1 [44].

B.1.2 Summary of Exercise 2 Technical Validation Objectives and success criteria

EXE2 technical validation objectives and success criteria summary is provided in PJ.17-01 TRL6 TVALP §5.2.3 [44].

B.1.3 Summary of Technical Validation Exercise #02 Validation scenarios

EXE2 validation scenarios are described in PJ.17-01 TRL6 TVALP §5.2.4 [44].

B.1.4 Summary Technical Validation Exercise #02 Assumptions

In accordance with PJ.17-01 TRL6 TVALP §5.2.5 [44], no assumptions concerning the validation activities have been recorded.

B.2 Deviation from the planned activities

Table 19 provides the deviations in terms of EXE2 technical validation objectives coverage with respect to what was as planned in the TVALP [44]. For completeness, the table includes planned coverage (refer to Table 10) and when applicable deviations are highlighted and justified.

Technical Validation Objective ID	Success Criterion ID	EXE2	EXE2 Justification

Technical Validation Objective ID	Success Criterion ID	EXE2	EXE2 Justification
OBJ-17.01-TRL6-TVALP-PERF.0001	CRT-17.01-TRL6-TVALP-PERF.0001	No deviation	N/A
OBJ-17.01-TRL6-TVALP-PERF.0002	CRT-17.01-TRL6-TVALP-PERF.0002	No deviation	N/A
OBJ-17.01-TRL6-TVALP-PERF.0003	CRT-17.01-TRL6-TVALP-PERF.0003	No deviation	N/A
OBJ-17.01-TRL6-TVALP-PERF.0004	CRT-17.01-TRL6-TVALP-PERF.0004	No deviation	N/A
OBJ-17.01-TRL6-TVALP-PERF.0005	CRT-17.01-TRL6-TVALP-PERF.0005	No deviation	N/A
OBJ-17.01-TRL6-TVALP-PERF.0005	CRT-17.01-TRL6-TVALP-PERF.0006	No deviation	N/A
OBJ-17.01-TRL6-TVALP-PERF.0006	CRT-17.01-TRL6-TVALP-PERF.0007	No deviation	N/A
OBJ-17.01-TRL6-TVALP-PERF.0006	CRT-17.01-TRL6-TVALP-PERF.0006	No deviation	N/A
OBJ-17.01-TRL6-TVALP-PERF.0007	CRT-17.01-TRL6-TVALP-PERF.0008	No deviation	N/A
OBJ-17.01-TRL6-TVALP-PERF.0007	CRT-17.01-TRL6-TVALP-PERF.0006	No deviation	N/A
OBJ-17.01-TRL6-TVALP-PERF.0008	CRT-17.01-TRL6-TVALP-PERF.0009	No deviation	N/A
OBJ-17.01-TRL6-TVALP-PERF.0008	CRT-17.01-TRL6-TVALP-PERF.0006	No deviation	N/A
OBJ-17.01-TRL6-TVALP-PERF.0009	CRT-17.01-TRL6-TVALP-PERF.0010	No deviation	N/A
OBJ-17.01-TRL6-TVALP-PERF.0010	CRT-17.01-TRL6-TVALP-PERF.0011	No deviation	N/A
OBJ-17.01-TRL6-TVALP-PERF.0011	CRT-17.01-TRL6-TVALP-PERF.0012	No deviation	N/A
OBJ-17.01-TRL6-TVALP-PERF.0012	CRT-17.01-TRL6-TVALP-PERF.0013	No deviation	N/A
OBJ-17.01-TRL6-TVALP-PERF.0013	CRT-17.01-TRL6-TVALP-PERF.0014	No deviation	N/A

Technical Validation Objective ID	Success Criterion ID	EXE2	EXE2 Justification
OBJ-17.01-TRL6-TVALP-PERF.0014	CRT-17.01-TRL6-TVALP-PERF.0015	No deviation	N/A
OBJ-17.01-TRL6-TVALP-PERF.0015	CRT-17.01-TRL6-TVALP-PERF.0016	No deviation	N/A
OBJ-17.01-TRL6-TVALP-PERF.0016	CRT-17.01-TRL6-TVALP-PERF.0017	No deviation	N/A
OBJ-17.01-TRL6-TVALP-PERF.0017	CRT-17.01-TRL6-TVALP-PERF.0018	No deviation	N/A
OBJ-17.01-TRL6-TVALP-PERF.0018	CRT-17.01-TRL6-TVALP-PERF.0019	No deviation	N/A
OBJ-17.01-TRL6-TVALP-PERF.0019	CRT-17.01-TRL6-TVALP-PERF.0020	No deviation	N/A
OBJ-17.01-TRL6-TVALP-PERF.0020	CRT-17.01-TRL6-TVALP-PERF.0021	No deviation	N/A
OBJ-17.01-TRL6-TVALP-PERF.0021	CRT-17.01-TRL6-TVALP-PERF.0022	No deviation	N/A
OBJ-17.01-TRL6-TVALP-PERF.0022	CRT-17.01-TRL6-TVALP-PERF.0023	No deviation	N/A
OBJ-17.01-TRL6-TVALP-PERF.0023	CRT-17.01-TRL6-TVALP-PERF.0024	No deviation	N/A
OBJ-17.01-TRL6-TVALP-PERF.0024	CRT-17.01-TRL6-TVALP-PERF.0025	No deviation	N/A
OBJ-17.01-TRL6-TVALP-PERF.0025	CRT-17.01-TRL6-TVALP-PERF.0026	No deviation	N/A
OBJ-17.01-TRL6-TVALP-PERF.0026	CRT-17.01-TRL6-TVALP-PERF.0027	No deviation	N/A
OBJ-17.01-TRL6-TVALP-REL.0001	CRT-17.01-TRL6-TVALP-REL.0001	No deviation	N/A
OBJ-17.01-TRL6-TVALP-REL.0001	CRT-17.01-TRL6-TVALP-REL.0002	No deviation	N/A
OBJ-17.01-TRL6-TVALP-REL.0001	CRT-17.01-TRL6-TVALP-REL.0026	No deviation	N/A
OBJ-17.01-TRL6-TVALP-REL.0001	CRT-17.01-TRL6-TVALP-REL.0003	No deviation	N/A

Technical Validation Objective ID	Success Criterion ID	EXE2	EXE2 Justification
OBJ-17.01-TRL6-TVALP-REL.0001	CRT-17.01-TRL6-TVALP-REL.0004	No deviation	N/A
OBJ-17.01-TRL6-TVALP-REL.0001	CRT-17.01-TRL6-TVALP-REL.0027	No deviation	N/A
OBJ-17.01-TRL6-TVALP-REL.0001	CRT-17.01-TRL6-TVALP-REL.0005	No deviation	N/A
OBJ-17.01-TRL6-TVALP-REL.0001	CRT-17.01-TRL6-TVALP-REL.0006	No deviation	N/A
OBJ-17.01-TRL6-TVALP-REL.0001	CRT-17.01-TRL6-TVALP-REL.0007	No deviation	N/A
OBJ-17.01-TRL6-TVALP-REL.0002	CRT-17.01-TRL6-TVALP-REL.0008	No deviation	N/A
OBJ-17.01-TRL6-TVALP-REL.0002	CRT-17.01-TRL6-TVALP-REL.0009	No deviation	N/A
OBJ-17.01-TRL6-TVALP-REL.0002	CRT-17.01-TRL6-TVALP-REL.0028	No deviation	N/A
OBJ-17.01-TRL6-TVALP-REL.0002	CRT-17.01-TRL6-TVALP-REL.0010	No deviation	N/A
OBJ-17.01-TRL6-TVALP-REL.0002	CRT-17.01-TRL6-TVALP-REL.0011	No deviation	N/A
OBJ-17.01-TRL6-TVALP-REL.0002	CRT-17.01-TRL6-TVALP-REL.0029	No deviation	N/A
OBJ-17.01-TRL6-TVALP-REL.0002	CRT-17.01-TRL6-TVALP-REL.0005	No deviation	N/A
OBJ-17.01-TRL6-TVALP-REL.0002	CRT-17.01-TRL6-TVALP-REL.0006	No deviation	N/A
OBJ-17.01-TRL6-TVALP-REL.0002	CRT-17.01-TRL6-TVALP-REL.0007	No deviation	N/A
OBJ-17.01-TRL6-TVALP-REL.0003	CRT-17.01-TRL6-TVALP-REL.0012	No deviation	N/A
OBJ-17.01-TRL6-TVALP-REL.0003	CRT-17.01-TRL6-TVALP-REL.0013	No deviation	N/A
OBJ-17.01-TRL6-TVALP-REL.0003	CRT-17.01-TRL6-TVALP-REL.0030	No deviation	N/A

Technical Validation Objective ID	Success Criterion ID	EXE2	EXE2 Justification
OBJ-17.01-TRL6-TVALP-REL.0003	CRT-17.01-TRL6-TVALP-REL.0005	No deviation	N/A
OBJ-17.01-TRL6-TVALP-REL.0003	CRT-17.01-TRL6-TVALP-REL.0006	No deviation	N/A
OBJ-17.01-TRL6-TVALP-REL.0003	CRT-17.01-TRL6-TVALP-REL.0007	No deviation	N/A
OBJ-17.01-TRL6-TVALP-REL.0004	CRT-17.01-TRL6-TVALP-REL.0014	No deviation	N/A
OBJ-17.01-TRL6-TVALP-REL.0004	CRT-17.01-TRL6-TVALP-REL.0015	No deviation	N/A
OBJ-17.01-TRL6-TVALP-REL.0004	CRT-17.01-TRL6-TVALP-REL.0031	No deviation	N/A
OBJ-17.01-TRL6-TVALP-REL.0004	CRT-17.01-TRL6-TVALP-REL.0005	No deviation	N/A
OBJ-17.01-TRL6-TVALP-REL.0004	CRT-17.01-TRL6-TVALP-REL.0006	No deviation	N/A
OBJ-17.01-TRL6-TVALP-REL.0004	CRT-17.01-TRL6-TVALP-REL.0007	No deviation	N/A
OBJ-17.01-TRL6-TVALP-REL.0005	CRT-17.01-TRL6-TVALP-REL.0016	No deviation	N/A
OBJ-17.01-TRL6-TVALP-REL.0005	CRT-17.01-TRL6-TVALP-REL.0017	No deviation	N/A
OBJ-17.01-TRL6-TVALP-REL.0005	CRT-17.01-TRL6-TVALP-REL.0032	No deviation	N/A
OBJ-17.01-TRL6-TVALP-REL.0005	CRT-17.01-TRL6-TVALP-REL.0018	No deviation	N/A
OBJ-17.01-TRL6-TVALP-REL.0005	CRT-17.01-TRL6-TVALP-REL.0019	No deviation	N/A
OBJ-17.01-TRL6-TVALP-REL.0005	CRT-17.01-TRL6-TVALP-REL.0033	No deviation	N/A
OBJ-17.01-TRL6-TVALP-REL.0005	CRT-17.01-TRL6-TVALP-REL.0005	No deviation	N/A
OBJ-17.01-TRL6-TVALP-REL.0005	CRT-17.01-TRL6-TVALP-REL.0006	No deviation	N/A

Technical Validation Objective ID	Success Criterion ID	EXE2	EXE2 Justification
OBJ-17.01-TRL6-TVALP-REL.0005	CRT-17.01-TRL6-TVALP-REL.0007	No deviation	N/A
OBJ-17.01-TRL6-TVALP-REL.0006	CRT-17.01-TRL6-TVALP-REL.0020	No deviation	N/A
OBJ-17.01-TRL6-TVALP-REL.0006	CRT-17.01-TRL6-TVALP-REL.0021	No deviation	N/A
OBJ-17.01-TRL6-TVALP-REL.0006	CRT-17.01-TRL6-TVALP-REL.0034	No deviation	N/A
OBJ-17.01-TRL6-TVALP-REL.0006	CRT-17.01-TRL6-TVALP-REL.0022	No deviation	N/A
OBJ-17.01-TRL6-TVALP-REL.0006	CRT-17.01-TRL6-TVALP-REL.0011	No deviation	N/A
OBJ-17.01-TRL6-TVALP-REL.0006	CRT-17.01-TRL6-TVALP-REL.0035	No deviation	N/A
OBJ-17.01-TRL6-TVALP-REL.0006	CRT-17.01-TRL6-TVALP-REL.0005	No deviation	N/A
OBJ-17.01-TRL6-TVALP-REL.0006	CRT-17.01-TRL6-TVALP-REL.0006	No deviation	N/A
OBJ-17.01-TRL6-TVALP-REL.0006	CRT-17.01-TRL6-TVALP-REL.0007	No deviation	N/A
OBJ-17.01-TRL6-TVALP-REL.0007	CRT-17.01-TRL6-TVALP-REL.0023	No deviation	N/A
OBJ-17.01-TRL6-TVALP-REL.0007	CRT-17.01-TRL6-TVALP-REL.0024	No deviation	N/A
OBJ-17.01-TRL6-TVALP-REL.0007	CRT-17.01-TRL6-TVALP-REL.0036	No deviation	N/A
OBJ-17.01-TRL6-TVALP-REL.0007	CRT-17.01-TRL6-TVALP-REL.0005	No deviation	N/A
OBJ-17.01-TRL6-TVALP-REL.0007	CRT-17.01-TRL6-TVALP-REL.0006	No deviation	N/A
OBJ-17.01-TRL6-TVALP-REL.0007	CRT-17.01-TRL6-TVALP-REL.0007	No deviation	N/A
OBJ-17.01-TRL6-TVALP-REL.0008	CRT-17.01-TRL6-TVALP-REL.0025	No deviation	N/A

Technical Validation Objective ID	Success Criterion ID	EXE2	EXE2 Justification
OBJ-17.01-TRL6-TVALP-REL.0008	CRT-17.01-TRL6-TVALP-REL.0038	No deviation	N/A
OBJ-17.01-TRL6-TVALP-REL.0008	CRT-17.01-TRL6-TVALP-REL.0037	No deviation	N/A
OBJ-17.01-TRL6-TVALP-REL.0008	CRT-17.01-TRL6-TVALP-REL.0005	No deviation	N/A
OBJ-17.01-TRL6-TVALP-REL.0008	CRT-17.01-TRL6-TVALP-REL.0006	No deviation	N/A
OBJ-17.01-TRL6-TVALP-REL.0008	CRT-17.01-TRL6-TVALP-REL.0007	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0001	CRT-17.01-TRL6-TVALP-SEC.0001	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0001	CRT-17.01-TRL6-TVALP-SEC.0002	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0001	CRT-17.01-TRL6-TVALP-SEC.0003	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0001	CRT-17.01-TRL6-TVALP-SEC.0004	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0001	CRT-17.01-TRL6-TVALP-SEC.0008	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0001	CRT-17.01-TRL6-TVALP-SEC.0009	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0002	CRT-17.01-TRL6-TVALP-SEC.0001	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0002	CRT-17.01-TRL6-TVALP-SEC.0002	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0002	CRT-17.01-TRL6-TVALP-SEC.0003	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0002	CRT-17.01-TRL6-TVALP-SEC.0005	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0002	CRT-17.01-TRL6-TVALP-SEC.0006	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0002	CRT-17.01-TRL6-TVALP-SEC.0007	No deviation	N/A

Technical Validation Objective ID	Success Criterion ID	EXE2	EXE2 Justification
OBJ-17.01-TRL6-TVALP-SEC.0002	CRT-17.01-TRL6-TVALP-SEC.0008	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0002	CRT-17.01-TRL6-TVALP-SEC.0009	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0003	CRT-17.01-TRL6-TVALP-SEC.0010	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0003	CRT-17.01-TRL6-TVALP-SEC.0011	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0003	CRT-17.01-TRL6-TVALP-SEC.0012	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0003	CRT-17.01-TRL6-TVALP-SEC.0004	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0003	CRT-17.01-TRL6-TVALP-SEC.0008	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0003	CRT-17.01-TRL6-TVALP-SEC.0009	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0004	CRT-17.01-TRL6-TVALP-SEC.0010	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0004	CRT-17.01-TRL6-TVALP-SEC.0011	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0004	CRT-17.01-TRL6-TVALP-SEC.0012	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0004	CRT-17.01-TRL6-TVALP-SEC.0005	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0004	CRT-17.01-TRL6-TVALP-SEC.0006	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0004	CRT-17.01-TRL6-TVALP-SEC.0007	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0004	CRT-17.01-TRL6-TVALP-SEC.0008	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0004	CRT-17.01-TRL6-TVALP-SEC.0009	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0005	CRT-17.01-TRL6-TVALP-SEC.0013	**Fully covered**	Implementation of this feature had no impact on the development plan, so it was included.

Technical Validation Objective ID	Success Criterion ID	EXE2	EXE2 Justification
OBJ-17.01-TRL6-TVALP-SEC.0005	CRT-17.01-TRL6-TVALP-SEC.0014	**Fully covered**	Implementation of this feature had no impact on the development plan, so it was included.
OBJ-17.01-TRL6-TVALP-SEC.0005	CRT-17.01-TRL6-TVALP-SEC.0015	**Fully covered**	Implementation of this feature had no impact on the development plan, so it was included.
OBJ-17.01-TRL6-TVALP-SEC.0005	CRT-17.01-TRL6-TVALP-SEC.0016	**Fully covered**	A complete Audit policy was not in the scope of EXE2, but this kind of events are logged.
OBJ-17.01-TRL6-TVALP-SEC.0005	CRT-17.01-TRL6-TVALP-SEC.0017	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0005	CRT-17.01-TRL6-TVALP-SEC.0018	**Fully covered**	Implementation of this feature had no impact on the development plan, so it was included.
OBJ-17.01-TRL6-TVALP-SEC.0005	CRT-17.01-TRL6-TVALP-SEC.0019	**Fully covered**	Implementation of this feature had no impact on the development plan, so it was included.
OBJ-17.01-TRL6-TVALP-SEC.0006	CRT-17.01-TRL6-TVALP-SEC.0020	**Fully covered**	Implementation of this feature had no impact on the development plan, so it was included.
OBJ-17.01-TRL6-TVALP-SEC.0006	CRT-17.01-TRL6-TVALP-SEC.0021	**Fully covered**	Implementation of this feature had no impact on the development plan, so it was included.
OBJ-17.01-TRL6-TVALP-SEC.0006	CRT-17.01-TRL6-TVALP-SEC.0022	**Fully covered**	Implementation of this feature had no impact on the development plan, so it was included.
OBJ-17.01-TRL6-TVALP-SEC.0006	CRT-17.01-TRL6-TVALP-SEC.0016	**Fully covered**	A complete Audit policy was not in the scope of EXE2, but this kind of events are logged.
OBJ-17.01-TRL6-TVALP-SEC.0006	CRT-17.01-TRL6-TVALP-SEC.0017	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0006	CRT-17.01-TRL6-TVALP-SEC.0018	**Fully covered**	Implementation of this feature had no impact on the development plan, so it was included.
OBJ-17.01-TRL6-TVALP-SEC.0006	CRT-17.01-TRL6-TVALP-SEC.0019	**Fully covered**	Implementation of this feature had no impact on the development plan, so it was included.

Technical Validation Objective ID	Success Criterion ID	EXE2	EXE2 Justification
OBJ-17.01-TRL6-TVALP-SEC.0007	CRT-17.01-TRL6-TVALP-SEC.0013	**Partially covered**	Implementation of this feature had no impact on the development plan, so it was included.
OBJ-17.01-TRL6-TVALP-SEC.0007	CRT-17.01-TRL6-TVALP-SEC.0014	**Partially covered**	Implementation of this feature had no impact on the development plan, so it was included.
OBJ-17.01-TRL6-TVALP-SEC.0007	CRT-17.01-TRL6-TVALP-SEC.0015	**Partially covered**	Implementation of this feature had no impact on the development plan, so it was included.
OBJ-17.01-TRL6-TVALP-SEC.0007	CRT-17.01-TRL6-TVALP-SEC.0016	**Fully covered**	A complete Audit policy was not in the scope of EXE2, but this kind of events are logged.
OBJ-17.01-TRL6-TVALP-SEC.0007	CRT-17.01-TRL6-TVALP-SEC.0017	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0007	CRT-17.01-TRL6-TVALP-SEC.0023	**Partially covered**	Message queue capacity (REQ-17.01-TS-0160.0060) is implemented partially, covering queue limit in terms of size (Mbytes).
OBJ-17.01-TRL6-TVALP-SEC.0008	CRT-17.01-TRL6-TVALP-SEC.0020	**Partially covered**	Implementation of this feature had no impact on the development plan, so it was included.
OBJ-17.01-TRL6-TVALP-SEC.0008	CRT-17.01-TRL6-TVALP-SEC.0021	**Partially covered**	Implementation of this feature had no impact on the development plan, so it was included.
OBJ-17.01-TRL6-TVALP-SEC.0008	CRT-17.01-TRL6-TVALP-SEC.0022	**Partially covered**	Implementation of this feature had no impact on the development plan, so it was included.
OBJ-17.01-TRL6-TVALP-SEC.0008	CRT-17.01-TRL6-TVALP-SEC.0016	**Fully covered**	A complete Audit policy was not in the scope of EXE2, but this kind of events are logged.
OBJ-17.01-TRL6-TVALP-SEC.0008	CRT-17.01-TRL6-TVALP-SEC.0017	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0008	CRT-17.01-TRL6-TVALP-SEC.0024	**Partially covered**	N/A
OBJ-17.01-TRL6-TVALP-SEC.0009	CRT-17.01-TRL6-TVALP-SEC.0025	No deviation	N/A

Technical Validation Objective ID	Success Criterion ID	EXE2	EXE2 Justification
OBJ-17.01-TRL6-TVALP-SEC.0009	CRT-17.01-TRL6-TVALP-SEC.0016	**Fully covered**	A complete Audit policy was not in the scope of EXE2, but this kind of events are logged.
OBJ-17.01-TRL6-TVALP-SEC.0009	CRT-17.01-TRL6-TVALP-SEC.0026	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0010	CRT-17.01-TRL6-TVALP-SEC.0027	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0010	CRT-17.01-TRL6-TVALP-SEC.0016	**Fully covered**	A complete Audit policy was not in the scope of EXE2, but this kind of events are logged.
OBJ-17.01-TRL6-TVALP-SEC.0010	CRT-17.01-TRL6-TVALP-SEC.0028	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0011	CRT-17.01-TRL6-TVALP-SEC.0029	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0011	CRT-17.01-TRL6-TVALP-SEC.0030	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0011	CRT-17.01-TRL6-TVALP-SEC.0031	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0011	CRT-17.01-TRL6-TVALP-SEC.0032	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0011	CRT-17.01-TRL6-TVALP-SEC.0033	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0011	CRT-17.01-TRL6-TVALP-SEC.0034	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0011	CRT-17.01-TRL6-TVALP-SEC.0035	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0012	CRT-17.01-TRL6-TVALP-SEC.0036	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0012	CRT-17.01-TRL6-TVALP-SEC.0037	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0012	CRT-17.01-TRL6-TVALP-SEC.0038	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0013	CRT-17.01-TRL6-TVALP-SEC.0029	No deviation	N/A

Technical Validation Objective ID	Success Criterion ID	EXE2	EXE2 Justification
OBJ-17.01-TRL6-TVALP-SEC.0013	CRT-17.01-TRL6-TVALP-SEC.0030	**Not covered**	No OCSP was planned for EXE2. Some related requirements were covered because SEC.0030 criterion was covered for validation objective SEC.0011. This one was considered covered too for this objective. But taking into account OCSP context, this cannot be considered covered just based on requirements coverage.
OBJ-17.01-TRL6-TVALP-SEC.0013	CRT-17.01-TRL6-TVALP-SEC.0031	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0013	CRT-17.01-TRL6-TVALP-SEC.0032	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0013	CRT-17.01-TRL6-TVALP-SEC.0039	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0013	CRT-17.01-TRL6-TVALP-SEC.0040	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0013	CRT-17.01-TRL6-TVALP-SEC.0041	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0013	CRT-17.01-TRL6-TVALP-SEC.0042	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0014	CRT-17.01-TRL6-TVALP-SEC.0043	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0014	CRT-17.01-TRL6-TVALP-SEC.0044	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0014	CRT-17.01-TRL6-TVALP-SEC.0045	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0014	CRT-17.01-TRL6-TVALP-SEC.0046	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0014	CRT-17.01-TRL6-TVALP-SEC.0047	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0014	CRT-17.01-TRL6-TVALP-SEC.0048	No deviation	N/A

Technical Validation Objective ID	Success Criterion ID	EXE2	EXE2 Justification
OBJ-17.01-TRL6-TVALP-SEC.0015	CRT-17.01-TRL6-TVALP-SEC.0049	**Fully covered**	Further analysis of this criterion changed the perspective about its coverage and it was included without major impact on development schedule.
OBJ-17.01-TRL6-TVALP-SEC.0015	CRT-17.01-TRL6-TVALP-SEC.0050	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0015	CRT-17.01-TRL6-TVALP-SEC.0051	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0015	CRT-17.01-TRL6-TVALP-SEC.0052	**Fully covered**	Further analysis of this criterion changed the perspective about its coverage and it was included without major impact on development schedule.
OBJ-17.01-TRL6-TVALP-SEC.0015	CRT-17.01-TRL6-TVALP-SEC.0053	**Fully covered**	A complete Audit policy was not in the scope of EXE2, but this kind of events are logged.
OBJ-17.01-TRL6-TVALP-SEC.0015	CRT-17.01-TRL6-TVALP-SEC.0054	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0015	CRT-17.01-TRL6-TVALP-SEC.0055	**Fully covered**	This is a logical consequence of changing coverage on criterion 0049 and 0052 of this validation objective.
OBJ-17.01-TRL6-TVALP-SEC.0015	CRT-17.01-TRL6-TVALP-SEC.0056	**Fully covered**	This is a logical consequence of changing coverage on criterion 0049 and 0052 of this validation objective.
OBJ-17.01-TRL6-TVALP-SEC.0015	CRT-17.01-TRL6-TVALP-SEC.0057	**Fully covered**	This is a logical consequence of changing coverage on criterion 0049 and 0052 of this validation objective.
OBJ-17.01-TRL6-TVALP-SEC.0015	CRT-17.01-TRL6-TVALP-SEC.0058	**Fully covered**	This is a logical consequence of changing coverage on criterion 0049 and 0052 of this validation objective.
OBJ-17.01-TRL6-TVALP-SEC.0016	CRT-17.01-TRL6-TVALP-SEC.0059	**Fully covered**	Further analysis of this criterion changed the perspective about its coverage and it was included without major impact on development schedule.
OBJ-17.01-TRL6-TVALP-SEC.0016	CRT-17.01-TRL6-TVALP-SEC.0060	No deviation	N/A

Technical Validation Objective ID	Success Criterion ID	EXE2	EXE2 Justification
OBJ-17.01-TRL6-TVALP-SEC.0016	CRT-17.01-TRL6-TVALP-SEC.0061	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0016	CRT-17.01-TRL6-TVALP-SEC.0062	**Fully covered**	Further analysis of this criterion changed the perspective about its coverage and it was included without major impact on development schedule.
OBJ-17.01-TRL6-TVALP-SEC.0016	CRT-17.01-TRL6-TVALP-SEC.0053	**Fully covered**	A complete Audit policy was not in the scope of EXE2, but this kind of events are logged.
OBJ-17.01-TRL6-TVALP-SEC.0016	CRT-17.01-TRL6-TVALP-SEC.0054	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0016	CRT-17.01-TRL6-TVALP-SEC.0063	**Fully covered**	This is a logical consequence of changing coverage on criterion 0059 and 0062 of this validation objective.
OBJ-17.01-TRL6-TVALP-SEC.0016	CRT-17.01-TRL6-TVALP-SEC.0064	**Fully covered**	This is a logical consequence of changing coverage on criterion 0059 and 0062 of this validation objective.
OBJ-17.01-TRL6-TVALP-SEC.0016	CRT-17.01-TRL6-TVALP-SEC.0065	**Fully covered**	This is a logical consequence of changing coverage on criterion 0059 and 0062 of this validation objective.
OBJ-17.01-TRL6-TVALP-SEC.0016	CRT-17.01-TRL6-TVALP-SEC.0066	**Fully covered**	This is a logical consequence of changing coverage on criterion 0059 and 0062 of this validation objective.
OBJ-17.01-TRL6-TVALP-SEC.0017	CRT-17.01-TRL6-TVALP-SEC.0067	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0017	CRT-17.01-TRL6-TVALP-SEC.0068	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0017	CRT-17.01-TRL6-TVALP-SEC.0069	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0017	CRT-17.01-TRL6-TVALP-SEC.0070	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0017	CRT-17.01-TRL6-TVALP-SEC.0071	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0017	CRT-17.01-TRL6-TVALP-SEC.0072	No deviation	N/A

Technical Validation Objective ID	Success Criterion ID	EXE2	EXE2 Justification
OBJ-17.01-TRL6-TVALP-SEC.0017	CRT-17.01-TRL6-TVALP-SEC.0073	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0018	CRT-17.01-TRL6-TVALP-SEC.0074	**Partially covered**	At this time, AMQP 1.0 footer is not compatible with JMS so it was not possible to use it for end-to-end security.
OBJ-17.01-TRL6-TVALP-SEC.0018	CRT-17.01-TRL6-TVALP-SEC.0075	**Partially covered**	At this time, AMQP 1.0 footer is not compatible with JMS so it was not possible to use it for end-to-end security.
OBJ-17.01-TRL6-TVALP-SEC.0018	CRT-17.01-TRL6-TVALP-SEC.0076	**Partially covered**	At this time, AMQP 1.0 footer is not compatible with JMS so it was not possible to use it for end-to-end security.
OBJ-17.01-TRL6-TVALP-SEC.0018	CRT-17.01-TRL6-TVALP-SEC.0077	**Partially covered**	At this time, AMQP 1.0 footer is not compatible with JMS so it was not possible to use it for end-to-end security.
OBJ-17.01-TRL6-TVALP-SEC.0019	CRT-17.01-TRL6-TVALP-SEC.0078	**Partially covered**	At this time, AMQP 1.0 footer is not compatible with JMS so it was not possible to use it for end-to-end security.
OBJ-17.01-TRL6-TVALP-SEC.0019	CRT-17.01-TRL6-TVALP-SEC.0079	**Partially covered**	At this time, AMQP 1.0 footer is not compatible with JMS so it was not possible to use it for end-to-end security.
OBJ-17.01-TRL6-TVALP-SEC.0019	CRT-17.01-TRL6-TVALP-SEC.0080	**Partially covered**	At this time, AMQP 1.0 footer is not compatible with JMS so it was not possible to use it for end-to-end security.
OBJ-17.01-TRL6-TVALP-SEC.0019	CRT-17.01-TRL6-TVALP-SEC.0081	**Partially covered**	At this time, AMQP 1.0 footer is not compatible with JMS so it was not possible to use it for end-to-end security.
OBJ-17.01-TRL6-TVALP-SEC.0020	CRT-17.01-TRL6-TVALP-SEC.0078	**Partially covered**	At this time, AMQP 1.0 footer is not compatible with JMS so it was not possible to use it for end-to-end security.

Technical Validation Objective ID	Success Criterion ID	EXE2	EXE2 Justification
OBJ-17.01-TRL6-TVALP-SEC.0020	CRT-17.01-TRL6-TVALP-SEC.0079	**Partially covered**	At this time, AMQP 1.0 footer is not compatible with JMS so it was not possible to use it for end-to-end security.
OBJ-17.01-TRL6-TVALP-SEC.0020	CRT-17.01-TRL6-TVALP-SEC.0080	**Partially covered**	At this time, AMQP 1.0 footer is not compatible with JMS so it was not possible to use it for end-to-end security.
OBJ-17.01-TRL6-TVALP-SEC.0020	CRT-17.01-TRL6-TVALP-SEC.0081	**Partially covered**	At this time, AMQP 1.0 footer is not compatible with JMS so it was not possible to use it for end-to-end security.
OBJ-17.01-TRL6-TVALP-SEC.0021	CRT-17.01-TRL6-TVALP-SEC.0082	**Partially covered**	At this time, AMQP 1.0 footer is not compatible with JMS so it was not possible to use it for end-to-end security.
OBJ-17.01-TRL6-TVALP-SEC.0021	CRT-17.01-TRL6-TVALP-SEC.0083	**Partially covered**	At this time, AMQP 1.0 footer is not compatible with JMS so it was not possible to use it for end-to-end security.
OBJ-17.01-TRL6-TVALP-SEC.0021	CRT-17.01-TRL6-TVALP-SEC.0084	**Partially covered**	At this time, AMQP 1.0 footer is not compatible with JMS so it was not possible to use it for end-to-end security.
OBJ-17.01-TRL6-TVALP-SEC.0021	CRT-17.01-TRL6-TVALP-SEC.0085	**Partially covered**	At this time, AMQP 1.0 footer is not compatible with JMS so it was not possible to use it for end-to-end security.
OBJ-17.01-TRL6-TVALP-SEC.0021	CRT-17.01-TRL6-TVALP-SEC.0086	**Partially covered**	At this time, AMQP 1.0 footer is not compatible with JMS so it was not possible to use it for end-to-end security.
OBJ-17.01-TRL6-TVALP-SEC.0021	CRT-17.01-TRL6-TVALP-SEC.0087	**Partially covered**	At this time, AMQP 1.0 footer is not compatible with JMS so it was not possible to use it for end-to-end security.
OBJ-17.01-TRL6-TVALP-SEC.0022	CRT-17.01-TRL6-TVALP-SEC.0088	**Partially covered**	At this time, AMQP 1.0 footer is not compatible with JMS so it was not possible to use it for end-to-end security.

Technical Validation Objective ID	Success Criterion ID	EXE2	EXE2 Justification
OBJ-17.01-TRL6-TVALP-SEC.0022	CRT-17.01-TRL6-TVALP-SEC.0089	**Partially covered**	At this time, AMQP 1.0 footer is not compatible with JMS so it was not possible to use it for end-to-end security.
OBJ-17.01-TRL6-TVALP-SEC.0022	CRT-17.01-TRL6-TVALP-SEC.0090	**Partially covered**	At this time, AMQP 1.0 footer is not compatible with JMS so it was not possible to use it for end-to-end security.
OBJ-17.01-TRL6-TVALP-SEC.0022	CRT-17.01-TRL6-TVALP-SEC.0091	**Partially covered**	At this time, AMQP 1.0 footer is not compatible with JMS so it was not possible to use it for end-to-end security.
OBJ-17.01-TRL6-TVALP-SEC.0022	CRT-17.01-TRL6-TVALP-SEC.0092	**Partially covered**	At this time, AMQP 1.0 footer is not compatible with JMS so it was not possible to use it for end-to-end security.
OBJ-17.01-TRL6-TVALP-SEC.0023	CRT-17.01-TRL6-TVALP-SEC.0088	**Partially covered**	At this time, AMQP 1.0 footer is not compatible with JMS so it was not possible to use it for end-to-end security.
OBJ-17.01-TRL6-TVALP-SEC.0023	CRT-17.01-TRL6-TVALP-SEC.0089	**Partially covered**	At this time, AMQP 1.0 footer is not compatible with JMS so it was not possible to use it for end-to-end security.
OBJ-17.01-TRL6-TVALP-SEC.0023	CRT-17.01-TRL6-TVALP-SEC.0090	**Partially covered**	At this time, AMQP 1.0 footer is not compatible with JMS so it was not possible to use it for end-to-end security.
OBJ-17.01-TRL6-TVALP-SEC.0023	CRT-17.01-TRL6-TVALP-SEC.0091	**Partially covered**	At this time, AMQP 1.0 footer is not compatible with JMS so it was not possible to use it for end-to-end security.
OBJ-17.01-TRL6-TVALP-SEC.0023	CRT-17.01-TRL6-TVALP-SEC.0092	**Partially covered**	At this time, AMQP 1.0 footer is not compatible with JMS so it was not possible to use it for end-to-end security.
OBJ-17.01-TRL6-TVALP-SEC.0024	CRT-17.01-TRL6-TVALP-SEC.0093	**Partially covered**	At this time, AMQP 1.0 footer is not compatible with JMS so it was not possible to use it for end-to-end security.

Technical Validation Objective ID	Success Criterion ID	EXE2	EXE2 Justification
OBJ-17.01-TRL6-TVALP-SEC.0024	CRT-17.01-TRL6-TVALP-SEC.0094	**Partially covered**	At this time, AMQP 1.0 footer is not compatible with JMS so it was not possible to use it for end-to-end security.
OBJ-17.01-TRL6-TVALP-SEC.0024	CRT-17.01-TRL6-TVALP-SEC.0095	**Partially covered**	At this time, AMQP 1.0 footer is not compatible with JMS so it was not possible to use it for end-to-end security.
OBJ-17.01-TRL6-TVALP-SEC.0025	CRT-17.01-TRL6-TVALP-SEC.0096	**Partially covered**	At this time, AMQP 1.0 footer is not compatible with JMS so it was not possible to use it for end-to-end security.
OBJ-17.01-TRL6-TVALP-SEC.0025	CRT-17.01-TRL6-TVALP-SEC.0097	**Partially covered**	At this time, AMQP 1.0 footer is not compatible with JMS so it was not possible to use it for end-to-end security.
OBJ-17.01-TRL6-TVALP-SEC.0026	CRT-17.01-TRL6-TVALP-SEC.0096	**Partially covered**	At this time, AMQP 1.0 footer is not compatible with JMS so it was not possible to use it for end-to-end security.
OBJ-17.01-TRL6-TVALP-SEC.0026	CRT-17.01-TRL6-TVALP-SEC.0097	**Partially covered**	At this time, AMQP 1.0 footer is not compatible with JMS so it was not possible to use it for end-to-end security.

Table 19: Deviations in terms of PJ.17-01 TRL6 EXE2 technical validation objectives coverage

More details about deviations and validation results are provided in B.3.

B.3 Technical Validation Exercise #02 Validation Results

B.3.1 Summary of Technical Validation Exercise #02 Results

In this section a detailed list of Validation Objectives results is provided. EXE2 focus was to maximize the coverage of Validation Objectives Success Criterion through coverage of requirements. Due to time limitations, <PP Core> and <PP Ground> were the priority Profile Parts. Coverage on not mandatory Profile Part is limited and restricted to its link with covered Success Criterion. Take into account that EXE2 is about Ground SWIM Node and all the aircrafts are simulated, so there is no coverage on any Air specific Profile Part requirements.

This is a quantitative summary of the requirement coverage by Profile Parts:

- <PP Core> 89% of coverage (220/248 requirements)

- Full coverage on 208 requirements (84%)
- Partial coverage on 12 requirements (5%)

- <PP Ground> 71% of coverage (15/21 requirements)
  - Full coverage on 12 requirements (57%))
  - Partial coverage on 3 requirements (14%)
  - Requirements not covered were all related with dynamic configurations, that were not in the scope of the requirements as stated on TVALP . In addition to this, REQ-17.01-TS-0110.0335 is not covered either.
- <PP Ground Advanced> 69% of coverage (22/32 requirements)
  - Full coverage on 21 requirements (66%)
  - Partial coverage on 1 requirement (3%)
  - Requirements not covered are those related mostly with Exactly-once Delivery Guarantees. Other are those about run-time configurations, Advanced Subscription Management Operations, and Deflate and Zlib compression technologies.
- <PP Ground Security+> 26% of coverage (7/27 requirements)
  - Full coverage on 6 requirements (22%)
  - Partial coverage on 1 requirement (4%)
  - Requirements nor covered are those related with OCSP, LDAP and CDP HTTP. The rest of the requirements are related with security elements that are not part of the middleware, so were not in the scope of EXE2.

Having a look back to Figure 18, the SWIM Nodes capabilities provided by this prototype are shown. There it is a more detailed list about the partial coverage, changes from the TVALP expected coverage and total lack of coverage:

- Message Enrichment is not covered.
- Message Screening is limited to malformed messages, not taking into account malicious messages.
- Audit. There is not a policy for that, but the system logs and records all the information that must be logged and recorded according to the TS requirements.
- Overload protection was not in the original scope of EXE2 as stated in TVALP. It has a partial coverage as it will be detailed in B.3.4.3.

Capabilities not listed here have the same coverage as anticipated in the TVALP.

Table 20~~Table 20~~ provides a summary of the EXE2 validation results per validation objective.

- OK: technical validation objective achieves the expectations (exercise results achieve success criteria).
- NOK: technical validation objective does not achieve the expectations (exercise results do not achieve success criteria).
- Partially OK: technical validation objective achieves the expectations to a certain extent. The reasons why the technical validation objective is not fully achieved have been recorded in table below.

EXE2 requirements coverage is provided in Appendix J.

Technical Validation Exercise #02 Technical Validation Objective ID	Technical Validation Exercise #02 Technical Validation Objective Title	Technical Validation Exercise #02 Success Criterion ID	Technical Validation Exercise #02 Success Criterion	Technical Validation Exercise #02 Validation Results	Technical Validation Exercise #02 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-PERF.0001	FIFO message queue level ordering guarantees QoS for uplink service	CRT-17.01-TRL6-TVALP-PERF.0001	Messages sent by the ground sender are received in the same FIFO order by the aircraft application.	As foreseen in TVALP, the validation only used IPv4, but the prototype was completely compatible with IPv6 as EXE4 validated. Ordering capabilities were successfully validated.	OK
OBJ-17.01-TRL6-TVALP-PERF.0002	FIFO message queue level ordering guarantees QoS for downlink service	CRT-17.01-TRL6-TVALP-PERF.0002	Messages sent by the air sender are received in the same FIFO order by the ground application.	As foreseen in TVALP, the validation only used IPv4, but the prototype was completely compatible with IPv6 as EXE4 validated. Ordering capabilities were successfully validated.	OK
OBJ-17.01-TRL6-TVALP-PERF.0003	FIFO message topic level ordering guarantees QoS for uplink service	CRT-17.01-TRL6-TVALP-PERF.0003	Messages published by the ground publisher are received in the same FIFO order by the aircraft application(s).	As foreseen in TVALP, the validation only used IPv4, but the prototype was completely compatible with IPv6 as EXE4 validated. Ordering capabilities were successfully validated.	OK
OBJ-17.01-TRL6-TVALP-PERF.0004	FIFO message topic level ordering guarantees QoS for downlink service	CRT-17.01-TRL6-TVALP-PERF.0004	Messages published by the air publisher(s) are received in the same FIFO order by the ground application(s).	As foreseen in TVALP, the validation only used IPv4, but the prototype was completely compatible with IPv6 as EXE4 validated. Ordering capabilities were successfully validated.	OK

Technical Validation Exercise #02 Technical Validation Objective ID	Technical Validation Exercise #02 Technical Validation Objective Title	Technical Validation Exercise #02 Success Criterion ID	Technical Validation Exercise #02 Success Criterion	Technical Validation Exercise #02 Validation Results	Technical Validation Exercise #02 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-PERF.0005	Message priority message queue level ordering guarantees QoS for uplink service	CRT-17.01-TRL6-TVALP-PERF.0005	The ground sender sends messages with different priorities and the aircraft application receives them ordered according to the priority (best effort).	As foreseen in TVALP, the validation only used IPv4, but the prototype was completely compatible with IPv6 as EXE4 validated. Priority capabilities were successfully validated.	OK
OBJ-17.01-TRL6-TVALP-PERF.0005	Message priority message queue level ordering guarantees QoS for uplink service	CRT-17.01-TRL6-TVALP-PERF.0006	Messages with the same priority are received with FIFO ordering.	As foreseen in TVALP, the validation only used IPv4, but the prototype was completely compatible with IPv6 as EXE4 validated. Priority capabilities were successfully validated.	OK
OBJ-17.01-TRL6-TVALP-PERF.0006	Message priority message queue level ordering guarantees QoS for downlink service	CRT-17.01-TRL6-TVALP-PERF.0007	The air sender sends messages with different priorities and the ground application receives them ordered according to the priority (best effort).	As foreseen in TVALP, the validation only used IPv4, but the prototype was completely compatible with IPv6 as EXE4 validated. Priority capabilities were successfully validated.	OK
OBJ-17.01-TRL6-TVALP-PERF.0006	Message priority message queue level ordering guarantees QoS for downlink service	CRT-17.01-TRL6-TVALP-PERF.0006	Messages with the same priority are received with FIFO ordering.	As foreseen in TVALP, the validation only used IPv4, but the prototype was completely compatible with IPv6 as EXE4 validated. Priority capabilities were successfully validated.	OK

Technical Validation Exercise #02 Technical Validation Objective ID	Technical Validation Exercise #02 Technical Validation Objective Title	Technical Validation Exercise #02 Success Criterion ID	Technical Validation Exercise #02 Success Criterion	Technical Validation Exercise #02 Validation Results	Technical Validation Exercise #02 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-PERF.0007	Message priority topic level ordering guarantees QoS for uplink service	CRT-17.01-TRL6-TVALP-PERF.0008	The ground publisher publishes messages with different priorities and the aircraft applications receive them ordered according to the priority (best effort).	As foreseen in TVALP, the validation only used IPv4, but the prototype was completely compatible with IPv6 as EXE4 validated. Priority capabilities were successfully validated.	OK
OBJ-17.01-TRL6-TVALP-PERF.0007	Message priority topic level ordering guarantees QoS for uplink service	CRT-17.01-TRL6-TVALP-PERF.0006	Messages with the same priority are received with FIFO ordering.	As foreseen in TVALP, the validation only used IPv4, but the prototype was completely compatible with IPv6 as EXE4 validated. Priority capabilities were successfully validated.	OK
OBJ-17.01-TRL6-TVALP-PERF.0008	Message priority message topic level ordering guarantees QoS for downlink service	CRT-17.01-TRL6-TVALP-PERF.0009	The air publisher publishes messages with different priorities and the ground applications receive them ordered according to the priority (best effort).	As foreseen in TVALP, the validation only used IPv4, but the prototype was completely compatible with IPv6 as EXE4 validated. Priority capabilities were successfully validated.	OK
OBJ-17.01-TRL6-TVALP-PERF.0008	Message priority message topic level ordering guarantees QoS for downlink service	CRT-17.01-TRL6-TVALP-PERF.0006	Messages with the same priority are received with FIFO ordering.	As foreseen in TVALP, the validation only used IPv4, but the prototype was completely compatible with IPv6 as EXE4 validated. Priority capabilities in combination with ordering policies were successfully validated.	OK

Technical Validation Exercise #02 Technical Validation Objective ID	Technical Validation Exercise #02 Technical Validation Objective Title	Technical Validation Exercise #02 Success Criterion ID	Technical Validation Exercise #02 Success Criterion	Technical Validation Exercise #02 Validation Results	Technical Validation Exercise #02 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-PERF.0009	End to end message latency for Category A uplink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-PERF.0010	The measured end to end message latency for Category A uplink Request/Response Purple Profile enabled SWIM services is <= 20s for 95% of the messages and <= 40s for 98% of the messages in the reference measurement conditions.	As stated in the TVALP (4.4) time requirements were not feasible for performance objectives, so this should be take into account as a reference, in order to have a common setup for all the exercises. Results from this performance tests should be used during industrialization phase in order to define a complete and realistic situations. In this context, and due to hardware limitations, EXE2 was able to manage up to 500 aircrafts simultaneously. Detailed figures are shown on TVALR Appendix B. REQ-17.01-TS-0040.0105 still uncovered.	Partially OK

Technical Validation Exercise #02 Technical Validation Objective ID	Technical Validation Exercise #02 Technical Validation Objective Title	Technical Validation Exercise #02 Success Criterion ID	Technical Validation Exercise #02 Success Criterion	Technical Validation Exercise #02 Validation Results	Technical Validation Exercise #02 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-PERF.0010	End to end message latency for Category A downlink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-PERF.0011	The measured end to end message latency for Category A downlink Request/Response Purple Profile enabled SWIM services is <= 20s for 95% of the messages and <= 40s for 98% of the messages in the reference measurement conditions.	As stated in the TVALP (4.4) time requirements were not feasible for performance objectives, so this should be take into account as a reference, in order to have a common setup for all the exercises. Results from this performance tests should be used during industrialization phase in order to define a complete and realistic situations. In this context, and due to hardware limitations, EXE2 was able to manage up to 500 aircrafts simultaneously. Detailed figures are shown on TVALR Appendix B. REQ-17.01-TS-0040.0105 still uncovered.	Partially OK

Technical Validation Exercise #02 Technical Validation Objective ID	Technical Validation Exercise #02 Technical Validation Objective Title	Technical Validation Exercise #02 Success Criterion ID	Technical Validation Exercise #02 Success Criterion	Technical Validation Exercise #02 Validation Results	Technical Validation Exercise #02 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-PERF.0011	End to end message latency for Category B uplink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-PERF.0012	The measured end to end message latency for Category B uplink Request/Response Purple Profile enabled SWIM services is <= 30s for 95% of the messages and <= 60s for 98% of the messages in the reference measurement conditions.	As stated in the TVALP (4.4) time requirements were not feasible for performance objectives, so this should be take into account as a reference, in order to have a common setup for all the exercises. Results from this performance tests should be used during industrialization phase in order to define a complete and realistic situations. In this context, and due to hardware limitations, EXE2 was able to manage up to 500 aircrafts simultaneously. Detailed figures are shown on TVALR Appendix B. REQ-17.01-TS-0040.0105 still uncovered.	Partially OK

Technical Validation Exercise #02 Technical Validation Objective ID	Technical Validation Exercise #02 Technical Validation Objective Title	Technical Validation Exercise #02 Success Criterion ID	Technical Validation Exercise #02 Success Criterion	Technical Validation Exercise #02 Validation Results	Technical Validation Exercise #02 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-PERF.0012	End to end message latency for Category B downlink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-PERF.0013	The measured end to end message latency for Category B downlink Request/Response Purple Profile enabled SWIM services is <= 30s for 95% of the messages and <= 60s for 98% of the messages in the reference measurement conditions.	As stated in the TVALP (4.4) time requirements were not feasible for performance objectives, so this should be take into account as a reference, in order to have a common setup for all the exercises. Results from this performance tests should be used during industrialization phase in order to define a complete and realistic situations. In this context, and due to hardware limitations, EXE2 was able to manage up to 500 aircrafts simultaneously. Detailed figures are shown on TVALR Appendix B. REQ-17.01-TS-0040.0105 still uncovered.	Partially OK

Technical Validation Exercise #02 Technical Validation Objective ID	Technical Validation Exercise #02 Technical Validation Objective Title	Technical Validation Exercise #02 Success Criterion ID	Technical Validation Exercise #02 Success Criterion	Technical Validation Exercise #02 Validation Results	Technical Validation Exercise #02 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-PERF.0013	End to end message latency for Category C uplink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-PERF.0014	The measured end to end message latency for Category C uplink Request/Response Purple Profile enabled SWIM services is <= 50s for 95% of the messages and <= 100s for 98% of the messages in the reference measurement conditions.	As stated in the TVALP (4.4) time requirements were not feasible for performance objectives, so this should be take into account as a reference, in order to have a common setup for all the exercises. Results from this performance tests should be used during industrialization phase in order to define a complete and realistic situations. In this context, and due to hardware limitations, EXE2 was able to manage up to 500 aircrafts simultaneously. Detailed figures are shown on TVALR Appendix B. REQ-17.01-TS-0040.0105 still uncovered.	Partially OK

Technical Validation Exercise #02 Technical Validation Objective ID	Technical Validation Exercise #02 Technical Validation Objective Title	Technical Validation Exercise #02 Success Criterion ID	Technical Validation Exercise #02 Success Criterion	Technical Validation Exercise #02 Validation Results	Technical Validation Exercise #02 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-PERF.0014	End to end message latency for Category C downlink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-PERF.0015	The measured end to end message latency for Category C downlink Request/Response Purple Profile enabled SWIM services is <= 50s for 95% of the messages and <= 100s for 98% of the messages in the reference measurement conditions.	As stated in the TVALP (4.4) time requirements were not feasible for performance objectives, so this should be take into account as a reference, in order to have a common setup for all the exercises. Results from this performance tests should be used during industrialization phase in order to define a complete and realistic situations. In this context, and due to hardware limitations, EXE2 was able to manage up to 500 aircrafts simultaneously. Detailed figures are shown on TVALR Appendix B. REQ-17.01-TS-0040.0105 still uncovered.	Partially OK

Technical Validation Exercise #02 Technical Validation Objective ID	Technical Validation Exercise #02 Technical Validation Objective Title	Technical Validation Exercise #02 Success Criterion ID	Technical Validation Exercise #02 Success Criterion	Technical Validation Exercise #02 Validation Results	Technical Validation Exercise #02 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-PERF.0015	End to end message latency for Category D uplink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-PERF.0016	The measured end to end message latency for Category D uplink Request/Response Purple Profile enabled SWIM services is <= 60s for 95% of the messages and <= 120s for 98% of the messages in the reference measurement conditions.	As stated in the TVALP (4.4) time requirements were not feasible for performance objectives, so this should be take into account as a reference, in order to have a common setup for all the exercises. Results from this performance tests should be used during industrialization phase in order to define a complete and realistic situations. In this context, and due to hardware limitations, EXE2 was able to manage up to 500 aircrafts simultaneously. Detailed figures are shown on TVALR Appendix B. REQ-17.01-TS-0040.0105 still uncovered.	Partially OK

Technical Validation Exercise #02 Technical Validation Objective ID	Technical Validation Exercise #02 Technical Validation Objective Title	Technical Validation Exercise #02 Success Criterion ID	Technical Validation Exercise #02 Success Criterion	Technical Validation Exercise #02 Validation Results	Technical Validation Exercise #02 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-PERF.0016	End to end message latency for Category D downlink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-PERF.0017	The measured end to end message latency for Category D downlink Request/Response Purple Profile enabled SWIM services is <= 60s for 95% of the messages and <= 120s for 98% of the messages in the reference measurement conditions.	As stated in the TVALP (4.4) time requirements were not feasible for performance objectives, so this should be take into account as a reference, in order to have a common setup for all the exercises. Results from this performance tests should be used during industrialization phase in order to define a complete and realistic situations. In this context, and due to hardware limitations, EXE2 was able to manage up to 500 aircrafts simultaneously. Detailed figures are shown on TVALR Appendix B. REQ-17.01-TS-0040.0105 still uncovered.	Partially OK

Technical Validation Exercise #02 Technical Validation Objective ID	Technical Validation Exercise #02 Technical Validation Objective Title	Technical Validation Exercise #02 Success Criterion ID	Technical Validation Exercise #02 Success Criterion	Technical Validation Exercise #02 Validation Results	Technical Validation Exercise #02 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-PERF.0017	End to end message latency for Category A uplink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-PERF.0018	The measured end to end message latency for Category A uplink Publish/Subscribe Purple Profile enabled SWIM services is <= 20s for 95% of the messages and <= 40s for 98% of the messages in the reference measurement conditions.	As stated in the TVALP (4.4) time requirements were not feasible for performance objectives, so this should be take into account as a reference, in order to have a common setup for all the exercises. Results from this performance tests should be used during industrialization phase in order to define a complete and realistic situations. In this context, and due to hardware limitations, EXE2 was able to manage up to 500 aircrafts simultaneously. Detailed figures are shown on TVALR Appendix B. REQ-17.01-TS-0040.0105 still uncovered.	Partially OK

Technical Validation Exercise #02 Technical Validation Objective ID	Technical Validation Exercise #02 Technical Validation Objective Title	Technical Validation Exercise #02 Success Criterion ID	Technical Validation Exercise #02 Success Criterion	Technical Validation Exercise #02 Validation Results	Technical Validation Exercise #02 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-PERF.0018	End to end message latency for Category A downlink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-PERF.0019	The measured end to end message latency for Category A downlink Publish/Subscribe Purple Profile enabled SWIM services is <= 20s for 95% of the messages and <= 40s for 98% of the messages in the reference measurement conditions.	As stated in the TVALP (4.4) time requirements were not feasible for performance objectives, so this should be take into account as a reference, in order to have a common setup for all the exercises. Results from this performance tests should be used during industrialization phase in order to define a complete and realistic situations. In this context, and due to hardware limitations, EXE2 was able to manage up to 500 aircrafts simultaneously. Detailed figures are shown on TVALR Appendix B. REQ-17.01-TS-0040.0105 still uncovered.	Partially OK

Technical Validation Exercise #02 Technical Validation Objective ID	Technical Validation Exercise #02 Technical Validation Objective Title	Technical Validation Exercise #02 Success Criterion ID	Technical Validation Exercise #02 Success Criterion	Technical Validation Exercise #02 Validation Results	Technical Validation Exercise #02 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-PERF.0019	End to end message latency for Category B uplink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-PERF.0020	The measured end to end message latency for Category B uplink Publish/Subscribe Purple Profile enabled SWIM services is <= 30s for 95% of the messages and <= 60s for 98% of the messages in the reference measurement conditions.	As stated in the TVALP (4.4) time requirements were not feasible for performance objectives, so this should be take into account as a reference, in order to have a common setup for all the exercises. Results from this performance tests should be used during industrialization phase in order to define a complete and realistic situations. In this context, and due to hardware limitations, EXE2 was able to manage up to 500 aircrafts simultaneously. Detailed figures are shown on TVALR Appendix B. REQ-17.01-TS-0040.0105 still uncovered.	Partially OK

Technical Validation Exercise #02 Technical Validation Objective ID	Technical Validation Exercise #02 Technical Validation Objective Title	Technical Validation Exercise #02 Success Criterion ID	Technical Validation Exercise #02 Success Criterion	Technical Validation Exercise #02 Validation Results	Technical Validation Exercise #02 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-PERF.0020	End to end message latency for Category B downlink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-PERF.0021	The measured end to end message latency for Category B downlink Publish/Subscribe Purple Profile enabled SWIM services is <= 30s for 95% of the messages and <= 60s for 98% of the messages in the reference measurement conditions.	As stated in the TVALP (4.4) time requirements were not feasible for performance objectives, so this should be take into account as a reference, in order to have a common setup for all the exercises. Results from this performance tests should be used during industrialization phase in order to define a complete and realistic situations. In this context, and due to hardware limitations, EXE2 was able to manage up to 500 aircrafts simultaneously. Detailed figures are shown on TVALR Appendix B. REQ-17.01-TS-0040.0105 still uncovered.	Partially OK

Technical Validation Exercise #02 Technical Validation Objective ID	Technical Validation Exercise #02 Technical Validation Objective Title	Technical Validation Exercise #02 Success Criterion ID	Technical Validation Exercise #02 Success Criterion	Technical Validation Exercise #02 Validation Results	Technical Validation Exercise #02 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-PERF.0021	End to end message latency for Category C uplink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-PERF.0022	The measured end to end message latency for Category C uplink Publish/Subscribe Purple Profile enabled SWIM services is <= 50s for 95% of the messages and <= 100s for 98% of the messages in the reference measurement conditions.	As stated in the TVALP (4.4) time requirements were not feasible for performance objectives, so this should be take into account as a reference, in order to have a common setup for all the exercises. Results from this performance tests should be used during industrialization phase in order to define a complete and realistic situations. In this context, and due to hardware limitations, EXE2 was able to manage up to 500 aircrafts simultaneously. Detailed figures are shown on TVALR Appendix B. REQ-17.01-TS-0040.0105 still uncovered.	Partially OK

Technical Validation Exercise #02 Technical Validation Objective ID	Technical Validation Exercise #02 Technical Validation Objective Title	Technical Validation Exercise #02 Success Criterion ID	Technical Validation Exercise #02 Success Criterion	Technical Validation Exercise #02 Validation Results	Technical Validation Exercise #02 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-PERF.0022	End to end message latency for Category C downlink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-PERF.0023	The measured end to end message latency for Category C downlink Publish/Subscribe Purple Profile enabled SWIM services is <= 50s for 95% of the messages and <= 100s for 98% of the messages in the reference measurement conditions.	As stated in the TVALP (4.4) time requirements were not feasible for performance objectives, so this should be take into account as a reference, in order to have a common setup for all the exercises. Results from this performance tests should be used during industrialization phase in order to define a complete and realistic situations. In this context, and due to hardware limitations, EXE2 was able to manage up to 500 aircrafts simultaneously. Detailed figures are shown on TVALR Appendix B. REQ-17.01-TS-0040.0105 still uncovered.	Partially OK

Technical Validation Exercise #02 Technical Validation Objective ID	Technical Validation Exercise #02 Technical Validation Objective Title	Technical Validation Exercise #02 Success Criterion ID	Technical Validation Exercise #02 Success Criterion	Technical Validation Exercise #02 Validation Results	Technical Validation Exercise #02 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-PERF.0023	End to end message latency for Category D uplink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-PERF.0024	The measured end to end message latency for Category D uplink Publish/Subscribe Purple Profile enabled SWIM services is <= 60s for 95% of the messages and <= 120s for 98% of the messages in the reference measurement conditions.	As stated in the TVALP (4.4) time requirements were not feasible for performance objectives, so this should be take into account as a reference, in order to have a common setup for all the exercises. Results from this performance tests should be used during industrialization phase in order to define a complete and realistic situations. In this context, and due to hardware limitations, EXE2 was able to manage up to 500 aircrafts simultaneously. Detailed figures are shown on TVALR Appendix B. REQ-17.01-TS-0040.0105 still uncovered.	Partially OK

Technical Validation Exercise #02 Technical Validation Objective ID	Technical Validation Exercise #02 Technical Validation Objective Title	Technical Validation Exercise #02 Success Criterion ID	Technical Validation Exercise #02 Success Criterion	Technical Validation Exercise #02 Validation Results	Technical Validation Exercise #02 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-PERF.0024	End to end message latency for Category D downlink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-PERF.0025	The measured end to end message latency for Category C downlink Publish/Subscribe Purple Profile enabled SWIM services is <= 60s for 95% of the messages and <= 120s for 98% of the messages in the reference measurement conditions.	As stated in the TVALP (4.4) time requirements were not feasible for performance objectives, so this should be take into account as a reference, in order to have a common setup for all the exercises. Results from this performance tests should be used during industrialization phase in order to define a complete and realistic situations. In this context, and due to hardware limitations, EXE2 was able to manage up to 500 aircrafts simultaneously. Detailed figures are shown on TVALR Appendix B. REQ-17.01-TS-0040.0105 still uncovered.	Partially OK
OBJ-17.01-TRL6-TVALP-PERF.0025	On-the-fly compression QoS for uplink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-PERF.0026	Response messages sent by the ground responder are compressed and uncompressed on-the-fly by the Ground-Air SWIM Nodes pair, without violating message integrity, and received by the aircraft application.	Actually, REQ-17.01-TS-0040.0105 does not apply directly to this objective, so the original coverage explanation (TVALP) was not right. This is considered partially covered anyway because compression is done only with Gzip, not using deflate.	Partially OK

Technical Validation Exercise #02 Technical Validation Objective ID	Technical Validation Exercise #02 Technical Validation Objective Title	Technical Validation Exercise #02 Success Criterion ID	Technical Validation Exercise #02 Success Criterion	Technical Validation Exercise #02 Validation Results	Technical Validation Exercise #02 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-PERF.0026	On-the-fly compression QoS for uplink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-PERF.0027	Publication messages sent by the ground publisher are compressed and uncompressed on-the-fly by the Ground-Air SWIM Nodes pair, without violating message integrity, and received by the aircraft application.	Actually, REQ-17.01-TS-0040.0105 does not apply directly to this objective, so the original coverage explanation (TVALP) was not right. This is considered partially covered anyway because compression is done only with Gzip, not using deflate.	Partially OK
OBJ-17.01-TRL6-TVALP-REL.0001	End-to-end at-least-once delivery guarantees QoS for uplink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0001	A request message from aircraft requestor is received at least once by the ground responder although, while routing the request message, a connection establishment failure event (successfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	At-least-once delivery guarantee is configured for uplink and downlink. Delivery of request, response and publication messages is successful during connection failures or abnormal disconnections. REQ-17.01-TS-0400.0055 and REQ-17.01-TS-0400.0060 are not covered, but they are part of optional Profile Parts.	OK

Technical Validation Exercise #02 Technical Validation Objective ID	Technical Validation Exercise #02 Technical Validation Objective Title	Technical Validation Exercise #02 Success Criterion ID	Technical Validation Exercise #02 Success Criterion	Technical Validation Exercise #02 Validation Results	Technical Validation Exercise #02 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-REL.0001	End-to-end at-least-once delivery guarantees QoS for uplink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0002	A request message from aircraft requestor is received at least once by the ground responder although, while routing the request message, an abnormal disconnection event due to transient network error (successfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	At-least-once delivery guarantee is configured for uplink and downlink. Delivery of request, response and publication messages is successful during connection failures or abnormal disconnections. REQ-17.01-TS-0400.0055 and REQ-17.01-TS-0400.0060 are not covered, but they are part of optional Profile Parts.	OK
OBJ-17.01-TRL6-TVALP-REL.0001	End-to-end at-least-once delivery guarantees QoS for uplink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0026	A request message from aircraft requestor is received at least once by the ground responder although, while routing the request message, an abnormal disconnection event due to ground peer restart (successfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	At-least-once delivery guarantee is configured for uplink and downlink. Delivery of request, response and publication messages is successful during connection failures or abnormal disconnections. REQ-17.01-TS-0400.0055 and REQ-17.01-TS-0400.0060 are not covered, but they are part of optional Profile Parts.	OK

Technical Validation Exercise #02 Technical Validation Objective ID	Technical Validation Exercise #02 Technical Validation Objective Title	Technical Validation Exercise #02 Success Criterion ID	Technical Validation Exercise #02 Success Criterion	Technical Validation Exercise #02 Validation Results	Technical Validation Exercise #02 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-REL.0001	End-to-end at-least-once delivery guarantees QoS for uplink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0003	A response message from the ground responder is received at least once by the aircraft requestor although, while routing the response message, a connection establishment failure event (successfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	At-least-once delivery guarantee is configured for uplink and downlink. Delivery of request, response and publication messages is successful during connection failures or abnormal disconnections. REQ-17.01-TS-0400.0055 and REQ-17.01-TS-0400.0060 are not covered, but they are part of optional Profile Parts.	OK
OBJ-17.01-TRL6-TVALP-REL.0001	End-to-end at-least-once delivery guarantees QoS for uplink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0004	A response message from the ground responder is received at least once by the aircraft requestor although, while routing the response message, an abnormal disconnection event due to transient network error (successfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	At-least-once delivery guarantee is configured for uplink and downlink. Delivery of request, response and publication messages is successful during connection failures or abnormal disconnections. REQ-17.01-TS-0400.0055 and REQ-17.01-TS-0400.0060 are not covered, but they are part of optional Profile Parts.	OK

Technical Validation Exercise #02 Technical Validation Objective ID	Technical Validation Exercise #02 Technical Validation Objective Title	Technical Validation Exercise #02 Success Criterion ID	Technical Validation Exercise #02 Success Criterion	Technical Validation Exercise #02 Validation Results	Technical Validation Exercise #02 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-REL.0001	End-to-end at-least-once delivery guarantees QoS for uplink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0027	A response message from the ground responder is received at least once by the aircraft requestor although, while routing the response message, an abnormal disconnection event due to ground peer restart (successfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	At-least-once delivery guarantee is configured for uplink and downlink. Delivery of request, response and publication messages is successful during connection failures or abnormal disconnections. REQ-17.01-TS-0400.0055 and REQ-17.01-TS-0400.0060 are not covered, but they are part of optional Profile Parts.	OK
OBJ-17.01-TRL6-TVALP-REL.0001	End-to-end at-least-once delivery guarantees QoS for uplink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0005	Message not delivered failure event is logged and traced because, while routing the message, a connection establishment failure event (unsuccessfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	At-least-once delivery guarantee is configured for uplink and downlink. Delivery of request, response and publication messages is successful during connection failures or abnormal disconnections. REQ-17.01-TS-0400.0055 and REQ-17.01-TS-0400.0060 are not covered, but they are part of optional Profile Parts.	OK

Technical Validation Exercise #02 Technical Validation Objective ID	Technical Validation Exercise #02 Technical Validation Objective Title	Technical Validation Exercise #02 Success Criterion ID	Technical Validation Exercise #02 Success Criterion	Technical Validation Exercise #02 Validation Results	Technical Validation Exercise #02 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-REL.0001	End-to-end at-least-once delivery guarantees QoS for uplink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0006	Message not delivered failure event is logged and traced because, while routing the message, an abnormal disconnection event (unsuccessfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	At-least-once delivery guarantee is configured for uplink and downlink. Delivery of request, response and publication messages is successful during connection failures or abnormal disconnections. REQ-17.01-TS-0400.0055 and REQ-17.01-TS-0400.0060 are not covered, but they are part of optional Profile Parts.	OK
OBJ-17.01-TRL6-TVALP-REL.0001	End-to-end at-least-once delivery guarantees QoS for uplink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0007	Message not delivered failure event is logged and traced because, while handling abnormal disconnection or connection establishment failure events at Air-Ground SWIM Nodes connection level, the message expires.	At-least-once delivery guarantee is configured for uplink and downlink. Delivery of request, response and publication messages is successful during connection failures or abnormal disconnections. REQ-17.01-TS-0400.0055 and REQ-17.01-TS-0400.0060 are not covered, but they are part of optional Profile Parts.	OK

Technical Validation Exercise #02 Technical Validation Objective ID	Technical Validation Exercise #02 Technical Validation Objective Title	Technical Validation Exercise #02 Success Criterion ID	Technical Validation Exercise #02 Success Criterion	Technical Validation Exercise #02 Validation Results	Technical Validation Exercise #02 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-REL.0002	End-to-end at-least-once delivery guarantees QoS for downlink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0008	A request message from ground requestor is received at least once by the aircraft responder although, while routing the request message, a connection establishment failure event (successfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	At-least-once delivery guarantee is configured for uplink and downlink. Delivery of request, response and publication messages is successful during connection failures or abnormal disconnections. REQ-17.01-TS-0400.0055 and REQ-17.01-TS-0400.0060 are not covered, but they are part of optional Profile Parts.	OK
OBJ-17.01-TRL6-TVALP-REL.0002	End-to-end at-least-once delivery guarantees QoS for downlink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0009	A request message from ground requestor is received at least once by the aircraft responder although, while routing the request message, an abnormal disconnection event due to transient network error (successfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	At-least-once delivery guarantee is configured for uplink and downlink. Delivery of request, response and publication messages is successful during connection failures or abnormal disconnections. REQ-17.01-TS-0400.0055 and REQ-17.01-TS-0400.0060 are not covered, but they are part of optional Profile Parts.	OK

Technical Validation Exercise #02 Technical Validation Objective ID	Technical Validation Exercise #02 Technical Validation Objective Title	Technical Validation Exercise #02 Success Criterion ID	Technical Validation Exercise #02 Success Criterion	Technical Validation Exercise #02 Validation Results	Technical Validation Exercise #02 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-REL.0002	End-to-end at-least-once delivery guarantees QoS for downlink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0028	A request message from ground requestor is received at least once by the aircraft responder although, while routing the request message, an abnormal disconnection event due to ground peer restart (successfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	At-least-once delivery guarantee is configured for uplink and downlink. Delivery of request, response and publication messages is successful during connection failures or abnormal disconnections. REQ-17.01-TS-0400.0055 and REQ-17.01-TS-0400.0060 are not covered, but they are part of optional Profile Parts.	OK
OBJ-17.01-TRL6-TVALP-REL.0002	End-to-end at-least-once delivery guarantees QoS for downlink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0010	A response message from the aircraft responder is received at least once by the ground requestor although, while routing the response message, a connection establishment failure event (successfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	At-least-once delivery guarantee is configured for uplink and downlink. Delivery of request, response and publication messages is successful during connection failures or abnormal disconnections. REQ-17.01-TS-0400.0055 and REQ-17.01-TS-0400.0060 are not covered, but they are part of optional Profile Parts.	OK

Technical Validation Exercise #02 Technical Validation Objective ID	Technical Validation Exercise #02 Technical Validation Objective Title	Technical Validation Exercise #02 Success Criterion ID	Technical Validation Exercise #02 Success Criterion	Technical Validation Exercise #02 Validation Results	Technical Validation Exercise #02 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-REL.0002	End-to-end at-least-once delivery guarantees QoS for downlink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0011	A response message from the aircraft responder is received at least once by the ground requestor although, while routing the response message, an abnormal disconnection event due to transient network error (successfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	At-least-once delivery guarantee is configured for uplink and downlink. Delivery of request, response and publication messages is successful during connection failures or abnormal disconnections. REQ-17.01-TS-0400.0055 and REQ-17.01-TS-0400.0060 are not covered, but they are part of optional Profile Parts.	OK
OBJ-17.01-TRL6-TVALP-REL.0002	End-to-end at-least-once delivery guarantees QoS for downlink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0029	A response message from the aircraft responder is received at least once by the ground requestor although, while routing the response message, an abnormal disconnection event due to ground peer restart (successfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	At-least-once delivery guarantee is configured for uplink and downlink. Delivery of request, response and publication messages is successful during connection failures or abnormal disconnections. REQ-17.01-TS-0400.0055 and REQ-17.01-TS-0400.0060 are not covered, but they are part of optional Profile Parts.	OK

Technical Validation Exercise #02 Technical Validation Objective ID	Technical Validation Exercise #02 Technical Validation Objective Title	Technical Validation Exercise #02 Success Criterion ID	Technical Validation Exercise #02 Success Criterion	Technical Validation Exercise #02 Validation Results	Technical Validation Exercise #02 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-REL.0002	End-to-end at-least-once delivery guarantees QoS for downlink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0005	Message not delivered failure event is logged and traced because, while routing the message, a connection establishment failure event (unsuccessfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	At-least-once delivery guarantee is configured for uplink and downlink. Delivery of request, response and publication messages is successful during connection failures or abnormal disconnections. REQ-17.01-TS-0400.0055 and REQ-17.01-TS-0400.0060 are not covered, but they are part of optional Profile Parts.	OK
OBJ-17.01-TRL6-TVALP-REL.0002	End-to-end at-least-once delivery guarantees QoS for downlink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0006	Message not delivered failure event is logged and traced because, while routing the message, an abnormal disconnection event (unsuccessfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	At-least-once delivery guarantee is configured for uplink and downlink. Delivery of request, response and publication messages is successful during connection failures or abnormal disconnections. REQ-17.01-TS-0400.0055 and REQ-17.01-TS-0400.0060 are not covered, but they are part of optional Profile Parts.	OK

Technical Validation Exercise #02 Technical Validation Objective ID	Technical Validation Exercise #02 Technical Validation Objective Title	Technical Validation Exercise #02 Success Criterion ID	Technical Validation Exercise #02 Success Criterion	Technical Validation Exercise #02 Validation Results	Technical Validation Exercise #02 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-REL.0002	End-to-end at-least-once delivery guarantees QoS for downlink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0007	Message not delivered failure event is logged and traced because, while handling abnormal disconnection or connection establishment failure events at Air-Ground SWIM Nodes connection level, the message expires.	At-least-once delivery guarantee is configured for uplink and downlink. Delivery of request, response and publication messages is successful during connection failures or abnormal disconnections. REQ-17.01-TS-0400.0055 and REQ-17.01-TS-0400.0060 are not covered, but they are part of optional Profile Parts.	OK
OBJ-17.01-TRL6-TVALP-REL.0003	End-to-end at-least-once delivery guarantees QoS for uplink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0012	A publication message from ground publisher is received at least once by the aircraft subscriber although, while routing the message, a connection establishment failure event (successfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	At-least-once delivery guarantee is configured for uplink and downlink. Delivery of request, response and publication messages is successful during connection failures or abnormal disconnections. REQ-17.01-TS-0400.0055 and REQ-17.01-TS-0400.0060 are not covered, but they are part of optional Profile Parts.	OK

Technical Validation Exercise #02 Technical Validation Objective ID	Technical Validation Exercise #02 Technical Validation Objective Title	Technical Validation Exercise #02 Success Criterion ID	Technical Validation Exercise #02 Success Criterion	Technical Validation Exercise #02 Validation Results	Technical Validation Exercise #02 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-REL.0003	End-to-end at-least-once delivery guarantees QoS for uplink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0013	A publication message from ground publisher is received at least once by the aircraft subscriber although, while routing the message, an abnormal disconnection event due to transient network error (successfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	At-least-once delivery guarantee is configured for uplink and downlink. Delivery of request, response and publication messages is successful during connection failures or abnormal disconnections. REQ-17.01-TS-0400.0055 and REQ-17.01-TS-0400.0060 are not covered, but they are part of optional Profile Parts.	OK
OBJ-17.01-TRL6-TVALP-REL.0003	End-to-end at-least-once delivery guarantees QoS for uplink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0030	A publication message from ground publisher is received at least once by the aircraft subscriber although, while routing the message, an abnormal disconnection event due to ground peer restart (successfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	At-least-once delivery guarantee is configured for uplink and downlink. Delivery of request, response and publication messages is successful during connection failures or abnormal disconnections. REQ-17.01-TS-0400.0055 and REQ-17.01-TS-0400.0060 are not covered, but they are part of optional Profile Parts.	OK

Technical Validation Exercise #02 Technical Validation Objective ID	Technical Validation Exercise #02 Technical Validation Objective Title	Technical Validation Exercise #02 Success Criterion ID	Technical Validation Exercise #02 Success Criterion	Technical Validation Exercise #02 Validation Results	Technical Validation Exercise #02 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-REL.0003	End-to-end at-least-once delivery guarantees QoS for uplink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0005	Message not delivered failure event is logged and traced because, while routing the message, a connection establishment failure event (unsuccessfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	At-least-once delivery guarantee is configured for uplink and downlink. Delivery of request, response and publication messages is successful during connection failures or abnormal disconnections. REQ-17.01-TS-0400.0055 and REQ-17.01-TS-0400.0060 are not covered, but they are part of optional Profile Parts.	OK
OBJ-17.01-TRL6-TVALP-REL.0003	End-to-end at-least-once delivery guarantees QoS for uplink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0006	Message not delivered failure event is logged and traced because, while routing the message, an abnormal disconnection event (unsuccessfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	At-least-once delivery guarantee is configured for uplink and downlink. Delivery of request, response and publication messages is successful during connection failures or abnormal disconnections. REQ-17.01-TS-0400.0055 and REQ-17.01-TS-0400.0060 are not covered, but they are part of optional Profile Parts.	OK

Technical Validation Exercise #02 Technical Validation Objective ID	Technical Validation Exercise #02 Technical Validation Objective Title	Technical Validation Exercise #02 Success Criterion ID	Technical Validation Exercise #02 Success Criterion	Technical Validation Exercise #02 Validation Results	Technical Validation Exercise #02 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-REL.0003	End-to-end at-least-once delivery guarantees QoS for uplink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0007	Message not delivered failure event is logged and traced because, while handling abnormal disconnection or connection establishment failure events at Air-Ground SWIM Nodes connection level, the message expires.	At-least-once delivery guarantee is configured for uplink and downlink. Delivery of request, response and publication messages is successful during connection failures or abnormal disconnections. REQ-17.01-TS-0400.0055 and REQ-17.01-TS-0400.0060 are not covered, but they are part of optional Profile Parts.	OK
OBJ-17.01-TRL6-TVALP-REL.0004	End-to-end at-least-once delivery guarantees QoS for downlink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0014	A publication message from aircraft publisher is received at least once by the ground subscriber although, while routing the message, a connection establishment failure event (successfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	At-least-once delivery guarantee is configured for uplink and downlink. Delivery of request, response and publication messages is successful during connection failures or abnormal disconnections. REQ-17.01-TS-0400.0055 and REQ-17.01-TS-0400.0060 are not covered, but they are part of optional Profile Parts.	OK

Technical Validation Exercise #02 Technical Validation Objective ID	Technical Validation Exercise #02 Technical Validation Objective Title	Technical Validation Exercise #02 Success Criterion ID	Technical Validation Exercise #02 Success Criterion	Technical Validation Exercise #02 Validation Results	Technical Validation Exercise #02 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-REL.0004	End-to-end at-least-once delivery guarantees QoS for downlink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0015	A publication message from aircraft publisher is received at least once by the ground subscriber although, while routing the message, an abnormal disconnection event due to transient network error (successfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	At-least-once delivery guarantee is configured for uplink and downlink. Delivery of request, response and publication messages is successful during connection failures or abnormal disconnections. REQ-17.01-TS-0400.0055 and REQ-17.01-TS-0400.0060 are not covered, but they are part of optional Profile Parts.	OK
OBJ-17.01-TRL6-TVALP-REL.0004	End-to-end at-least-once delivery guarantees QoS for downlink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0031	A publication message from aircraft publisher is received at least once by the ground subscriber although, while routing the message, an abnormal disconnection event due to ground peer restart (successfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	At-least-once delivery guarantee is configured for uplink and downlink. Delivery of request, response and publication messages is successful during connection failures or abnormal disconnections. REQ-17.01-TS-0400.0055 and REQ-17.01-TS-0400.0060 are not covered, but they are part of optional Profile Parts.	OK

Technical Validation Exercise #02 Technical Validation Objective ID	Technical Validation Exercise #02 Technical Validation Objective Title	Technical Validation Exercise #02 Success Criterion ID	Technical Validation Exercise #02 Success Criterion	Technical Validation Exercise #02 Validation Results	Technical Validation Exercise #02 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-REL.0004	End-to-end at-least-once delivery guarantees QoS for downlink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0005	Message not delivered failure event is logged and traced because, while routing the message, a connection establishment failure event (unsuccessfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	At-least-once delivery guarantee is configured for uplink and downlink. Delivery of request, response and publication messages is successful during connection failures or abnormal disconnections. REQ-17.01-TS-0400.0055 and REQ-17.01-TS-0400.0060 are not covered, but they are part of optional Profile Parts.	OK
OBJ-17.01-TRL6-TVALP-REL.0004	End-to-end at-least-once delivery guarantees QoS for downlink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0006	Message not delivered failure event is logged and traced because, while routing the message, an abnormal disconnection event (unsuccessfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	At-least-once delivery guarantee is configured for uplink and downlink. Delivery of request, response and publication messages is successful during connection failures or abnormal disconnections. REQ-17.01-TS-0400.0055 and REQ-17.01-TS-0400.0060 are not covered, but they are part of optional Profile Parts.	OK

Technical Validation Exercise #02 Technical Validation Objective ID	Technical Validation Exercise #02 Technical Validation Objective Title	Technical Validation Exercise #02 Success Criterion ID	Technical Validation Exercise #02 Success Criterion	Technical Validation Exercise #02 Validation Results	Technical Validation Exercise #02 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-REL.0004	End-to-end at-least-once delivery guarantees QoS for downlink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0007	Message not delivered failure event is logged and traced because, while handling abnormal disconnection or connection establishment failure events at Air-Ground SWIM Nodes connection level, the message expires.	At-least-once delivery guarantee is configured for uplink and downlink. Delivery of request, response and publication messages is successful during connection failures or abnormal disconnections. REQ-17.01-TS-0400.0055 and REQ-17.01-TS-0400.0060 are not covered, but they are part of optional Profile Parts.	OK
OBJ-17.01-TRL6-TVALP-REL.0005	End-to-end exactly-once delivery guarantees QoS for uplink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0016	A request message from aircraft requestor is received exactly once by the ground responder although, while routing the request message, a connection establishment failure event (successfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	Not planned	N/A

Technical Validation Exercise #02 Technical Validation Objective ID	Technical Validation Exercise #02 Technical Validation Objective Title	Technical Validation Exercise #02 Success Criterion ID	Technical Validation Exercise #02 Success Criterion	Technical Validation Exercise #02 Validation Results	Technical Validation Exercise #02 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-REL.0005	End-to-end exactly-once delivery guarantees QoS for uplink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0017	A request message from aircraft requestor is received exactly once by the ground responder although, while routing the request message, an abnormal disconnection event due to transient network error (successfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-REL.0005	End-to-end exactly-once delivery guarantees QoS for uplink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0032	A request message from aircraft requestor is received exactly once by the ground responder although, while routing the request message, an abnormal disconnection event due to ground peer restart (successfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	Not planned	N/A

Technical Validation Exercise #02 Technical Validation Objective ID	Technical Validation Exercise #02 Technical Validation Objective Title	Technical Validation Exercise #02 Success Criterion ID	Technical Validation Exercise #02 Success Criterion	Technical Validation Exercise #02 Validation Results	Technical Validation Exercise #02 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-REL.0005	End-to-end exactly-once delivery guarantees QoS for uplink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0018	A response message from the ground responder is received exactly once by the aircraft requestor although, while routing the response message, a connection establishment failure event (successfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-REL.0005	End-to-end exactly-once delivery guarantees QoS for uplink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0019	A response message from the ground responder is received exactly once by the aircraft requestor although, while routing the response message, an abnormal disconnection event due to transient network error (successfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	Not planned	N/A

Technical Validation Exercise #02 Technical Validation Objective ID	Technical Validation Exercise #02 Technical Validation Objective Title	Technical Validation Exercise #02 Success Criterion ID	Technical Validation Exercise #02 Success Criterion	Technical Validation Exercise #02 Validation Results	Technical Validation Exercise #02 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-REL.0005	End-to-end exactly-once delivery guarantees QoS for uplink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0033	A response message from the ground responder is received exactly once by the aircraft requestor although, while routing the response message, an abnormal disconnection event due to ground peer restart (successfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-REL.0005	End-to-end exactly-once delivery guarantees QoS for uplink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0005	Message not delivered failure event is logged and traced because, while routing the message, a connection establishment failure event (unsuccessfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	Not planned	N/A

Technical Validation Exercise #02 Technical Validation Objective ID	Technical Validation Exercise #02 Technical Validation Objective Title	Technical Validation Exercise #02 Success Criterion ID	Technical Validation Exercise #02 Success Criterion	Technical Validation Exercise #02 Validation Results	Technical Validation Exercise #02 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-REL.0005	End-to-end exactly-once delivery guarantees QoS for uplink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0006	Message not delivered failure event is logged and traced because, while routing the message, an abnormal disconnection event (unsuccessfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-REL.0005	End-to-end exactly-once delivery guarantees QoS for uplink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0007	Message not delivered failure event is logged and traced because, while handling abnormal disconnection or connection establishment failure events at Air-Ground SWIM Nodes connection level, the message expires.	Not planned	N/A

Technical Validation Exercise #02 Technical Validation Objective ID	Technical Validation Exercise #02 Technical Validation Objective Title	Technical Validation Exercise #02 Success Criterion ID	Technical Validation Exercise #02 Success Criterion	Technical Validation Exercise #02 Validation Results	Technical Validation Exercise #02 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-REL.0006	End-to-end exactly-once delivery guarantees QoS for downlink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0020	A request message from ground requestor is received exactly once by the aircraft responder although, while routing the request message, a connection establishment failure event (successfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-REL.0006	End-to-end exactly-once delivery guarantees QoS for downlink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0021	A request message from ground requestor is received exactly once by the aircraft responder although, while routing the request message, an abnormal disconnection event due to transient network error (successfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	Not planned	N/A

Technical Validation Exercise #02 Technical Validation Objective ID	Technical Validation Exercise #02 Technical Validation Objective Title	Technical Validation Exercise #02 Success Criterion ID	Technical Validation Exercise #02 Success Criterion	Technical Validation Exercise #02 Validation Results	Technical Validation Exercise #02 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-REL.0006	End-to-end exactly-once delivery guarantees QoS for downlink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0034	A request message from ground requestor is received exactly once by the aircraft responder although, while routing the request message, an abnormal disconnection event due to ground peer restart (successfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-REL.0006	End-to-end exactly-once delivery guarantees QoS for downlink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0022	A response message from the aircraft responder is received exactly once by the ground requestor although, while routing the response message, a connection establishment failure event (successfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	Not planned	N/A

Technical Validation Exercise #02 Technical Validation Objective ID	Technical Validation Exercise #02 Technical Validation Objective Title	Technical Validation Exercise #02 Success Criterion ID	Technical Validation Exercise #02 Success Criterion	Technical Validation Exercise #02 Validation Results	Technical Validation Exercise #02 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-REL.0006	End-to-end exactly-once delivery guarantees QoS for downlink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0011	A response message from the aircraft responder is received exactly once by the ground requestor although, while routing the response message, an abnormal disconnection event due to transient network error (successfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-REL.0006	End-to-end exactly-once delivery guarantees QoS for downlink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0035	A response message from the aircraft responder is received exactly once by the ground requestor although, while routing the response message, an abnormal disconnection event due to ground peer restart (successfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	Not planned	N/A

Technical Validation Exercise #02 Technical Validation Objective ID	Technical Validation Exercise #02 Technical Validation Objective Title	Technical Validation Exercise #02 Success Criterion ID	Technical Validation Exercise #02 Success Criterion	Technical Validation Exercise #02 Validation Results	Technical Validation Exercise #02 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-REL.0006	End-to-end exactly-once delivery guarantees QoS for downlink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0005	Message not delivered failure event is logged and traced because, while routing the message, a connection establishment failure event (unsuccessfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-REL.0006	End-to-end exactly-once delivery guarantees QoS for downlink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0006	Message not delivered failure event is logged and traced because, while routing the message, an abnormal disconnection event (unsuccessfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	Not planned	N/A

Technical Validation Exercise #02 Technical Validation Objective ID	Technical Validation Exercise #02 Technical Validation Objective Title	Technical Validation Exercise #02 Success Criterion ID	Technical Validation Exercise #02 Success Criterion	Technical Validation Exercise #02 Validation Results	Technical Validation Exercise #02 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-REL.0006	End-to-end exactly-once delivery guarantees QoS for downlink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0007	Message not delivered failure event is logged and traced because, while handling abnormal disconnection or connection establishment failure events at Air-Ground SWIM Nodes connection level, the message expires.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-REL.0007	End-to-end exactly-once delivery guarantees QoS for uplink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0023	A publication message from ground publisher is received exactly once by the aircraft subscriber although, while routing the message, a connection establishment failure event (successfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	Not planned	N/A

Technical Validation Exercise #02 Technical Validation Objective ID	Technical Validation Exercise #02 Technical Validation Objective Title	Technical Validation Exercise #02 Success Criterion ID	Technical Validation Exercise #02 Success Criterion	Technical Validation Exercise #02 Validation Results	Technical Validation Exercise #02 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-REL.0007	End-to-end exactly-once delivery guarantees QoS for uplink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0024	A publication message from ground publisher is received exactly once by the aircraft subscriber although, while routing the message, an abnormal disconnection event due to transient network error (successfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-REL.0007	End-to-end exactly-once delivery guarantees QoS for uplink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0036	A publication message from ground publisher is received exactly once by the aircraft subscriber although, while routing the message, an abnormal disconnection event due to ground peer restart (successfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	Not planned	N/A

Technical Validation Exercise #02 Technical Validation Objective ID	Technical Validation Exercise #02 Technical Validation Objective Title	Technical Validation Exercise #02 Success Criterion ID	Technical Validation Exercise #02 Success Criterion	Technical Validation Exercise #02 Validation Results	Technical Validation Exercise #02 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-REL.0007	End-to-end exactly-once delivery guarantees QoS for uplink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0005	Message not delivered failure event is logged and traced because, while routing the message, a connection establishment failure event (unsuccessfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-REL.0007	End-to-end exactly-once delivery guarantees QoS for uplink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0006	Message not delivered failure event is logged and traced because, while routing the message, an abnormal disconnection event (unsuccessfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	Not planned	N/A

Technical Validation Exercise #02 Technical Validation Objective ID	Technical Validation Exercise #02 Technical Validation Objective Title	Technical Validation Exercise #02 Success Criterion ID	Technical Validation Exercise #02 Success Criterion	Technical Validation Exercise #02 Validation Results	Technical Validation Exercise #02 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-REL.0007	End-to-end exactly-once delivery guarantees QoS for uplink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0007	Message not delivered failure event is logged and traced because, while handling abnormal disconnection or connection establishment failure events at Air-Ground SWIM Nodes connection level, the message expires.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-REL.0008	End-to-end exactly-once delivery guarantees QoS for downlink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0025	A publication message from aircraft publisher is received exactly once by the ground subscriber although, while routing the message, a connection establishment failure event (successfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	Not planned	N/A

Technical Validation Exercise #02 Technical Validation Objective ID	Technical Validation Exercise #02 Technical Validation Objective Title	Technical Validation Exercise #02 Success Criterion ID	Technical Validation Exercise #02 Success Criterion	Technical Validation Exercise #02 Validation Results	Technical Validation Exercise #02 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-REL.0008	End-to-end exactly-once delivery guarantees QoS for downlink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0038	A publication message from aircraft publisher is received exactly once by the ground subscriber although, while routing the message, an abnormal disconnection event due to transient network error (successfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-REL.0008	End-to-end exactly-once delivery guarantees QoS for downlink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0037	A publication message from aircraft publisher is received exactly once by the ground subscriber although, while routing the message, an abnormal disconnection event due to ground peer restart (successfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	Not planned	N/A

Technical Validation Exercise #02 Technical Validation Objective ID	Technical Validation Exercise #02 Technical Validation Objective Title	Technical Validation Exercise #02 Success Criterion ID	Technical Validation Exercise #02 Success Criterion	Technical Validation Exercise #02 Validation Results	Technical Validation Exercise #02 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-REL.0008	End-to-end exactly-once delivery guarantees QoS for downlink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0005	Message not delivered failure event is logged and traced because, while routing the message, a connection establishment failure event (unsuccessfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-REL.0008	End-to-end exactly-once delivery guarantees QoS for downlink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0006	Message not delivered failure event is logged and traced because, while routing the message, an abnormal disconnection event (unsuccessfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	Not planned	N/A

Technical Validation Exercise #02 Technical Validation Objective ID	Technical Validation Exercise #02 Technical Validation Objective Title	Technical Validation Exercise #02 Success Criterion ID	Technical Validation Exercise #02 Success Criterion	Technical Validation Exercise #02 Validation Results	Technical Validation Exercise #02 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-REL.0008	End-to-end exactly-once delivery guarantees QoS for downlink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0007	Message not delivered failure event is logged and traced because, while handling abnormal disconnection or connection establishment failure events at Air-Ground SWIM Nodes connection level, the message expires.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-SEC.0001	Basic message screening security controls for message queue based information exchange	CRT-17.01-TRL6-TVALP-SEC.0001	Different message screening policies are successfully configured for two or more message queues.	Not planned	OK
OBJ-17.01-TRL6-TVALP-SEC.0001	Basic message screening security controls for message queue based information exchange	CRT-17.01-TRL6-TVALP-SEC.0002	Message screening policies are enforced on message queues used by Purple Profile enabled sender applications.	Not planned	OK

Technical Validation Exercise #02 Technical Validation Objective ID	Technical Validation Exercise #02 Technical Validation Objective Title	Technical Validation Exercise #02 Success Criterion ID	Technical Validation Exercise #02 Success Criterion	Technical Validation Exercise #02 Validation Results	Technical Validation Exercise #02 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-SEC.0001	Basic message screening security controls for message queue based information exchange	CRT-17.01-TRL6-TVALP-SEC.0003	Message screening policies are enforced on Ground SWIM Node side message queues used by Air SWIM Nodes to send/consume messages.	Not planned	OK
OBJ-17.01-TRL6-TVALP-SEC.0001	Basic message screening security controls for message queue based information exchange	CRT-17.01-TRL6-TVALP-SEC.0004	A malformed AMQP 1.0 annotated message with uncomplete or invalid message properties is filtered out by enforcing the message screening policy.	Not planned	OK
OBJ-17.01-TRL6-TVALP-SEC.0001	Basic message screening security controls for message queue based information exchange	CRT-17.01-TRL6-TVALP-SEC.0008	Events concerning the message screening policies enforcement are logged in accordance with applicable audit policy.	Not planned	OK
OBJ-17.01-TRL6-TVALP-SEC.0001	Basic message screening security controls for message queue based information exchange	CRT-17.01-TRL6-TVALP-SEC.0009	A message screening policy is successfully updated at run-time without restarting the Ground SWIM Node.	Not planned	N/A

Technical Validation Exercise #02 Technical Validation Objective ID	Technical Validation Exercise #02 Technical Validation Objective Title	Technical Validation Exercise #02 Success Criterion ID	Technical Validation Exercise #02 Success Criterion	Technical Validation Exercise #02 Validation Results	Technical Validation Exercise #02 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-SEC.0002	Advanced message screening security controls for message queue based information exchange	CRT-17.01-TRL6-TVALP-SEC.0001	Different message screening policies are successfully configured for two or more message queues.	Not planned	OK
OBJ-17.01-TRL6-TVALP-SEC.0002	Advanced message screening security controls for message queue based information exchange	CRT-17.01-TRL6-TVALP-SEC.0002	Message screening policies are enforced on message queues used by Purple Profile enabled sender applications.	Not planned	OK
OBJ-17.01-TRL6-TVALP-SEC.0002	Advanced message screening security controls for message queue based information exchange	CRT-17.01-TRL6-TVALP-SEC.0003	Message screening policies are enforced on Ground SWIM Node side message queues used by Air SWIM Nodes to send/consume messages.	Not planned	OK
OBJ-17.01-TRL6-TVALP-SEC.0002	Advanced message screening security controls for message queue based information exchange	CRT-17.01-TRL6-TVALP-SEC.0005	A malformed AMQP 1.0 annotated message with syntactically invalid message payload is filtered out by enforcing the message screening policy.	Not planned	N/A

Technical Validation Exercise #02 Technical Validation Objective ID	Technical Validation Exercise #02 Technical Validation Objective Title	Technical Validation Exercise #02 Success Criterion ID	Technical Validation Exercise #02 Success Criterion	Technical Validation Exercise #02 Validation Results	Technical Validation Exercise #02 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-SEC.0002	Advanced message screening security controls for message queue based information exchange	CRT-17.01-TRL6-TVALP-SEC.0006	A malformed AMQP 1.0 annotated message with unexpected message payload is filtered out by enforcing the message screening policy.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-SEC.0002	Advanced message screening security controls for message queue based information exchange	CRT-17.01-TRL6-TVALP-SEC.0007	A malicious AMQP 1.0 annotated message with malicious property/payload is filtered out by enforcing the message screening policy.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-SEC.0002	Advanced message screening security controls for message queue based information exchange	CRT-17.01-TRL6-TVALP-SEC.0008	Events concerning the message screening policies enforcement are logged in accordance with applicable audit policy.	Not planned	OK
OBJ-17.01-TRL6-TVALP-SEC.0002	Advanced message screening security controls for message queue based information exchange	CRT-17.01-TRL6-TVALP-SEC.0009	A message screening policy is successfully updated at run-time without restarting the Ground SWIM Node.	Not planned	N/A

Technical Validation Exercise #02 Technical Validation Objective ID	Technical Validation Exercise #02 Technical Validation Objective Title	Technical Validation Exercise #02 Success Criterion ID	Technical Validation Exercise #02 Success Criterion	Technical Validation Exercise #02 Validation Results	Technical Validation Exercise #02 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-SEC.0003	Basic message screening security controls for message topic based information exchange	CRT-17.01-TRL6-TVALP-SEC.0010	Different message screening policies are successfully configured for two or more message topics.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-SEC.0003	Basic message screening security controls for message topic based information exchange	CRT-17.01-TRL6-TVALP-SEC.0011	Message screening policies are enforced on message topics used by Purple Profile enabled publisher applications.	Not planned	OK
OBJ-17.01-TRL6-TVALP-SEC.0003	Basic message screening security controls for message topic based information exchange	CRT-17.01-TRL6-TVALP-SEC.0012	Message screening policies are enforced on Ground SWIM Node side message topics used by Air SWIM Nodes to publish/consume messages.	Not planned	OK
OBJ-17.01-TRL6-TVALP-SEC.0003	Basic message screening security controls for message topic based information exchange	CRT-17.01-TRL6-TVALP-SEC.0004	A malformed AMQP 1.0 annotated message with uncomplete or invalid message properties is filtered out by enforcing the message screening policy.	Not planned	OK

Technical Validation Exercise #02 Technical Validation Objective ID	Technical Validation Exercise #02 Technical Validation Objective Title	Technical Validation Exercise #02 Success Criterion ID	Technical Validation Exercise #02 Success Criterion	Technical Validation Exercise #02 Validation Results	Technical Validation Exercise #02 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-SEC.0003	Basic message screening security controls for message topic based information exchange	CRT-17.01-TRL6-TVALP-SEC.0008	Events concerning the message screening policies enforcement are logged in accordance with applicable audit policy.	Not planned	OK
OBJ-17.01-TRL6-TVALP-SEC.0003	Basic message screening security controls for message topic based information exchange	CRT-17.01-TRL6-TVALP-SEC.0009	A message screening policy is successfully updated at run-time without restarting the Ground SWIM Node.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-SEC.0004	Advanced message screening security controls for message topic based information exchange	CRT-17.01-TRL6-TVALP-SEC.0010	Different message screening policies are successfully configured for two or more message topics.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-SEC.0004	Advanced message screening security controls for message topic based information exchange	CRT-17.01-TRL6-TVALP-SEC.0011	Message screening policies are enforced on message topics used by Purple Profile enabled publisher applications.	Not planned	OK

Technical Validation Exercise #02 Technical Validation Objective ID	Technical Validation Exercise #02 Technical Validation Objective Title	Technical Validation Exercise #02 Success Criterion ID	Technical Validation Exercise #02 Success Criterion	Technical Validation Exercise #02 Validation Results	Technical Validation Exercise #02 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-SEC.0004	Advanced message screening security controls for message topic based information exchange	CRT-17.01-TRL6-TVALP-SEC.0012	Message screening policies are enforced on Ground SWIM Node side message topics used by Air SWIM Nodes to publish/consume messages.	Not planned	OK
OBJ-17.01-TRL6-TVALP-SEC.0004	Advanced message screening security controls for message topic based information exchange	CRT-17.01-TRL6-TVALP-SEC.0005	A malformed AMQP 1.0 annotated message with syntactically invalid message payload is filtered out by enforcing the message screening policy.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-SEC.0004	Advanced message screening security controls for message topic based information exchange	CRT-17.01-TRL6-TVALP-SEC.0006	A malformed AMQP 1.0 annotated message with unexpected message payload is filtered out by enforcing the message screening policy.	Not planned	N/A

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OBJ-17.01-TRL6-TVALP-SEC.0004	Advanced message screening security controls for message topic based information exchange	CRT-17.01-TRL6-TVALP-SEC.0007	A malicious AMQP 1.0 annotated message with malicious property/payload is filtered out by enforcing the message screening policy.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-SEC.0004	Advanced message screening security controls for message topic based information exchange	CRT-17.01-TRL6-TVALP-SEC.0008	Events concerning the message screening policies enforcement are logged in accordance with applicable audit policy.	Not planned	OK
OBJ-17.01-TRL6-TVALP-SEC.0004	Advanced message screening security controls for message topic based information exchange	CRT-17.01-TRL6-TVALP-SEC.0009	A message screening policy is successfully updated at run-time without restarting the Ground SWIM Node.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-SEC.0005	Maximum message size overload protection security controls for message queue based information exchange	CRT-17.01-TRL6-TVALP-SEC.0013	Different overload protection policies are successfully configured for two or more message queues.	Not planned	OK

Technical Validation Exercise #02 Technical Validation Objective ID	Technical Validation Exercise #02 Technical Validation Objective Title	Technical Validation Exercise #02 Success Criterion ID	Technical Validation Exercise #02 Success Criterion	Technical Validation Exercise #02 Validation Results	Technical Validation Exercise #02 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-SEC.0005	Maximum message size overload protection security controls for message queue based information exchange	CRT-17.01-TRL6-TVALP-SEC.0014	Overload protection policies are enforced on message queues used by Purple Profile enabled sender applications.	Not planned	OK
OBJ-17.01-TRL6-TVALP-SEC.0005	Maximum message size overload protection security controls for message queue based information exchange	CRT-17.01-TRL6-TVALP-SEC.0015	Overload protection policies are enforced on Ground SWIM Node side message queues used by Air SWIM Nodes to send/consume messages.	Not planned	OK
OBJ-17.01-TRL6-TVALP-SEC.0005	Maximum message size overload protection security controls for message queue based information exchange	CRT-17.01-TRL6-TVALP-SEC.0016	Events concerning the overload protection policies enforcement are logged in accordance with applicable audit policy.	Not planned	OK
OBJ-17.01-TRL6-TVALP-SEC.0005	Maximum message size overload protection security controls for message queue based information exchange	CRT-17.01-TRL6-TVALP-SEC.0017	An overload protection policy is successfully updated at run-time without restarting the Ground SWIM Node.	Not planned	N/A

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OBJ-17.01-TRL6-TVALP-SEC.0005	Maximum message size overload protection security controls for message queue based information exchange	CRT-17.01-TRL6-TVALP-SEC.0018	An AMQP 1.0 annotated message exceeding maximum message size is rejected by enforcing the overload protection policy, the sender is notified and the event routed according to the applicable context-based routing monitoring policy.	Not planned	OK
OBJ-17.01-TRL6-TVALP-SEC.0005	Maximum message size overload protection security controls for message queue based information exchange	CRT-17.01-TRL6-TVALP-SEC.0019	An AMQP 1.0 annotated message exceeding maximum message size is dropped by enforcing the overload protection policy and the event routed according to the applicable context-based routing monitoring policy.	Not planned	OK
OBJ-17.01-TRL6-TVALP-SEC.0006	Maximum message size overload protection security controls for message topic based information exchange	CRT-17.01-TRL6-TVALP-SEC.0020	Different overload protection policies are successfully configured for two or more message topics.	Not planned	OK

Technical Validation Exercise #02 Technical Validation Objective ID	Technical Validation Exercise #02 Technical Validation Objective Title	Technical Validation Exercise #02 Success Criterion ID	Technical Validation Exercise #02 Success Criterion	Technical Validation Exercise #02 Validation Results	Technical Validation Exercise #02 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-SEC.0006	Maximum message size overload protection security controls for message topic based information exchange	CRT-17.01-TRL6-TVALP-SEC.0021	Overload protection policies are enforced on message topics used by Purple Profile enabled publisher applications.	Not planned	OK
OBJ-17.01-TRL6-TVALP-SEC.0006	Maximum message size overload protection security controls for message topic based information exchange	CRT-17.01-TRL6-TVALP-SEC.0022	Overload protection policies are enforced on Ground SWIM Node side message topics used by Air SWIM Nodes to publish/consume messages.	Not planned	OK
OBJ-17.01-TRL6-TVALP-SEC.0006	Maximum message size overload protection security controls for message topic based information exchange	CRT-17.01-TRL6-TVALP-SEC.0016	Events concerning the overload protection policies enforcement are logged in accordance with applicable audit policy.	Not planned	OK
OBJ-17.01-TRL6-TVALP-SEC.0006	Maximum message size overload protection security controls for message topic based information exchange	CRT-17.01-TRL6-TVALP-SEC.0017	An overload protection policy is successfully updated at run-time without restarting the Ground SWIM Node.	Not planned	N/A

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OBJ-17.01-TRL6-TVALP-SEC.0006	Maximum message size overload protection security controls for message topic based information exchange	CRT-17.01-TRL6-TVALP-SEC.0018	An AMQP 1.0 annotated message exceeding maximum message size is rejected by enforcing the overload protection policy, the sender is notified and the event routed according to the applicable context-based routing monitoring policy.	Not planned	OK
OBJ-17.01-TRL6-TVALP-SEC.0006	Maximum message size overload protection security controls for message topic based information exchange	CRT-17.01-TRL6-TVALP-SEC.0019	An AMQP 1.0 annotated message exceeding maximum message size is dropped by enforcing the overload protection policy and the event routed according to the applicable context-based routing monitoring policy.	Not planned	OK
OBJ-17.01-TRL6-TVALP-SEC.0007	Maximum message queue capacity overload protection security controls	CRT-17.01-TRL6-TVALP-SEC.0013	Different overload protection policies are successfully configured for two or more message queues.	Not planned	Partially OK

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OBJ-17.01-TRL6-TVALP-SEC.0007	Maximum message queue capacity overload protection security controls	CRT-17.01-TRL6-TVALP-SEC.0014	Overload protection policies are enforced on message queues used by Purple Profile enabled sender applications.	Not planned	Partially OK
OBJ-17.01-TRL6-TVALP-SEC.0007	Maximum message queue capacity overload protection security controls	CRT-17.01-TRL6-TVALP-SEC.0015	Overload protection policies are enforced on Ground SWIM Node side message queues used by Air SWIM Nodes to send/consume messages.	Not planned	Partially OK
OBJ-17.01-TRL6-TVALP-SEC.0007	Maximum message queue capacity overload protection security controls	CRT-17.01-TRL6-TVALP-SEC.0016	Events concerning the overload protection policies enforcement are logged in accordance with applicable audit policy.	Not planned	OK
OBJ-17.01-TRL6-TVALP-SEC.0007	Maximum message queue capacity overload protection security controls	CRT-17.01-TRL6-TVALP-SEC.0017	An overload protection policy is successfully updated at run-time without restarting the Ground SWIM Node.	Not planned	N/A

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OBJ-17.01-TRL6-TVALP-SEC.0007	Maximum message queue capacity overload protection security controls	CRT-17.01-TRL6-TVALP-SEC.0023	An attempt to send an AMQP 1.0 annotated message is rejected because maximum message queue capacity is exceeded.	Not planned	OK
OBJ-17.01-TRL6-TVALP-SEC.0008	Maximum message topic capacity overload protection security controls	CRT-17.01-TRL6-TVALP-SEC.0020	Different overload protection policies are successfully configured for two or more message topics.	Not planned	Partially OK
OBJ-17.01-TRL6-TVALP-SEC.0008	Maximum message topic capacity overload protection security controls	CRT-17.01-TRL6-TVALP-SEC.0021	Overload protection policies are enforced on message topics used by Purple Profile enabled publisher applications.	Not planned	Partially OK
OBJ-17.01-TRL6-TVALP-SEC.0008	Maximum message topic capacity overload protection security controls	CRT-17.01-TRL6-TVALP-SEC.0022	Overload protection policies are enforced on Ground SWIM Node side message topics used by Air SWIM Nodes to publish/consume messages.	Not planned	Partially OK

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OBJ-17.01-TRL6-TVALP-SEC.0008	Maximum message topic capacity overload protection security controls	CRT-17.01-TRL6-TVALP-SEC.0016	Events concerning the overload protection policies enforcement are logged in accordance with applicable audit policy.	Not planned	OK
OBJ-17.01-TRL6-TVALP-SEC.0008	Maximum message topic capacity overload protection security controls	CRT-17.01-TRL6-TVALP-SEC.0017	An overload protection policy is successfully updated at run-time without restarting the Ground SWIM Node.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-SEC.0008	Maximum message topic capacity overload protection security controls	CRT-17.01-TRL6-TVALP-SEC.0024	An attempt to publish an AMQP 1.0 annotated message is rejected because maximum message topic capacity is exceeded.	Not planned	OK
OBJ-17.01-TRL6-TVALP-SEC.0009	Consolidated connections limits overload protection security controls	CRT-17.01-TRL6-TVALP-SEC.0025	Maximum number of consolidated connections is successfully configured.	Not planned	OK
OBJ-17.01-TRL6-TVALP-SEC.0009	Consolidated connections limits overload protection security controls	CRT-17.01-TRL6-TVALP-SEC.0016	Events concerning the overload protection policies enforcement are logged in accordance with applicable audit policy.	Not planned	OK

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OBJ-17.01-TRL6-TVALP-SEC.0009	Consolidated connections limits overload protection security controls	CRT-17.01-TRL6-TVALP-SEC.0026	An attempt to establish an AMQP 1.0 connection is rejected because the maximum number of consolidated connections is exceeded.	Not planned	OK
OBJ-17.01-TRL6-TVALP-SEC.0010	Concurrent connections limits per connecting entity overload protection security controls	CRT-17.01-TRL6-TVALP-SEC.0027	Maximum number of concurrent connections per connecting entity is successfully configured.	Not planned	OK
OBJ-17.01-TRL6-TVALP-SEC.0010	Concurrent connections limits per connecting entity overload protection security controls	CRT-17.01-TRL6-TVALP-SEC.0016	Events concerning the overload protection policies enforcement are logged in accordance with applicable audit policy.	Not planned	OK
OBJ-17.01-TRL6-TVALP-SEC.0010	Concurrent connections limits per connecting entity overload protection security controls	CRT-17.01-TRL6-TVALP-SEC.0028	An attempt to establish an AMQP 1.0 connection is rejected because the maximum number of concurrent connections for the connecting entity is exceeded.	Not planned	OK

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OBJ-17.01-TRL6-TVALP-SEC.0011	Mutual authentication and basic certificate revocation status check security controls	CRT-17.01-TRL6-TVALP-SEC.0029	Amqps mutual authentication is enforced between aircraft application and Air SWIM Node.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-SEC.0011	Mutual authentication and basic certificate revocation status check security controls	CRT-17.01-TRL6-TVALP-SEC.0030	Amqps mutual authentication is enforced between Air and Ground SWIM Node.	Not planned	OK
OBJ-17.01-TRL6-TVALP-SEC.0011	Mutual authentication and basic certificate revocation status check security controls	CRT-17.01-TRL6-TVALP-SEC.0031	Amqps mutual authentication is enforced between Ground SWIM Node and ground application.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-SEC.0011	Mutual authentication and basic certificate revocation status check security controls	CRT-17.01-TRL6-TVALP-SEC.0032	Events concerning mutual authentication enforcement are logged in accordance with applicable audit policy.	Not planned	OK
OBJ-17.01-TRL6-TVALP-SEC.0011	Mutual authentication and basic certificate revocation status check security controls	CRT-17.01-TRL6-TVALP-SEC.0033	Amqps peers successfully mutual authenticate although one of the peer requires the fallback to TLS 1.2.	Not planned	OK

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OBJ-17.01-TRL6-TVALP-SEC.0011	Mutual authentication and basic certificate revocation status check security controls	CRT-17.01-TRL6-TVALP-SEC.0034	Mutual authentication between amqps peers fails in all the following cases:- one of the peer requires the fallback to a TLS version lower than TLS 1.2.- peer's X.509v3 certificate is not trusted.- peer's X.509v3 certificate is expired.- peer's X.509v3 certificate has been revoked (it is included in the local CRL).- the local CRL is not the current CRL or the CRL scope is not appropriate and the authentication policy does not allow potentially revoked or compromised certificates.	Not planned	OK

Technical Validation Exercise #02 Technical Validation Objective ID	Technical Validation Exercise #02 Technical Validation Objective Title	Technical Validation Exercise #02 Success Criterion ID	Technical Validation Exercise #02 Success Criterion	Technical Validation Exercise #02 Validation Results	Technical Validation Exercise #02 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-SEC.0011	Mutual authentication and basic certificate revocation status check security controls	CRT-17.01-TRL6-TVALP-SEC.0035	Amqps peers successfully mutual authenticate although the local CRL is not the current CRL or the CRL scope is not appropriate because the authentication policy allows potentially revoked or compromised certificate.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-SEC.0012	CRL update mechanisms	CRT-17.01-TRL6-TVALP-SEC.0036	The CRL used by SWIM Node is successfully updated via administrative interface.	Not planned	OK
OBJ-17.01-TRL6-TVALP-SEC.0012	CRL update mechanisms	CRT-17.01-TRL6-TVALP-SEC.0037	The CRL used by SWIM Node is not the current CRL and it is successfully updated on-the-fly via the HTTP CDP.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-SEC.0012	CRL update mechanisms	CRT-17.01-TRL6-TVALP-SEC.0038	A delta-CRL is used to successfully update the CRL used by SWIM Node.	Not planned	N/A

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OBJ-17.01-TRL6-TVALP-SEC.0013	Mutual authentication with OCSP certificate revocation status check security controls	CRT-17.01-TRL6-TVALP-SEC.0029	Amqps mutual authentication is enforced between aircraft application and Air SWIM Node.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-SEC.0013	Mutual authentication with OCSP certificate revocation status check security controls	CRT-17.01-TRL6-TVALP-SEC.0030	Amqps mutual authentication is enforced between Air and Ground SWIM Node.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-SEC.0013	Mutual authentication with OCSP certificate revocation status check security controls	CRT-17.01-TRL6-TVALP-SEC.0031	Amqps mutual authentication is enforced between Ground SWIM Node and ground application.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-SEC.0013	Mutual authentication with OCSP certificate revocation status check security controls	CRT-17.01-TRL6-TVALP-SEC.0032	Events concerning mutual authentication enforcement are logged in accordance with applicable audit policy.	Not planned	N/A

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OBJ-17.01-TRL6-TVALP-SEC.0013	Mutual authentication with OCSP certificate revocation status check security controls	CRT-17.01-TRL6-TVALP-SEC.0039	Amqps peer's certificate revocation status is retrieved from the OCSP response, and the authentication is successfully completed because the certificate is not revoked.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-SEC.0013	Mutual authentication with OCSP certificate revocation status check security controls	CRT-17.01-TRL6-TVALP-SEC.0040	Amqps peer's certificate revocation status is retrieved from the OCSP response, and the authentication fails because the certificate has been revoked.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-SEC.0013	Mutual authentication with OCSP certificate revocation status check security controls	CRT-17.01-TRL6-TVALP-SEC.0041	OCSP responder URL is retrieved from pre-configured local resources.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-SEC.0013	Mutual authentication with OCSP certificate revocation status check security controls	CRT-17.01-TRL6-TVALP-SEC.0042	OCSP responder URL is retrieved from location identified in the OCSP field in the Authority Information Access extension in the peer's certificate.	Not planned	N/A

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OBJ-17.01-TRL6-TVALP-SEC.0014	Mutual authentication with combined OCSP and CRL based certificate revocation status check security controls	CRT-17.01-TRL6-TVALP-SEC.0043	OCSP is configured and used as preferred certificate revocation status check mechanism disabling the fallback to CRL.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-SEC.0014	Mutual authentication with combined OCSP and CRL based certificate revocation status check security controls	CRT-17.01-TRL6-TVALP-SEC.0044	OCSP is configured as preferred certificate revocation status check mechanism but because the responder is not available and the fallback is enabled, the CRL is successfully used.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-SEC.0014	Mutual authentication with combined OCSP and CRL based certificate revocation status check security controls	CRT-17.01-TRL6-TVALP-SEC.0045	CRL is configured and used as preferred certificate revocation status check mechanism disabling the fallback to OCSP.	Not planned	N/A

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OBJ-17.01-TRL6-TVALP-SEC.0014	Mutual authentication with combined OCSP and CRL based certificate revocation status check security controls	CRT-17.01-TRL6-TVALP-SEC.0046	CRL is configured as preferred certificate revocation status check mechanism but because the CRL is not available/valid and the fallback is enabled, the OCSP is successfully used.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-SEC.0014	Mutual authentication with combined OCSP and CRL based certificate revocation status check security controls	CRT-17.01-TRL6-TVALP-SEC.0047	Amqps peers successfully mutual authenticate although none of the combined certificate revocation status mechanisms are available but the authentication policy allows potentially revoked or compromised certificate.	Not planned	N/A

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OBJ-17.01-TRL6-TVALP-SEC.0014	Mutual authentication with combined OCSP and CRL based certificate revocation status check security controls	CRT-17.01-TRL6-TVALP-SEC.0048	Mutual authentication between amqps peers fails because none of the combined certificate revocation status mechanisms are available and the authentication policy does not allow potentially revoked or compromised certificate.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-SEC.0015	Authorization security controls for message queue based information exchange	CRT-17.01-TRL6-TVALP-SEC.0049	Different authorization policies are successfully configured for two or more message queues.	Not planned	OK
OBJ-17.01-TRL6-TVALP-SEC.0015	Authorization security controls for message queue based information exchange	CRT-17.01-TRL6-TVALP-SEC.0050	Authorization policies are enforced on message queue used by Purple Profile enabled sender applications.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-SEC.0015	Authorization security controls for message queue based information exchange	CRT-17.01-TRL6-TVALP-SEC.0051	Authorization policies are enforced on message queue used by Purple Profile enabled receiver applications.	Not planned	N/A

Technical Validation Exercise #02 Technical Validation Objective ID	Technical Validation Exercise #02 Technical Validation Objective Title	Technical Validation Exercise #02 Success Criterion ID	Technical Validation Exercise #02 Success Criterion	Technical Validation Exercise #02 Validation Results	Technical Validation Exercise #02 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-SEC.0015	Authorization security controls for message queue based information exchange	CRT-17.01-TRL6-TVALP-SEC.0052	Authorization policies are enforced on Ground SWIM Node side message queue used by Air SWIM Nodes to send/receive messages.	Not planned	OK
OBJ-17.01-TRL6-TVALP-SEC.0015	Authorization security controls for message queue based information exchange	CRT-17.01-TRL6-TVALP-SEC.0053	Events concerning the authorization policies enforcement are logged in accordance with applicable audit policy.	Not planned	OK
OBJ-17.01-TRL6-TVALP-SEC.0015	Authorization security controls for message queue based information exchange	CRT-17.01-TRL6-TVALP-SEC.0054	An authorization policy is successfully updated at run-time without restarting the Ground SWIM Node.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-SEC.0015	Authorization security controls for message queue based information exchange	CRT-17.01-TRL6-TVALP-SEC.0055	An attempt to send a message to a queue is authorized because the sending entity is successfully authenticated with sender role for that queue.	Not planned	OK

Technical Validation Exercise #02 Technical Validation Objective ID	Technical Validation Exercise #02 Technical Validation Objective Title	Technical Validation Exercise #02 Success Criterion ID	Technical Validation Exercise #02 Success Criterion	Technical Validation Exercise #02 Validation Results	Technical Validation Exercise #02 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-SEC.0015	Authorization security controls for message queue based information exchange	CRT-17.01-TRL6-TVALP-SEC.0056	An attempt to send a message to a queue is not authorized because the authenticated sending entity has not assigned the sender role for that queue.	Not planned	OK
OBJ-17.01-TRL6-TVALP-SEC.0015	Authorization security controls for message queue based information exchange	CRT-17.01-TRL6-TVALP-SEC.0057	An attempt to receive a message from a queue is authorized because the receiving entity is successfully authenticated with receiver role for that queue.	Not planned	OK
OBJ-17.01-TRL6-TVALP-SEC.0015	Authorization security controls for message queue based information exchange	CRT-17.01-TRL6-TVALP-SEC.0058	An attempt to receive a message from a queue is not authorized because the authenticated receiving entity has not assigned the receiver role for that queue.	Not planned	OK
OBJ-17.01-TRL6-TVALP-SEC.0016	Authorization security controls for message topic based information exchange	CRT-17.01-TRL6-TVALP-SEC.0059	Different authorization policies are successfully configured for two or more message topics.	Not planned	OK

Technical Validation Exercise #02 Technical Validation Objective ID	Technical Validation Exercise #02 Technical Validation Objective Title	Technical Validation Exercise #02 Success Criterion ID	Technical Validation Exercise #02 Success Criterion	Technical Validation Exercise #02 Validation Results	Technical Validation Exercise #02 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-SEC.0016	Authorization security controls for message topic based information exchange	CRT-17.01-TRL6-TVALP-SEC.0060	Authorization policies are enforced on message topic used by Purple Profile enabled publisher applications.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-SEC.0016	Authorization security controls for message topic based information exchange	CRT-17.01-TRL6-TVALP-SEC.0061	Authorization policies are enforced on message topic used by Purple Profile enabled subscriber applications.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-SEC.0016	Authorization security controls for message topic based information exchange	CRT-17.01-TRL6-TVALP-SEC.0062	Authorization policies are enforced on Ground SWIM Node side message topic used by Air SWIM Nodes to publish/consume messages.	Not planned	OK
OBJ-17.01-TRL6-TVALP-SEC.0016	Authorization security controls for message topic based information exchange	CRT-17.01-TRL6-TVALP-SEC.0053	Events concerning the authorization policies enforcement are logged in accordance with applicable audit policy.	Not planned	OK

Technical Validation Exercise #02 Technical Validation Objective ID	Technical Validation Exercise #02 Technical Validation Objective Title	Technical Validation Exercise #02 Success Criterion ID	Technical Validation Exercise #02 Success Criterion	Technical Validation Exercise #02 Validation Results	Technical Validation Exercise #02 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-SEC.0016	Authorization security controls for message topic based information exchange	CRT-17.01-TRL6-TVALP-SEC.0054	An authorization policy is successfully updated at run-time without restarting the Ground SWIM Node.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-SEC.0016	Authorization security controls for message topic based information exchange	CRT-17.01-TRL6-TVALP-SEC.0063	An attempt to publish a message to a topic is authorized because the publishing entity is successfully authenticated with publisher role for that topic.	Only authorized entities with appropriate roles are allowed to send messages to specific topics.	OK
OBJ-17.01-TRL6-TVALP-SEC.0016	Authorization security controls for message topic based information exchange	CRT-17.01-TRL6-TVALP-SEC.0064	An attempt to publish a message to a topic is not authorized because the authenticated publishing entity has not assigned the publisher role for that topic.	Only authorized entities with appropriate roles are allowed to send messages to specific topics.	OK
OBJ-17.01-TRL6-TVALP-SEC.0016	Authorization security controls for message topic based information exchange	CRT-17.01-TRL6-TVALP-SEC.0065	An attempt to subscribe to a topic is authorized because the subscribing entity is successfully authenticated with subscriber role for that topic.	Only authorized entities with appropriate roles are allowed to subscribe to specific topics.	OK

Technical Validation Exercise #02 Technical Validation Objective ID	Technical Validation Exercise #02 Technical Validation Objective Title	Technical Validation Exercise #02 Success Criterion ID	Technical Validation Exercise #02 Success Criterion	Technical Validation Exercise #02 Validation Results	Technical Validation Exercise #02 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-SEC.0016	Authorization security controls for message topic based information exchange	CRT-17.01-TRL6-TVALP-SEC.0066	An attempt to subscribe to a topic is not authorized because the authenticated subscribing entity has not assigned the subscriber role for that topic.	Only authorized entities with appropriate roles are allowed to subscribe to specific topics.	OK
OBJ-17.01-TRL6-TVALP-SEC.0017	Authorization security controls for message queue and topic lifecycle management	CRT-17.01-TRL6-TVALP-SEC.0067	An entity fails to connect to a message queue because the queue does not exist and the messaging resources lifecycle management is only authorized via administrative interfaces.	Connections to non-existing resources (queue/topic) are rejected and its management is successfully controlled over administrative interfaces.	OK
OBJ-17.01-TRL6-TVALP-SEC.0017	Authorization security controls for message queue and topic lifecycle management	CRT-17.01-TRL6-TVALP-SEC.0068	An entity fails to connect to a message topic because the topic does not exist and the messaging resources lifecycle management is only authorized via administrative interfaces.	Connections to non-existing resources (queue/topic) are rejected and its management is successfully controlled over administrative interfaces.	OK

Technical Validation Exercise #02 Technical Validation Objective ID	Technical Validation Exercise #02 Technical Validation Objective Title	Technical Validation Exercise #02 Success Criterion ID	Technical Validation Exercise #02 Success Criterion	Technical Validation Exercise #02 Validation Results	Technical Validation Exercise #02 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-SEC.0017	Authorization security controls for message queue and topic lifecycle management	CRT-17.01-TRL6-TVALP-SEC.0069	A message queue is successfully created via administrative interface by an user with administrator role.	Administrative interface allowed to create and delete queues and topics.	OK
OBJ-17.01-TRL6-TVALP-SEC.0017	Authorization security controls for message queue and topic lifecycle management	CRT-17.01-TRL6-TVALP-SEC.0070	A message topic is successfully created via administrative interface by an user with administrator role.	Administrative interface allowed to create and delete queues and topics.	OK
OBJ-17.01-TRL6-TVALP-SEC.0017	Authorization security controls for message queue and topic lifecycle management	CRT-17.01-TRL6-TVALP-SEC.0071	A message queue is successfully deleted via administrative interface by an user with administrator role.	Administrative interface allowed to create and delete queues and topics.	OK
OBJ-17.01-TRL6-TVALP-SEC.0017	Authorization security controls for message queue and topic lifecycle management	CRT-17.01-TRL6-TVALP-SEC.0072	A message topic is successfully deleted via administrative interface by an user with administrator role.	Administrative interface allowed to create and delete queues and topics.	OK

Technical Validation Exercise #02 Technical Validation Objective ID	Technical Validation Exercise #02 Technical Validation Objective Title	Technical Validation Exercise #02 Success Criterion ID	Technical Validation Exercise #02 Success Criterion	Technical Validation Exercise #02 Validation Results	Technical Validation Exercise #02 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-SEC.0017	Authorization security controls for message queue and topic lifecycle management	CRT-17.01-TRL6-TVALP-SEC.0073	An user without administrator role fails to create/delete message queue/topic via administrative interface.	Users without the appropriate roles had no access to create/delete queues or topic functions.	OK

Technical Validation Exercise #02 Technical Validation Objective ID	Technical Validation Exercise #02 Technical Validation Objective Title	Technical Validation Exercise #02 Success Criterion ID	Technical Validation Exercise #02 Success Criterion	Technical Validation Exercise #02 Validation Results	Technical Validation Exercise #02 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-SEC.0018	End-to-end confidentiality for uplink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-SEC.0074	Following steps are successfully completed:- The requestor creates and sends an AMQP 1.0 annotated request message with application-data section containing encrypted data and ENPT AMQP footer with value containing both Encryption-Algorithm and Encryption-Secret for the intender responder.- While the request message is in transit at SWIM nodes level, it is not possible to access/visualize sensitive information because both application data and shared secret are encrypted- The request message is delivered to the intended responder that successfully decrypts it relying on delivered ENPT AMQP footer.	This prototype followed a "Security information attached to the data" approach, according to section 4.2.2.3.3 of the TS. Hybrid cryptography (RSA + AES) was used to encrypt messages.	NOK

Technical Validation Exercise #02 Technical Validation Objective ID	Technical Validation Exercise #02 Technical Validation Objective Title	Technical Validation Exercise #02 Success Criterion ID	Technical Validation Exercise #02 Success Criterion	Technical Validation Exercise #02 Validation Results	Technical Validation Exercise #02 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-SEC.0018	End-to-end confidentiality for uplink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-SEC.0075	Following steps are successfully completed: -The responder creates and sends an AMQP 1.0 annotated response message with application-data section containing encrypted data and ENPT AMQP footer with value containing both Encryption-Algorithm and Encryption-Secret for the requestor.- While the response message is in transit at SWIM nodes level, it is not possible to access request/visualize sensitive information because both application data and shared secret are encrypted.- The response message is delivered to the intended requestor that successfully decrypts it relying on delivered ENPT AMQP footer.	This prototype followed a "Security information attached to the data" approach, according to section 4.2.2.3.3 of the TS. Hybrid cryptography (RSA + AES) was used to encrypt messages.	NOK

Technical Validation Exercise #02 Technical Validation Objective ID	Technical Validation Exercise #02 Technical Validation Objective Title	Technical Validation Exercise #02 Success Criterion ID	Technical Validation Exercise #02 Success Criterion	Technical Validation Exercise #02 Validation Results	Technical Validation Exercise #02 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-SEC.0018	End-to-end confidentiality for uplink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-SEC.0076	Following steps are successfully completed:- The requestor creates and sends an additional AMQP 1.0 annotated request message for the same responder with application-data section containing encrypted data and ENPT AMQP footer containing only the Encryption-Algorithm.- The request message is delivered to the intended responder that successfully decrypts it relying on delivered ENPT AMQP footer and cached Encryption-Secret from previous request messages.	This prototype followed a "Security information attached to the data" approach, according to section 4.2.2.3.3 of the TS. Hybrid cryptography (RSA + AES) was used to encrypt messages.	NOK

Technical Validation Exercise #02 Technical Validation Objective ID	Technical Validation Exercise #02 Technical Validation Objective Title	Technical Validation Exercise #02 Success Criterion ID	Technical Validation Exercise #02 Success Criterion	Technical Validation Exercise #02 Validation Results	Technical Validation Exercise #02 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-SEC.0018	End-to-end confidentiality for uplink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-SEC.0077	Following steps are successfully completed:- The requestor creates and sends an additional AMQP 1.0 annotated request message for the same responder with application-data section containing encrypted data and ENPT AMQP footer containing also a new Encryption-Secret.- The request message is delivered to the intended responder that successfully decrypts it relying on delivered ENPT AMQP footer replacing cached Encryption-Secret.	This prototype followed a "Security information attached to the data" approach, according to section 4.2.2.3.3 of the TS. Hybrid cryptography (RSA + AES) was used to encrypt messages.	NOK

Technical Validation Exercise #02 Technical Validation Objective ID	Technical Validation Exercise #02 Technical Validation Objective Title	Technical Validation Exercise #02 Success Criterion ID	Technical Validation Exercise #02 Success Criterion	Technical Validation Exercise #02 Validation Results	Technical Validation Exercise #02 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-SEC.0019	End-to-end confidentiality for uplink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-SEC.0078	Following steps are successfully completed:- The publisher creates and publishes an AMQP 1.0 annotated publication message with application-data section containing encrypted data and ENPT AMQP footer with value containing both Encryption-Algorithm and Encryption-Secret for two or more subscribers.- While the publication message is in transit at SWIM nodes level, it is not possible to access/visualize sensitive information because both application data and shared secret are encrypted.- The publication message is delivered to the intended subscribers that successfully decrypt it relying on delivered ENPT AMQP footer.	This prototype followed a "Security information attached to the data" approach, according to section 4.2.2.3.3 of the TS. Hybrid cryptography (RSA + AES) was used to encrypt messages.	NOK

Technical Validation Exercise #02 Technical Validation Objective ID	Technical Validation Exercise #02 Technical Validation Objective Title	Technical Validation Exercise #02 Success Criterion ID	Technical Validation Exercise #02 Success Criterion	Technical Validation Exercise #02 Validation Results	Technical Validation Exercise #02 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-SEC.0019	End-to-end confidentiality for uplink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-SEC.0079	Following steps are successfully completed:- The publisher creates and publishes an additional AMQP 1.0 annotated publication message for the same subscribers with application-data section containing encrypted data and ENPT AMQP footer containing only the Encryption-Algorithm.- The publication message is delivered to the intended subscribers that successfully decrypt it relying on delivered ENPT AMQP footer and cached Encryption-Secret from previous messages.	This prototype followed a "Security information attached to the data" approach, according to section 4.2.2.3.3 of the TS. Hybrid cryptography (RSA + AES) was used to encrypt messages.	NOK

Technical Validation Exercise #02 Technical Validation Objective ID	Technical Validation Exercise #02 Technical Validation Objective Title	Technical Validation Exercise #02 Success Criterion ID	Technical Validation Exercise #02 Success Criterion	Technical Validation Exercise #02 Validation Results	Technical Validation Exercise #02 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-SEC.0019	End-to-end confidentiality for uplink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-SEC.0080	Following steps are successfully completed:- An additional subscriber ("new_sub") successfully subscribes to the topic.- The publisher creates and publishes an additional AMQP 1.0 annotated publication message with application-data section containing encrypted data and ENPT AMQP footer containing the Encryption-Algorithm and only the Encryption-Secret for the new subscriber.- The publication message is delivered to all the subscribers and in particular to the new one that successfully decrypts the message relying on delivered ENPT AMQP footer.- The other subscribers successfully decrypt the message relying on delivered ENPT AMQP footer and cached Encryption-Secret from previous messages.	This prototype followed a "Security information attached to the data" approach, according to section 4.2.2.3.3 of the TS. Hybrid cryptography (RSA + AES) was used to encrypt messages.	NOK

Technical Validation Exercise #02 Technical Validation Objective ID	Technical Validation Exercise #02 Technical Validation Objective Title	Technical Validation Exercise #02 Success Criterion ID	Technical Validation Exercise #02 Success Criterion	Technical Validation Exercise #02 Validation Results	Technical Validation Exercise #02 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-SEC.0019	End-to-end confidentiality for uplink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-SEC.0081	Following steps are successfully completed:- The publisher creates and publishes an additional AMQP 1.0 annotated publication message with application-data section containing encrypted data and ENPT AMQP footer containing also a new Encryption-Secret.- The publication message is delivered to the intended subscribers that successfully decrypt it relying on delivered ENPT AMQP footer and replacing cached Encryption-Secret.	This prototype followed a "Security information attached to the data" approach, according to section 4.2.2.3.3 of the TS. Hybrid cryptography (RSA + AES) was used to encrypt messages.	NOK

Technical Validation Exercise #02 Technical Validation Objective ID	Technical Validation Exercise #02 Technical Validation Objective Title	Technical Validation Exercise #02 Success Criterion ID	Technical Validation Exercise #02 Success Criterion	Technical Validation Exercise #02 Validation Results	Technical Validation Exercise #02 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-SEC.0020	End-to-end confidentiality for downlink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-SEC.0078	Following steps are successfully completed:- The publisher creates and publishes an AMQP 1.0 annotated publication message with application-data section containing encrypted data and ENPT AMQP footer with value containing both Encryption-Algorithm and Encryption-Secret for two or more subscribers.- While the publication message is in transit at SWIM nodes level, it is not possible to access/visualize sensitive information because both application data and shared secret are encrypted.- The publication message is delivered to the intended subscribers that successfully decrypt it relying on delivered ENPT AMQP footer.	This prototype followed a "Security information attached to the data" approach, according to section 4.2.2.3.3 of the TS. Hybrid cryptography (RSA + AES) was used to encrypt messages.	NOK

Technical Validation Exercise #02 Technical Validation Objective ID	Technical Validation Exercise #02 Technical Validation Objective Title	Technical Validation Exercise #02 Success Criterion ID	Technical Validation Exercise #02 Success Criterion	Technical Validation Exercise #02 Validation Results	Technical Validation Exercise #02 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-SEC.0020	End-to-end confidentiality for downlink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-SEC.0079	Following steps are successfully completed:- The publisher creates and publishes an additional AMQP 1.0 annotated publication message for the same subscribers with application-data section containing encrypted data and ENPT AMQP footer containing only the Encryption-Algorithm.- The publication message is delivered to the intended subscribers that successfully decrypt it relying on delivered ENPT AMQP footer and cached eEncryption-Secret from previous messages.	This prototype followed a "Security information attached to the data" approach, according to section 4.2.2.3.3 of the TS. Hybrid cryptography (RSA + AES) was used to encrypt messages.	NOK

Technical Validation Exercise #02 Technical Validation Objective ID	Technical Validation Exercise #02 Technical Validation Objective Title	Technical Validation Exercise #02 Success Criterion ID	Technical Validation Exercise #02 Success Criterion	Technical Validation Exercise #02 Validation Results	Technical Validation Exercise #02 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-SEC.0020	End-to-end confidentiality for downlink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-SEC.0080	Following steps are successfully completed:- An additional subscriber ("new_sub") successfully subscribes to the topic.- The publisher creates and publishes an additional AMQP 1.0 annotated publication message with application-data section containing encrypted data and ENPT AMQP footer containing the Encryption-Algorithm and only the Encryption-Secret for the new subscriber.- The publication message is delivered to all the subscribers and in particular to the new one that successfully decrypts the message relying on delivered ENPT AMQP footer.- The other subscribers successfully decrypt the message relying on delivered ENPT AMQP footer and cached Encryption-Secret from previous messages.	This prototype followed a "Security information attached to the data" approach, according to section 4.2.2.3.3 of the TS. Hybrid cryptography (RSA + AES) was used to encrypt messages.	NOK

Technical Validation Exercise #02 Technical Validation Objective ID	Technical Validation Exercise #02 Technical Validation Objective Title	Technical Validation Exercise #02 Success Criterion ID	Technical Validation Exercise #02 Success Criterion	Technical Validation Exercise #02 Validation Results	Technical Validation Exercise #02 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-SEC.0020	End-to-end confidentiality for downlink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-SEC.0081	Following steps are successfully completed:- The publisher creates and publishes an additional AMQP 1.0 annotated publication message with application-data section containing encrypted data and ENPT AMQP footer containing also a new Encryption-Secret.- The publication message is delivered to the intended subscribers that successfully decrypt it relying on delivered ENPT AMQP footer and replacing cached Encryption-Secret.	This prototype followed a "Security information attached to the data" approach, according to section 4.2.2.3.3 of the TS. Hybrid cryptography (RSA + AES) was used to encrypt messages.	NOK

Technical Validation Exercise #02 Technical Validation Objective ID	Technical Validation Exercise #02 Technical Validation Objective Title	Technical Validation Exercise #02 Success Criterion ID	Technical Validation Exercise #02 Success Criterion	Technical Validation Exercise #02 Validation Results	Technical Validation Exercise #02 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-SEC.0021	End-to-end HMAC based message level integrity and authenticity for uplink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-SEC.0082	Following steps are successfully completed:- The requestor creates and sends an AMQP 1.0 annotated request message with HMAC AMQP footer with value containing HMAC-Algorithm, HMAC-Target, HMAC-Digest and HMAC-Secret for the intender responder.- The request message is delivered to the intended responder that successfully validates the authenticity and integrity of the message relying on delivered HMAC AMQP footer.	This prototype followed a "Security information attached to the data" approach, according to section 4.2.2.3.3 of the TS. Hybrid cryptography (RSA + AES) was used to encrypt messages.	NOK

Technical Validation Exercise #02 Technical Validation Objective ID	Technical Validation Exercise #02 Technical Validation Objective Title	Technical Validation Exercise #02 Success Criterion ID	Technical Validation Exercise #02 Success Criterion	Technical Validation Exercise #02 Validation Results	Technical Validation Exercise #02 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-SEC.0021	End-to-end HMAC based message level integrity and authenticity for uplink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-SEC.0083	Following steps are successfully completed: - The responder creates and sends an AMQP 1.0 annotated response message with HMAC AMQP footer with value containing HMAC-Algorithm, HMAC-Target, HMAC-Digest and HMAC-Secret for the requestor.- The response message is delivered to the intended requestor that successfully validates the authenticity and integrity of the message relying on delivered HMAC AMQP footer.	This prototype followed a "Security information attached to the data" approach, according to section 4.2.2.3.3 of the TS. Hybrid cryptography (RSA + AES) was used to encrypt messages.	NOK

Technical Validation Exercise #02 Technical Validation Objective ID	Technical Validation Exercise #02 Technical Validation Objective Title	Technical Validation Exercise #02 Success Criterion ID	Technical Validation Exercise #02 Success Criterion	Technical Validation Exercise #02 Validation Results	Technical Validation Exercise #02 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-SEC.0021	End-to-end HMAC based message level integrity and authenticity for uplink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-SEC.0084	Following steps are successfully completed:- The requestor creates and sends an additional AMQP 1.0 annotated request message for the same responder with HMAC AMQP footer containing only HMAC-Algorithm, HMAC-Target and HMAC-Digest.- The request message is delivered to the intended responder that successfully validates the authenticity and integrity of the message relying on delivered HMAC AMQP footer and cached HMAC-Secret from previous request messages.	This prototype followed a "Security information attached to the data" approach, according to section 4.2.2.3.3 of the TS. Hybrid cryptography (RSA + AES) was used to encrypt messages.	NOK

Technical Validation Exercise #02 Technical Validation Objective ID	Technical Validation Exercise #02 Technical Validation Objective Title	Technical Validation Exercise #02 Success Criterion ID	Technical Validation Exercise #02 Success Criterion	Technical Validation Exercise #02 Validation Results	Technical Validation Exercise #02 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-SEC.0021	End-to-end HMAC based message level integrity and authenticity for uplink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-SEC.0085	Following steps are successfully completed:- The responder creates and sends an additional AMQP 1.0 annotated response message for the same requestor with HMAC AMQP footer containing only HMAC-Algorithm, HMAC-Target and HMAC-Digest.- The response message is delivered to the intended requestor that successfully validates the authenticity and integrity of the message relying on delivered HMAC AMQP footer and cached HMAC-Secret from previous response messages.	This prototype followed a "Security information attached to the data" approach, according to section 4.2.2.3.3 of the TS. Hybrid cryptography (RSA + AES) was used to encrypt messages.	NOK

Technical Validation Exercise #02 Technical Validation Objective ID	Technical Validation Exercise #02 Technical Validation Objective Title	Technical Validation Exercise #02 Success Criterion ID	Technical Validation Exercise #02 Success Criterion	Technical Validation Exercise #02 Validation Results	Technical Validation Exercise #02 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-SEC.0021	End-to-end HMAC based message level integrity and authenticity for uplink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-SEC.0086	Following steps are successfully completed:- The requestor creates and sends an additional AMQP 1.0 annotated request message for the same responder with HMAC AMQP footer containing HMAC-Algorithm, HMAC-Target, HMAC-Digest and the new shared secret.- The request message is delivered to the intended responder that successfully validates the authenticity and integrity of the message relying on delivered HMAC AMQP footer replacing cached HMAC-Secret.	This prototype followed a "Security information attached to the data" approach, according to section 4.2.2.3.3 of the TS. Hybrid cryptography (RSA + AES) was used to encrypt messages.	NOK

Technical Validation Exercise #02 Technical Validation Objective ID	Technical Validation Exercise #02 Technical Validation Objective Title	Technical Validation Exercise #02 Success Criterion ID	Technical Validation Exercise #02 Success Criterion	Technical Validation Exercise #02 Validation Results	Technical Validation Exercise #02 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-SEC.0021	End-to-end HMAC based message level integrity and authenticity for uplink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-SEC.0087	Following steps are successfully completed: - The responder creates and sends an AMQP 1.0 annotated response message with HMAC AMQP footer with value containing HMAC-Algorithm, HMAC-Target, HMAC-Digest and HMAC-Secret for the requestor.- While in transit the response message data section is modified.- The response message is delivered to the intended requestor that, relying on delivered HMAC AMQP footer, recognizes that the authenticity and integrity of the message have been violated.- The requestor discards the message and the event is logged in accordance with the applicable audit policy.	This prototype followed a "Security information attached to the data" approach, according to section 4.2.2.3.3 of the TS. Hybrid cryptography (RSA + AES) was used to encrypt messages.	NOK

Technical Validation Exercise #02 Technical Validation Objective ID	Technical Validation Exercise #02 Technical Validation Objective Title	Technical Validation Exercise #02 Success Criterion ID	Technical Validation Exercise #02 Success Criterion	Technical Validation Exercise #02 Validation Results	Technical Validation Exercise #02 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-SEC.0022	End-to-end HMAC based message level integrity and authenticity for uplink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-SEC.0088	Following steps are successfully completed:- The publisher creates and publishes an AMQP 1.0 annotated publication message with HMAC AMQP footer with value containing HMAC-Algorithm, HMAC-Target, HMAC-Digest and HMAC-Secret for two or more subscribers.- The publication message is delivered to the intended subscribers validate the authenticity and integrity of the message relying on delivered HMAC AMQP footer.	This prototype followed a "Security information attached to the data" approach, according to section 4.2.2.3.3 of the TS. Hybrid cryptography (RSA + AES) was used to encrypt messages.	NOK

Technical Validation Exercise #02 Technical Validation Objective ID	Technical Validation Exercise #02 Technical Validation Objective Title	Technical Validation Exercise #02 Success Criterion ID	Technical Validation Exercise #02 Success Criterion	Technical Validation Exercise #02 Validation Results	Technical Validation Exercise #02 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-SEC.0022	End-to-end HMAC based message level integrity and authenticity for uplink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-SEC.0089	Following steps are successfully completed:- The publisher creates and publishes an additional AMQP 1.0 annotated publication message for the same subscribers with HMAC AMQP footer containing only HMAC-Algorithm, HMAC-Target and HMAC-Digest.- The publication message is delivered to the intended subscribers that successfully validate the authenticity and integrity of the message relying on delivered HMAC AMQP footer and cached HMAC-Secret from previous messages.	This prototype followed a "Security information attached to the data" approach, according to section 4.2.2.3.3 of the TS. Hybrid cryptography (RSA + AES) was used to encrypt messages.	NOK

Technical Validation Exercise #02 Technical Validation Objective ID	Technical Validation Exercise #02 Technical Validation Objective Title	Technical Validation Exercise #02 Success Criterion ID	Technical Validation Exercise #02 Success Criterion	Technical Validation Exercise #02 Validation Results	Technical Validation Exercise #02 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-SEC.0022	End-to-end HMAC based message level integrity and authenticity for uplink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-SEC.0090	Following steps are successfully completed:- An additional subscriber ("new_sub") successfully subscribes to the topic.- The publisher creates and publishes an additional AMQP 1.0 annotated publication message with HMAC AMQP footer containing HMAC-Algorithm, HMAC-Target, HMAC-Digest and only the HMAC-Secret for the new subscriber.- The publication message is delivered to all the subscribers and in particular to the new one that successfully validates the authenticity and integrity of the message relying on delivered HMAC AMQP footer.- The other subscribers successfully validate the authenticity and integrity of the message relying on delivered HMAC AMQP footer and cached HMAC-Secret from previous messages.	This prototype followed a "Security information attached to the data" approach, according to section 4.2.2.3.3 of the TS. Hybrid cryptography (RSA + AES) was used to encrypt messages.	NOK

Technical Validation Exercise #02 Technical Validation Objective ID	Technical Validation Exercise #02 Technical Validation Objective Title	Technical Validation Exercise #02 Success Criterion ID	Technical Validation Exercise #02 Success Criterion	Technical Validation Exercise #02 Validation Results	Technical Validation Exercise #02 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-SEC.0022	End-to-end HMAC based message level integrity and authenticity for uplink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-SEC.0091	Following steps are successfully completed:- The publisher creates and publishes an additional AMQP 1.0 annotated publication message with HMAC AMQP footer containing also the new shared secret.- The publication message is delivered to the intended subscribers that successfully validate the authenticity and integrity of the message relying on delivered HMAC AMQP footer and replacing the cached HMAC-Secret.	This prototype followed a "Security information attached to the data" approach, according to section 4.2.2.3.3 of the TS. Hybrid cryptography (RSA + AES) was used to encrypt messages.	NOK

Technical Validation Exercise #02 Technical Validation Objective ID	Technical Validation Exercise #02 Technical Validation Objective Title	Technical Validation Exercise #02 Success Criterion ID	Technical Validation Exercise #02 Success Criterion	Technical Validation Exercise #02 Validation Results	Technical Validation Exercise #02 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-SEC.0022	End-to-end HMAC based message level integrity and authenticity for uplink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-SEC.0092	Following steps are successfully completed: -The publisher creates and publishes an additional AMQP 1.0 annotated publication message for the same subscribers with HMAC AMQP footer containing HMAC-Algorithm, HMAC-Target, HMAC-Digest and HMAC-Secret.- While in transit the publication message data section is modified.- The publication message is delivered to the intended subscribers that, relying on delivered HMAC AMQP footer, recognize that the authenticity and integrity of the message have been violated.- The subscribers discards the message and the event is logged in accordance with the applicable audit policy.	This prototype followed a "Security information attached to the data" approach, according to section 4.2.2.3.3 of the TS. Hybrid cryptography (RSA + AES) was used to encrypt messages.	NOK

Company General Use

Technical Validation Exercise #02 Technical Validation Objective ID	Technical Validation Exercise #02 Technical Validation Objective Title	Technical Validation Exercise #02 Success Criterion ID	Technical Validation Exercise #02 Success Criterion	Technical Validation Exercise #02 Validation Results	Technical Validation Exercise #02 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-SEC.0023	End-to-end HMAC based message level integrity and authenticity for downlink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-SEC.0088	Following steps are successfully completed:- The publisher creates and publishes an AMQP 1.0 annotated publication message with HMAC AMQP footer with value containing HMAC-Algorithm, HMAC-Target, HMAC-Digest and HMAC-Secret for two or more subscribers.- The publication message is delivered to the intended subscribers validate the authenticity and integrity of the message relying on delivered HMAC AMQP footer.	This prototype followed a "Security information attached to the data" approach, according to section 4.2.2.3.3 of the TS. Hybrid cryptography (RSA + AES) was used to encrypt messages.	NOK

Technical Validation Exercise #02 Technical Validation Objective ID	Technical Validation Exercise #02 Technical Validation Objective Title	Technical Validation Exercise #02 Success Criterion ID	Technical Validation Exercise #02 Success Criterion	Technical Validation Exercise #02 Validation Results	Technical Validation Exercise #02 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-SEC.0023	End-to-end HMAC based message level integrity and authenticity for downlink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-SEC.0089	Following steps are successfully completed:- The publisher creates and publishes an additional AMQP 1.0 annotated publication message for the same subscribers with HMAC AMQP footer containing only HMAC-Algorithm, HMAC-Target and HMAC-Digest.- The publication message is delivered to the intended subscribers that successfully validate the authenticity and integrity of the message relying on delivered HMAC AMQP footer and cached HMAC-Secret from previous messages.	This prototype followed a "Security information attached to the data" approach, according to section 4.2.2.3.3 of the TS. Hybrid cryptography (RSA + AES) was used to encrypt messages.	NOK

Technical Validation Exercise #02 Technical Validation Objective ID	Technical Validation Exercise #02 Technical Validation Objective Title	Technical Validation Exercise #02 Success Criterion ID	Technical Validation Exercise #02 Success Criterion	Technical Validation Exercise #02 Validation Results	Technical Validation Exercise #02 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-SEC.0023	End-to-end HMAC based message level integrity and authenticity for downlink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-SEC.0090	Following steps are successfully completed:- An additional subscriber ("new_sub") successfully subscribes to the topic.- The publisher creates and publishes an additional AMQP 1.0 annotated publication message with HMAC AMQP footer containing HMAC-Algorithm, HMAC-Target, HMAC-Digest and only the HMAC-Secret for the new subscriber.- The publication message is delivered to all the subscribers and in particular to the new one that successfully validates the authenticity and integrity of the message relying on delivered HMAC AMQP footer.- The other subscribers successfully validate the authenticity and integrity of the message relying on delivered HMAC AMQP footer and cached HMAC-Secret from previous messages.	This prototype followed a "Security information attached to the data" approach, according to section 4.2.2.3.3 of the TS. Hybrid cryptography (RSA + AES) was used to encrypt messages.	NOK

Company General Use

Technical Validation Exercise #02 Technical Validation Objective ID	Technical Validation Exercise #02 Technical Validation Objective Title	Technical Validation Exercise #02 Success Criterion ID	Technical Validation Exercise #02 Success Criterion	Technical Validation Exercise #02 Validation Results	Technical Validation Exercise #02 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-SEC.0023	End-to-end HMAC based message level integrity and authenticity for downlink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-SEC.0091	Following steps are successfully completed:- The publisher creates and publishes an additional AMQP 1.0 annotated publication message with HMAC AMQP footer containing also the new shared secret.- The publication message is delivered to the intended subscribers that successfully validate the authenticity and integrity of the message relying on delivered HMAC AMQP footer and replacing the cached HMAC-Secret.	This prototype followed a "Security information attached to the data" approach, according to section 4.2.2.3.3 of the TS. Hybrid cryptography (RSA + AES) was used to encrypt messages.	NOK

Technical Validation Exercise #02 Technical Validation Objective ID	Technical Validation Exercise #02 Technical Validation Objective Title	Technical Validation Exercise #02 Success Criterion ID	Technical Validation Exercise #02 Success Criterion	Technical Validation Exercise #02 Validation Results	Technical Validation Exercise #02 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-SEC.0023	End-to-end HMAC based message level integrity and authenticity for downlink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-SEC.0092	Following steps are successfully completed: -The publisher creates and publishes an additional AMQP 1.0 annotated publication message for the same subscribers with HMAC AMQP footer containing HMAC-Algorithm, HMAC-Target, HMAC-Digest and HMAC-Secret.- While in transit the publication message data section is modified.- The publication message is delivered to the intended subscribers that, relying on delivered HMAC AMQP footer, recognize that the authenticity and integrity of the message have been violated.- The subscribers discards the message and the event is logged in accordance with the applicable audit policy.	This prototype followed a "Security information attached to the data" approach, according to section 4.2.2.3.3 of the TS. Hybrid cryptography (RSA + AES) was used to encrypt messages.	NOK

Technical Validation Exercise #02 Technical Validation Objective ID	Technical Validation Exercise #02 Technical Validation Objective Title	Technical Validation Exercise #02 Success Criterion ID	Technical Validation Exercise #02 Success Criterion	Technical Validation Exercise #02 Validation Results	Technical Validation Exercise #02 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-SEC.0024	End-to-end digital signature based message level integrity and authenticity for uplink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-SEC.0093	Following steps are successfully completed:- The requestor creates and sends an AMQP 1.0 annotated request message with DSGN AMQP footer with value containing DSGN-Algorithm, DSGN-Target and DSGN-Signature.- The request message is delivered to the intended responder that successfully validates the authenticity and integrity of the message relying on delivered DSGN AMQP footer.	This prototype followed a "Security information attached to the data" approach, according to section 4.2.2.3.3 of the TS. Hybrid cryptography (RSA + AES) was used to encrypt messages.	NOK

Technical Validation Exercise #02 Technical Validation Objective ID	Technical Validation Exercise #02 Technical Validation Objective Title	Technical Validation Exercise #02 Success Criterion ID	Technical Validation Exercise #02 Success Criterion	Technical Validation Exercise #02 Validation Results	Technical Validation Exercise #02 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-SEC.0024	End-to-end digital signature based message level integrity and authenticity for uplink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-SEC.0094	Following steps are successfully completed: - The responder creates and sends an AMQP 1.0 annotated response message with DSGN AMQP footer with value containing DSGN-Algorithm, DSGN-Target and DSGN-Signature.- The response message is delivered to the intended requestor that successfully validates the authenticity and integrity of the message relying on delivered DSGN AMQP footer.	This prototype followed a "Security information attached to the data" approach, according to section 4.2.2.3.3 of the TS. Hybrid cryptography (RSA + AES) was used to encrypt messages.	NOK

Technical Validation Exercise #02 Technical Validation Objective ID	Technical Validation Exercise #02 Technical Validation Objective Title	Technical Validation Exercise #02 Success Criterion ID	Technical Validation Exercise #02 Success Criterion	Technical Validation Exercise #02 Validation Results	Technical Validation Exercise #02 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-SEC.0024	End-to-end digital signature based message level integrity and authenticity for uplink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-SEC.0095	Following steps are successfully completed: - The responder creates and sends an AMQP 1.0 annotated response message with DSGN AMQP footer with value containing DSGN-Algorithm, DSGN-Target and DSGN-Signature.- While in transit the response message data section is modified.- The response message is delivered to the intended requestor that, relying on delivered DSGN AMQP footer, recognizes that the authenticity and integrity of the message have been violated.- The requestor discards the message and the event is logged in accordance with the applicable audit policy.	This prototype followed a "Security information attached to the data" approach, according to section 4.2.2.3.3 of the TS. Hybrid cryptography (RSA + AES) was used to encrypt messages.	NOK

Technical Validation Exercise #02 Technical Validation Objective ID	Technical Validation Exercise #02 Technical Validation Objective Title	Technical Validation Exercise #02 Success Criterion ID	Technical Validation Exercise #02 Success Criterion	Technical Validation Exercise #02 Validation Results	Technical Validation Exercise #02 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-SEC.0025	End-to-end digital signature based message level integrity and authenticity for uplink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-SEC.0096	Following steps are successfully completed:- The publisher creates and publishes an AMQP 1.0 annotated publication message with DSGN AMQP footer with value containing DSGN-Algorithm, DSGN-Target and DSGN-Signature.- The publication message is delivered to the intended subscribers that successfully validate the authenticity and integrity of the message relying on delivered DSGN AMQP footer.	This prototype followed a "Security information attached to the data" approach, according to section 4.2.2.3.3 of the TS. Hybrid cryptography (RSA + AES) was used to encrypt messages.	NOK

Technical Validation Exercise #02 Technical Validation Objective ID	Technical Validation Exercise #02 Technical Validation Objective Title	Technical Validation Exercise #02 Success Criterion ID	Technical Validation Exercise #02 Success Criterion	Technical Validation Exercise #02 Validation Results	Technical Validation Exercise #02 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-SEC.0025	End-to-end digital signature based message level integrity and authenticity for uplink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-SEC.0097	Following steps are successfully completed: - The publisher creates and publishes an AMQP 1.0 annotated publication message with DSGN AMQP footer with value containing DSGN-Algorithm, DSGN-Target and DSGN-Signature.- While in transit the publication message data section is modified.- The publication message is delivered to the intended subscribers that, relying on delivered DSGN AMQP footer, recognize that the authenticity and integrity of the message have been violated.- The subscribers discard the message and the event is logged in accordance with the applicable audit policy.	This prototype followed a "Security information attached to the data" approach, according to section 4.2.2.3.3 of the TS. Hybrid cryptography (RSA + AES) was used to encrypt messages.	NOK

Technical Validation Exercise #02 Technical Validation Objective ID	Technical Validation Exercise #02 Technical Validation Objective Title	Technical Validation Exercise #02 Success Criterion ID	Technical Validation Exercise #02 Success Criterion	Technical Validation Exercise #02 Validation Results	Technical Validation Exercise #02 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-SEC.0026	End-to-end digital signature based message level integrity and authenticity for downlink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-SEC.0096	Following steps are successfully completed:- The publisher creates and publishes an AMQP 1.0 annotated publication message with DSGN AMQP footer with value containing DSGN-Algorithm, DSGN-Target and DSGN-Signature.- The publication message is delivered to the intended subscribers that successfully validate the authenticity and integrity of the message relying on delivered DSGN AMQP footer.	This prototype followed a "Security information attached to the data" approach, according to section 4.2.2.3.3 of the TS. Hybrid cryptography (RSA + AES) was used to encrypt messages.	NOK

Technical Validation Exercise #02 Technical Validation Objective ID	Technical Validation Exercise #02 Technical Validation Objective Title	Technical Validation Exercise #02 Success Criterion ID	Technical Validation Exercise #02 Success Criterion	Technical Validation Exercise #02 Validation Results	Technical Validation Exercise #02 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-SEC.0026	End-to-end digital signature based message level integrity and authenticity for downlink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-SEC.0097	Following steps are successfully completed: - The publisher creates and publishes an AMQP 1.0 annotated publication message with DSGN AMQP footer with value containing DSGN-Algorithm, DSGN-Target and DSGN-Signature.- While in transit the publication message data section is modified.- The publication message is delivered to the intended subscribers that, relying on delivered DSGN AMQP footer, recognize that the authenticity and integrity of the message have been violated.- The subscribers discard the message and the event is logged in accordance with the applicable audit policy.	This prototype followed a "Security information attached to the data" approach, according to section 4.2.2.3.3 of the TS. Hybrid cryptography (RSA + AES) was used to encrypt messages.	NOK

Table 20: Technical Validation Results Exercise 2


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B.3.2 Results on technical feasibility

All the validation tests were focused on technical feasibility since realistic operational scenario was not in the scope of EXE2. Technical feasibility of this iteration was focused on Performance, Reliability and Security. For further details on each category, see B.3.4.

Although is not in the scope of TRL6 Validation Objectives, EXE2 still in conformance with TRL4 technical aspects. Some technical capabilities not covered in the previous validation, all of them related with bindings, are now covered.

Results on EXE2 validation tests were satisfactory and they do not cast any doubts on the technical feasibility of this solution.

B.3.3 Results per KPA

Impact assessment on KPAs for this technological solution is provided in TVALP [44] §4.3.1. As stated, no validation targets have been allocated to this solution. EXE2 has not analysed results per KPA, but its involvement in Security can be seen on B.3.4.3.

Indra's prototype has no contribution to Global Interoperability in EXE2, but in EXE4. Please, see D.3.3 for further information.

B.3.4 Analysis of Exercise 2 Results per Technical Validation objective

This section provides the EXE2 analysis of the validation results per validation objective group.

B.3.4.1. Performance efficiency characteristic Technical Validation Objectives

Performance Technical Validation Objectives could be split in three different categories: Ordering Delivery Guarantees (FIFO + Priority), Time Behaviour and On-the-Fly Compression.

Ordering Delivery Guarantees was successfully validated in several ways, using non-nominal cases where the broker crashes, allowing to prepare an ideal situation for the combination of ordering and priority capabilities. This, along with On-The-Fly Compression were successfully validated.

Performance Validation Objectives OBJ-17.01-TRL6-TVALP-PERF.0009 to OBJ-17.01-TRL6-TVALP-PERF.0024 have been conditioned by hardware limitations. EXE2 Validation Platform includes two servers that handle simulated aircrafts (half of them on flight phase, half of them on the ground). These two servers were tested with satisfactory results managing up to 500 aircrafts (250 on air, 250 on the ground aircrafts). EXE2 team run tests with 600 aircraft, but aircraft servers could not handle such amount of simulations at a time.

With this conditioning factors, EXE2 performance tests have been performed on specific configurations that allow us to analyse the behaviour and the capacity of the SWIM Node when managing several degrees of load. Network configurations, which define the test groups and the way the results are shown in this chapter, have a secondary role. This is not because they are not important (specific network bandwidth allows to identify transfer times for future performance requirements), but the congestion of the network is something that is out of control of SWIM Node.

It should be noticed that for all the results shown in this sections, every tests included all types of transactions. Every test had a duration of two hours with the following distribution for each entity:

Service Category	Uplink/Downlink	Number of messages	Message "Type"	message size percentage distribution
Category A/B Service	Uplink	10	request messages	5 messages of 100 KB
				5 messages of 200 KB
			response messages	4 messages of 2 MB
				3 messages of 1 MB
				2 messages of 500 KB
				1 messages of 100 KB
Category A/B Service	Downlink	10	request messages	5 messages of 100 KB
				5 messages of 200 KB
			response messages	4 messages of 2 MB
				3 messages of 1 MB
				2 messages of 500 KB
				1 messages of 100 KB
Category A/B Service	Uplink	10	publication messages	4 messages of 2 MB
				3 messages of 1 MB
				2 messages of 500 KB
				1 messages of 100 KB
Category A/B Service	Downlink	10	publication messages	4 messages of 2 MB
				3 messages of 1 MB
				2 messages of 500 KB
				1 messages of 100 KB
Category C/D Service	Uplink	10	request messages	5 messages of 100 KB
				5 messages of 200 KB
			response messages	4 messages of 20 MB
				3 messages of 10 MB
				2 messages of 5 MB
				1 messages of 3 MB
Category C/D Service	Downlink	10	request messages	5 messages of 100 KB
				5 messages of 200 KB
			response messages	4 messages of 20 MB
				3 messages of 10 MB
				2 messages of 5 MB
				1 messages of 3 MB
Category C/D Service	Uplink	10	publication messages	4 messages of 20 MB
				3 messages of 10 MB
				2 messages of 5 MB
				1 messages of 3 MB
Category C/D Service	Downlink	10	publication messages	4 messages of 20 MB
				3 messages of 10 MB

				2 messages of 5 MB
				1 messages of 3 MB

Table 21: EXE2 test message distribution summary

In the same way, it should be take into account that times metrics include processing time within the Ground SWIM Node.

Tests over LAN

First batch of performance results is based on runs over a simple LAN, without any limitation from SATCOM. These basic tests allow us to have a clear view about the behaviour of Ground SWIM Node without network noise. Transfer times are pictured only for illustrative purposes, since network capabilities are not the ones defined in the requirements and they should not be take into account for requirements refinement in future phases.

LAN bandwidth during the tests was 27000 KB/s.

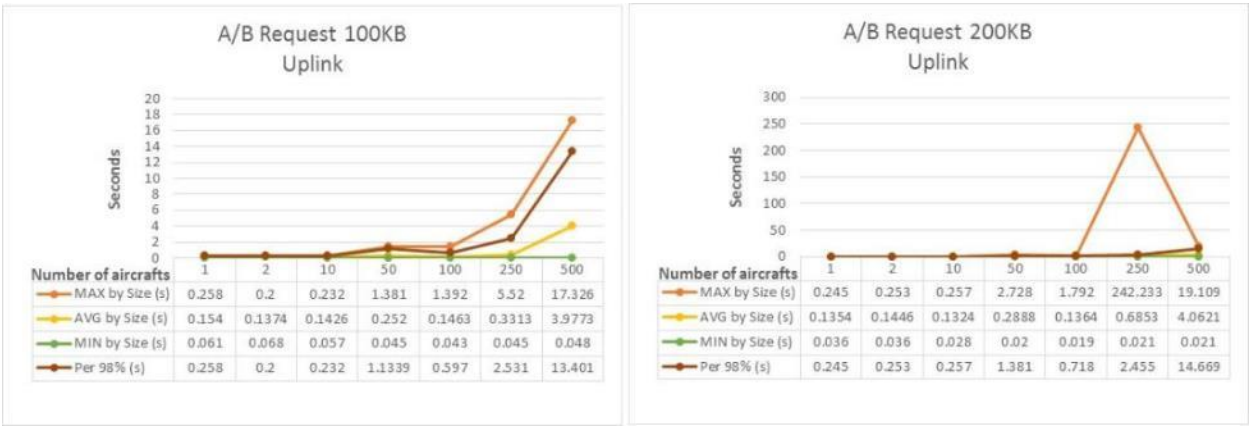


Figure 19: EXE2 Request message times by number of aircrafts - A/B category - Uplink

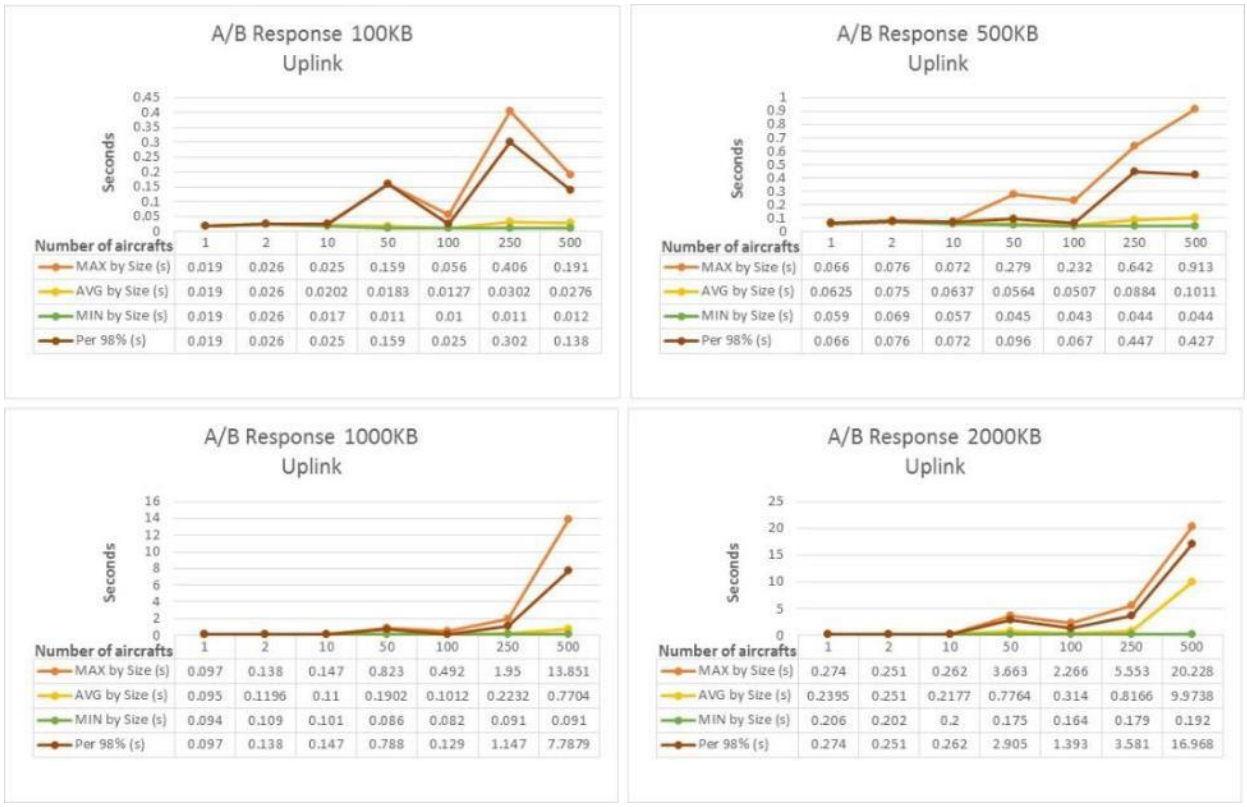


Figure 20: EXE2 Response message times by number of aircrafts - A/B category – Uplink

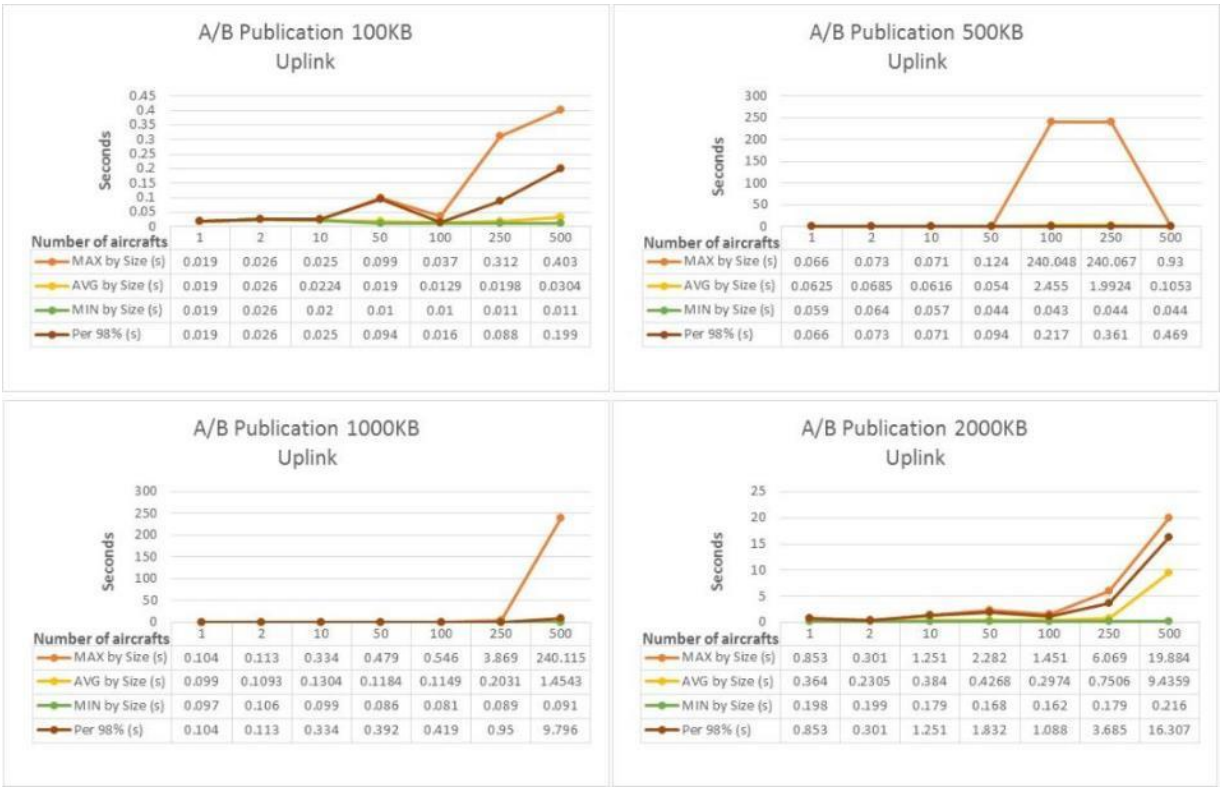


Figure 21: EXE2 Publication message times by number of aircrafts - A/B category – Uplink

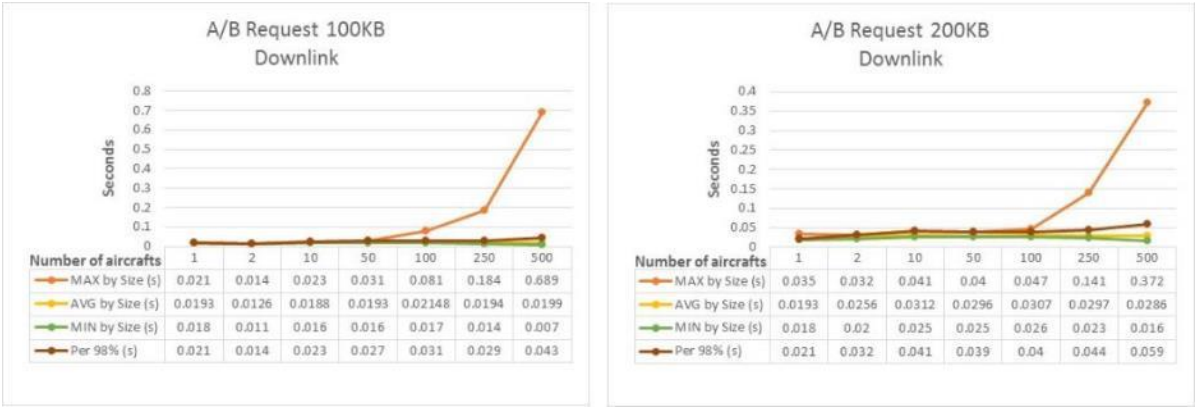


Figure 22: EXE2 Request message times by number of aircrafts - A/B category – Downlink

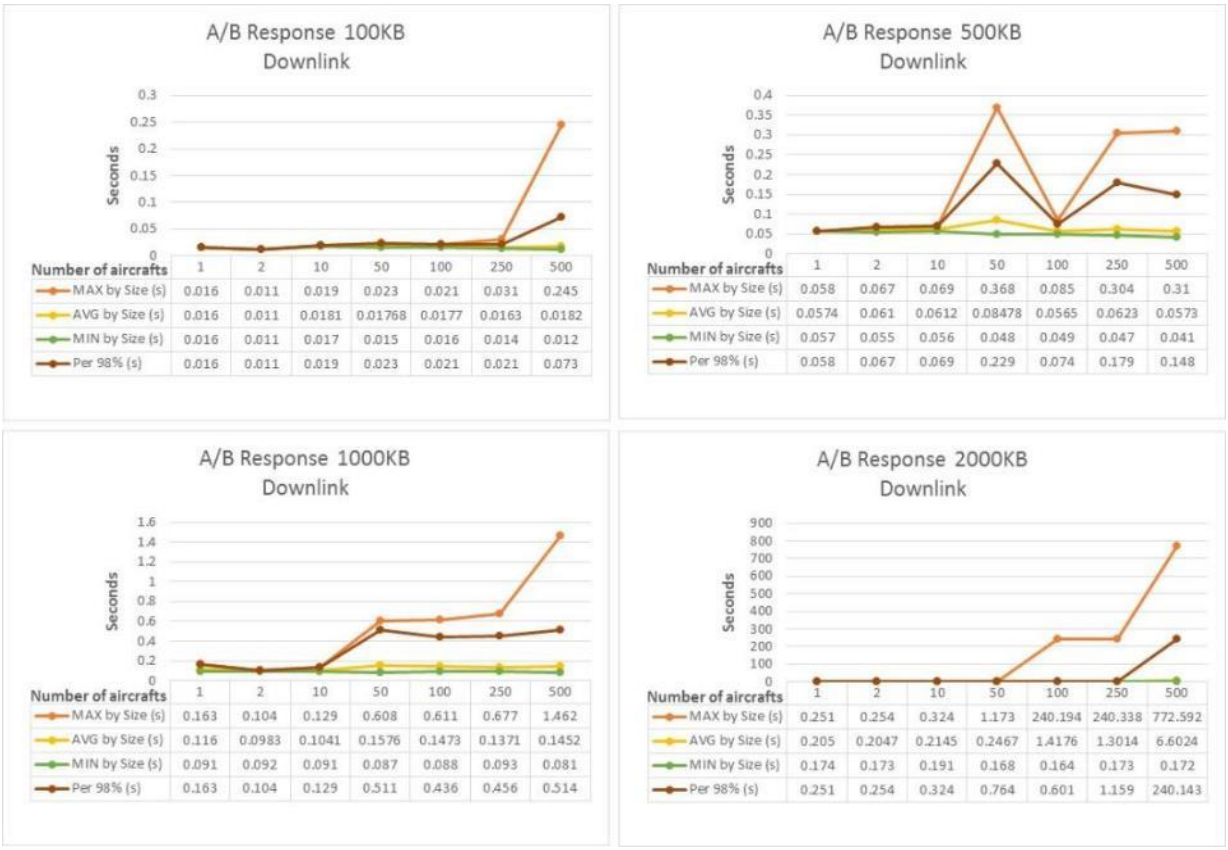


Figure 23: EXE2 Response message times by number of aircrafts - A/B category – Downlink



Figure 24: EXE2 Publication message times by number of aircrafts - A/B category – Downlink

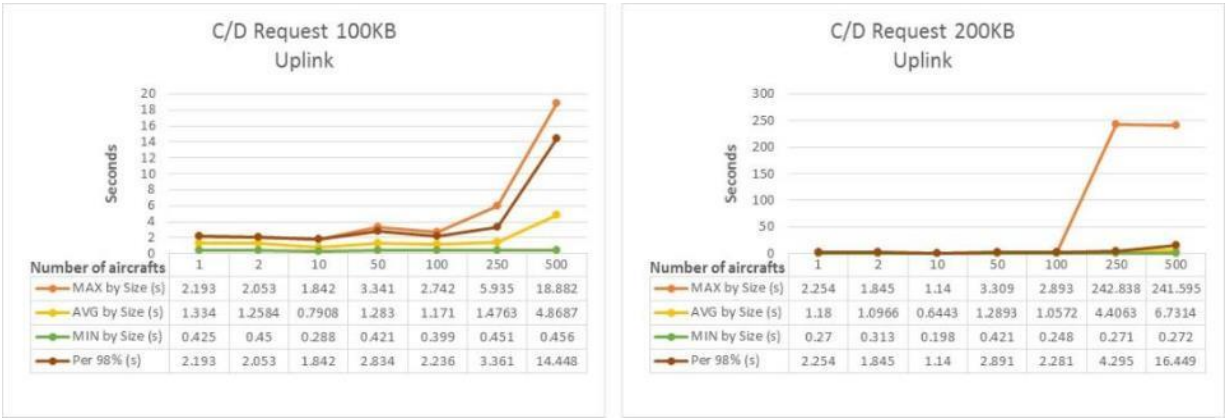


Figure 25: EXE2 Request message times by number of aircrafts - C/D category – Uplink

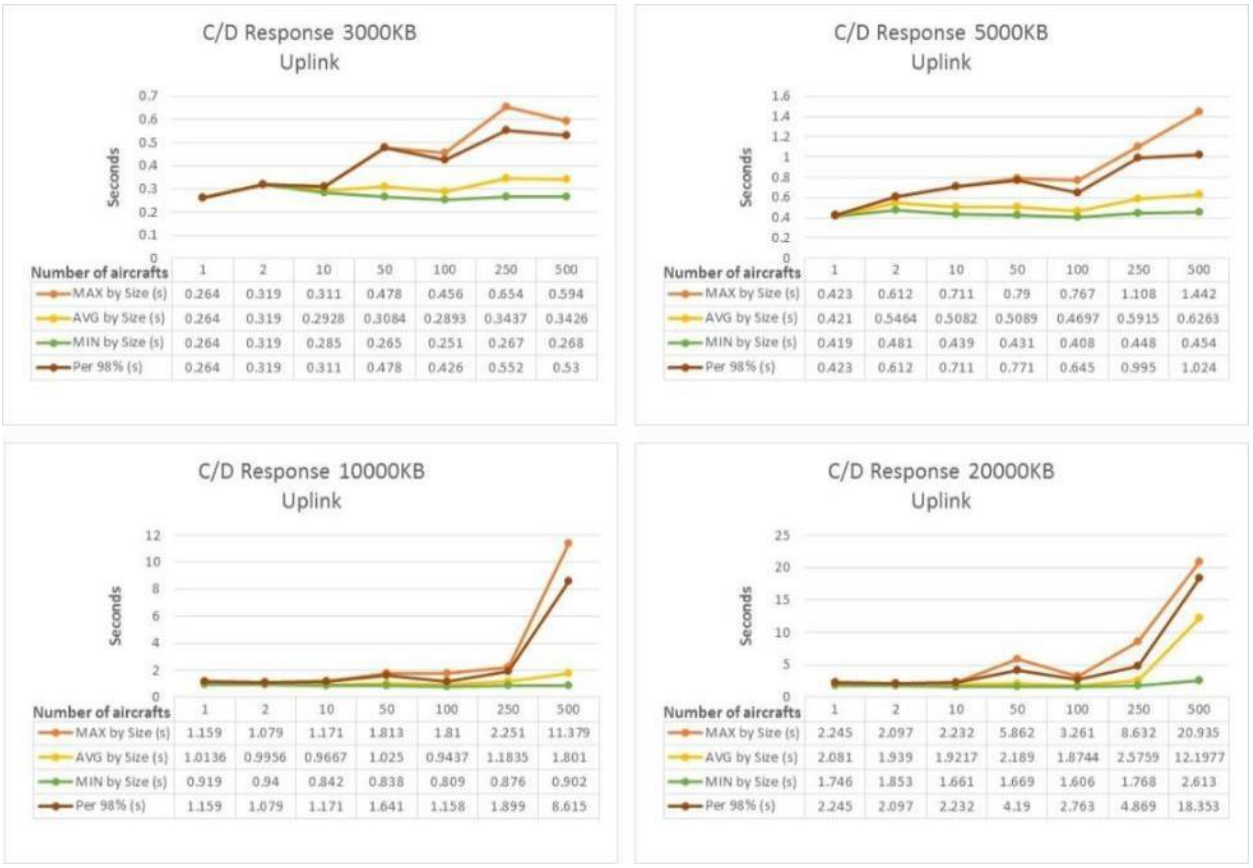


Figure 26: EXE2 Response message times by number of aircrafts - C/D category – Uplink

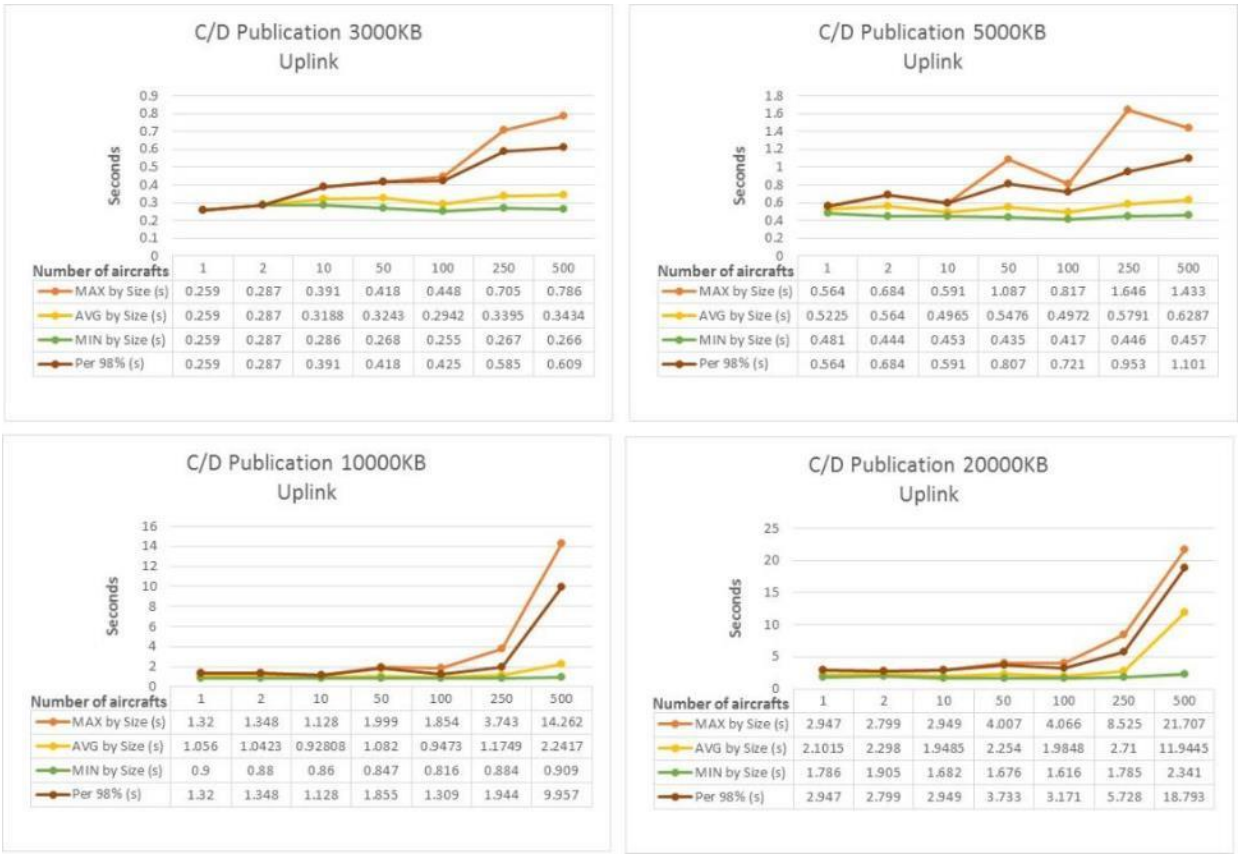


Figure 27: EXE2 Publication message times by number of aircrafts - C/D category – Uplink

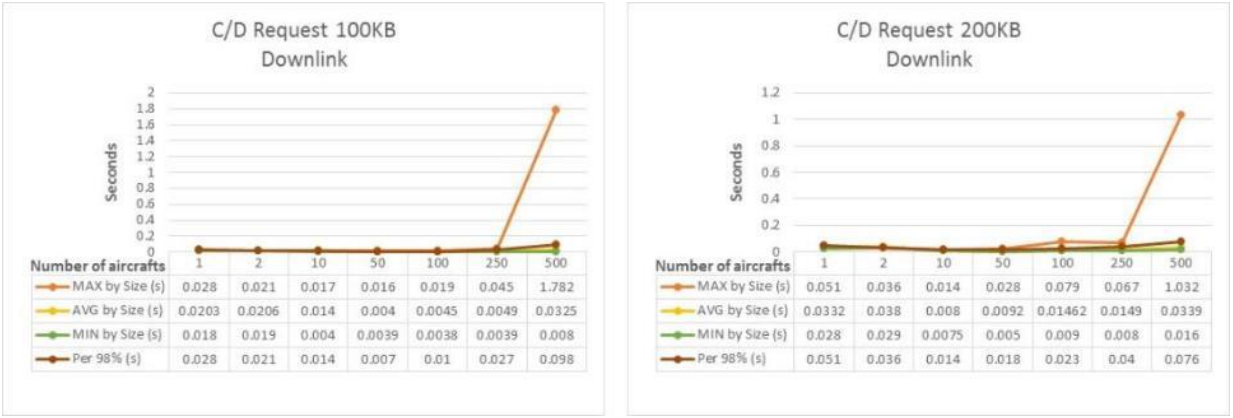


Figure 28: EXE2 Request message times by number of aircrafts - C/D category – Downlink



Figure 29: EXE2 Response message times by number of aircrafts - C/D category – Downlink

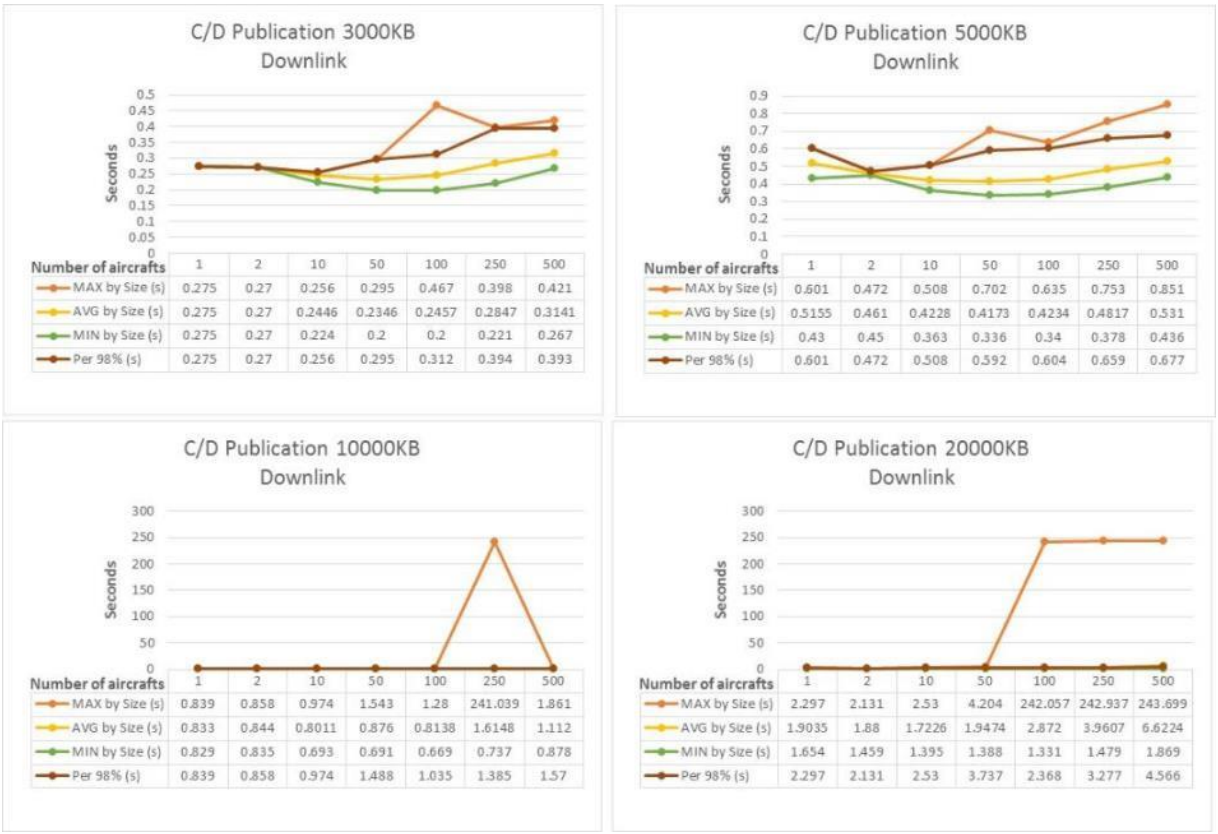


Figure 30: EXE2 Publication message times by number of aircrafts - C/D category – Downlink

These tests without network restrictions are focused on testing the behaviour of Ground SWIM Node during conditions where the number of messages received per time unit is very high. All the message times are within good range, but they should not be taken into account since networks conditions are not realistic in an Air/Ground communication environment.

Basic test over SATCOM

During TVALP preparation, some deviations with performance requirements OBJ-17.01-TRL6-TVALP-PERF.0009 to OBJ-17.01-TRL6-TVALP-PERF.0024 were identified. They contain time figures that were incorrect. In order to be able to define time conditions it was purposed to maintain the test conditions, but without any specific time goals in order to use those figures to analyse future time behaviour conditions.

From EXE2 perspective, while the previous section dealt with a basic network configuration in order to test behaviour of Ground SWIM Nodes in terms of capacity, this section provides two basic tests directly related with time-behaviour requirements. SATCOM is now active providing two 512 kbps channels. An aircraft is connected to each of these channels. These dedicated channels and the absence of messages overload are key conditions to check average measurements for basic transactions when proper and more realistic network configuration comes into play.

Bandwidth for these tests was 60.2 KB/s for Uplink and 60.1 KB/s for Downlink.

First set of tests under this category have a cardinality of 1:1 (1 Ground SWIM Node and 1 aircraft) and A/B category messages.

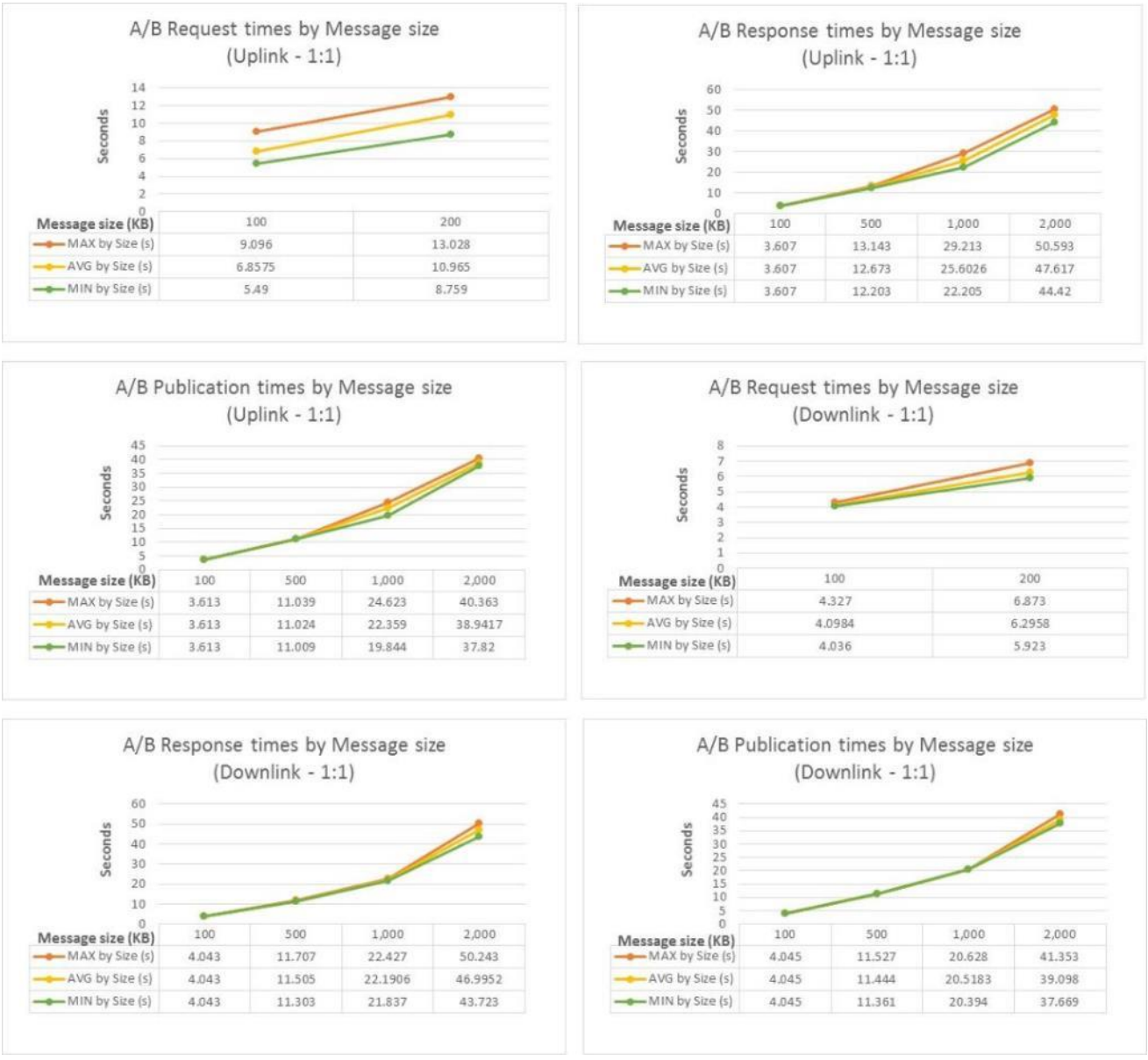


Figure 31: EXE2 Message times by message size - A/B category (1:1)

Second set is again for A/B category messages, but two aircrafts (1:2) on flight.

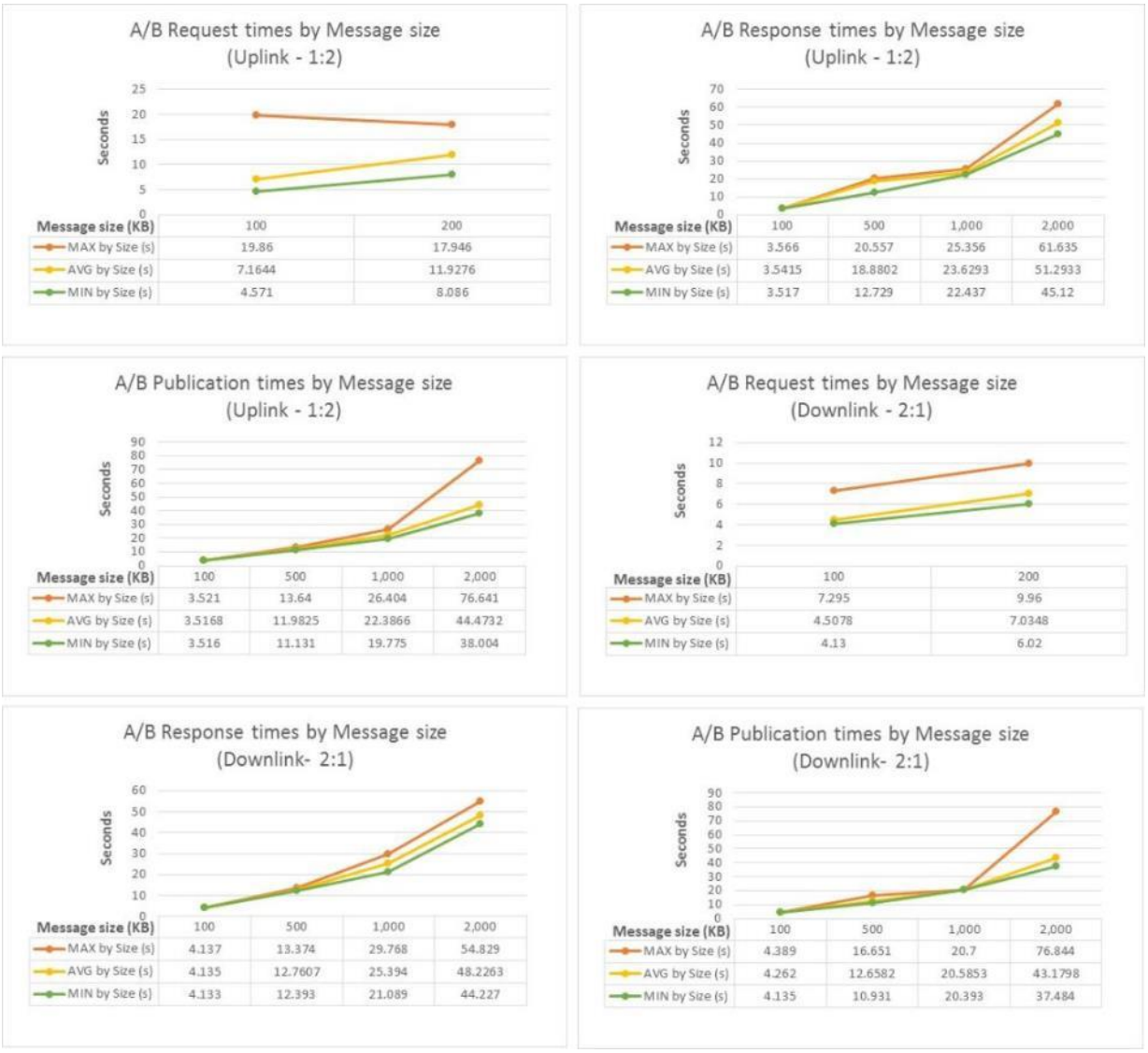


Figure 32: EXE2 Message times by message size - A/B category (1:2)

Next logical test are those related with C/D category messages. Two more test were carried out with changes on SATCOM configuration. The first one is a 1:1 test (1 Ground SWIM Node, 1 aircraft) and C/D category messages with a 2Mbps channel. Bandwidth for these tests was 219.4 KB/s and 217.7 KB/s for Uplink and Downlink respectively.

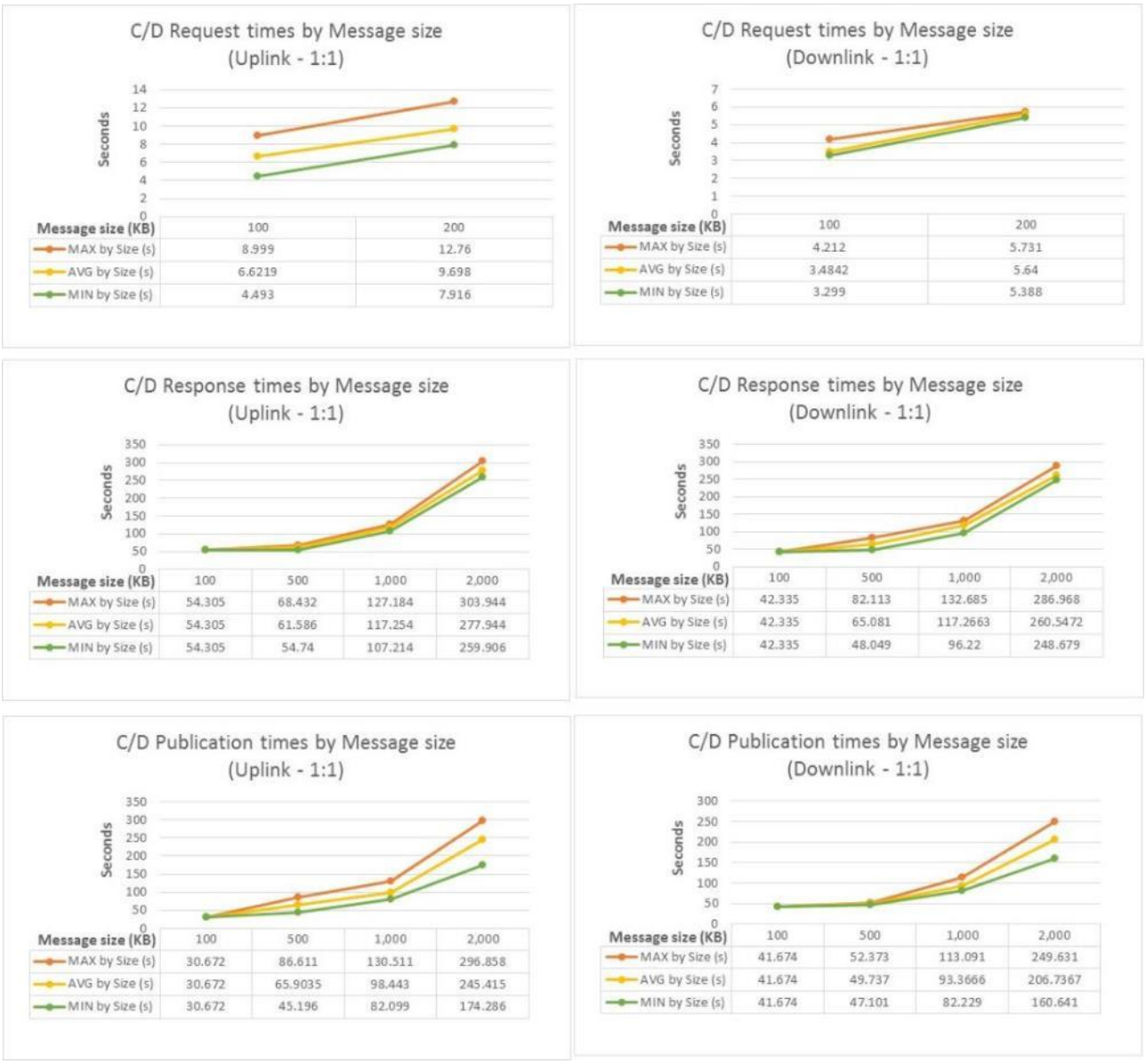


Figure 33: EXE2 Message times by message size - C/D category (1:1)

Now results for C/D category messages, but two aircrafts (1:2) on the ground.

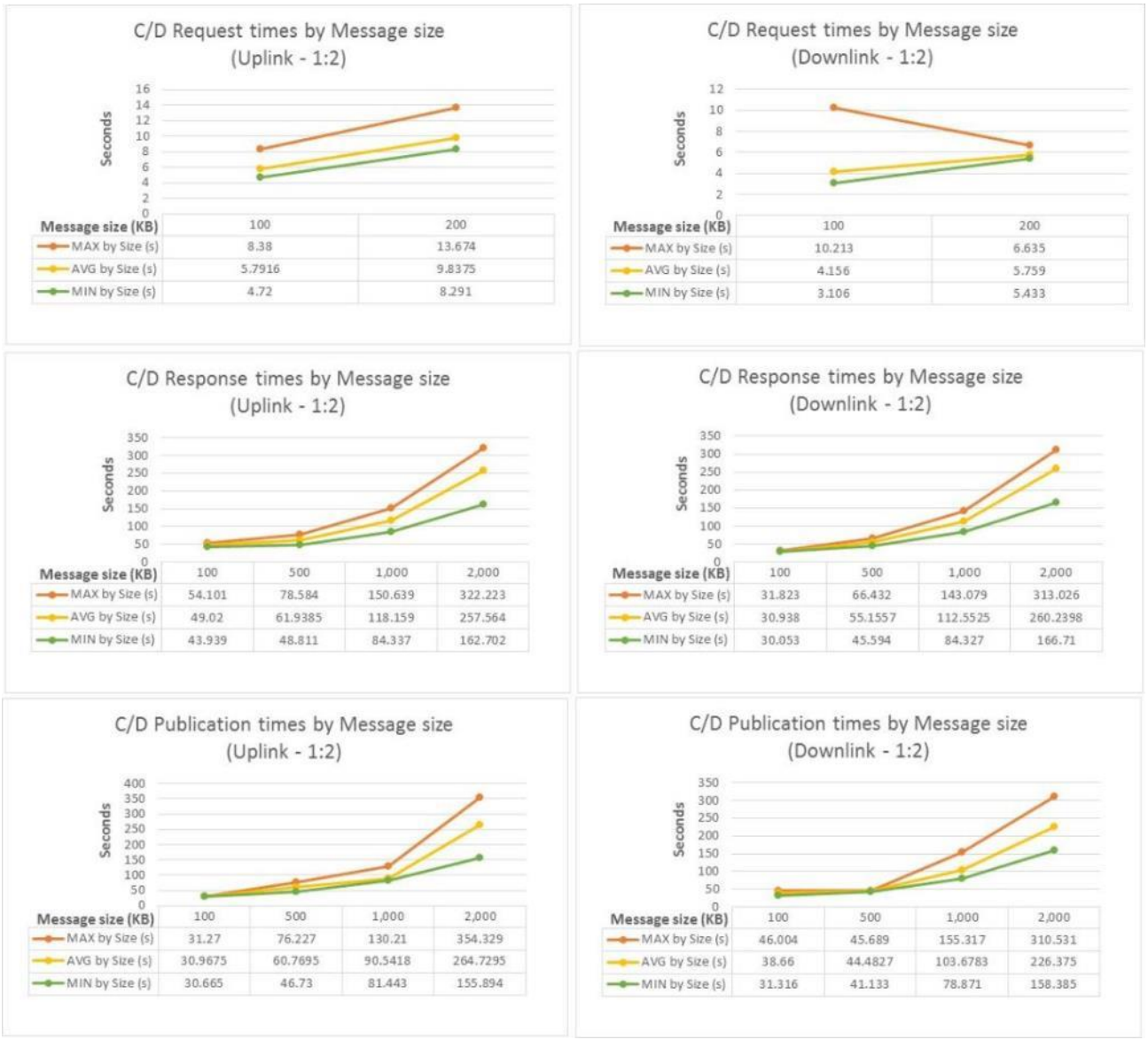


Figure 34: EXE2 Publication message times by message size - C/D category (1:2)

Full tests over SATCOM

Finally, to have a global view, the setup for the initial tests (1:n over LAN) were run again, but using SATCOM instead of a simple LAN. SATCOM is configured at its maximum capacity (20 Mbit/s for A/B and 50 Mbit/s for C/D), which is not enough for replicate the network needs for such amount of aircrafts in parallel. That is why these tests only cover simulations up to 50 aircrafts.

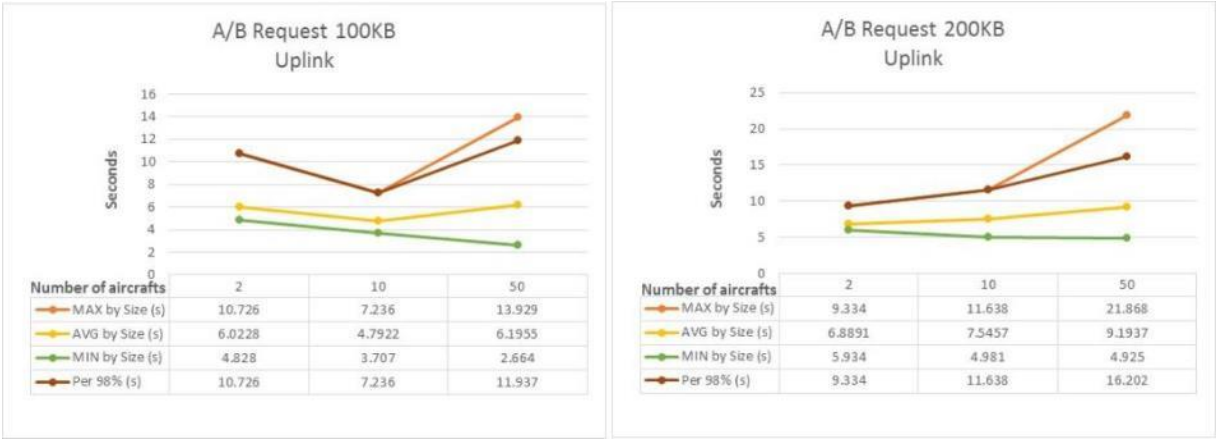


Figure 35: EXE2 Request message times by number of aircrafts - A/B category – Uplink

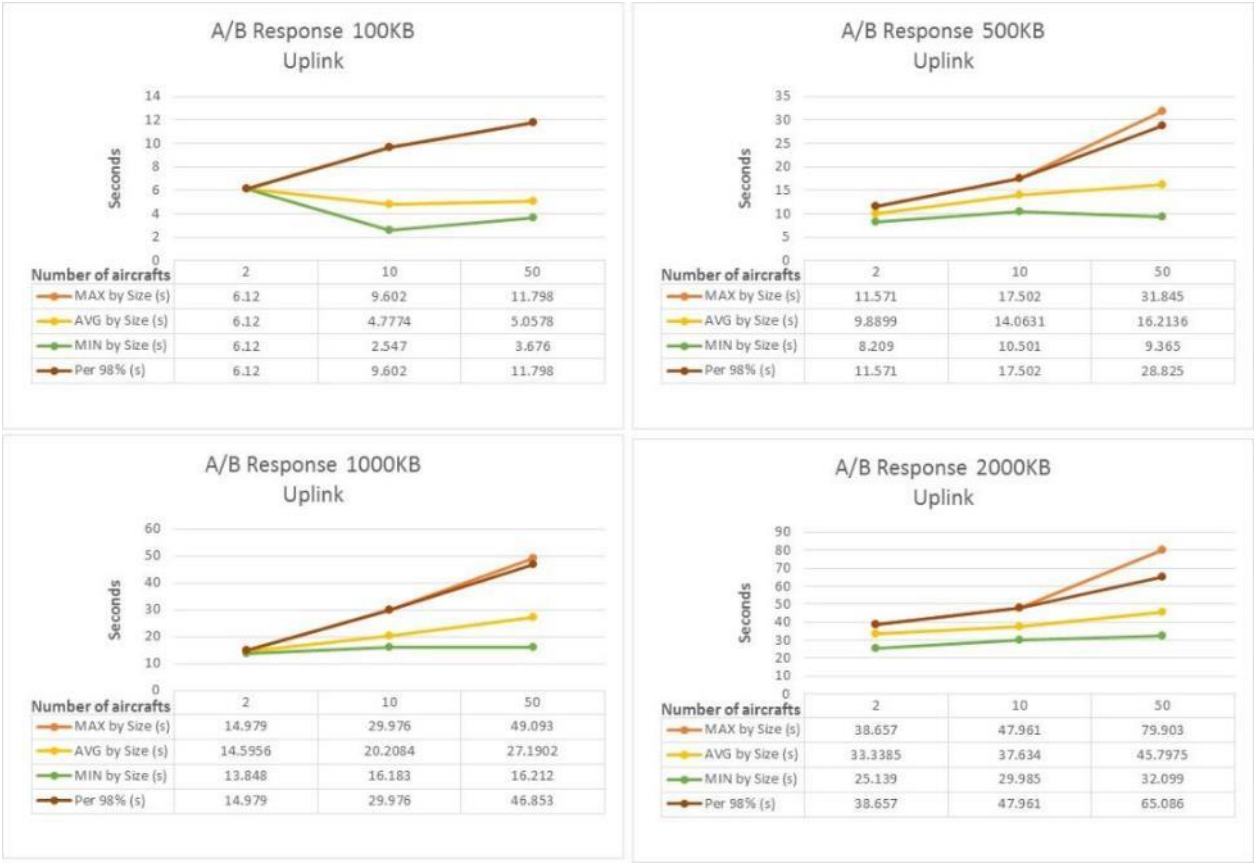


Figure 36: EXE2 Response message times by number of aircrafts - A/B category – Uplink

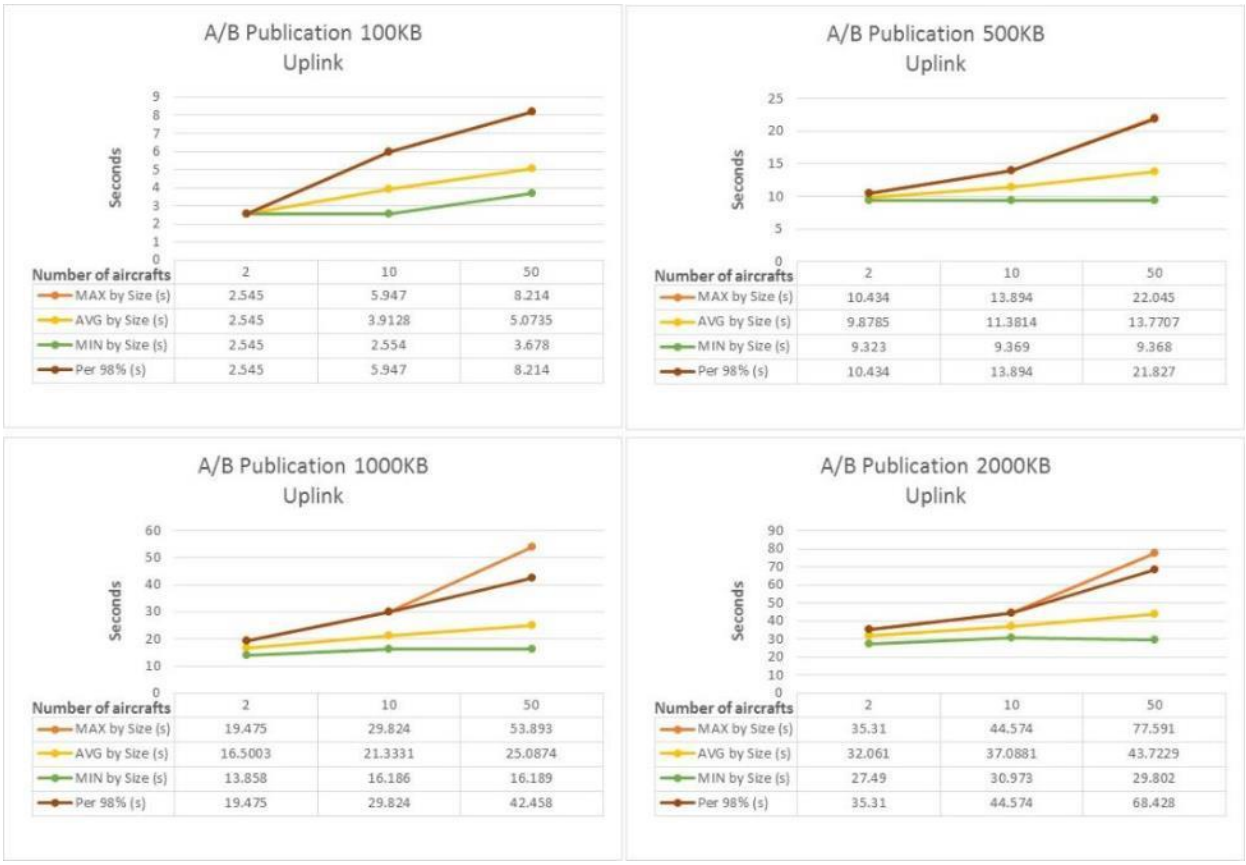


Figure 37: EXE2 Publication message times by number of aircrafts - A/B category – Uplink

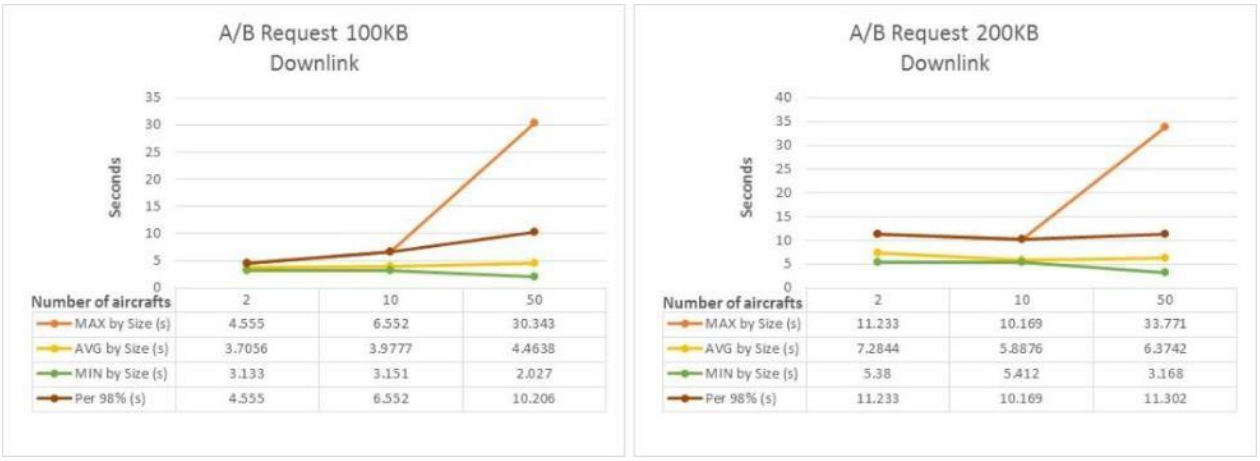


Figure 38: EXE2 Request message times by number of aircrafts - A/B category – Downlink

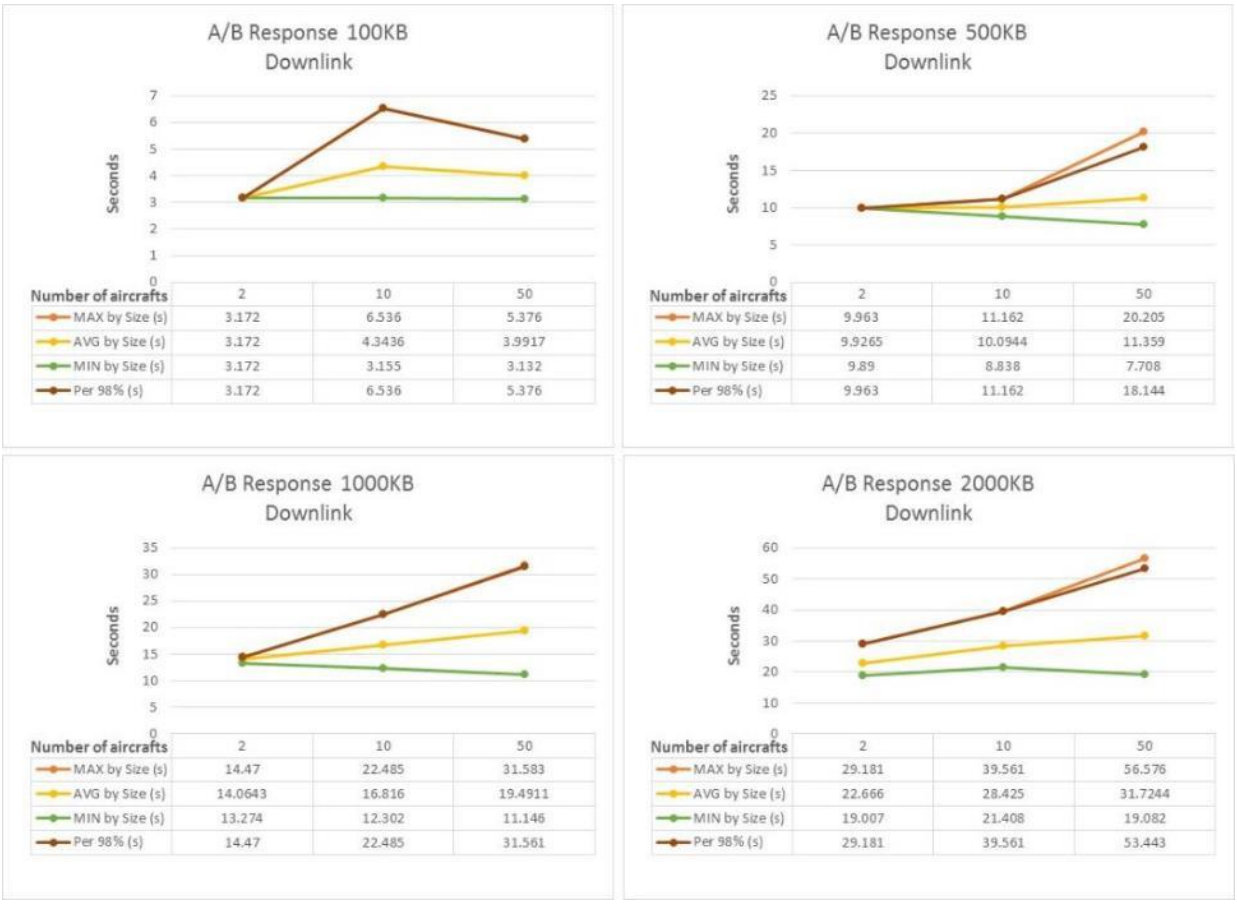


Figure 39: EXE2 Response message times by number of aircrafts - A/B category – Downlink

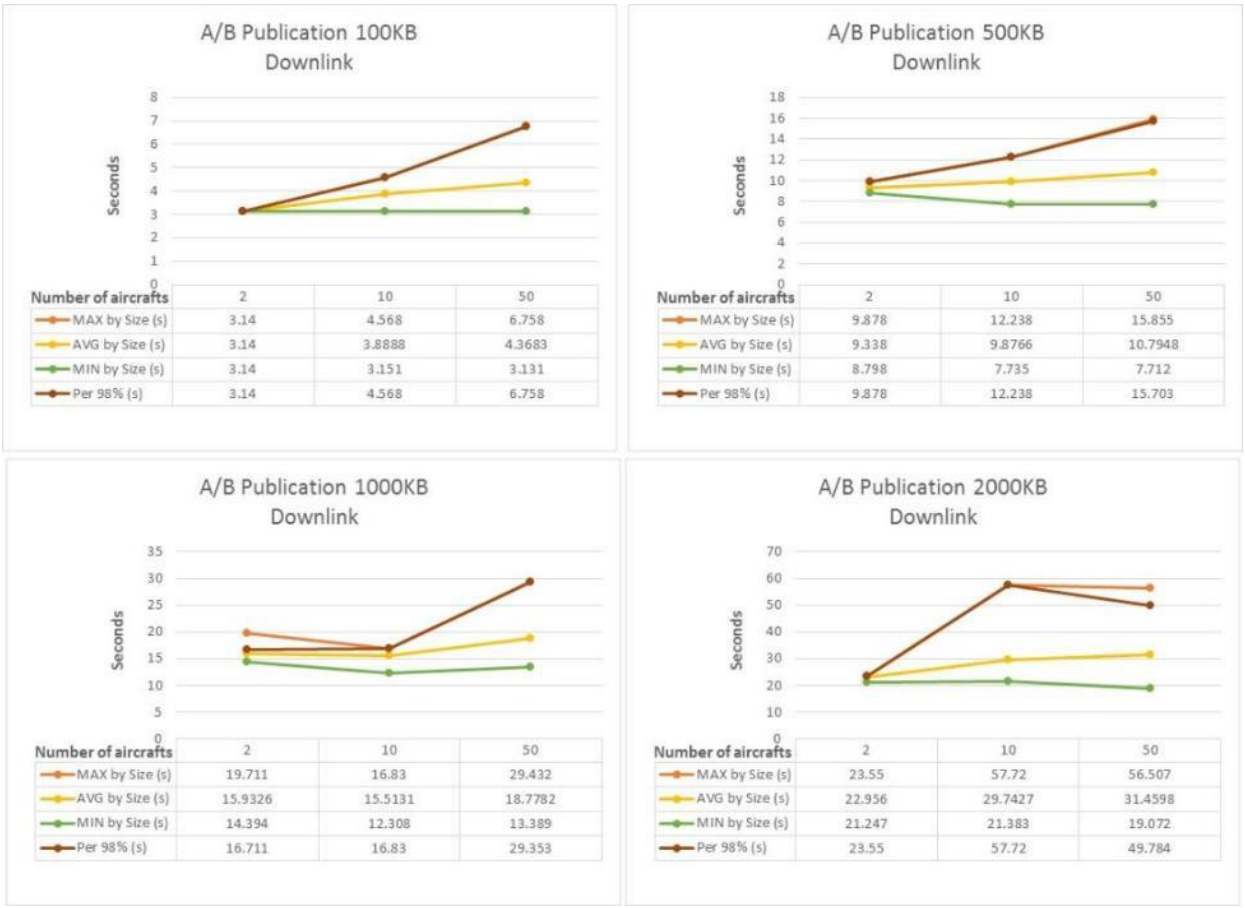


Figure 40: EXE2 Publication message times by number of aircrafts - A/B category – Downlink

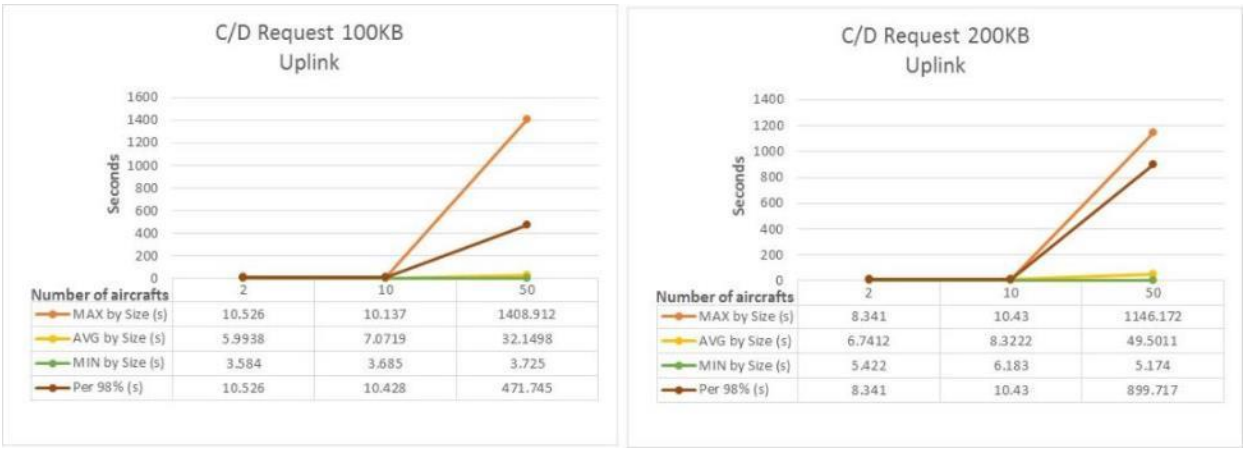


Figure 41: EXE2 Request message times by number of aircrafts - C/D category – Uplink

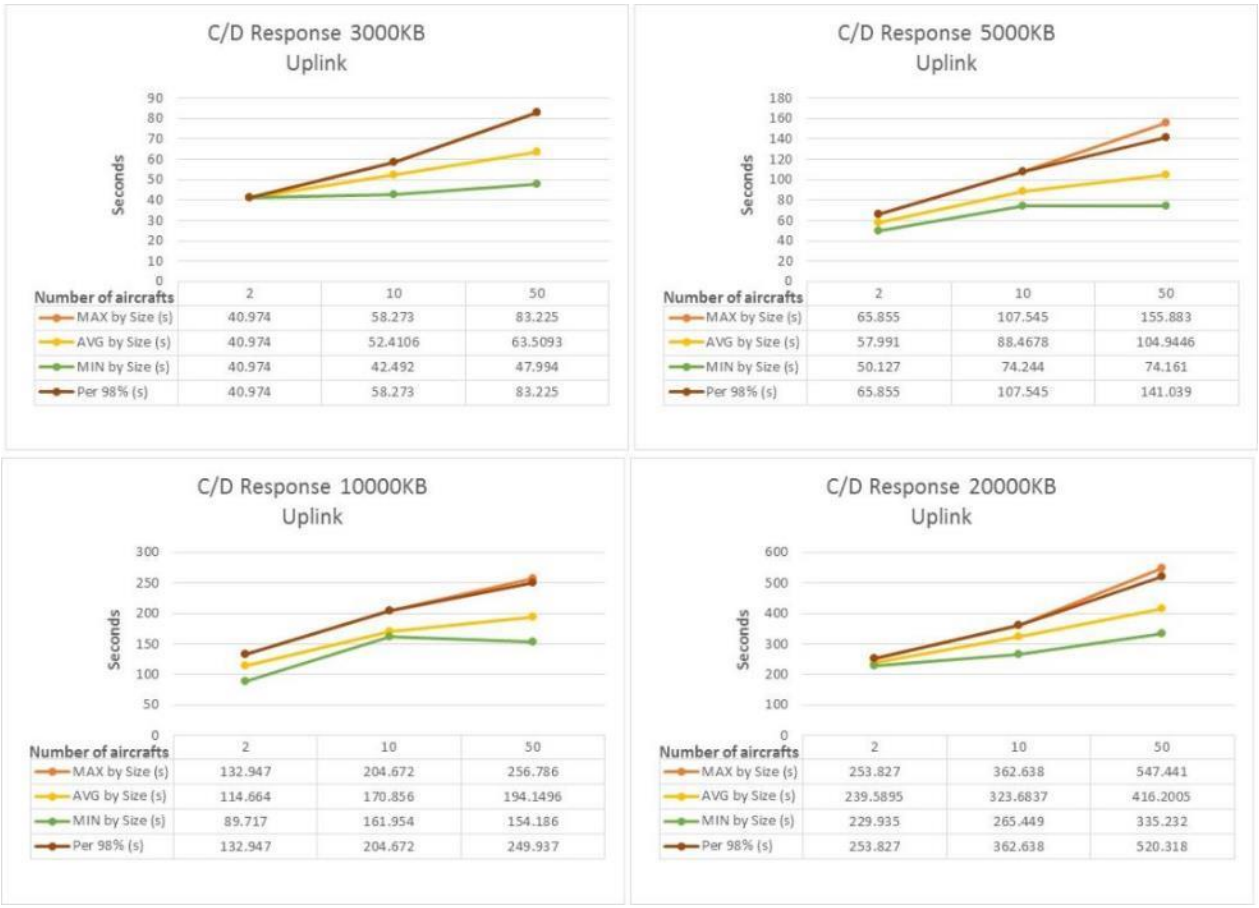


Figure 42: EXE2 Response message times by number of aircrafts - C/D category – Uplink

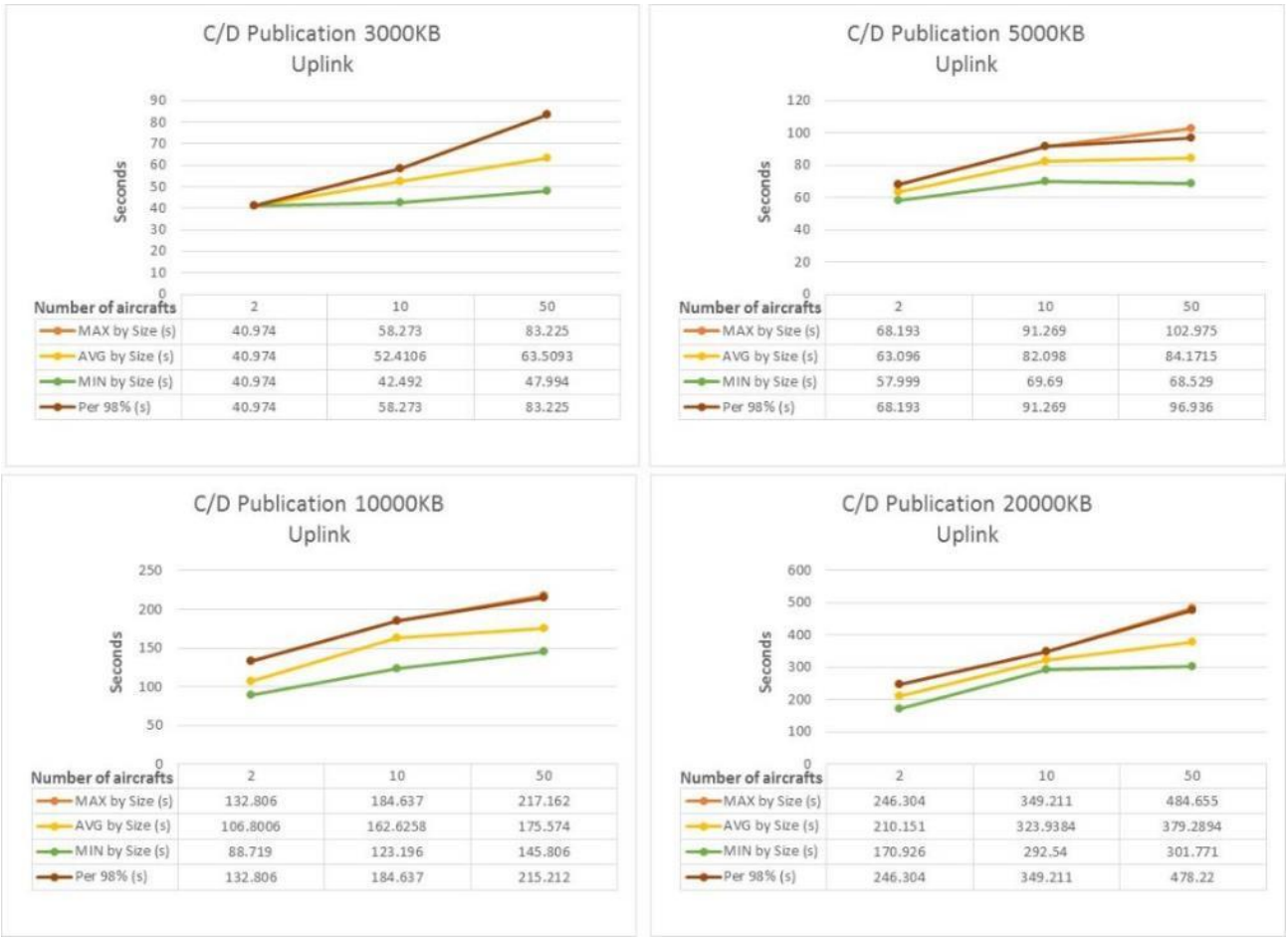


Figure 43: EXE2 Publication message times by number of aircrafts - C/D category – Uplink

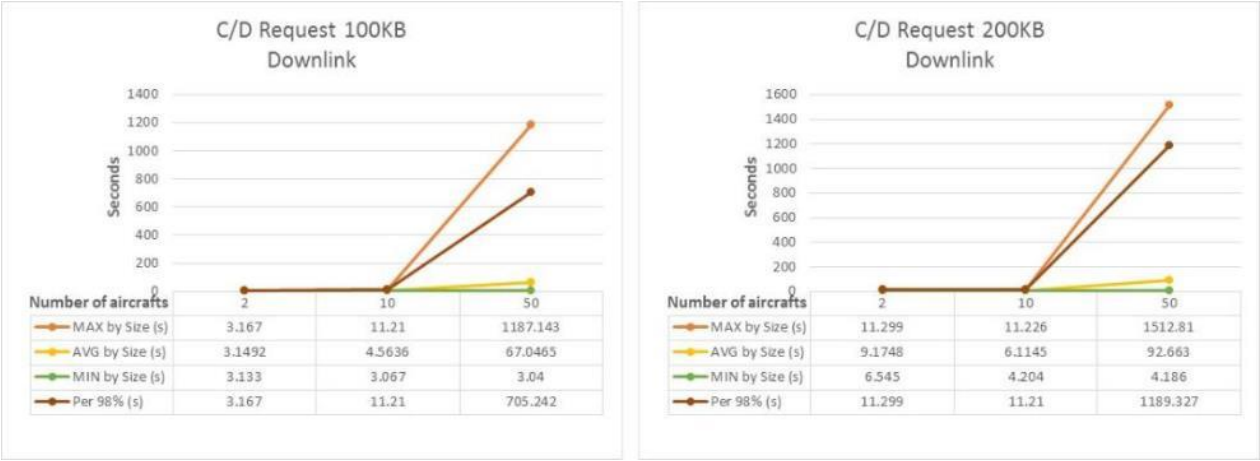


Figure 44: EXE2 Request message times by number of aircrafts - C/D category – Downlink

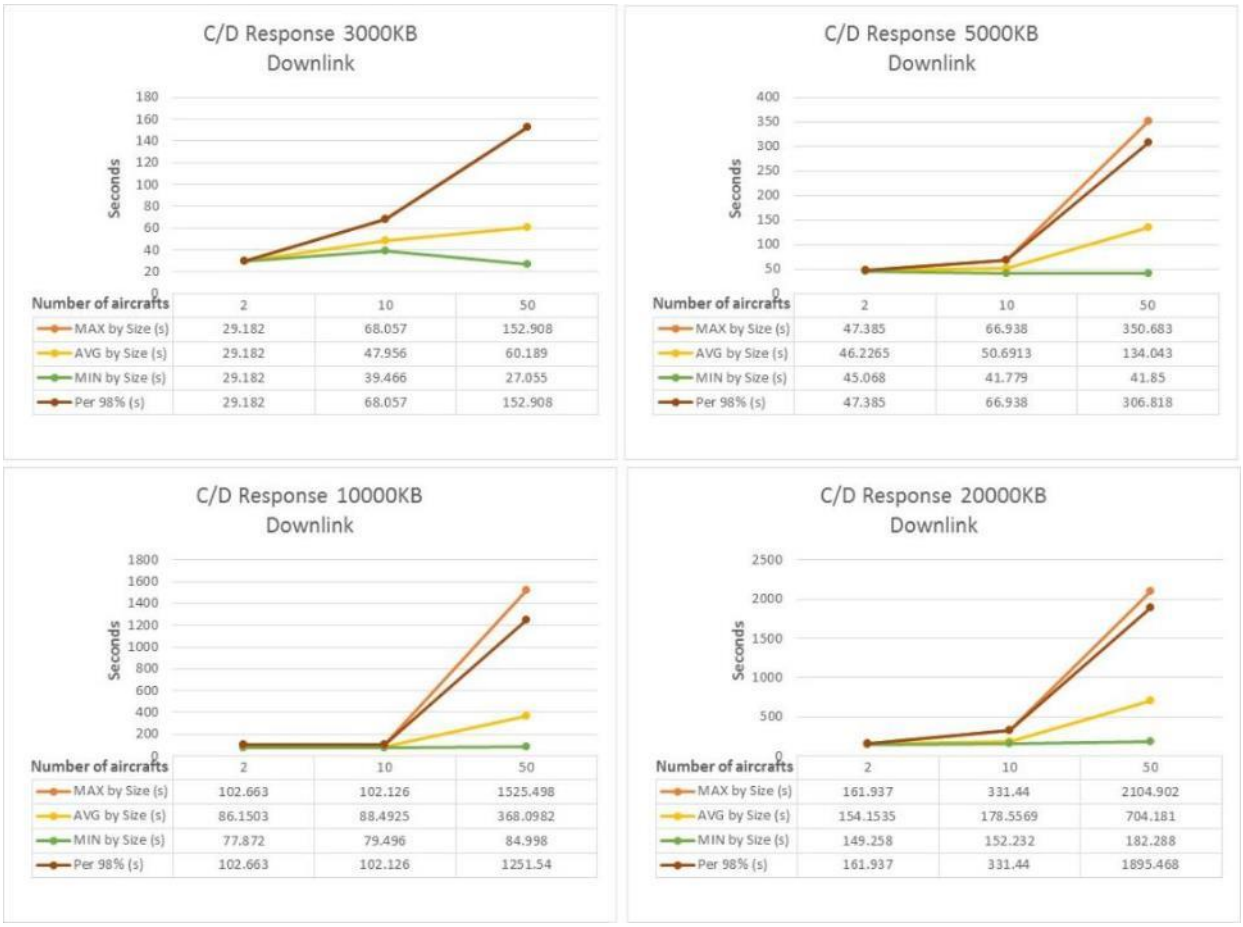


Figure 45: EXE2 Response message times by number of aircrafts - C/D category – Downlink

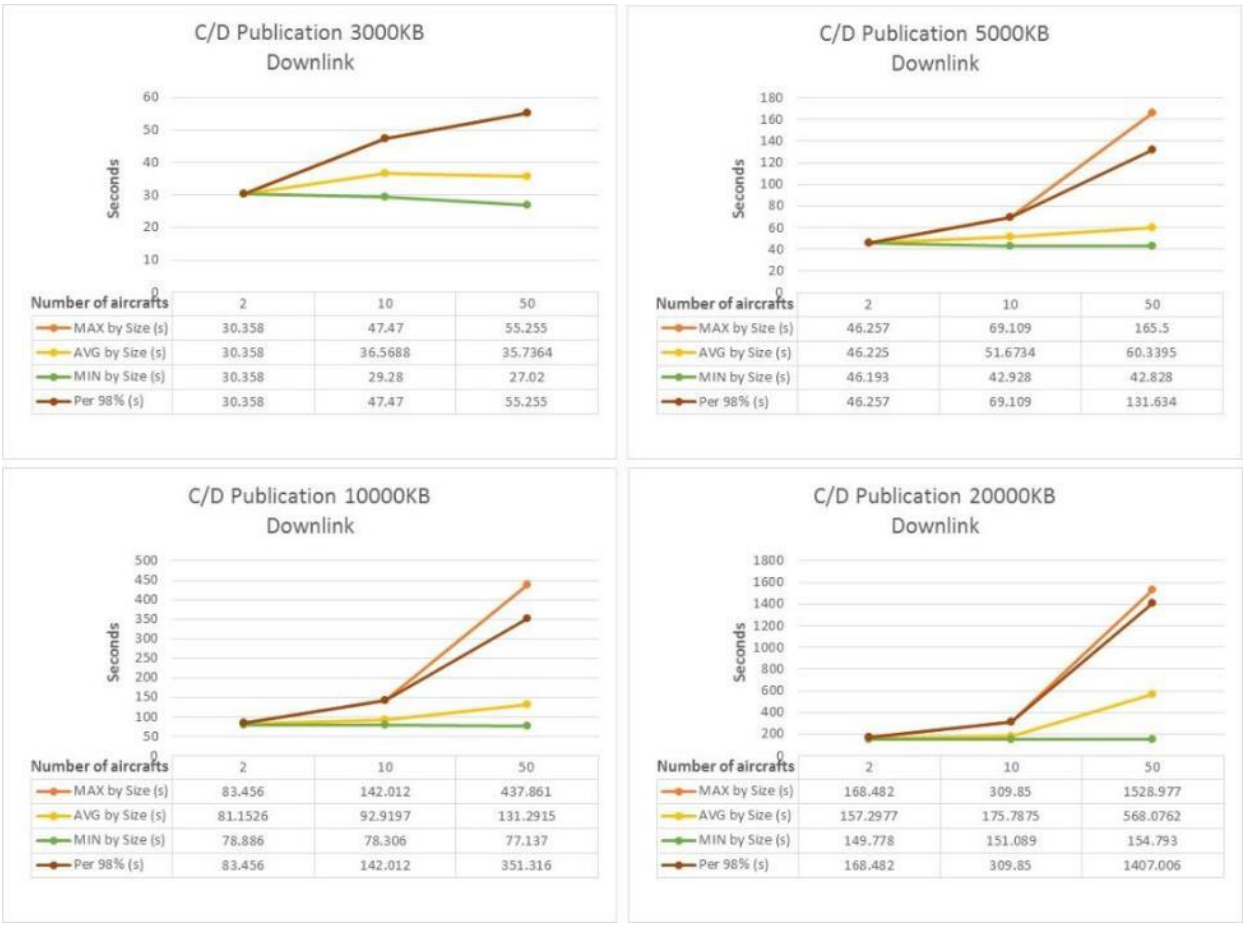


Figure 46: EXE2 Publication message times by number of aircrafts - C/D Category – Downlink

In these conditions, the network degrades very quickly and, on average, transfer times could exceed ten minutes when only 50 aircrafts are working simultaneously. These network architecture is useful to analyze the behavior when using Data Link communications, proving that is technically feasible (which is the goal of this validation), but does not support the simulation of such amount of Data Links connections in parallel. This is the least representative of the whole set of performance tests for Time-Behavior objectives.

B.3.4.2.Reliability efficiency Technical Validation Objectives

Coverage on Reliability put the focus on non-nominal cases. Using AMQP 1.0 QoS capabilities to ensure the delivery of messages during failures on connections and/or transient network errors. EXE2 aimed from the beginning to a fully coverage on this matter focused on at-least-once delivery guarantees.

All the tests performed were successful on the different situations defined in the Success Criterion. Optional requirements belonging to PP Ground Advanced Profile Part were mostly covered.

B.3.4.3.Security characteristic Technical Validation Objectives

To have a clear and detailed view on Security Validation Objectives coverage, sorted by Success Criterion, check Table 18~~Table 18~~.

From a global perspective, we can ensure that coverage of security objectives is better than the one described in TVALP. Some of the requirements, and therefore their related criterion, that were not in the scope of EXE2 are now covered because they had no impact on the timing and the benefits were clear. This includes Overload Protection with maximum size limit for queues and topics (and all the related functionality), although it is only covered in one of the two possible ways defined in the TS. Authorization policies for queues and topics are covered too.

AMQP footer related Validation Objectives (message level security) coverage is different from what was planned (changed from Fully to Partial). At the time of developing the prototypes, AMQP footer was not mapped between JMS and AMQP 1.0 standard, so it was decided to follow another option compliant with TS. In chapter 4.2.2.3.3 it is stated that Purple Profile provide two mechanisms for message level security. One of them is the aforementioned AMQP 1.0 footer, and the other one is related with security information attached to the data. This option was implemented by EXE2 using hybrid cryptography combining RSA + AES. Coverage for these validation objective is considered NOK, but message level security is provided conforming to the TS, but not in the way the Success Criterion are defined. EXE2 results proved that security information can be part of the data, being transparent to SWIM-TI in terms of transport.

On the other hand, there is only one Success Criterion that was intended to be covered, that was not validated. CRT-17.01-TRL6-TVALP-SEC.0030 was mistakenly included as Fully Covered on TVALP, while OCSP was not in the scope of EXE2. The reason is that this Success Criterion is linked to a set of requirements that, individually, are covered by this exercise and the criterion was considered covered too. However, it cannot be considered covered from a purely requirement coverage perspective without any OSCP implementation.

B.3.5 Unexpected Behaviours/Results

No unexpected behaviours or results in EXE2 validation.

B.3.6 Confidence in Results of Validation Exercise 2

B.3.6.1.Level of significance/limitations of Technical Validation Exercise Results

Overall, the significance of the validation results of EXE2 is high, taking into account that this is a technical validation and not an operational one. EXE2 participates on the following aspects:

- Functional and non-functional requirements coverage.
- Technical Validation Objectives Full coverage is high, keeping the ratio of Partially covered validation low.
- Validation Platform based on
    - A single Ground SWIM Node including AMQP broker.
    - ICARO integrated as a real SWIM Enabled Application sending real information.

- SATCOM as a WAN Emulator able to simulate a real Data Link connection between Ground SWIM Node and simulated aircrafts.

Limitations in terms of requirements coverage are already listed on B.3.1, where specific not covered requirements linked to validation objectives are listed.

Other identified limitations were:

- The use of not real time data. Due to network restrictions was not possible to use real time data, although the use of ICARO allowed to use real data stored in the system.
- The lack of multi-partner interoperability tests in this exercise. This was solved with EXE4, where Leonardo and Indra shared a same platform to test interoperability between Air and Ground SWIM Nodes.
- The coverage of optional Profile Parts (Advanced Ground and Security+) is not consistent. Some of these requirements were covered, but most of them are not. See spreadsheet coverage for a more detailed view about the matter (Appendix J).
- Hardware limitations on simulator servers did not allow us to test and identify the top capacity of the Ground SWIM Node.

B.3.6.2.Quality of Technical Validation Exercises Results

The quality is good because the coverage of validation objectives is higher than anticipated in TRL6 TVALP. Coverage on some Security Validation Objectives has changed from Fully to Partial, because prototypes did not use AMQP footer, but EXE2's message level security still covered and compliant with PJ17-01 TS.

B.3.6.3.Significance of Technical Validation Exercises Results

From a purely technical aspect, the significance is high since Ground SWIM Node has a high level of coverage of validation objectives.

Time-Behaviour results are significant from a technical perspective because they ensure the capacity of the Ground SWIM Node, but time measurements results are quite situational. They could be understood as a reference, but behaviour in more realistic scenarios focused on operational aspects instead of technical could have different results.

B.3.7 Conclusions

This section provides a summary of the conclusions raised by EXE2 validation activities results detailed in §B.3.4.

B.3.7.1.Conclusions on technical feasibility

According to EXE2, there is no doubt about PJ17-01 technical feasibility. Validation Objectives not covered by this exercise were not fulfilled due to time limitations and none of the results that did not fulfilled the requirements (i.e. Performance Time Behaviour with 1000 aircrafts) are an issue for technical feasibility.

It was interesting to see, especially during interoperability tests on EXE4, how polyvalent AMQP is and all the different products and implementations that the different partners used, making interoperability more challenging, but there were always AMQP mechanisms to achieve a solution.

B.3.7.2.Conclusions on performance assessments

As said in previous section of this Appendix, performance results on technical aspects are highly significant and we can be sure that the technical feasibility is proved: Compression, Ordering and Priority capabilities have been successfully tested.

For capacity performance results, performance of the Ground SWIM Node is significant. Due to hardware limitations on the simulators side, it was not possible to test a thousand aircraft simultaneously, but the entire tests set performed (up to 500 simulated aircrafts) was successful and the performance of the Ground SWIM Node was highly satisfactory.

For Time-Behaviour, as it was already stated, they should be taken into account only as reference for future figures on industrialization or future solutions that would use PJ17-01 as baseline. They were run with aircraft simulators and WAN Emulator from a purely technical solution, not as part of real environments with an operational focus, which limits the significance on those metrics. Nevertheless, from all the metrics shown on B.3.4.1 two of them are significant: Tests over LAN and Basic Test over SATCOM. Those two sets represent the capacity of the Ground SWIM Node on ideal network conditions and single message metrics on an A/G simulated network respectively.

B.3.8 Recommendations

Based on experience from the whole team in the different phases of this prototype, but especially during development, some recommendations were identified. They are not key aspects for the technical feasibility, since it was already proved, but they would make a stronger architecture and a better defined specification.

- TS/IRS:
    - The lack of operational functionality linked to specific environments led to a lack of messaging functionality. This is not an issue of the TS per se, but at a programme level. There were no operational inputs and depending on the environment, this could have an impact. This is not a technical issue, not something that PJ17-01 has to fix at this stage, but a reminder that should be take into account for future evolutions of the Purple Profile.
    - It should be improved the communication mechanism between SWIM nodes:
        - There is no nodes discovery mechanism for the Air SWIM nodes to know dynamically the Ground nodes they can communicate with. It was assumed by the exercise that this was a preconfigured list that is updated periodically.
        - There is no mechanism for the Ground SWIM nodes to identify which Air SWIM nodes they can communicate with. It was assumed by the exercise that this was a preconfigured list that is updated periodically.

- There is no routing mechanism defined to route requests. Subscription have a more mature system (Subscription Management).

Company General Use

Appendix C Technical Validation Exercise #03 Report

C.1 Summary of the Technical Validation Exercise #03 Plan

This exercise consists in validating the capabilities, security, performance and reliability vis-à-vis the support of PP enabled SWIM services such as the 'upload of weather information to several aircrafts according to their planned route' service.

Exercise#03 TRL6 plan is described in the PJ.17-01 TRL6 TVALP §5.3 [44].

C.1.1 Technical Validation Exercise #03 description and scope

Exercise#03 scope, derived from generic PP A/G capabilities, instantiate Messaging, Security Capabilities. The following figure depicts the instantiation of Exercise#03 (TRL6) PP A/G.

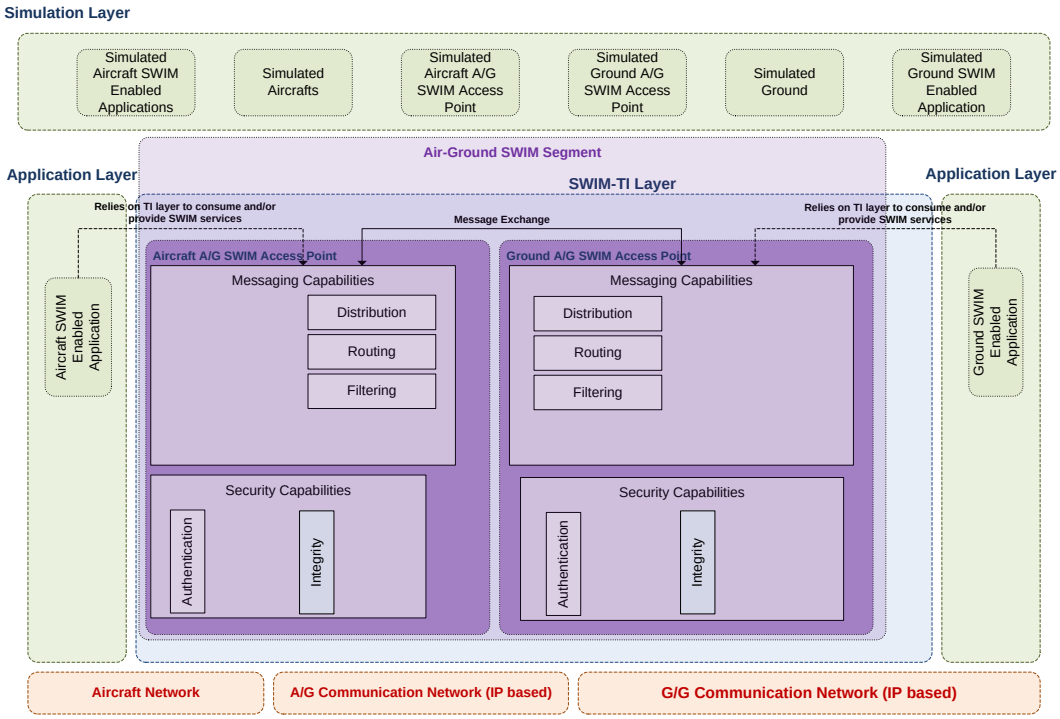


Figure 47: EXE3 PJ17-01 Specific EXE3 (TRL6) Air-Ground SWIM Layered View and Capabilities

Exercice #03 (TRL6) main constituants are:

- Aircrafts: In the scope of the PP, the Aircraft component is comprised of an Air Purple Profile SWIM AP and a set of Aircraft SWIM Enabled Applications. When required by the scenario, the Load Test Tool simulated multiple aircrafts.
- A/G SWIM Segment: The A/G SWIM Segment is comprised of an Air Purple Profile SWIM AP and a Ground A/G SWIM AP. When required by the scenario, the Load Test Tool simulates several Air Purple Profile SWIM APs and/or one Ground A/G SWIM AP.
- Ground Information Providers: Ground Information Providers are implemented by Simulated Ground SWIM Enabled Applications

Further details are provided in PJ.17-01 TRL6 TVALP §5.3.1 [44].

C.1.2 Summary of Exercise 3 Technical Validation Objectives and success criteria

Exercise#03 technical validation objectives and success criteria summary planned coverage is provided in PJ.17-01 TRL6 TVALP §5.3.3 [44].

PJ17.01 Performance objectives and success criteria planned by Exercise#03 were covered without deviations concerning the purple profile core requirements.

PJ17.01 Reliability objectives and success criteria planned by Exercise#03 were covered without deviations concerning the purple profile core requirements.

PJ17.01 Security objectives and success criteria planned by Exercise#03 were covered without deviations concerning the purple profile core requirements.

C.1.3 Summary of Technical Validation Exercise #03 Validation scenarios

Exercise#03 validation scenarios are described in PJ.17-01 TRL6 TVALP §5.3.4 [44].

Exercise#03 Security objectives have been evaluated through capacity scenario based tests, as described in PJ.17-01 TRL6 TVALP §5.3.4.2.1 [44].

Exercise#03 reliability objectives have been evaluated through reliability scenario based tests, as described in PJ.17-01 TRL6 TVALP §5.3.4.2.2 [44].

Exercise#03 performance objectives have been evaluated through performance scenario based tests, as described in PJ.17-01 TRL6 TVALP §5.3.4.2. [44].

C.1.4 Summary Technical Validation Exercise #03 Assumptions

In accordance with PJ.17-01 TRL6 TVALP §5.3.5 [44], no assumptions concerning the validation activities have been recorded by Exercise#03.

C.2 Deviation from the planned activities

The following table provides the deviations in terms of Exercise#03 technical validation objectives coverage with respect to what was as planned in the TVALP [44].

For completeness, the table includes planned coverage (refer to Table 10) and when applicable deviations are highlighted and justified. PJ17.01 objectives and success criteria planned by Exercise#03 were covered without deviations.

Technical Validation Objective ID	Success Criterion ID	EXE3	EXE3 Justification
OBJ-17.01-TRL6-TVALP-PERF.0001	CRT-17.01-TRL6-TVALP-PERF.0001	No deviation	not applicable

Technical Validation Objective ID	Success Criterion ID	EXE3	EXE3 Justification
OBJ-17.01-TRL6-TVALP-PERF.0002	CRT-17.01-TRL6-TVALP-PERF.0002	No deviation	not applicable
OBJ-17.01-TRL6-TVALP-PERF.0003	CRT-17.01-TRL6-TVALP-PERF.0003	No deviation	not applicable
OBJ-17.01-TRL6-TVALP-PERF.0004	CRT-17.01-TRL6-TVALP-PERF.0004	No deviation	not applicable
OBJ-17.01-TRL6-TVALP-PERF.0005	CRT-17.01-TRL6-TVALP-PERF.0005	No deviation	not applicable
OBJ-17.01-TRL6-TVALP-PERF.0005	CRT-17.01-TRL6-TVALP-PERF.0006	No deviation	not applicable
OBJ-17.01-TRL6-TVALP-PERF.0006	CRT-17.01-TRL6-TVALP-PERF.0007	No deviation	not applicable
OBJ-17.01-TRL6-TVALP-PERF.0006	CRT-17.01-TRL6-TVALP-PERF.0006	No deviation	not applicable
OBJ-17.01-TRL6-TVALP-PERF.0007	CRT-17.01-TRL6-TVALP-PERF.0008	No deviation	not applicable
OBJ-17.01-TRL6-TVALP-PERF.0007	CRT-17.01-TRL6-TVALP-PERF.0006	No deviation	not applicable
OBJ-17.01-TRL6-TVALP-PERF.0008	CRT-17.01-TRL6-TVALP-PERF.0009	No deviation	not applicable
OBJ-17.01-TRL6-TVALP-PERF.0008	CRT-17.01-TRL6-TVALP-PERF.0006	No deviation	not applicable
OBJ-17.01-TRL6-TVALP-PERF.0009	CRT-17.01-TRL6-TVALP-PERF.0010	No deviation	not applicable
OBJ-17.01-TRL6-TVALP-PERF.0010	CRT-17.01-TRL6-TVALP-PERF.0011	No deviation	not applicable
OBJ-17.01-TRL6-TVALP-PERF.0011	CRT-17.01-TRL6-TVALP-PERF.0012	No deviation	not applicable
OBJ-17.01-TRL6-TVALP-PERF.0012	CRT-17.01-TRL6-TVALP-PERF.0013	No deviation	not applicable
OBJ-17.01-TRL6-TVALP-PERF.0013	CRT-17.01-TRL6-TVALP-PERF.0014	No deviation	not applicable
OBJ-17.01-TRL6-TVALP-PERF.0014	CRT-17.01-TRL6-TVALP-PERF.0015	No deviation	not applicable

Technical Validation Objective ID	Success Criterion ID	EXE3	EXE3 Justification
OBJ-17.01-TRL6-TVALP-PERF.0015	CRT-17.01-TRL6-TVALP-PERF.0016	No deviation	not applicable
OBJ-17.01-TRL6-TVALP-PERF.0016	CRT-17.01-TRL6-TVALP-PERF.0017	No deviation	not applicable
OBJ-17.01-TRL6-TVALP-PERF.0017	CRT-17.01-TRL6-TVALP-PERF.0018	No deviation	not applicable
OBJ-17.01-TRL6-TVALP-PERF.0018	CRT-17.01-TRL6-TVALP-PERF.0019	No deviation	not applicable
OBJ-17.01-TRL6-TVALP-PERF.0019	CRT-17.01-TRL6-TVALP-PERF.0020	No deviation	not applicable
OBJ-17.01-TRL6-TVALP-PERF.0020	CRT-17.01-TRL6-TVALP-PERF.0021	No deviation	not applicable
OBJ-17.01-TRL6-TVALP-PERF.0021	CRT-17.01-TRL6-TVALP-PERF.0022	No deviation	not applicable
OBJ-17.01-TRL6-TVALP-PERF.0022	CRT-17.01-TRL6-TVALP-PERF.0023	No deviation	not applicable
OBJ-17.01-TRL6-TVALP-PERF.0023	CRT-17.01-TRL6-TVALP-PERF.0024	No deviation	not applicable
OBJ-17.01-TRL6-TVALP-PERF.0024	CRT-17.01-TRL6-TVALP-PERF.0025	No deviation	not applicable
OBJ-17.01-TRL6-TVALP-PERF.0025	CRT-17.01-TRL6-TVALP-PERF.0026	No deviation	not applicable
OBJ-17.01-TRL6-TVALP-PERF.0026	CRT-17.01-TRL6-TVALP-PERF.0027	No deviation	not applicable
OBJ-17.01-TRL6-TVALP-REL.0001	CRT-17.01-TRL6-TVALP-REL.0001	No deviation	not applicable
OBJ-17.01-TRL6-TVALP-REL.0001	CRT-17.01-TRL6-TVALP-REL.0002	No deviation	not applicable
OBJ-17.01-TRL6-TVALP-REL.0001	CRT-17.01-TRL6-TVALP-REL.0026	No deviation	not applicable
OBJ-17.01-TRL6-TVALP-REL.0001	CRT-17.01-TRL6-TVALP-REL.0003	No deviation	not applicable
OBJ-17.01-TRL6-TVALP-REL.0001	CRT-17.01-TRL6-TVALP-REL.0004	No deviation	not applicable

Technical Validation Objective ID	Success Criterion ID	EXE3	EXE3 Justification
OBJ-17.01-TRL6-TVALP-REL.0001	CRT-17.01-TRL6-TVALP-REL.0027	No deviation	not applicable
OBJ-17.01-TRL6-TVALP-REL.0001	CRT-17.01-TRL6-TVALP-REL.0005	No deviation	not applicable
OBJ-17.01-TRL6-TVALP-REL.0001	CRT-17.01-TRL6-TVALP-REL.0006	No deviation	not applicable
OBJ-17.01-TRL6-TVALP-REL.0001	CRT-17.01-TRL6-TVALP-REL.0007	No deviation	not applicable
OBJ-17.01-TRL6-TVALP-REL.0002	CRT-17.01-TRL6-TVALP-REL.0008	No deviation	not applicable
OBJ-17.01-TRL6-TVALP-REL.0002	CRT-17.01-TRL6-TVALP-REL.0009	No deviation	not applicable
OBJ-17.01-TRL6-TVALP-REL.0002	CRT-17.01-TRL6-TVALP-REL.0028	No deviation	not applicable
OBJ-17.01-TRL6-TVALP-REL.0002	CRT-17.01-TRL6-TVALP-REL.0010	No deviation	not applicable
OBJ-17.01-TRL6-TVALP-REL.0002	CRT-17.01-TRL6-TVALP-REL.0011	No deviation	not applicable
OBJ-17.01-TRL6-TVALP-REL.0002	CRT-17.01-TRL6-TVALP-REL.0029	No deviation	not applicable
OBJ-17.01-TRL6-TVALP-REL.0002	CRT-17.01-TRL6-TVALP-REL.0005	No deviation	not applicable
OBJ-17.01-TRL6-TVALP-REL.0002	CRT-17.01-TRL6-TVALP-REL.0006	No deviation	not applicable
OBJ-17.01-TRL6-TVALP-REL.0002	CRT-17.01-TRL6-TVALP-REL.0007	No deviation	not applicable
OBJ-17.01-TRL6-TVALP-REL.0003	CRT-17.01-TRL6-TVALP-REL.0012	No deviation	not applicable
OBJ-17.01-TRL6-TVALP-REL.0003	CRT-17.01-TRL6-TVALP-REL.0013	No deviation	not applicable
OBJ-17.01-TRL6-TVALP-REL.0003	CRT-17.01-TRL6-TVALP-REL.0030	No deviation	not applicable
OBJ-17.01-TRL6-TVALP-REL.0003	CRT-17.01-TRL6-TVALP-REL.0005	No deviation	not applicable

Technical Validation Objective ID	Success Criterion ID	EXE3	EXE3 Justification
OBJ-17.01-TRL6-TVALP-REL.0003	CRT-17.01-TRL6-TVALP-REL.0006	No deviation	not applicable
OBJ-17.01-TRL6-TVALP-REL.0003	CRT-17.01-TRL6-TVALP-REL.0007	No deviation	not applicable
OBJ-17.01-TRL6-TVALP-REL.0004	CRT-17.01-TRL6-TVALP-REL.0014	No deviation	not applicable
OBJ-17.01-TRL6-TVALP-REL.0004	CRT-17.01-TRL6-TVALP-REL.0015	No deviation	not applicable
OBJ-17.01-TRL6-TVALP-REL.0004	CRT-17.01-TRL6-TVALP-REL.0031	No deviation	not applicable
OBJ-17.01-TRL6-TVALP-REL.0004	CRT-17.01-TRL6-TVALP-REL.0005	No deviation	not applicable
OBJ-17.01-TRL6-TVALP-REL.0004	CRT-17.01-TRL6-TVALP-REL.0006	No deviation	not applicable
OBJ-17.01-TRL6-TVALP-REL.0004	CRT-17.01-TRL6-TVALP-REL.0007	No deviation	not applicable
OBJ-17.01-TRL6-TVALP-REL.0005	CRT-17.01-TRL6-TVALP-REL.0016	No deviation	not applicable
OBJ-17.01-TRL6-TVALP-REL.0005	CRT-17.01-TRL6-TVALP-REL.0017	No deviation	not applicable
OBJ-17.01-TRL6-TVALP-REL.0005	CRT-17.01-TRL6-TVALP-REL.0032	No deviation	not applicable
OBJ-17.01-TRL6-TVALP-REL.0005	CRT-17.01-TRL6-TVALP-REL.0018	No deviation	not applicable
OBJ-17.01-TRL6-TVALP-REL.0005	CRT-17.01-TRL6-TVALP-REL.0019	No deviation	not applicable
OBJ-17.01-TRL6-TVALP-REL.0005	CRT-17.01-TRL6-TVALP-REL.0033	No deviation	not applicable
OBJ-17.01-TRL6-TVALP-REL.0005	CRT-17.01-TRL6-TVALP-REL.0005	No deviation	not applicable
OBJ-17.01-TRL6-TVALP-REL.0005	CRT-17.01-TRL6-TVALP-REL.0006	No deviation	not applicable
OBJ-17.01-TRL6-TVALP-REL.0005	CRT-17.01-TRL6-TVALP-REL.0007	No deviation	not applicable

Technical Validation Objective ID	Success Criterion ID	EXE3	EXE3 Justification
OBJ-17.01-TRL6-TVALP-REL.0006	CRT-17.01-TRL6-TVALP-REL.0020	No deviation	not applicable
OBJ-17.01-TRL6-TVALP-REL.0006	CRT-17.01-TRL6-TVALP-REL.0021	No deviation	not applicable
OBJ-17.01-TRL6-TVALP-REL.0006	CRT-17.01-TRL6-TVALP-REL.0034	No deviation	not applicable
OBJ-17.01-TRL6-TVALP-REL.0006	CRT-17.01-TRL6-TVALP-REL.0022	No deviation	not applicable
OBJ-17.01-TRL6-TVALP-REL.0006	CRT-17.01-TRL6-TVALP-REL.0011	No deviation	not applicable
OBJ-17.01-TRL6-TVALP-REL.0006	CRT-17.01-TRL6-TVALP-REL.0035	No deviation	not applicable
OBJ-17.01-TRL6-TVALP-REL.0006	CRT-17.01-TRL6-TVALP-REL.0005	No deviation	not applicable
OBJ-17.01-TRL6-TVALP-REL.0006	CRT-17.01-TRL6-TVALP-REL.0006	No deviation	not applicable
OBJ-17.01-TRL6-TVALP-REL.0006	CRT-17.01-TRL6-TVALP-REL.0007	No deviation	not applicable
OBJ-17.01-TRL6-TVALP-REL.0007	CRT-17.01-TRL6-TVALP-REL.0023	No deviation	not applicable
OBJ-17.01-TRL6-TVALP-REL.0007	CRT-17.01-TRL6-TVALP-REL.0024	No deviation	not applicable
OBJ-17.01-TRL6-TVALP-REL.0007	CRT-17.01-TRL6-TVALP-REL.0036	No deviation	not applicable
OBJ-17.01-TRL6-TVALP-REL.0007	CRT-17.01-TRL6-TVALP-REL.0005	No deviation	not applicable
OBJ-17.01-TRL6-TVALP-REL.0007	CRT-17.01-TRL6-TVALP-REL.0006	No deviation	not applicable
OBJ-17.01-TRL6-TVALP-REL.0007	CRT-17.01-TRL6-TVALP-REL.0007	No deviation	not applicable
OBJ-17.01-TRL6-TVALP-REL.0008	CRT-17.01-TRL6-TVALP-REL.0025	No deviation	not applicable
OBJ-17.01-TRL6-TVALP-REL.0008	CRT-17.01-TRL6-TVALP-REL.0038	No deviation	not applicable

Technical Validation Objective ID	Success Criterion ID	EXE3	EXE3 Justification
OBJ-17.01-TRL6-TVALP-REL.0008	CRT-17.01-TRL6-TVALP-REL.0037	No deviation	not applicable
OBJ-17.01-TRL6-TVALP-REL.0008	CRT-17.01-TRL6-TVALP-REL.0005	No deviation	not applicable
OBJ-17.01-TRL6-TVALP-REL.0008	CRT-17.01-TRL6-TVALP-REL.0006	No deviation	not applicable
OBJ-17.01-TRL6-TVALP-REL.0008	CRT-17.01-TRL6-TVALP-REL.0007	No deviation	not applicable
OBJ-17.01-TRL6-TVALP-SEC.0001	CRT-17.01-TRL6-TVALP-SEC.0001	No deviation	not applicable
OBJ-17.01-TRL6-TVALP-SEC.0001	CRT-17.01-TRL6-TVALP-SEC.0002	No deviation	not applicable
OBJ-17.01-TRL6-TVALP-SEC.0001	CRT-17.01-TRL6-TVALP-SEC.0003	No deviation	not applicable
OBJ-17.01-TRL6-TVALP-SEC.0001	CRT-17.01-TRL6-TVALP-SEC.0004	No deviation	not applicable
OBJ-17.01-TRL6-TVALP-SEC.0001	CRT-17.01-TRL6-TVALP-SEC.0008	No deviation	not applicable
OBJ-17.01-TRL6-TVALP-SEC.0001	CRT-17.01-TRL6-TVALP-SEC.0009	No deviation	not applicable
OBJ-17.01-TRL6-TVALP-SEC.0002	CRT-17.01-TRL6-TVALP-SEC.0001	No deviation	not applicable
OBJ-17.01-TRL6-TVALP-SEC.0002	CRT-17.01-TRL6-TVALP-SEC.0002	No deviation	not applicable
OBJ-17.01-TRL6-TVALP-SEC.0002	CRT-17.01-TRL6-TVALP-SEC.0003	No deviation	not applicable
OBJ-17.01-TRL6-TVALP-SEC.0002	CRT-17.01-TRL6-TVALP-SEC.0005	No deviation	not applicable
OBJ-17.01-TRL6-TVALP-SEC.0002	CRT-17.01-TRL6-TVALP-SEC.0006	No deviation	not applicable
OBJ-17.01-TRL6-TVALP-SEC.0002	CRT-17.01-TRL6-TVALP-SEC.0007	No deviation	not applicable
OBJ-17.01-TRL6-TVALP-SEC.0002	CRT-17.01-TRL6-TVALP-SEC.0008	No deviation	not applicable

Technical Validation Objective ID	Success Criterion ID	EXE3	EXE3 Justification
OBJ-17.01-TRL6-TVALP-SEC.0002	CRT-17.01-TRL6-TVALP-SEC.0009	No deviation	not applicable
OBJ-17.01-TRL6-TVALP-SEC.0003	CRT-17.01-TRL6-TVALP-SEC.0010	No deviation	not applicable
OBJ-17.01-TRL6-TVALP-SEC.0003	CRT-17.01-TRL6-TVALP-SEC.0011	No deviation	not applicable
OBJ-17.01-TRL6-TVALP-SEC.0003	CRT-17.01-TRL6-TVALP-SEC.0012	No deviation	not applicable
OBJ-17.01-TRL6-TVALP-SEC.0003	CRT-17.01-TRL6-TVALP-SEC.0004	No deviation	not applicable
OBJ-17.01-TRL6-TVALP-SEC.0003	CRT-17.01-TRL6-TVALP-SEC.0008	No deviation	not applicable
OBJ-17.01-TRL6-TVALP-SEC.0003	CRT-17.01-TRL6-TVALP-SEC.0009	No deviation	not applicable
OBJ-17.01-TRL6-TVALP-SEC.0004	CRT-17.01-TRL6-TVALP-SEC.0010	No deviation	not applicable
OBJ-17.01-TRL6-TVALP-SEC.0004	CRT-17.01-TRL6-TVALP-SEC.0011	No deviation	not applicable
OBJ-17.01-TRL6-TVALP-SEC.0004	CRT-17.01-TRL6-TVALP-SEC.0012	No deviation	not applicable
OBJ-17.01-TRL6-TVALP-SEC.0004	CRT-17.01-TRL6-TVALP-SEC.0005	No deviation	not applicable
OBJ-17.01-TRL6-TVALP-SEC.0004	CRT-17.01-TRL6-TVALP-SEC.0006	No deviation	not applicable
OBJ-17.01-TRL6-TVALP-SEC.0004	CRT-17.01-TRL6-TVALP-SEC.0007	No deviation	not applicable
OBJ-17.01-TRL6-TVALP-SEC.0004	CRT-17.01-TRL6-TVALP-SEC.0008	No deviation	not applicable
OBJ-17.01-TRL6-TVALP-SEC.0004	CRT-17.01-TRL6-TVALP-SEC.0009	No deviation	not applicable
OBJ-17.01-TRL6-TVALP-SEC.0005	CRT-17.01-TRL6-TVALP-SEC.0013	No deviation	not applicable
OBJ-17.01-TRL6-TVALP-SEC.0005	CRT-17.01-TRL6-TVALP-SEC.0014	No deviation	not applicable

Technical Validation Objective ID	Success Criterion ID	EXE3	EXE3 Justification
OBJ-17.01-TRL6-TVALP-SEC.0005	CRT-17.01-TRL6-TVALP-SEC.0015	No deviation	not applicable
OBJ-17.01-TRL6-TVALP-SEC.0005	CRT-17.01-TRL6-TVALP-SEC.0016	No deviation	not applicable
OBJ-17.01-TRL6-TVALP-SEC.0005	CRT-17.01-TRL6-TVALP-SEC.0017	No deviation	not applicable
OBJ-17.01-TRL6-TVALP-SEC.0005	CRT-17.01-TRL6-TVALP-SEC.0018	No deviation	not applicable
OBJ-17.01-TRL6-TVALP-SEC.0005	CRT-17.01-TRL6-TVALP-SEC.0019	No deviation	not applicable
OBJ-17.01-TRL6-TVALP-SEC.0006	CRT-17.01-TRL6-TVALP-SEC.0020	No deviation	not applicable
OBJ-17.01-TRL6-TVALP-SEC.0006	CRT-17.01-TRL6-TVALP-SEC.0021	No deviation	not applicable
OBJ-17.01-TRL6-TVALP-SEC.0006	CRT-17.01-TRL6-TVALP-SEC.0022	No deviation	not applicable
OBJ-17.01-TRL6-TVALP-SEC.0006	CRT-17.01-TRL6-TVALP-SEC.0016	No deviation	not applicable
OBJ-17.01-TRL6-TVALP-SEC.0006	CRT-17.01-TRL6-TVALP-SEC.0017	No deviation	not applicable
OBJ-17.01-TRL6-TVALP-SEC.0006	CRT-17.01-TRL6-TVALP-SEC.0018	No deviation	not applicable
OBJ-17.01-TRL6-TVALP-SEC.0006	CRT-17.01-TRL6-TVALP-SEC.0019	No deviation	not applicable
OBJ-17.01-TRL6-TVALP-SEC.0007	CRT-17.01-TRL6-TVALP-SEC.0013	No deviation	not applicable
OBJ-17.01-TRL6-TVALP-SEC.0007	CRT-17.01-TRL6-TVALP-SEC.0014	No deviation	not applicable
OBJ-17.01-TRL6-TVALP-SEC.0007	CRT-17.01-TRL6-TVALP-SEC.0015	No deviation	not applicable
OBJ-17.01-TRL6-TVALP-SEC.0007	CRT-17.01-TRL6-TVALP-SEC.0016	No deviation	not applicable
OBJ-17.01-TRL6-TVALP-SEC.0007	CRT-17.01-TRL6-TVALP-SEC.0017	No deviation	not applicable

Technical Validation Objective ID	Success Criterion ID	EXE3	EXE3 Justification
OBJ-17.01-TRL6-TVALP-SEC.0007	CRT-17.01-TRL6-TVALP-SEC.0023	No deviation	not applicable
OBJ-17.01-TRL6-TVALP-SEC.0008	CRT-17.01-TRL6-TVALP-SEC.0020	No deviation	not applicable
OBJ-17.01-TRL6-TVALP-SEC.0008	CRT-17.01-TRL6-TVALP-SEC.0021	No deviation	not applicable
OBJ-17.01-TRL6-TVALP-SEC.0008	CRT-17.01-TRL6-TVALP-SEC.0022	No deviation	not applicable
OBJ-17.01-TRL6-TVALP-SEC.0008	CRT-17.01-TRL6-TVALP-SEC.0016	No deviation	not applicable
OBJ-17.01-TRL6-TVALP-SEC.0008	CRT-17.01-TRL6-TVALP-SEC.0017	No deviation	not applicable
OBJ-17.01-TRL6-TVALP-SEC.0008	CRT-17.01-TRL6-TVALP-SEC.0024	No deviation	not applicable
OBJ-17.01-TRL6-TVALP-SEC.0009	CRT-17.01-TRL6-TVALP-SEC.0025	No deviation	not applicable
OBJ-17.01-TRL6-TVALP-SEC.0009	CRT-17.01-TRL6-TVALP-SEC.0016	No deviation	not applicable
OBJ-17.01-TRL6-TVALP-SEC.0009	CRT-17.01-TRL6-TVALP-SEC.0026	No deviation	not applicable
OBJ-17.01-TRL6-TVALP-SEC.0010	CRT-17.01-TRL6-TVALP-SEC.0027	No deviation	not applicable
OBJ-17.01-TRL6-TVALP-SEC.0010	CRT-17.01-TRL6-TVALP-SEC.0016	No deviation	not applicable
OBJ-17.01-TRL6-TVALP-SEC.0010	CRT-17.01-TRL6-TVALP-SEC.0028	No deviation	not applicable
OBJ-17.01-TRL6-TVALP-SEC.0011	CRT-17.01-TRL6-TVALP-SEC.0029	No deviation	not applicable
OBJ-17.01-TRL6-TVALP-SEC.0011	CRT-17.01-TRL6-TVALP-SEC.0030	No deviation	not applicable
OBJ-17.01-TRL6-TVALP-SEC.0011	CRT-17.01-TRL6-TVALP-SEC.0031	No deviation	not applicable
OBJ-17.01-TRL6-TVALP-SEC.0011	CRT-17.01-TRL6-TVALP-SEC.0032	No deviation	not applicable

Technical Validation Objective ID	Success Criterion ID	EXE3	EXE3 Justification
OBJ-17.01-TRL6-TVALP-SEC.0011	CRT-17.01-TRL6-TVALP-SEC.0033	No deviation	not applicable
OBJ-17.01-TRL6-TVALP-SEC.0011	CRT-17.01-TRL6-TVALP-SEC.0034	No deviation	not applicable
OBJ-17.01-TRL6-TVALP-SEC.0011	CRT-17.01-TRL6-TVALP-SEC.0035	No deviation	not applicable
OBJ-17.01-TRL6-TVALP-SEC.0012	CRT-17.01-TRL6-TVALP-SEC.0036	No deviation	not applicable
OBJ-17.01-TRL6-TVALP-SEC.0012	CRT-17.01-TRL6-TVALP-SEC.0037	No deviation	not applicable
OBJ-17.01-TRL6-TVALP-SEC.0012	CRT-17.01-TRL6-TVALP-SEC.0038	No deviation	not applicable
OBJ-17.01-TRL6-TVALP-SEC.0013	CRT-17.01-TRL6-TVALP-SEC.0029	No deviation	not applicable
OBJ-17.01-TRL6-TVALP-SEC.0013	CRT-17.01-TRL6-TVALP-SEC.0030	No deviation	not applicable
OBJ-17.01-TRL6-TVALP-SEC.0013	CRT-17.01-TRL6-TVALP-SEC.0031	No deviation	not applicable
OBJ-17.01-TRL6-TVALP-SEC.0013	CRT-17.01-TRL6-TVALP-SEC.0032	No deviation	not applicable
OBJ-17.01-TRL6-TVALP-SEC.0013	CRT-17.01-TRL6-TVALP-SEC.0039	No deviation	not applicable
OBJ-17.01-TRL6-TVALP-SEC.0013	CRT-17.01-TRL6-TVALP-SEC.0040	No deviation	not applicable
OBJ-17.01-TRL6-TVALP-SEC.0013	CRT-17.01-TRL6-TVALP-SEC.0041	No deviation	not applicable
OBJ-17.01-TRL6-TVALP-SEC.0013	CRT-17.01-TRL6-TVALP-SEC.0042	No deviation	not applicable
OBJ-17.01-TRL6-TVALP-SEC.0014	CRT-17.01-TRL6-TVALP-SEC.0043	No deviation	not applicable
OBJ-17.01-TRL6-TVALP-SEC.0014	CRT-17.01-TRL6-TVALP-SEC.0044	No deviation	not applicable
OBJ-17.01-TRL6-TVALP-SEC.0014	CRT-17.01-TRL6-TVALP-SEC.0045	No deviation	not applicable

Technical Validation Objective ID	Success Criterion ID	EXE3	EXE3 Justification
OBJ-17.01-TRL6-TVALP-SEC.0014	CRT-17.01-TRL6-TVALP-SEC.0046	No deviation	not applicable
OBJ-17.01-TRL6-TVALP-SEC.0014	CRT-17.01-TRL6-TVALP-SEC.0047	No deviation	not applicable
OBJ-17.01-TRL6-TVALP-SEC.0014	CRT-17.01-TRL6-TVALP-SEC.0048	No deviation	not applicable
OBJ-17.01-TRL6-TVALP-SEC.0015	CRT-17.01-TRL6-TVALP-SEC.0049	No deviation	not applicable
OBJ-17.01-TRL6-TVALP-SEC.0015	CRT-17.01-TRL6-TVALP-SEC.0050	No deviation	not applicable
OBJ-17.01-TRL6-TVALP-SEC.0015	CRT-17.01-TRL6-TVALP-SEC.0051	No deviation	not applicable
OBJ-17.01-TRL6-TVALP-SEC.0015	CRT-17.01-TRL6-TVALP-SEC.0052	No deviation	not applicable
OBJ-17.01-TRL6-TVALP-SEC.0015	CRT-17.01-TRL6-TVALP-SEC.0053	No deviation	not applicable
OBJ-17.01-TRL6-TVALP-SEC.0015	CRT-17.01-TRL6-TVALP-SEC.0054	No deviation	not applicable
OBJ-17.01-TRL6-TVALP-SEC.0015	CRT-17.01-TRL6-TVALP-SEC.0055	No deviation	not applicable
OBJ-17.01-TRL6-TVALP-SEC.0015	CRT-17.01-TRL6-TVALP-SEC.0056	No deviation	not applicable
OBJ-17.01-TRL6-TVALP-SEC.0015	CRT-17.01-TRL6-TVALP-SEC.0057	No deviation	not applicable
OBJ-17.01-TRL6-TVALP-SEC.0015	CRT-17.01-TRL6-TVALP-SEC.0058	No deviation	not applicable
OBJ-17.01-TRL6-TVALP-SEC.0016	CRT-17.01-TRL6-TVALP-SEC.0059	No deviation	not applicable
OBJ-17.01-TRL6-TVALP-SEC.0016	CRT-17.01-TRL6-TVALP-SEC.0060	No deviation	not applicable
OBJ-17.01-TRL6-TVALP-SEC.0016	CRT-17.01-TRL6-TVALP-SEC.0061	No deviation	not applicable
OBJ-17.01-TRL6-TVALP-SEC.0016	CRT-17.01-TRL6-TVALP-SEC.0062	No deviation	not applicable

Technical Validation Objective ID	Success Criterion ID	EXE3	EXE3 Justification
OBJ-17.01-TRL6-TVALP-SEC.0016	CRT-17.01-TRL6-TVALP-SEC.0053	No deviation	not applicable
OBJ-17.01-TRL6-TVALP-SEC.0016	CRT-17.01-TRL6-TVALP-SEC.0054	No deviation	not applicable
OBJ-17.01-TRL6-TVALP-SEC.0016	CRT-17.01-TRL6-TVALP-SEC.0063	No deviation	not applicable
OBJ-17.01-TRL6-TVALP-SEC.0016	CRT-17.01-TRL6-TVALP-SEC.0064	No deviation	not applicable
OBJ-17.01-TRL6-TVALP-SEC.0016	CRT-17.01-TRL6-TVALP-SEC.0065	No deviation	not applicable
OBJ-17.01-TRL6-TVALP-SEC.0016	CRT-17.01-TRL6-TVALP-SEC.0066	No deviation	not applicable
OBJ-17.01-TRL6-TVALP-SEC.0017	CRT-17.01-TRL6-TVALP-SEC.0067	No deviation	not applicable
OBJ-17.01-TRL6-TVALP-SEC.0017	CRT-17.01-TRL6-TVALP-SEC.0068	No deviation	not applicable
OBJ-17.01-TRL6-TVALP-SEC.0017	CRT-17.01-TRL6-TVALP-SEC.0069	No deviation	not applicable
OBJ-17.01-TRL6-TVALP-SEC.0017	CRT-17.01-TRL6-TVALP-SEC.0070	No deviation	not applicable
OBJ-17.01-TRL6-TVALP-SEC.0017	CRT-17.01-TRL6-TVALP-SEC.0071	No deviation	not applicable
OBJ-17.01-TRL6-TVALP-SEC.0017	CRT-17.01-TRL6-TVALP-SEC.0072	No deviation	not applicable
OBJ-17.01-TRL6-TVALP-SEC.0017	CRT-17.01-TRL6-TVALP-SEC.0073	No deviation	not applicable
OBJ-17.01-TRL6-TVALP-SEC.0018	CRT-17.01-TRL6-TVALP-SEC.0074	No deviation	not applicable
OBJ-17.01-TRL6-TVALP-SEC.0018	CRT-17.01-TRL6-TVALP-SEC.0075	No deviation	not applicable
OBJ-17.01-TRL6-TVALP-SEC.0018	CRT-17.01-TRL6-TVALP-SEC.0076	No deviation	not applicable
OBJ-17.01-TRL6-TVALP-SEC.0018	CRT-17.01-TRL6-TVALP-SEC.0077	No deviation	not applicable

Technical Validation Objective ID	Success Criterion ID	EXE3	EXE3 Justification
OBJ-17.01-TRL6-TVALP-SEC.0019	CRT-17.01-TRL6-TVALP-SEC.0078	No deviation	not applicable
OBJ-17.01-TRL6-TVALP-SEC.0019	CRT-17.01-TRL6-TVALP-SEC.0079	No deviation	not applicable
OBJ-17.01-TRL6-TVALP-SEC.0019	CRT-17.01-TRL6-TVALP-SEC.0080	No deviation	not applicable
OBJ-17.01-TRL6-TVALP-SEC.0019	CRT-17.01-TRL6-TVALP-SEC.0081	No deviation	not applicable
OBJ-17.01-TRL6-TVALP-SEC.0020	CRT-17.01-TRL6-TVALP-SEC.0078	No deviation	not applicable
OBJ-17.01-TRL6-TVALP-SEC.0020	CRT-17.01-TRL6-TVALP-SEC.0079	No deviation	not applicable
OBJ-17.01-TRL6-TVALP-SEC.0020	CRT-17.01-TRL6-TVALP-SEC.0080	No deviation	not applicable
OBJ-17.01-TRL6-TVALP-SEC.0020	CRT-17.01-TRL6-TVALP-SEC.0081	No deviation	not applicable
OBJ-17.01-TRL6-TVALP-SEC.0021	CRT-17.01-TRL6-TVALP-SEC.0082	No deviation	not applicable
OBJ-17.01-TRL6-TVALP-SEC.0021	CRT-17.01-TRL6-TVALP-SEC.0083	No deviation	not applicable
OBJ-17.01-TRL6-TVALP-SEC.0021	CRT-17.01-TRL6-TVALP-SEC.0084	No deviation	not applicable
OBJ-17.01-TRL6-TVALP-SEC.0021	CRT-17.01-TRL6-TVALP-SEC.0085	No deviation	not applicable
OBJ-17.01-TRL6-TVALP-SEC.0021	CRT-17.01-TRL6-TVALP-SEC.0086	No deviation	not applicable
OBJ-17.01-TRL6-TVALP-SEC.0021	CRT-17.01-TRL6-TVALP-SEC.0087	No deviation	not applicable
OBJ-17.01-TRL6-TVALP-SEC.0022	CRT-17.01-TRL6-TVALP-SEC.0088	No deviation	not applicable
OBJ-17.01-TRL6-TVALP-SEC.0022	CRT-17.01-TRL6-TVALP-SEC.0089	No deviation	not applicable
OBJ-17.01-TRL6-TVALP-SEC.0022	CRT-17.01-TRL6-TVALP-SEC.0090	No deviation	not applicable

Technical Validation Objective ID	Success Criterion ID	EXE3	EXE3 Justification
OBJ-17.01-TRL6-TVALP-SEC.0022	CRT-17.01-TRL6-TVALP-SEC.0091	No deviation	not applicable
OBJ-17.01-TRL6-TVALP-SEC.0022	CRT-17.01-TRL6-TVALP-SEC.0092	No deviation	not applicable
OBJ-17.01-TRL6-TVALP-SEC.0023	CRT-17.01-TRL6-TVALP-SEC.0088	No deviation	not applicable
OBJ-17.01-TRL6-TVALP-SEC.0023	CRT-17.01-TRL6-TVALP-SEC.0089	No deviation	not applicable
OBJ-17.01-TRL6-TVALP-SEC.0023	CRT-17.01-TRL6-TVALP-SEC.0090	No deviation	not applicable
OBJ-17.01-TRL6-TVALP-SEC.0023	CRT-17.01-TRL6-TVALP-SEC.0091	No deviation	not applicable
OBJ-17.01-TRL6-TVALP-SEC.0023	CRT-17.01-TRL6-TVALP-SEC.0092	No deviation	not applicable
OBJ-17.01-TRL6-TVALP-SEC.0024	CRT-17.01-TRL6-TVALP-SEC.0093	No deviation	not applicable
OBJ-17.01-TRL6-TVALP-SEC.0024	CRT-17.01-TRL6-TVALP-SEC.0094	No deviation	not applicable
OBJ-17.01-TRL6-TVALP-SEC.0024	CRT-17.01-TRL6-TVALP-SEC.0095	No deviation	not applicable
OBJ-17.01-TRL6-TVALP-SEC.0025	CRT-17.01-TRL6-TVALP-SEC.0096	No deviation	not applicable
OBJ-17.01-TRL6-TVALP-SEC.0025	CRT-17.01-TRL6-TVALP-SEC.0097	No deviation	not applicable
OBJ-17.01-TRL6-TVALP-SEC.0026	CRT-17.01-TRL6-TVALP-SEC.0096	No deviation	not applicable
OBJ-17.01-TRL6-TVALP-SEC.0026	CRT-17.01-TRL6-TVALP-SEC.0097	No deviation	not applicable

Table 22: Deviations in terms of PJ.17-01 TRL6 EXE3 technical validation objectives coverage

The table below provides the technical validation exercise milestones for this exercise.

EXE Milestone	Description	End Date
EXE3-TRL6-TVAL.01	V&VP underlying hardware platform setup	**18/01/2019**

EXE3-TRL6-TVAL.02	A/G SWIM Segment development in accordance to TS including SWIM enabled (test) Applications and PP SWIM enabled (test) services.	**26/04/2019**
EXE3-TRL6-TVAL.03	Load Test Tool development	**15/03/2019**
EXE3-TRL6-TVAL.04	Test Tool scenarios development in accordance with validation scenarios	**15/03/2019**
EXE3-TRL6-TVAL.05	Integration and test of the V&VP	**14/06/2019**
EXE3-TRL6-TVAL.06	All test procedures, i.e. all validation scenarios, are run	**18/07/2019**
EXE3-TRL6-TVAL.07	TVALR is written	**As planned**

Table 23: EXE3 technical validation exercise milestones

Details about validation results are provided in the section below.

C.3 Technical Validation Exercise #03 Validation Results

C.3.1 Summary of Technical Validation Exercise #03 Results

As reported in the Exercise#03 AN [46], consistently with the planned objective coverage for the exercise documented in TVALP [44] §5.3.1.2 & §5.3.3, not all solution validation objectives, success criteria, and thus associated requirements have been implemented on the Air and Ground SWIM prototyped nodes.

Exercise#03 implementation main characteristics are:

- Support for PP SWIM enabled services: The following <PP core> functionalities are supported:
  - Message distribution: Synchronous non-blocking pull style Publish/Subscribe MEP (PSPULL-MEP), Synchronous non-blocking fully Decoupled Request/Reply MEP (FDRR-MEP), both uplink and downlink.
  - Message routing & filtering: Subject-based filtering & routing. Expired, undeliverable messages are handled through drop context-based routing. Message enrichment is not supported.
  - Messaging policies: routing policy and filtering policy are solely based on Exercise#03 services (PosRep, Taf/Metar, FreeText. Unidentified message are drop without notice.
  - Message screening, protection: Maximum sizing is configured according to the Exercise#03 services (PosRep, Taf/Metar, FreeText. Malformed message are filtered out against properties syntax validity. Supported message types are textual (taf/metar/free text) and json (pos rep). There are no audit exchanges in Exercise#03 scenario.
  - Messaging Security:

- Authentication: PP nodes' digital identities are exchanged through a coordinated procedure between Exercise#03 partners.
- Integrity: end-to-end integrity is based on HMAC algorithm.

- Specific <PP Air> functionalities are supported:
  - Air purple profile node is integrated to a single-aisle aircraft type, as referenced in A660B [49] for a 2010's like avionics architecture.
  - Air purple profile node deployment is based on a hybrid insertion to avionics with partial allocation to a secure aircraft server, supporting distribution over 2 independent C-PED.

- Specific <PP Ground> functionalities are supported:
  - Ground purple profile node allowing an airline to exchange information with its aircraft

- Communication between Air Purple Profile SWIM AP and Ground A/G SWIM AP: The communication on the wire (i.e. between SWIM AP) is based on AMQP 1.0 over TLS over IP version 4. Following <PP core> network binding are supported:
  - IP version 4 network routing, based on best effort Qos.
  - Data transport based on TCP, datagram are not supported.
  - Security: TLS with mutual authentication.
  - Network bandwidth profile tuned according to Performance objective latency requirements.

EXE3 requirements coverage is provided in Appendix J.

The following table provides a summary of the Exercise#03 validation results per validation objective.

- OK: technical validation objective achieves the expectations (exercise results achieve success criteria).

- NOK: technical validation objective does not achieve the expectations (exercise results do not achieve success criteria).

- Partially OK: technical validation objective achieves the expectations to a certain extent. The reasons why the technical validation objective is not fully achieved have been recorded in table below.

Technical Validation Exercise #03 Technical Validation Objective ID	Technical Validation Exercise #03 Technical Validation Objective Title	Technical Validation Exercise #03 Success Criterion ID	Technical Validation Exercise #03 Success Criterion	Technical Validation Exercise #03 Validation Results	Technical Validation Exercise #03 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-PERF.0001	FIFO message queue level ordering guarantees QoS for uplink service	CRT-17.01-TRL6-TVALP-PERF.0001	Messages sent by the ground sender are received in the same FIFO order by the aircraft application.	successful messages delivery sequence	OK
OBJ-17.01-TRL6-TVALP-PERF.0002	FIFO message queue level ordering guarantees QoS for downlink service	CRT-17.01-TRL6-TVALP-PERF.0002	Messages sent by the air sender are received in the same FIFO order by the ground application.	successful messages delivery sequence	OK
OBJ-17.01-TRL6-TVALP-PERF.0003	FIFO message topic level ordering guarantees QoS for uplink service	CRT-17.01-TRL6-TVALP-PERF.0003	Messages published by the ground publisher are received in the same FIFO order by the aircraft application(s).	successful messages delivery sequence	OK
OBJ-17.01-TRL6-TVALP-PERF.0004	FIFO message topic level ordering guarantees QoS for downlink service	CRT-17.01-TRL6-TVALP-PERF.0004	Messages published by the air publisher(s) are received in the same FIFO order by the ground application(s).	successful messages delivery sequence	OK
OBJ-17.01-TRL6-TVALP-PERF.0005	Message priority message queue level ordering guarantees QoS for uplink service	CRT-17.01-TRL6-TVALP-PERF.0005	The ground sender sends messages with different priorities and the aircraft application receives them ordered according to the priority (best effort).	successful messages delivery sequence	OK

Technical Validation Exercise #03 Technical Validation Objective ID	Technical Validation Exercise #03 Technical Validation Objective Title	Technical Validation Exercise #03 Success Criterion ID	Technical Validation Exercise #03 Success Criterion	Technical Validation Exercise #03 Validation Results	Technical Validation Exercise #03 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-PERF.0005	Message priority message queue level ordering guarantees QoS for uplink service	CRT-17.01-TRL6-TVALP-PERF.0006	Messages with the same priority are received with FIFO ordering.	successful messages delivery sequence	OK
OBJ-17.01-TRL6-TVALP-PERF.0006	Message priority message queue level ordering guarantees QoS for downlink service	CRT-17.01-TRL6-TVALP-PERF.0007	The air sender sends messages with different priorities and the ground application receives them ordered according to the priority (best effort).	successful messages delivery sequence	OK
OBJ-17.01-TRL6-TVALP-PERF.0006	Message priority message queue level ordering guarantees QoS for downlink service	CRT-17.01-TRL6-TVALP-PERF.0006	Messages with the same priority are received with FIFO ordering.	successful messages delivery sequence	OK
OBJ-17.01-TRL6-TVALP-PERF.0007	Message priority topic level ordering guarantees QoS for uplink service	CRT-17.01-TRL6-TVALP-PERF.0008	The ground publisher publishes messages with different priorities and the aircraft applications receive them ordered according to the priority (best effort).	successful messages delivery sequence	OK

Technical Validation Exercise #03 Technical Validation Objective ID	Technical Validation Exercise #03 Technical Validation Objective Title	Technical Validation Exercise #03 Success Criterion ID	Technical Validation Exercise #03 Success Criterion	Technical Validation Exercise #03 Validation Results	Technical Validation Exercise #03 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-PERF.0007	Message priority topic level ordering guarantees QoS for uplink service	CRT-17.01-TRL6-TVALP-PERF.0006	Messages with the same priority are received with FIFO ordering.	successful messages delivery sequence	OK
OBJ-17.01-TRL6-TVALP-PERF.0008	Message priority message topic level ordering guarantees QoS for downlink service	CRT-17.01-TRL6-TVALP-PERF.0009	The air publisher publishes messages with different priorities and the ground applications receive them ordered according to the priority (best effort).	successful messages delivery sequence	OK
OBJ-17.01-TRL6-TVALP-PERF.0008	Message priority message topic level ordering guarantees QoS for downlink service	CRT-17.01-TRL6-TVALP-PERF.0006	Messages with the same priority are received with FIFO ordering.	successful messages delivery sequence	OK

Technical Validation Exercise #03 Technical Validation Objective ID	Technical Validation Exercise #03 Technical Validation Objective Title	Technical Validation Exercise #03 Success Criterion ID	Technical Validation Exercise #03 Success Criterion	Technical Validation Exercise #03 Validation Results	Technical Validation Exercise #03 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-PERF.0009	End to end message latency for Category A uplink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-PERF.0010	The measured end to end message latency for Category A uplink Request/Response Purple Profile enabled SWIM services is <= 20s for 95% of the messages and <= 40s for 98% of the messages in the reference measurement conditions.	Category A uplink Request/Response Load tested up to 20 Aircraft's instances for the following system's segments: - inflight to ground - ground to inflight - onground to ground - ground to onground Figure for the required 1000 Aircraft's instances resulting from a linear extrapolation of those test results would not met the required transit delay.	NOK
OBJ-17.01-TRL6-TVALP-PERF.0010	End to end message latency for Category A downlink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-PERF.0011	The measured end to end message latency for Category A downlink Request/Response Purple Profile enabled SWIM services is <= 20s for 95% of the messages and <= 40s for 98% of the messages in the reference measurement conditions.	Category A downlink Request/Response Load tested up to 20 Aircraft's instances for the following system's segments: - inflight to ground - ground to inflight - onground to ground - ground to onground Figure for the required 1000 Aircraft's instances resulting from a linear extrapolation of those test results would not met the required transit delay.	NOK

Technical Validation Exercise #03 Technical Validation Objective ID	Technical Validation Exercise #03 Technical Validation Objective Title	Technical Validation Exercise #03 Success Criterion ID	Technical Validation Exercise #03 Success Criterion	Technical Validation Exercise #03 Validation Results	Technical Validation Exercise #03 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-PERF.0011	End to end message latency for Category B uplink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-PERF.0012	The measured end to end message latency for Category B uplink Request/Response Purple Profile enabled SWIM services is <= 30s for 95% of the messages and <= 60s for 98% of the messages in the reference measurement conditions.	Category B uplink Request/Response Load tested up to 20 Aircraft's instances for the following system's segments: - inflight to ground - ground to inflight - onground to ground - ground to onground Figure for the required 1000 Aircraft's instances resulting from a linear extrapolation of those test results would not met the required transit delay.	NOK
OBJ-17.01-TRL6-TVALP-PERF.0012	End to end message latency for Category B downlink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-PERF.0013	The measured end to end message latency for Category B downlink Request/Response Purple Profile enabled SWIM services is <= 30s for 95% of the messages and <= 60s for 98% of the messages in the reference measurement conditions.	Category B downlink Request/ResponseLoad tested up to 20 Aircraft's instances for the following system's segments: - inflight to ground - ground to inflight - onground to ground - ground to onground Figure for the required 1000 Aircraft's instances resulting from a linear extrapolation of those test results would not met the required transit delay.	NOK

Technical Validation Exercise #03 Technical Validation Objective ID	Technical Validation Exercise #03 Technical Validation Objective Title	Technical Validation Exercise #03 Success Criterion ID	Technical Validation Exercise #03 Success Criterion	Technical Validation Exercise #03 Validation Results	Technical Validation Exercise #03 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-PERF.0013	End to end message latency for Category C uplink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-PERF.0014	The measured end to end message latency for Category C uplink Request/Response Purple Profile enabled SWIM services is <= 50s for 95% of the messages and <= 100s for 98% of the messages in the reference measurement conditions.	Category C uplink Request/Response Load tested up to 20 Aircraft's instances for the following system's segments: - inflight to ground - ground to inflight - onground to ground - ground to onground Figure for the required 1000 Aircraft's instances resulting from a linear extrapolation of those test results would not met the required transit delay.	NOK
OBJ-17.01-TRL6-TVALP-PERF.0014	End to end message latency for Category C downlink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-PERF.0015	The measured end to end message latency for Category C downlink Request/Response Purple Profile enabled SWIM services is <= 50s for 95% of the messages and <= 100s for 98% of the messages in the reference measurement conditions.	Category C downlink Request/Response Load tested up to 20 Aircraft's instances for the following system's segments: - inflight to ground - ground to inflight - onground to ground - ground to onground Figure for the required 1000 Aircraft's instances resulting from a linear extrapolation of those test results would not met the required transit delay.	NOK

Technical Validation Exercise #03 Technical Validation Objective ID	Technical Validation Exercise #03 Technical Validation Objective Title	Technical Validation Exercise #03 Success Criterion ID	Technical Validation Exercise #03 Success Criterion	Technical Validation Exercise #03 Validation Results	Technical Validation Exercise #03 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-PERF.0015	End to end message latency for Category D uplink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-PERF.0016	The measured end to end message latency for Category D uplink Request/Response Purple Profile enabled SWIM services is <= 60s for 95% of the messages and <= 120s for 98% of the messages in the reference measurement conditions.	Category D uplink Request/Response Load tested up to 20 Aircraft's instances for the following system's segments: - inflight to ground - ground to inflight - onground to ground - ground to onground Figure for the required 1000 Aircraft's instances resulting from a linear extrapolation of those test results would not met the required transit delay.	NOK
OBJ-17.01-TRL6-TVALP-PERF.0016	End to end message latency for Category D downlink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-PERF.0017	The measured end to end message latency for Category D downlink Request/Response Purple Profile enabled SWIM services is <= 60s for 95% of the messages and <= 120s for 98% of the messages in the reference measurement conditions.	Category D downlink Request/Response Load tested up to 20 Aircraft's instances for the following system's segments: - inflight to ground - ground to inflight - onground to ground - ground to onground Figure for the required 1000 Aircraft's instances resulting from a linear extrapolation of those test results would not met the required transit delay.	NOK

Technical Validation Exercise #03 Technical Validation Objective ID	Technical Validation Exercise #03 Technical Validation Objective Title	Technical Validation Exercise #03 Success Criterion ID	Technical Validation Exercise #03 Success Criterion	Technical Validation Exercise #03 Validation Results	Technical Validation Exercise #03 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-PERF.0017	End to end message latency for Category A uplink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-PERF.0018	The measured end to end message latency for Category A uplink Publish/Subscribe Purple Profile enabled SWIM services is <= 20s for 95% of the messages and <= 40s for 98% of the messages in the reference measurement conditions.	Category A uplink Publish/Subscribe Load tested up to 20 Aircraft's instances for the following system's segments: - inflight to ground - ground to inflight - onground to ground - ground to onground Figure for the required 1000 Aircraft's instances resulting from a linear extrapolation of those test results would not met the required transit delay.	NOK
OBJ-17.01-TRL6-TVALP-PERF.0018	End to end message latency for Category A downlink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-PERF.0019	The measured end to end message latency for Category A downlink Publish/Subscribe Purple Profile enabled SWIM services is <= 20s for 95% of the messages and <= 40s for 98% of the messages in the reference measurement conditions.	Category A downlink Publish/SubscribeLoad tested up to 20 Aircraft's instances for the following system's segments: - inflight to ground - ground to inflight - onground to ground - ground to onground Figure for the required 1000 Aircraft's instances resulting from a linear extrapolation of those test results would not met the required transit delay.	NOK

Technical Validation Exercise #03 Technical Validation Objective ID	Technical Validation Exercise #03 Technical Validation Objective Title	Technical Validation Exercise #03 Success Criterion ID	Technical Validation Exercise #03 Success Criterion	Technical Validation Exercise #03 Validation Results	Technical Validation Exercise #03 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-PERF.0019	End to end message latency for Category B uplink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-PERF.0020	The measured end to end message latency for Category B uplink Publish/Subscribe Purple Profile enabled SWIM services is <= 30s for 95% of the messages and <= 60s for 98% of the messages in the reference measurement conditions.	Category B uplink Publish/Subscribe Load tested up to 20 Aircraft's instances for the following system's segments: - inflight to ground - ground to inflight - onground to ground - ground to onground Figure for the required 1000 Aircraft's instances resulting from a linear extrapolation of those test results would not met the required transit delay.	NOK
OBJ-17.01-TRL6-TVALP-PERF.0020	End to end message latency for Category B downlink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-PERF.0021	The measured end to end message latency for Category B downlink Publish/Subscribe Purple Profile enabled SWIM services is <= 30s for 95% of the messages and <= 60s for 98% of the messages in the reference measurement conditions.	Category B downlink Publish/Subscribe Load tested up to 20 Aircraft's instances for the following system's segments: - inflight to ground - ground to inflight - onground to ground - ground to onground Figure for the required 1000 Aircraft's instances resulting from a linear extrapolation of those test results would not met the required transit delay.	NOK

Technical Validation Exercise #03 Technical Validation Objective ID	Technical Validation Exercise #03 Technical Validation Objective Title	Technical Validation Exercise #03 Success Criterion ID	Technical Validation Exercise #03 Success Criterion	Technical Validation Exercise #03 Validation Results	Technical Validation Exercise #03 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-PERF.0021	End to end message latency for Category C uplink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-PERF.0022	The measured end to end message latency for Category C uplink Publish/Subscribe Purple Profile enabled SWIM services is <= 50s for 95% of the messages and <= 100s for 98% of the messages in the reference measurement conditions.	Category C uplink Publish/Subscribe Load tested up to 20 Aircraft's instances for the following system's segments: - inflight to ground - ground to inflight - onground to ground - ground to onground Figure for the required 1000 Aircraft's instances resulting from a linear extrapolation of those test results would not met the required transit delay.	NOK
OBJ-17.01-TRL6-TVALP-PERF.0022	End to end message latency for Category C downlink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-PERF.0023	The measured end to end message latency for Category C downlink Publish/Subscribe Purple Profile enabled SWIM services is <= 50s for 95% of the messages and <= 100s for 98% of the messages in the reference measurement conditions.	Category C downlink Publish/Subscribe Load tested up to 20 Aircraft's instances for the following system's segments: - inflight to ground - ground to inflight - onground to ground - ground to onground Figure for the required 1000 Aircraft's instances resulting from a linear extrapolation of those test results would not met the required transit delay.	NOK

Technical Validation Exercise #03 Technical Validation Objective ID	Technical Validation Exercise #03 Technical Validation Objective Title	Technical Validation Exercise #03 Success Criterion ID	Technical Validation Exercise #03 Success Criterion	Technical Validation Exercise #03 Validation Results	Technical Validation Exercise #03 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-PERF.0023	End to end message latency for Category D uplink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-PERF.0024	The measured end to end message latency for Category D uplink Publish/Subscribe Purple Profile enabled SWIM services is <= 60s for 95% of the messages and <= 120s for 98% of the messages in the reference measurement conditions.	Category D uplink Publish/Subscribe Load tested up to 20 Aircraft's instances for the following system's segments: - inflight to ground - ground to inflight - onground to ground - ground to onground Figure for the required 1000 Aircraft's instances resulting from a linear extrapolation of those test results would not met the required transit delay.	NOK
OBJ-17.01-TRL6-TVALP-PERF.0024	End to end message latency for Category D downlink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-PERF.0025	The measured end to end message latency for Category C downlink Publish/Subscribe Purple Profile enabled SWIM services is <= 60s for 95% of the messages and <= 120s for 98% of the messages in the reference measurement conditions.	Category D downlink Publish/Subscribe Load tested up to 20 Aircraft's instances for the following system's segments: - inflight to ground - ground to inflight - onground to ground - ground to onground Figure for the required 1000 Aircraft's instances resulting from a linear extrapolation of those test results would not met the required transit delay.	NOK

Technical Validation Exercise #03 Technical Validation Objective ID	Technical Validation Exercise #03 Technical Validation Objective Title	Technical Validation Exercise #03 Success Criterion ID	Technical Validation Exercise #03 Success Criterion	Technical Validation Exercise #03 Validation Results	Technical Validation Exercise #03 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-PERF.0025	On-the-fly compression QoS for uplink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-PERF.0026	Response messages sent by the ground responder are compressed and uncompressed on-the-fly by the Ground-Air SWIM Nodes pair, without violating message integrity, and received by the aircraft application.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-PERF.0026	On-the-fly compression QoS for uplink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-PERF.0027	Publication messages sent by the ground publisher are compressed and uncompressed on-the-fly by the Ground-Air SWIM Nodes pair, without violating message integrity, and received by the aircraft application.	Not planned	N/A

Technical Validation Exercise #03 Technical Validation Objective ID	Technical Validation Exercise #03 Technical Validation Objective Title	Technical Validation Exercise #03 Success Criterion ID	Technical Validation Exercise #03 Success Criterion	Technical Validation Exercise #03 Validation Results	Technical Validation Exercise #03 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-REL.0001	End-to-end at-least-once delivery guarantees QoS for uplink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0001	A request message from aircraft requestor is received at least once by the ground responder although, while routing the request message, a connection establishment failure event (successfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	Not planned	OK
OBJ-17.01-TRL6-TVALP-REL.0001	End-to-end at-least-once delivery guarantees QoS for uplink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0002	A request message from aircraft requestor is received at least once by the ground responder although, while routing the request message, an abnormal disconnection event due to transient network error (successfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	Not planned	OK

Technical Validation Exercise #03 Technical Validation Objective ID	Technical Validation Exercise #03 Technical Validation Objective Title	Technical Validation Exercise #03 Success Criterion ID	Technical Validation Exercise #03 Success Criterion	Technical Validation Exercise #03 Validation Results	Technical Validation Exercise #03 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-REL.0001	End-to-end at-least-once delivery guarantees QoS for uplink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0026	A request message from aircraft requestor is received at least once by the ground responder although, while routing the request message, an abnormal disconnection event due to ground peer restart (successfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	Not planned	OK
OBJ-17.01-TRL6-TVALP-REL.0001	End-to-end at-least-once delivery guarantees QoS for uplink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0003	A response message from the ground responder is received at least once by the aircraft requestor although, while routing the response message, a connection establishment failure event (successfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	Not planned	OK

Technical Validation Exercise #03 Technical Validation Objective ID	Technical Validation Exercise #03 Technical Validation Objective Title	Technical Validation Exercise #03 Success Criterion ID	Technical Validation Exercise #03 Success Criterion	Technical Validation Exercise #03 Validation Results	Technical Validation Exercise #03 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-REL.0001	End-to-end at-least-once delivery guarantees QoS for uplink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0004	A response message from the ground responder is received at least once by the aircraft requestor although, while routing the response message, an abnormal disconnection event due to transient network error (successfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	Not planned	OK
OBJ-17.01-TRL6-TVALP-REL.0001	End-to-end at-least-once delivery guarantees QoS for uplink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0027	A response message from the ground responder is received at least once by the aircraft requestor although, while routing the response message, an abnormal disconnection event due to ground peer restart (successfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	Not planned	OK

Technical Validation Exercise #03 Technical Validation Objective ID	Technical Validation Exercise #03 Technical Validation Objective Title	Technical Validation Exercise #03 Success Criterion ID	Technical Validation Exercise #03 Success Criterion	Technical Validation Exercise #03 Validation Results	Technical Validation Exercise #03 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-REL.0001	End-to-end at-least-once delivery guarantees QoS for uplink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0005	Message not delivered failure event is logged and traced because, while routing the message, a connection establishment failure event (unsuccessfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-REL.0001	End-to-end at-least-once delivery guarantees QoS for uplink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0006	Message not delivered failure event is logged and traced because, while routing the message, an abnormal disconnection event (unsuccessfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	Not planned	N/A

Technical Validation Exercise #03 Technical Validation Objective ID	Technical Validation Exercise #03 Technical Validation Objective Title	Technical Validation Exercise #03 Success Criterion ID	Technical Validation Exercise #03 Success Criterion	Technical Validation Exercise #03 Validation Results	Technical Validation Exercise #03 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-REL.0001	End-to-end at-least-once delivery guarantees QoS for uplink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0007	Message not delivered failure event is logged and traced because, while handling abnormal disconnection or connection establishment failure events at Air-Ground SWIM Nodes connection level, the message expires.	Not planned	OK
OBJ-17.01-TRL6-TVALP-REL.0002	End-to-end at-least-once delivery guarantees QoS for downlink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0008	A request message from ground requestor is received at least once by the aircraft responder although, while routing the request message, a connection establishment failure event (successfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	Not planned	OK

Technical Validation Exercise #03 Technical Validation Objective ID	Technical Validation Exercise #03 Technical Validation Objective Title	Technical Validation Exercise #03 Success Criterion ID	Technical Validation Exercise #03 Success Criterion	Technical Validation Exercise #03 Validation Results	Technical Validation Exercise #03 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-REL.0002	End-to-end at-least-once delivery guarantees QoS for downlink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0009	A request message from ground requestor is received at least once by the aircraft responder although, while routing the request message, an abnormal disconnection event due to transient network error (successfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	Not planned	OK
OBJ-17.01-TRL6-TVALP-REL.0002	End-to-end at-least-once delivery guarantees QoS for downlink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0028	A request message from ground requestor is received at least once by the aircraft responder although, while routing the request message, an abnormal disconnection event due to ground peer restart (successfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	Not planned	OK

Technical Validation Exercise #03 Technical Validation Objective ID	Technical Validation Exercise #03 Technical Validation Objective Title	Technical Validation Exercise #03 Success Criterion ID	Technical Validation Exercise #03 Success Criterion	Technical Validation Exercise #03 Validation Results	Technical Validation Exercise #03 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-REL.0002	End-to-end at-least-once delivery guarantees QoS for downlink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0010	A response message from the aircraft responder is received at least once by the ground requestor although, while routing the response message, a connection establishment failure event (successfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	Not planned	OK
OBJ-17.01-TRL6-TVALP-REL.0002	End-to-end at-least-once delivery guarantees QoS for downlink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0011	A response message from the aircraft responder is received at least once by the ground requestor although, while routing the response message, an abnormal disconnection event due to transient network error (successfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	Not planned	OK

Technical Validation Exercise #03 Technical Validation Objective ID	Technical Validation Exercise #03 Technical Validation Objective Title	Technical Validation Exercise #03 Success Criterion ID	Technical Validation Exercise #03 Success Criterion	Technical Validation Exercise #03 Validation Results	Technical Validation Exercise #03 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-REL.0002	End-to-end at-least-once delivery guarantees QoS for downlink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0029	A response message from the aircraft responder is received at least once by the ground requestor although, while routing the response message, an abnormal disconnection event due to ground peer restart (successfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	Not planned	OK
OBJ-17.01-TRL6-TVALP-REL.0002	End-to-end at-least-once delivery guarantees QoS for downlink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0005	Message not delivered failure event is logged and traced because, while routing the message, a connection establishment failure event (unsuccessfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	Not planned	N/A

Technical Validation Exercise #03 Technical Validation Objective ID	Technical Validation Exercise #03 Technical Validation Objective Title	Technical Validation Exercise #03 Success Criterion ID	Technical Validation Exercise #03 Success Criterion	Technical Validation Exercise #03 Validation Results	Technical Validation Exercise #03 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-REL.0002	End-to-end at-least-once delivery guarantees QoS for downlink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0006	Message not delivered failure event is logged and traced because, while routing the message, an abnormal disconnection event (unsuccessfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-REL.0002	End-to-end at-least-once delivery guarantees QoS for downlink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0007	Message not delivered failure event is logged and traced because, while handling abnormal disconnection or connection establishment failure events at Air-Ground SWIM Nodes connection level, the message expires.	Not planned	OK

Technical Validation Exercise #03 Technical Validation Objective ID	Technical Validation Exercise #03 Technical Validation Objective Title	Technical Validation Exercise #03 Success Criterion ID	Technical Validation Exercise #03 Success Criterion	Technical Validation Exercise #03 Validation Results	Technical Validation Exercise #03 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-REL.0003	End-to-end at-least-once delivery guarantees QoS for uplink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0012	A publication message from ground publisher is received at least once by the aircraft subscriber although, while routing the message, a connection establishment failure event (successfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	Not planned	OK
OBJ-17.01-TRL6-TVALP-REL.0003	End-to-end at-least-once delivery guarantees QoS for uplink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0013	A publication message from ground publisher is received at least once by the aircraft subscriber although, while routing the message, an abnormal disconnection event due to transient network error (successfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	Not planned	OK

Technical Validation Exercise #03 Technical Validation Objective ID	Technical Validation Exercise #03 Technical Validation Objective Title	Technical Validation Exercise #03 Success Criterion ID	Technical Validation Exercise #03 Success Criterion	Technical Validation Exercise #03 Validation Results	Technical Validation Exercise #03 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-REL.0003	End-to-end at-least-once delivery guarantees QoS for uplink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0030	A publication message from ground publisher is received at least once by the aircraft subscriber although, while routing the message, an abnormal disconnection event due to ground peer restart (successfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	Not planned	OK
OBJ-17.01-TRL6-TVALP-REL.0003	End-to-end at-least-once delivery guarantees QoS for uplink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0005	Message not delivered failure event is logged and traced because, while routing the message, a connection establishment failure event (unsuccessfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	Not planned	N/A

Technical Validation Exercise #03 Technical Validation Objective ID	Technical Validation Exercise #03 Technical Validation Objective Title	Technical Validation Exercise #03 Success Criterion ID	Technical Validation Exercise #03 Success Criterion	Technical Validation Exercise #03 Validation Results	Technical Validation Exercise #03 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-REL.0003	End-to-end at-least-once delivery guarantees QoS for uplink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0006	Message not delivered failure event is logged and traced because, while routing the message, an abnormal disconnection event (unsuccessfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-REL.0003	End-to-end at-least-once delivery guarantees QoS for uplink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0007	Message not delivered failure event is logged and traced because, while handling abnormal disconnection or connection establishment failure events at Air-Ground SWIM Nodes connection level, the message expires.	Not planned	OK

Technical Validation Exercise #03 Technical Validation Objective ID	Technical Validation Exercise #03 Technical Validation Objective Title	Technical Validation Exercise #03 Success Criterion ID	Technical Validation Exercise #03 Success Criterion	Technical Validation Exercise #03 Validation Results	Technical Validation Exercise #03 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-REL.0004	End-to-end at-least-once delivery guarantees QoS for downlink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0014	A publication message from aircraft publisher is received at least once by the ground subscriber although, while routing the message, a connection establishment failure event (successfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	Not planned	OK
OBJ-17.01-TRL6-TVALP-REL.0004	End-to-end at-least-once delivery guarantees QoS for downlink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0015	A publication message from aircraft publisher is received at least once by the ground subscriber although, while routing the message, an abnormal disconnection event due to transient network error (successfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	Not planned	OK

Technical Validation Exercise #03 Technical Validation Objective ID	Technical Validation Exercise #03 Technical Validation Objective Title	Technical Validation Exercise #03 Success Criterion ID	Technical Validation Exercise #03 Success Criterion	Technical Validation Exercise #03 Validation Results	Technical Validation Exercise #03 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-REL.0004	End-to-end at-least-once delivery guarantees QoS for downlink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0031	A publication message from aircraft publisher is received at least once by the ground subscriber although, while routing the message, an abnormal disconnection event due to ground peer restart (successfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	Not planned	OK
OBJ-17.01-TRL6-TVALP-REL.0004	End-to-end at-least-once delivery guarantees QoS for downlink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0005	Message not delivered failure event is logged and traced because, while routing the message, a connection establishment failure event (unsuccessfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	Not planned	N/A

Technical Validation Exercise #03 Technical Validation Objective ID	Technical Validation Exercise #03 Technical Validation Objective Title	Technical Validation Exercise #03 Success Criterion ID	Technical Validation Exercise #03 Success Criterion	Technical Validation Exercise #03 Validation Results	Technical Validation Exercise #03 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-REL.0004	End-to-end at-least-once delivery guarantees QoS for downlink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0006	Message not delivered failure event is logged and traced because, while routing the message, an abnormal disconnection event (unsuccessfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-REL.0004	End-to-end at-least-once delivery guarantees QoS for downlink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0007	Message not delivered failure event is logged and traced because, while handling abnormal disconnection or connection establishment failure events at Air-Ground SWIM Nodes connection level, the message expires.	Not planned	OK

Technical Validation Exercise #03 Technical Validation Objective ID	Technical Validation Exercise #03 Technical Validation Objective Title	Technical Validation Exercise #03 Success Criterion ID	Technical Validation Exercise #03 Success Criterion	Technical Validation Exercise #03 Validation Results	Technical Validation Exercise #03 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-REL.0005	End-to-end exactly-once delivery guarantees QoS for uplink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0016	A request message from aircraft requestor is received exactly once by the ground responder although, while routing the request message, a connection establishment failure event (successfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-REL.0005	End-to-end exactly-once delivery guarantees QoS for uplink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0017	A request message from aircraft requestor is received exactly once by the ground responder although, while routing the request message, an abnormal disconnection event due to transient network error (successfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	Not planned	N/A

Technical Validation Exercise #03 Technical Validation Objective ID	Technical Validation Exercise #03 Technical Validation Objective Title	Technical Validation Exercise #03 Success Criterion ID	Technical Validation Exercise #03 Success Criterion	Technical Validation Exercise #03 Validation Results	Technical Validation Exercise #03 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-REL.0005	End-to-end exactly-once delivery guarantees QoS for uplink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0032	A request message from aircraft requestor is received exactly once by the ground responder although, while routing the request message, an abnormal disconnection event due to ground peer restart (successfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-REL.0005	End-to-end exactly-once delivery guarantees QoS for uplink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0018	A response message from the ground responder is received exactly once by the aircraft requestor although, while routing the response message, a connection establishment failure event (successfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	Not planned	N/A

Technical Validation Exercise #03 Technical Validation Objective ID	Technical Validation Exercise #03 Technical Validation Objective Title	Technical Validation Exercise #03 Success Criterion ID	Technical Validation Exercise #03 Success Criterion	Technical Validation Exercise #03 Validation Results	Technical Validation Exercise #03 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-REL.0005	End-to-end exactly-once delivery guarantees QoS for uplink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0019	A response message from the ground responder is received exactly once by the aircraft requestor although, while routing the response message, an abnormal disconnection event due to transient network error (successfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-REL.0005	End-to-end exactly-once delivery guarantees QoS for uplink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0033	A response message from the ground responder is received exactly once by the aircraft requestor although, while routing the response message, an abnormal disconnection event due to ground peer restart (successfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	Not planned	N/A

Technical Validation Exercise #03 Technical Validation Objective ID	Technical Validation Exercise #03 Technical Validation Objective Title	Technical Validation Exercise #03 Success Criterion ID	Technical Validation Exercise #03 Success Criterion	Technical Validation Exercise #03 Validation Results	Technical Validation Exercise #03 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-REL.0005	End-to-end exactly-once delivery guarantees QoS for uplink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0005	Message not delivered failure event is logged and traced because, while routing the message, a connection establishment failure event (unsuccessfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-REL.0005	End-to-end exactly-once delivery guarantees QoS for uplink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0006	Message not delivered failure event is logged and traced because, while routing the message, an abnormal disconnection event (unsuccessfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	Not planned	N/A

Technical Validation Exercise #03 Technical Validation Objective ID	Technical Validation Exercise #03 Technical Validation Objective Title	Technical Validation Exercise #03 Success Criterion ID	Technical Validation Exercise #03 Success Criterion	Technical Validation Exercise #03 Validation Results	Technical Validation Exercise #03 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-REL.0005	End-to-end exactly-once delivery guarantees QoS for uplink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0007	Message not delivered failure event is logged and traced because, while handling abnormal disconnection or connection establishment failure events at Air-Ground SWIM Nodes connection level, the message expires.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-REL.0006	End-to-end exactly-once delivery guarantees QoS for downlink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0020	A request message from ground requestor is received exactly once by the aircraft responder although, while routing the request message, a connection establishment failure event (successfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	Not planned	N/A

Technical Validation Exercise #03 Technical Validation Objective ID	Technical Validation Exercise #03 Technical Validation Objective Title	Technical Validation Exercise #03 Success Criterion ID	Technical Validation Exercise #03 Success Criterion	Technical Validation Exercise #03 Validation Results	Technical Validation Exercise #03 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-REL.0006	End-to-end exactly-once delivery guarantees QoS for downlink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0021	A request message from ground requestor is received exactly once by the aircraft responder although, while routing the request message, an abnormal disconnection event due to transient network error (successfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-REL.0006	End-to-end exactly-once delivery guarantees QoS for downlink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0034	A request message from ground requestor is received exactly once by the aircraft responder although, while routing the request message, an abnormal disconnection event due to ground peer restart (successfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	Not planned	N/A

Technical Validation Exercise #03 Technical Validation Objective ID	Technical Validation Exercise #03 Technical Validation Objective Title	Technical Validation Exercise #03 Success Criterion ID	Technical Validation Exercise #03 Success Criterion	Technical Validation Exercise #03 Validation Results	Technical Validation Exercise #03 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-REL.0006	End-to-end exactly-once delivery guarantees QoS for downlink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0022	A response message from the aircraft responder is received exactly once by the ground requestor although, while routing the response message, a connection establishment failure event (successfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-REL.0006	End-to-end exactly-once delivery guarantees QoS for downlink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0011	A response message from the aircraft responder is received exactly once by the ground requestor although, while routing the response message, an abnormal disconnection event due to transient network error (successfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	Not planned	N/A

Technical Validation Exercise #03 Technical Validation Objective ID	Technical Validation Exercise #03 Technical Validation Objective Title	Technical Validation Exercise #03 Success Criterion ID	Technical Validation Exercise #03 Success Criterion	Technical Validation Exercise #03 Validation Results	Technical Validation Exercise #03 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-REL.0006	End-to-end exactly-once delivery guarantees QoS for downlink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0035	A response message from the aircraft responder is received exactly once by the ground requestor although, while routing the response message, an abnormal disconnection event due to ground peer restart (successfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-REL.0006	End-to-end exactly-once delivery guarantees QoS for downlink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0005	Message not delivered failure event is logged and traced because, while routing the message, a connection establishment failure event (unsuccessfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	Not planned	N/A

Technical Validation Exercise #03 Technical Validation Objective ID	Technical Validation Exercise #03 Technical Validation Objective Title	Technical Validation Exercise #03 Success Criterion ID	Technical Validation Exercise #03 Success Criterion	Technical Validation Exercise #03 Validation Results	Technical Validation Exercise #03 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-REL.0006	End-to-end exactly-once delivery guarantees QoS for downlink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0006	Message not delivered failure event is logged and traced because, while routing the message, an abnormal disconnection event (unsuccessfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-REL.0006	End-to-end exactly-once delivery guarantees QoS for downlink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0007	Message not delivered failure event is logged and traced because, while handling abnormal disconnection or connection establishment failure events at Air-Ground SWIM Nodes connection level, the message expires.	Not planned	N/A

Technical Validation Exercise #03 Technical Validation Objective ID	Technical Validation Exercise #03 Technical Validation Objective Title	Technical Validation Exercise #03 Success Criterion ID	Technical Validation Exercise #03 Success Criterion	Technical Validation Exercise #03 Validation Results	Technical Validation Exercise #03 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-REL.0007	End-to-end exactly-once delivery guarantees QoS for uplink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0023	A publication message from ground publisher is received exactly once by the aircraft subscriber although, while routing the message, a connection establishment failure event (successfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-REL.0007	End-to-end exactly-once delivery guarantees QoS for uplink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0024	A publication message from ground publisher is received exactly once by the aircraft subscriber although, while routing the message, an abnormal disconnection event due to transient network error (successfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	Not planned	N/A

Technical Validation Exercise #03 Technical Validation Objective ID	Technical Validation Exercise #03 Technical Validation Objective Title	Technical Validation Exercise #03 Success Criterion ID	Technical Validation Exercise #03 Success Criterion	Technical Validation Exercise #03 Validation Results	Technical Validation Exercise #03 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-REL.0007	End-to-end exactly-once delivery guarantees QoS for uplink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0036	A publication message from ground publisher is received exactly once by the aircraft subscriber although, while routing the message, an abnormal disconnection event due to ground peer restart (successfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-REL.0007	End-to-end exactly-once delivery guarantees QoS for uplink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0005	Message not delivered failure event is logged and traced because, while routing the message, a connection establishment failure event (unsuccessfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	Not planned	N/A

Technical Validation Exercise #03 Technical Validation Objective ID	Technical Validation Exercise #03 Technical Validation Objective Title	Technical Validation Exercise #03 Success Criterion ID	Technical Validation Exercise #03 Success Criterion	Technical Validation Exercise #03 Validation Results	Technical Validation Exercise #03 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-REL.0007	End-to-end exactly-once delivery guarantees QoS for uplink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0006	Message not delivered failure event is logged and traced because, while routing the message, an abnormal disconnection event (unsuccessfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-REL.0007	End-to-end exactly-once delivery guarantees QoS for uplink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0007	Message not delivered failure event is logged and traced because, while handling abnormal disconnection or connection establishment failure events at Air-Ground SWIM Nodes connection level, the message expires.	Not planned	N/A

Technical Validation Exercise #03 Technical Validation Objective ID	Technical Validation Exercise #03 Technical Validation Objective Title	Technical Validation Exercise #03 Success Criterion ID	Technical Validation Exercise #03 Success Criterion	Technical Validation Exercise #03 Validation Results	Technical Validation Exercise #03 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-REL.0008	End-to-end exactly-once delivery guarantees QoS for downlink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0025	A publication message from aircraft publisher is received exactly once by the ground subscriber although, while routing the message, a connection establishment failure event (successfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-REL.0008	End-to-end exactly-once delivery guarantees QoS for downlink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0038	A publication message from aircraft publisher is received exactly once by the ground subscriber although, while routing the message, an abnormal disconnection event due to transient network error (successfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	Not planned	N/A

Technical Validation Exercise #03 Technical Validation Objective ID	Technical Validation Exercise #03 Technical Validation Objective Title	Technical Validation Exercise #03 Success Criterion ID	Technical Validation Exercise #03 Success Criterion	Technical Validation Exercise #03 Validation Results	Technical Validation Exercise #03 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-REL.0008	End-to-end exactly-once delivery guarantees QoS for downlink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0037	A publication message from aircraft publisher is received exactly once by the ground subscriber although, while routing the message, an abnormal disconnection event due to ground peer restart (successfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-REL.0008	End-to-end exactly-once delivery guarantees QoS for downlink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0005	Message not delivered failure event is logged and traced because, while routing the message, a connection establishment failure event (unsuccessfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	Not planned	N/A

Technical Validation Exercise #03 Technical Validation Objective ID	Technical Validation Exercise #03 Technical Validation Objective Title	Technical Validation Exercise #03 Success Criterion ID	Technical Validation Exercise #03 Success Criterion	Technical Validation Exercise #03 Validation Results	Technical Validation Exercise #03 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-REL.0008	End-to-end exactly-once delivery guarantees QoS for downlink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0006	Message not delivered failure event is logged and traced because, while routing the message, an abnormal disconnection event (unsuccessfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-REL.0008	End-to-end exactly-once delivery guarantees QoS for downlink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0007	Message not delivered failure event is logged and traced because, while handling abnormal disconnection or connection establishment failure events at Air-Ground SWIM Nodes connection level, the message expires.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-SEC.0001	Basic message screening security controls for message queue based information exchange	CRT-17.01-TRL6-TVALP-SEC.0001	Different message screening policies are successfully configured for two or more message queues.	Not planned	OK

Technical Validation Exercise #03 Technical Validation Objective ID	Technical Validation Exercise #03 Technical Validation Objective Title	Technical Validation Exercise #03 Success Criterion ID	Technical Validation Exercise #03 Success Criterion	Technical Validation Exercise #03 Validation Results	Technical Validation Exercise #03 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-SEC.0001	Basic message screening security controls for message queue based information exchange	CRT-17.01-TRL6-TVALP-SEC.0002	Message screening policies are enforced on message queues used by Purple Profile enabled sender applications.	Not planned	OK
OBJ-17.01-TRL6-TVALP-SEC.0001	Basic message screening security controls for message queue based information exchange	CRT-17.01-TRL6-TVALP-SEC.0003	Message screening policies are enforced on Ground SWIM Node side message queues used by Air SWIM Nodes to send/consume messages.	Not planned	OK
OBJ-17.01-TRL6-TVALP-SEC.0001	Basic message screening security controls for message queue based information exchange	CRT-17.01-TRL6-TVALP-SEC.0004	A malformed AMQP 1.0 annotated message with uncomplete or invalid message properties is filtered out by enforcing the message screening policy.	Not planned	OK
OBJ-17.01-TRL6-TVALP-SEC.0001	Basic message screening security controls for message queue based information exchange	CRT-17.01-TRL6-TVALP-SEC.0008	Events concerning the message screening policies enforcement are logged in accordance with applicable audit policy.	Not planned	OK

Technical Validation Exercise #03 Technical Validation Objective ID	Technical Validation Exercise #03 Technical Validation Objective Title	Technical Validation Exercise #03 Success Criterion ID	Technical Validation Exercise #03 Success Criterion	Technical Validation Exercise #03 Validation Results	Technical Validation Exercise #03 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-SEC.0001	Basic message screening security controls for message queue based information exchange	CRT-17.01-TRL6-TVALP-SEC.0009	A message screening policy is successfully updated at run-time without restarting the Ground SWIM Node.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-SEC.0002	Advanced message screening security controls for message queue based information exchange	CRT-17.01-TRL6-TVALP-SEC.0001	Different message screening policies are successfully configured for two or more message queues.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-SEC.0002	Advanced message screening security controls for message queue based information exchange	CRT-17.01-TRL6-TVALP-SEC.0002	Message screening policies are enforced on message queues used by Purple Profile enabled sender applications.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-SEC.0002	Advanced message screening security controls for message queue based information exchange	CRT-17.01-TRL6-TVALP-SEC.0003	Message screening policies are enforced on Ground SWIM Node side message queues used by Air SWIM Nodes to send/consume messages.	Not planned	N/A

Technical Validation Exercise #03 Technical Validation Objective ID	Technical Validation Exercise #03 Technical Validation Objective Title	Technical Validation Exercise #03 Success Criterion ID	Technical Validation Exercise #03 Success Criterion	Technical Validation Exercise #03 Validation Results	Technical Validation Exercise #03 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-SEC.0002	Advanced message screening security controls for message queue based information exchange	CRT-17.01-TRL6-TVALP-SEC.0005	A malformed AMQP 1.0 annotated message with syntactically invalid message payload is filtered out by enforcing the message screening policy.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-SEC.0002	Advanced message screening security controls for message queue based information exchange	CRT-17.01-TRL6-TVALP-SEC.0006	A malformed AMQP 1.0 annotated message with unexpected message payload is filtered out by enforcing the message screening policy.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-SEC.0002	Advanced message screening security controls for message queue based information exchange	CRT-17.01-TRL6-TVALP-SEC.0007	A malicious AMQP 1.0 annotated message with malicious property/payload is filtered out by enforcing the message screening policy.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-SEC.0002	Advanced message screening security controls for message queue based information exchange	CRT-17.01-TRL6-TVALP-SEC.0008	Events concerning the message screening policies enforcement are logged in accordance with applicable audit policy.	Not planned	N/A

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OBJ-17.01-TRL6-TVALP-SEC.0002	Advanced message screening security controls for message queue based information exchange	CRT-17.01-TRL6-TVALP-SEC.0009	A message screening policy is successfully updated at run-time without restarting the Ground SWIM Node.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-SEC.0003	Basic message screening security controls for message topic based information exchange	CRT-17.01-TRL6-TVALP-SEC.0010	Different message screening policies are successfully configured for two or more message topics.	Not planned	OK
OBJ-17.01-TRL6-TVALP-SEC.0003	Basic message screening security controls for message topic based information exchange	CRT-17.01-TRL6-TVALP-SEC.0011	Message screening policies are enforced on message topics used by Purple Profile enabled publisher applications.	Not planned	OK
OBJ-17.01-TRL6-TVALP-SEC.0003	Basic message screening security controls for message topic based information exchange	CRT-17.01-TRL6-TVALP-SEC.0012	Message screening policies are enforced on Ground SWIM Node side message topics used by Air SWIM Nodes to publish/consume messages.	Not planned	OK

Technical Validation Exercise #03 Technical Validation Objective ID	Technical Validation Exercise #03 Technical Validation Objective Title	Technical Validation Exercise #03 Success Criterion ID	Technical Validation Exercise #03 Success Criterion	Technical Validation Exercise #03 Validation Results	Technical Validation Exercise #03 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-SEC.0003	Basic message screening security controls for message topic based information exchange	CRT-17.01-TRL6-TVALP-SEC.0004	A malformed AMQP 1.0 annotated message with uncomplete or invalid message properties is filtered out by enforcing the message screening policy.	Not planned	OK
OBJ-17.01-TRL6-TVALP-SEC.0003	Basic message screening security controls for message topic based information exchange	CRT-17.01-TRL6-TVALP-SEC.0008	Events concerning the message screening policies enforcement are logged in accordance with applicable audit policy.	Not planned	OK
OBJ-17.01-TRL6-TVALP-SEC.0003	Basic message screening security controls for message topic based information exchange	CRT-17.01-TRL6-TVALP-SEC.0009	A message screening policy is successfully updated at run-time without restarting the Ground SWIM Node.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-SEC.0004	Advanced message screening security controls for message topic based information exchange	CRT-17.01-TRL6-TVALP-SEC.0010	Different message screening policies are successfully configured for two or more message topics.	Not planned	N/A

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OBJ-17.01-TRL6-TVALP-SEC.0004	Advanced message screening security controls for message topic based information exchange	CRT-17.01-TRL6-TVALP-SEC.0011	Message screening policies are enforced on message topics used by Purple Profile enabled publisher applications.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-SEC.0004	Advanced message screening security controls for message topic based information exchange	CRT-17.01-TRL6-TVALP-SEC.0012	Message screening policies are enforced on Ground SWIM Node side message topics used by Air SWIM Nodes to publish/consume messages.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-SEC.0004	Advanced message screening security controls for message topic based information exchange	CRT-17.01-TRL6-TVALP-SEC.0005	A malformed AMQP 1.0 annotated message with syntactically invalid message payload is filtered out by enforcing the message screening policy.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-SEC.0004	Advanced message screening security controls for message topic based information exchange	CRT-17.01-TRL6-TVALP-SEC.0006	A malformed AMQP 1.0 annotated message with unexpected message payload is filtered out by enforcing the message screening policy.	Not planned	N/A

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OBJ-17.01-TRL6-TVALP-SEC.0004	Advanced message screening security controls for message topic based information exchange	CRT-17.01-TRL6-TVALP-SEC.0007	A malicious AMQP 1.0 annotated message with malicious property/payload is filtered out by enforcing the message screening policy.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-SEC.0004	Advanced message screening security controls for message topic based information exchange	CRT-17.01-TRL6-TVALP-SEC.0008	Events concerning the message screening policies enforcement are logged in accordance with applicable audit policy.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-SEC.0004	Advanced message screening security controls for message topic based information exchange	CRT-17.01-TRL6-TVALP-SEC.0009	A message screening policy is successfully updated at run-time without restarting the Ground SWIM Node.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-SEC.0005	Maximum message size overload protection security controls for message queue based information exchange	CRT-17.01-TRL6-TVALP-SEC.0013	Different overload protection policies are successfully configured for two or more message queues.	Not planned	OK

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OBJ-17.01-TRL6-TVALP-SEC.0005	Maximum message size overload protection security controls for message queue based information exchange	CRT-17.01-TRL6-TVALP-SEC.0014	Overload protection policies are enforced on message queues used by Purple Profile enabled sender applications.	Not planned	OK
OBJ-17.01-TRL6-TVALP-SEC.0005	Maximum message size overload protection security controls for message queue based information exchange	CRT-17.01-TRL6-TVALP-SEC.0015	Overload protection policies are enforced on Ground SWIM Node side message queues used by Air SWIM Nodes to send/consume messages.	Not planned	OK
OBJ-17.01-TRL6-TVALP-SEC.0005	Maximum message size overload protection security controls for message queue based information exchange	CRT-17.01-TRL6-TVALP-SEC.0016	Events concerning the overload protection policies enforcement are logged in accordance with applicable audit policy.	Not planned	OK
OBJ-17.01-TRL6-TVALP-SEC.0005	Maximum message size overload protection security controls for message queue based information exchange	CRT-17.01-TRL6-TVALP-SEC.0017	An overload protection policy is successfully updated at run-time without restarting the Ground SWIM Node.	Not planned	N/A

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OBJ-17.01-TRL6-TVALP-SEC.0005	Maximum message size overload protection security controls for message queue based information exchange	CRT-17.01-TRL6-TVALP-SEC.0018	An AMQP 1.0 annotated message exceeding maximum message size is rejected by enforcing the overload protection policy, the sender is notified and the event routed according to the applicable context-based routing monitoring policy.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-SEC.0005	Maximum message size overload protection security controls for message queue based information exchange	CRT-17.01-TRL6-TVALP-SEC.0019	An AMQP 1.0 annotated message exceeding maximum message size is dropped by enforcing the overload protection policy and the event routed according to the applicable context-based routing monitoring policy.	Not planned	OK
OBJ-17.01-TRL6-TVALP-SEC.0006	Maximum message size overload protection security controls for message topic based information exchange	CRT-17.01-TRL6-TVALP-SEC.0020	Different overload protection policies are successfully configured for two or more message topics.	Not planned	OK

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OBJ-17.01-TRL6-TVALP-SEC.0006	Maximum message size overload protection security controls for message topic based information exchange	CRT-17.01-TRL6-TVALP-SEC.0021	Overload protection policies are enforced on message topics used by Purple Profile enabled publisher applications.	Not planned	OK
OBJ-17.01-TRL6-TVALP-SEC.0006	Maximum message size overload protection security controls for message topic based information exchange	CRT-17.01-TRL6-TVALP-SEC.0022	Overload protection policies are enforced on Ground SWIM Node side message topics used by Air SWIM Nodes to publish/consume messages.	Not planned	OK
OBJ-17.01-TRL6-TVALP-SEC.0006	Maximum message size overload protection security controls for message topic based information exchange	CRT-17.01-TRL6-TVALP-SEC.0016	Events concerning the overload protection policies enforcement are logged in accordance with applicable audit policy.	Not planned	OK
OBJ-17.01-TRL6-TVALP-SEC.0006	Maximum message size overload protection security controls for message topic based information exchange	CRT-17.01-TRL6-TVALP-SEC.0017	An overload protection policy is successfully updated at run-time without restarting the Ground SWIM Node.	Not planned	N/A

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OBJ-17.01-TRL6-TVALP-SEC.0006	Maximum message size overload protection security controls for message topic based information exchange	CRT-17.01-TRL6-TVALP-SEC.0018	An AMQP 1.0 annotated message exceeding maximum message size is rejected by enforcing the overload protection policy, the sender is notified and the event routed according to the applicable context-based routing monitoring policy.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-SEC.0006	Maximum message size overload protection security controls for message topic based information exchange	CRT-17.01-TRL6-TVALP-SEC.0019	An AMQP 1.0 annotated message exceeding maximum message size is dropped by enforcing the overload protection policy and the event routed according to the applicable context-based routing monitoring policy.	Not planned	OK
OBJ-17.01-TRL6-TVALP-SEC.0007	Maximum message queue capacity overload protection security controls	CRT-17.01-TRL6-TVALP-SEC.0013	Different overload protection policies are successfully configured for two or more message queues.	Not planned	N/A

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OBJ-17.01-TRL6-TVALP-SEC.0007	Maximum message queue capacity overload protection security controls	CRT-17.01-TRL6-TVALP-SEC.0014	Overload protection policies are enforced on message queues used by Purple Profile enabled sender applications.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-SEC.0007	Maximum message queue capacity overload protection security controls	CRT-17.01-TRL6-TVALP-SEC.0015	Overload protection policies are enforced on Ground SWIM Node side message queues used by Air SWIM Nodes to send/consume messages.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-SEC.0007	Maximum message queue capacity overload protection security controls	CRT-17.01-TRL6-TVALP-SEC.0016	Events concerning the overload protection policies enforcement are logged in accordance with applicable audit policy.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-SEC.0007	Maximum message queue capacity overload protection security controls	CRT-17.01-TRL6-TVALP-SEC.0017	An overload protection policy is successfully updated at run-time without restarting the Ground SWIM Node.	Not planned	N/A

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OBJ-17.01-TRL6-TVALP-SEC.0007	Maximum message queue capacity overload protection security controls	CRT-17.01-TRL6-TVALP-SEC.0023	An attempt to send an AMQP 1.0 annotated message is rejected because maximum message queue capacity is exceeded.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-SEC.0008	Maximum message topic capacity overload protection security controls	CRT-17.01-TRL6-TVALP-SEC.0020	Different overload protection policies are successfully configured for two or more message topics.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-SEC.0008	Maximum message topic capacity overload protection security controls	CRT-17.01-TRL6-TVALP-SEC.0021	Overload protection policies are enforced on message topics used by Purple Profile enabled publisher applications.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-SEC.0008	Maximum message topic capacity overload protection security controls	CRT-17.01-TRL6-TVALP-SEC.0022	Overload protection policies are enforced on Ground SWIM Node side message topics used by Air SWIM Nodes to publish/consume messages.	Not planned	N/A

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OBJ-17.01-TRL6-TVALP-SEC.0008	Maximum message topic capacity overload protection security controls	CRT-17.01-TRL6-TVALP-SEC.0016	Events concerning the overload protection policies enforcement are logged in accordance with applicable audit policy.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-SEC.0008	Maximum message topic capacity overload protection security controls	CRT-17.01-TRL6-TVALP-SEC.0017	An overload protection policy is successfully updated at run-time without restarting the Ground SWIM Node.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-SEC.0008	Maximum message topic capacity overload protection security controls	CRT-17.01-TRL6-TVALP-SEC.0024	An attempt to publish an AMQP 1.0 annotated message is rejected because maximum message topic capacity is exceeded.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-SEC.0009	Consolidated connections limits overload protection security controls	CRT-17.01-TRL6-TVALP-SEC.0025	Maximum number of consolidated connections is successfully configured.	Not planned	OK
OBJ-17.01-TRL6-TVALP-SEC.0009	Consolidated connections limits overload protection security controls	CRT-17.01-TRL6-TVALP-SEC.0016	Events concerning the overload protection policies enforcement are logged in accordance with applicable audit policy.	Not planned	OK

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OBJ-17.01-TRL6-TVALP-SEC.0009	Consolidated connections limits overload protection security controls	CRT-17.01-TRL6-TVALP-SEC.0026	An attempt to establish an AMQP 1.0 connection is rejected because the maximum number of consolidated connections is exceeded.	Not planned	OK
OBJ-17.01-TRL6-TVALP-SEC.0010	Concurrent connections limits per connecting entity overload protection security controls	CRT-17.01-TRL6-TVALP-SEC.0027	Maximum number of concurrent connections per connecting entity is successfully configured.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-SEC.0010	Concurrent connections limits per connecting entity overload protection security controls	CRT-17.01-TRL6-TVALP-SEC.0016	Events concerning the overload protection policies enforcement are logged in accordance with applicable audit policy.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-SEC.0010	Concurrent connections limits per connecting entity overload protection security controls	CRT-17.01-TRL6-TVALP-SEC.0028	An attempt to establish an AMQP 1.0 connection is rejected because the maximum number of concurrent connections for the connecting entity is exceeded.	Not planned	N/A

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OBJ-17.01-TRL6-TVALP-SEC.0011	Mutual authentication and basic certificate revocation status check security controls	CRT-17.01-TRL6-TVALP-SEC.0029	Amqps mutual authentication is enforced between aircraft application and Air SWIM Node.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-SEC.0011	Mutual authentication and basic certificate revocation status check security controls	CRT-17.01-TRL6-TVALP-SEC.0030	Amqps mutual authentication is enforced between Air and Ground SWIM Node.	Not planned	OK
OBJ-17.01-TRL6-TVALP-SEC.0011	Mutual authentication and basic certificate revocation status check security controls	CRT-17.01-TRL6-TVALP-SEC.0031	Amqps mutual authentication is enforced between Ground SWIM Node and ground application.	Not planned	OK
OBJ-17.01-TRL6-TVALP-SEC.0011	Mutual authentication and basic certificate revocation status check security controls	CRT-17.01-TRL6-TVALP-SEC.0032	Events concerning mutual authentication enforcement are logged in accordance with applicable audit policy.	Not planned	OK
OBJ-17.01-TRL6-TVALP-SEC.0011	Mutual authentication and basic certificate revocation status check security controls	CRT-17.01-TRL6-TVALP-SEC.0033	Amqps peers successfully mutual authenticate although one of the peer requires the fallback to TLS 1.2.	Not planned	OK

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OBJ-17.01-TRL6-TVALP-SEC.0011	Mutual authentication and basic certificate revocation status check security controls	CRT-17.01-TRL6-TVALP-SEC.0034	Mutual authentication between amqps peers fails in all the following cases:- one of the peer requires the fallback to a TLS version lower than TLS 1.2.- peer's X.509v3 certificate is not trusted.- peer's X.509v3 certificate is expired.- peer's X.509v3 certificate has been revoked (it is included in the local CRL).- the local CRL is not the current CRL or the CRL scope is not appropriate and the authentication policy does not allow potentially revoked or compromised certificates.	Not planned	OK

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OBJ-17.01-TRL6-TVALP-SEC.0011	Mutual authentication and basic certificate revocation status check security controls	CRT-17.01-TRL6-TVALP-SEC.0035	Amqps peers successfully mutual authenticate although the local CRL is not the current CRL or the CRL scope is not appropriate because the authentication policy allows potentially revoked or compromised certificate.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-SEC.0012	CRL update mechanisms	CRT-17.01-TRL6-TVALP-SEC.0036	The CRL used by SWIM Node is successfully updated via administrative interface.	Not planned	OK
OBJ-17.01-TRL6-TVALP-SEC.0012	CRL update mechanisms	CRT-17.01-TRL6-TVALP-SEC.0037	The CRL used by SWIM Node is not the current CRL and it is successfully updated on-the-fly via the HTTP CDP.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-SEC.0012	CRL update mechanisms	CRT-17.01-TRL6-TVALP-SEC.0038	A delta-CRL is used to successfully update the CRL used by SWIM Node.	Not planned	N/A

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OBJ-17.01-TRL6-TVALP-SEC.0013	Mutual authentication with OCSP certificate revocation status check security controls	CRT-17.01-TRL6-TVALP-SEC.0029	Amqps mutual authentication is enforced between aircraft application and Air SWIM Node.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-SEC.0013	Mutual authentication with OCSP certificate revocation status check security controls	CRT-17.01-TRL6-TVALP-SEC.0030	Amqps mutual authentication is enforced between Air and Ground SWIM Node.	Not planned	OK
OBJ-17.01-TRL6-TVALP-SEC.0013	Mutual authentication with OCSP certificate revocation status check security controls	CRT-17.01-TRL6-TVALP-SEC.0031	Amqps mutual authentication is enforced between Ground SWIM Node and ground application.	Not planned	OK
OBJ-17.01-TRL6-TVALP-SEC.0013	Mutual authentication with OCSP certificate revocation status check security controls	CRT-17.01-TRL6-TVALP-SEC.0032	Events concerning mutual authentication enforcement are logged in accordance with applicable audit policy.	Not planned	OK

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OBJ-17.01-TRL6-TVALP-SEC.0013	Mutual authentication with OCSP certificate revocation status check security controls	CRT-17.01-TRL6-TVALP-SEC.0039	Amqps peer's certificate revocation status is retrieved from the OCSP response, and the authentication is successfully completed because the certificate is not revoked.	Not planned	OK
OBJ-17.01-TRL6-TVALP-SEC.0013	Mutual authentication with OCSP certificate revocation status check security controls	CRT-17.01-TRL6-TVALP-SEC.0040	Amqps peer's certificate revocation status is retrieved from the OCSP response, and the authentication fails because the certificate has been revoked.	Not planned	OK
OBJ-17.01-TRL6-TVALP-SEC.0013	Mutual authentication with OCSP certificate revocation status check security controls	CRT-17.01-TRL6-TVALP-SEC.0041	OCSP responder URL is retrieved from pre-configured local resources.	Not planned	OK
OBJ-17.01-TRL6-TVALP-SEC.0013	Mutual authentication with OCSP certificate revocation status check security controls	CRT-17.01-TRL6-TVALP-SEC.0042	OCSP responder URL is retrieved from location identified in the OCSP field in the Authority Information Access extension in the peer's certificate.	Not planned	N/A

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OBJ-17.01-TRL6-TVALP-SEC.0014	Mutual authentication with combined OCSP and CRL based certificate revocation status check security controls	CRT-17.01-TRL6-TVALP-SEC.0043	OCSP is configured and used as preferred certificate revocation status check mechanism disabling the fallback to CRL.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-SEC.0014	Mutual authentication with combined OCSP and CRL based certificate revocation status check security controls	CRT-17.01-TRL6-TVALP-SEC.0044	OCSP is configured as preferred certificate revocation status check mechanism but because the responder is not available and the fallback is enabled, the CRL is successfully used.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-SEC.0014	Mutual authentication with combined OCSP and CRL based certificate revocation status check security controls	CRT-17.01-TRL6-TVALP-SEC.0045	CRL is configured and used as preferred certificate revocation status check mechanism disabling the fallback to OCSP.	Not planned	N/A

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OBJ-17.01-TRL6-TVALP-SEC.0014	Mutual authentication with combined OCSP and CRL based certificate revocation status check security controls	CRT-17.01-TRL6-TVALP-SEC.0046	CRL is configured as preferred certificate revocation status check mechanism but because the CRL is not available/valid and the fallback is enabled, the OCSP is successfully used.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-SEC.0014	Mutual authentication with combined OCSP and CRL based certificate revocation status check security controls	CRT-17.01-TRL6-TVALP-SEC.0047	Amqps peers successfully mutual authenticate although none of the combined certificate revocation status mechanisms are available but the authentication policy allows potentially revoked or compromised certificate.	Not planned	N/A

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OBJ-17.01-TRL6-TVALP-SEC.0014	Mutual authentication with combined OCSP and CRL based certificate revocation status check security controls	CRT-17.01-TRL6-TVALP-SEC.0048	Mutual authentication between amqps peers fails because none of the combined certificate revocation status mechanisms are available and the authentication policy does not allow potentially revoked or compromised certificate.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-SEC.0015	Authorization security controls for message queue based information exchange	CRT-17.01-TRL6-TVALP-SEC.0049	Different authorization policies are successfully configured for two or more message queues.	Not planned	OK
OBJ-17.01-TRL6-TVALP-SEC.0015	Authorization security controls for message queue based information exchange	CRT-17.01-TRL6-TVALP-SEC.0050	Authorization policies are enforced on message queue used by Purple Profile enabled sender applications.	Not planned	OK
OBJ-17.01-TRL6-TVALP-SEC.0015	Authorization security controls for message queue based information exchange	CRT-17.01-TRL6-TVALP-SEC.0051	Authorization policies are enforced on message queue used by Purple Profile enabled receiver applications.	Not planned	OK

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OBJ-17.01-TRL6-TVALP-SEC.0015	Authorization security controls for message queue based information exchange	CRT-17.01-TRL6-TVALP-SEC.0052	Authorization policies are enforced on Ground SWIM Node side message queue used by Air SWIM Nodes to send/receive messages.	Not planned	OK
OBJ-17.01-TRL6-TVALP-SEC.0015	Authorization security controls for message queue based information exchange	CRT-17.01-TRL6-TVALP-SEC.0053	Events concerning the authorization policies enforcement are logged in accordance with applicable audit policy.	Not planned	OK
OBJ-17.01-TRL6-TVALP-SEC.0015	Authorization security controls for message queue based information exchange	CRT-17.01-TRL6-TVALP-SEC.0054	An authorization policy is successfully updated at run-time without restarting the Ground SWIM Node.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-SEC.0015	Authorization security controls for message queue based information exchange	CRT-17.01-TRL6-TVALP-SEC.0055	An attempt to send a message to a queue is authorized because the sending entity is successfully authenticated with sender role for that queue.	Not planned	OK

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OBJ-17.01-TRL6-TVALP-SEC.0015	Authorization security controls for message queue based information exchange	CRT-17.01-TRL6-TVALP-SEC.0056	An attempt to send a message to a queue is not authorized because the authenticated sending entity has not assigned the sender role for that queue.	Not planned	OK
OBJ-17.01-TRL6-TVALP-SEC.0015	Authorization security controls for message queue based information exchange	CRT-17.01-TRL6-TVALP-SEC.0057	An attempt to receive a message from a queue is authorized because the receiving entity is successfully authenticated with receiver role for that queue.	Not planned	OK
OBJ-17.01-TRL6-TVALP-SEC.0015	Authorization security controls for message queue based information exchange	CRT-17.01-TRL6-TVALP-SEC.0058	An attempt to receive a message from a queue is not authorized because the authenticated receiving entity has not assigned the receiver role for that queue.	Not planned	OK
OBJ-17.01-TRL6-TVALP-SEC.0016	Authorization security controls for message topic based information exchange	CRT-17.01-TRL6-TVALP-SEC.0059	Different authorization policies are successfully configured for two or more message topics.	Not planned	OK

Technical Validation Exercise #03 Technical Validation Objective ID	Technical Validation Exercise #03 Technical Validation Objective Title	Technical Validation Exercise #03 Success Criterion ID	Technical Validation Exercise #03 Success Criterion	Technical Validation Exercise #03 Validation Results	Technical Validation Exercise #03 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-SEC.0016	Authorization security controls for message topic based information exchange	CRT-17.01-TRL6-TVALP-SEC.0060	Authorization policies are enforced on message topic used by Purple Profile enabled publisher applications.	Not planned	OK
OBJ-17.01-TRL6-TVALP-SEC.0016	Authorization security controls for message topic based information exchange	CRT-17.01-TRL6-TVALP-SEC.0061	Authorization policies are enforced on message topic used by Purple Profile enabled subscriber applications.	Not planned	OK
OBJ-17.01-TRL6-TVALP-SEC.0016	Authorization security controls for message topic based information exchange	CRT-17.01-TRL6-TVALP-SEC.0062	Authorization policies are enforced on Ground SWIM Node side message topic used by Air SWIM Nodes to publish/consume messages.	Not planned	OK
OBJ-17.01-TRL6-TVALP-SEC.0016	Authorization security controls for message topic based information exchange	CRT-17.01-TRL6-TVALP-SEC.0053	Events concerning the authorization policies enforcement are logged in accordance with applicable audit policy.	Not planned	OK

Technical Validation Exercise #03 Technical Validation Objective ID	Technical Validation Exercise #03 Technical Validation Objective Title	Technical Validation Exercise #03 Success Criterion ID	Technical Validation Exercise #03 Success Criterion	Technical Validation Exercise #03 Validation Results	Technical Validation Exercise #03 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-SEC.0016	Authorization security controls for message topic based information exchange	CRT-17.01-TRL6-TVALP-SEC.0054	An authorization policy is successfully updated at run-time without restarting the Ground SWIM Node.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-SEC.0016	Authorization security controls for message topic based information exchange	CRT-17.01-TRL6-TVALP-SEC.0063	An attempt to publish a message to a topic is authorized because the publishing entity is successfully authenticated with publisher role for that topic.	Not planned	OK
OBJ-17.01-TRL6-TVALP-SEC.0016	Authorization security controls for message topic based information exchange	CRT-17.01-TRL6-TVALP-SEC.0064	An attempt to publish a message to a topic is not authorized because the authenticated publishing entity has not assigned the publisher role for that topic.	Not planned	OK
OBJ-17.01-TRL6-TVALP-SEC.0016	Authorization security controls for message topic based information exchange	CRT-17.01-TRL6-TVALP-SEC.0065	An attempt to subscribe to a topic is authorized because the subscribing entity is successfully authenticated with subscriber role for that topic.	Not planned	OK

Technical Validation Exercise #03 Technical Validation Objective ID	Technical Validation Exercise #03 Technical Validation Objective Title	Technical Validation Exercise #03 Success Criterion ID	Technical Validation Exercise #03 Success Criterion	Technical Validation Exercise #03 Validation Results	Technical Validation Exercise #03 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-SEC.0016	Authorization security controls for message topic based information exchange	CRT-17.01-TRL6-TVALP-SEC.0066	An attempt to subscribe to a topic is not authorized because the authenticated subscribing entity has not assigned the subscriber role for that topic.	Not planned	OK
OBJ-17.01-TRL6-TVALP-SEC.0017	Authorization security controls for message queue and topic lifecycle management	CRT-17.01-TRL6-TVALP-SEC.0067	An entity fails to connect to a message queue because the queue does not exist and the messaging resources lifecycle management is only authorized via administrative interfaces.	Not planned	OK
OBJ-17.01-TRL6-TVALP-SEC.0017	Authorization security controls for message queue and topic lifecycle management	CRT-17.01-TRL6-TVALP-SEC.0068	An entity fails to connect to a message topic because the topic does not exist and the messaging resources lifecycle management is only authorized via administrative interfaces.	Not planned	OK

Technical Validation Exercise #03 Technical Validation Objective ID	Technical Validation Exercise #03 Technical Validation Objective Title	Technical Validation Exercise #03 Success Criterion ID	Technical Validation Exercise #03 Success Criterion	Technical Validation Exercise #03 Validation Results	Technical Validation Exercise #03 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-SEC.0017	Authorization security controls for message queue and topic lifecycle management	CRT-17.01-TRL6-TVALP-SEC.0069	A message queue is successfully created via administrative interface by an user with administrator role.	Not planned	OK
OBJ-17.01-TRL6-TVALP-SEC.0017	Authorization security controls for message queue and topic lifecycle management	CRT-17.01-TRL6-TVALP-SEC.0070	A message topic is successfully created via administrative interface by an user with administrator role.	Not planned	OK
OBJ-17.01-TRL6-TVALP-SEC.0017	Authorization security controls for message queue and topic lifecycle management	CRT-17.01-TRL6-TVALP-SEC.0071	A message queue is successfully deleted via administrative interface by an user with administrator role.	Not planned	OK
OBJ-17.01-TRL6-TVALP-SEC.0017	Authorization security controls for message queue and topic lifecycle management	CRT-17.01-TRL6-TVALP-SEC.0072	A message topic is successfully deleted via administrative interface by an user with administrator role.	Not planned	OK

Technical Validation Exercise #03 Technical Validation Objective ID	Technical Validation Exercise #03 Technical Validation Objective Title	Technical Validation Exercise #03 Success Criterion ID	Technical Validation Exercise #03 Success Criterion	Technical Validation Exercise #03 Validation Results	Technical Validation Exercise #03 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-SEC.0017	Authorization security controls for message queue and topic lifecycle management	CRT-17.01-TRL6-TVALP-SEC.0073	An user without administrator role fails to create/delete message queue/topic via administrative interface.	Not planned	OK

Technical Validation Exercise #03 Technical Validation Objective ID	Technical Validation Exercise #03 Technical Validation Objective Title	Technical Validation Exercise #03 Success Criterion ID	Technical Validation Exercise #03 Success Criterion	Technical Validation Exercise #03 Validation Results	Technical Validation Exercise #03 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-SEC.0018	End-to-end confidentiality for uplink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-SEC.0074	Following steps are successfully completed:- The requestor creates and sends an AMQP 1.0 annotated request message with application-data section containing encrypted data and ENPT AMQP footer with value containing both Encryption-Algorithm and Encryption-Secret for the intender responder.- While the request message is in transit at SWIM nodes level, it is not possible to access/visualize sensitive information because both application data and shared secret are encrypted- The request message is delivered to the intended responder that successfully decrypts it relying on delivered ENPT AMQP footer.	Not planned	N/A

Technical Validation Exercise #03 Technical Validation Objective ID	Technical Validation Exercise #03 Technical Validation Objective Title	Technical Validation Exercise #03 Success Criterion ID	Technical Validation Exercise #03 Success Criterion	Technical Validation Exercise #03 Validation Results	Technical Validation Exercise #03 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-SEC.0018	End-to-end confidentiality for uplink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-SEC.0075	Following steps are successfully completed: -The responder creates and sends an AMQP 1.0 annotated response message with application-data section containing encrypted data and ENPT AMQP footer with value containing both Encryption-Algorithm and Encryption-Secret for the requestor.- While the response message is in transit at SWIM nodes level, it is not possible to access request/visualize sensitive information because both application data and shared secret are encrypted.- The response message is delivered to the intended requestor that successfully decrypts it relying on delivered ENPT AMQP footer.	Not planned	N/A

Technical Validation Exercise #03 Technical Validation Objective ID	Technical Validation Exercise #03 Technical Validation Objective Title	Technical Validation Exercise #03 Success Criterion ID	Technical Validation Exercise #03 Success Criterion	Technical Validation Exercise #03 Validation Results	Technical Validation Exercise #03 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-SEC.0018	End-to-end confidentiality for uplink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-SEC.0076	Following steps are successfully completed:- The requestor creates and sends an additional AMQP 1.0 annotated request message for the same responder with application-data section containing encrypted data and ENPT AMQP footer containing only the Encryption-Algorithm.- The request message is delivered to the intended responder that successfully decrypts it relying on delivered ENPT AMQP footer and cached Encryption-Secret from previous request messages.	Not planned	N/A

Technical Validation Exercise #03 Technical Validation Objective ID	Technical Validation Exercise #03 Technical Validation Objective Title	Technical Validation Exercise #03 Success Criterion ID	Technical Validation Exercise #03 Success Criterion	Technical Validation Exercise #03 Validation Results	Technical Validation Exercise #03 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-SEC.0018	End-to-end confidentiality for uplink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-SEC.0077	Following steps are successfully completed:- The requestor creates and sends an additional AMQP 1.0 annotated request message for the same responder with application-data section containing encrypted data and ENPT AMQP footer containing also a new Encryption-Secret.- The request message is delivered to the intended responder that successfully decrypts it relying on delivered ENPT AMQP footer replacing cached Encryption-Secret.	Not planned	N/A

Technical Validation Exercise #03 Technical Validation Objective ID	Technical Validation Exercise #03 Technical Validation Objective Title	Technical Validation Exercise #03 Success Criterion ID	Technical Validation Exercise #03 Success Criterion	Technical Validation Exercise #03 Validation Results	Technical Validation Exercise #03 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-SEC.0019	End-to-end confidentiality for uplink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-SEC.0078	Following steps are successfully completed:- The publisher creates and publishes an AMQP 1.0 annotated publication message with application-data section containing encrypted data and ENPT AMQP footer with value containing both Encryption-Algorithm and Encryption-Secret for two or more subscribers.- While the publication message is in transit at SWIM nodes level, it is not possible to access/visualize sensitive information because both application data and shared secret are encrypted.- The publication message is delivered to the intended subscribers that successfully decrypt it relying on delivered ENPT AMQP footer.	Not planned	N/A

Technical Validation Exercise #03 Technical Validation Objective ID	Technical Validation Exercise #03 Technical Validation Objective Title	Technical Validation Exercise #03 Success Criterion ID	Technical Validation Exercise #03 Success Criterion	Technical Validation Exercise #03 Validation Results	Technical Validation Exercise #03 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-SEC.0019	End-to-end confidentiality for uplink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-SEC.0079	Following steps are successfully completed:- The publisher creates and publishes an additional AMQP 1.0 annotated publication message for the same subscribers with application-data section containing encrypted data and ENPT AMQP footer containing only the Encryption-Algorithm.- The publication message is delivered to the intended subscribers that successfully decrypt it relying on delivered ENPT AMQP footer and cached Encryption-Secret from previous messages.	Not planned	N/A

Technical Validation Exercise #03 Technical Validation Objective ID	Technical Validation Exercise #03 Technical Validation Objective Title	Technical Validation Exercise #03 Success Criterion ID	Technical Validation Exercise #03 Success Criterion	Technical Validation Exercise #03 Validation Results	Technical Validation Exercise #03 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-SEC.0019	End-to-end confidentiality for uplink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-SEC.0080	Following steps are successfully completed:- An additional subscriber ("new_sub") successfully subscribes to the topic.- The publisher creates and publishes an additional AMQP 1.0 annotated publication message with application-data section containing encrypted data and ENPT AMQP footer containing the Encryption-Algorithm and only the Encryption-Secret for the new subscriber.- The publication message is delivered to all the subscribers and in particular to the new one that successfully decrypts the message relying on delivered ENPT AMQP footer.- The other subscribers successfully decrypt the message relying on delivered ENPT AMQP footer and cached Encryption-Secret from previous messages.	Not planned	N/A

Technical Validation Exercise #03 Technical Validation Objective ID	Technical Validation Exercise #03 Technical Validation Objective Title	Technical Validation Exercise #03 Success Criterion ID	Technical Validation Exercise #03 Success Criterion	Technical Validation Exercise #03 Validation Results	Technical Validation Exercise #03 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-SEC.0019	End-to-end confidentiality for uplink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-SEC.0081	Following steps are successfully completed:- The publisher creates and publishes an additional AMQP 1.0 annotated publication message with application-data section containing encrypted data and ENPT AMQP footer containing also a new Encryption-Secret.- The publication message is delivered to the intended subscribers that successfully decrypt it relying on delivered ENPT AMQP footer and replacing cached Encryption-Secret.	Not planned	N/A

Technical Validation Exercise #03 Technical Validation Objective ID	Technical Validation Exercise #03 Technical Validation Objective Title	Technical Validation Exercise #03 Success Criterion ID	Technical Validation Exercise #03 Success Criterion	Technical Validation Exercise #03 Validation Results	Technical Validation Exercise #03 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-SEC.0020	End-to-end confidentiality for downlink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-SEC.0078	Following steps are successfully completed:- The publisher creates and publishes an AMQP 1.0 annotated publication message with application-data section containing encrypted data and ENPT AMQP footer with value containing both Encryption-Algorithm and Encryption-Secret for two or more subscribers.- While the publication message is in transit at SWIM nodes level, it is not possible to access/visualize sensitive information because both application data and shared secret are encrypted.- The publication message is delivered to the intended subscribers that successfully decrypt it relying on delivered ENPT AMQP footer.	Not planned	N/A

Technical Validation Exercise #03 Technical Validation Objective ID	Technical Validation Exercise #03 Technical Validation Objective Title	Technical Validation Exercise #03 Success Criterion ID	Technical Validation Exercise #03 Success Criterion	Technical Validation Exercise #03 Validation Results	Technical Validation Exercise #03 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-SEC.0020	End-to-end confidentiality for downlink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-SEC.0079	Following steps are successfully completed:- The publisher creates and publishes an additional AMQP 1.0 annotated publication message for the same subscribers with application-data section containing encrypted data and ENPT AMQP footer containing only the Encryption-Algorithm.- The publication message is delivered to the intended subscribers that successfully decrypt it relying on delivered ENPT AMQP footer and cached eEncryption-Secret from previous messages.	Not planned	N/A

Technical Validation Exercise #03 Technical Validation Objective ID	Technical Validation Exercise #03 Technical Validation Objective Title	Technical Validation Exercise #03 Success Criterion ID	Technical Validation Exercise #03 Success Criterion	Technical Validation Exercise #03 Validation Results	Technical Validation Exercise #03 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-SEC.0020	End-to-end confidentiality for downlink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-SEC.0080	Following steps are successfully completed:- An additional subscriber ("new_sub") successfully subscribes to the topic.- The publisher creates and publishes an additional AMQP 1.0 annotated publication message with application-data section containing encrypted data and ENPT AMQP footer containing the Encryption-Algorithm and only the Encryption-Secret for the new subscriber.- The publication message is delivered to all the subscribers and in particular to the new one that successfully decrypts the message relying on delivered ENPT AMQP footer.- The other subscribers successfully decrypt the message relying on delivered ENPT AMQP footer and cached Encryption-Secret from previous messages.	Not planned	N/A

Technical Validation Exercise #03 Technical Validation Objective ID	Technical Validation Exercise #03 Technical Validation Objective Title	Technical Validation Exercise #03 Success Criterion ID	Technical Validation Exercise #03 Success Criterion	Technical Validation Exercise #03 Validation Results	Technical Validation Exercise #03 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-SEC.0020	End-to-end confidentiality for downlink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-SEC.0081	Following steps are successfully completed:- The publisher creates and publishes an additional AMQP 1.0 annotated publication message with application-data section containing encrypted data and ENPT AMQP footer containing also a new Encryption-Secret.- The publication message is delivered to the intended subscribers that successfully decrypt it relying on delivered ENPT AMQP footer and replacing cached Encryption-Secret.	Not planned	N/A

Technical Validation Exercise #03 Technical Validation Objective ID	Technical Validation Exercise #03 Technical Validation Objective Title	Technical Validation Exercise #03 Success Criterion ID	Technical Validation Exercise #03 Success Criterion	Technical Validation Exercise #03 Validation Results	Technical Validation Exercise #03 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-SEC.0021	End-to-end HMAC based message level integrity and authenticity for uplink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-SEC.0082	Following steps are successfully completed:- The requestor creates and sends an AMQP 1.0 annotated request message with HMAC AMQP footer with value containing HMAC-Algorithm, HMAC-Target, HMAC-Digest and HMAC-Secret for the intender responder.- The request message is delivered to the intended responder that successfully validates the authenticity and integrity of the message relying on delivered HMAC AMQP footer.	Not planned	OK

Technical Validation Exercise #03 Technical Validation Objective ID	Technical Validation Exercise #03 Technical Validation Objective Title	Technical Validation Exercise #03 Success Criterion ID	Technical Validation Exercise #03 Success Criterion	Technical Validation Exercise #03 Validation Results	Technical Validation Exercise #03 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-SEC.0021	End-to-end HMAC based message level integrity and authenticity for uplink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-SEC.0083	Following steps are successfully completed: - The responder creates and sends an AMQP 1.0 annotated response message with HMAC AMQP footer with value containing HMAC-Algorithm, HMAC-Target, HMAC-Digest and HMAC-Secret for the requestor.- The response message is delivered to the intended requestor that successfully validates the authenticity and integrity of the message relying on delivered HMAC AMQP footer.	Not planned	OK

Technical Validation Exercise #03 Technical Validation Objective ID	Technical Validation Exercise #03 Technical Validation Objective Title	Technical Validation Exercise #03 Success Criterion ID	Technical Validation Exercise #03 Success Criterion	Technical Validation Exercise #03 Validation Results	Technical Validation Exercise #03 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-SEC.0021	End-to-end HMAC based message level integrity and authenticity for uplink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-SEC.0084	Following steps are successfully completed:- The requestor creates and sends an additional AMQP 1.0 annotated request message for the same responder with HMAC AMQP footer containing only HMAC-Algorithm, HMAC-Target and HMAC-Digest.- The request message is delivered to the intended responder that successfully validates the authenticity and integrity of the message relying on delivered HMAC AMQP footer and cached HMAC-Secret from previous request messages.	Not planned	N/A

Technical Validation Exercise #03 Technical Validation Objective ID	Technical Validation Exercise #03 Technical Validation Objective Title	Technical Validation Exercise #03 Success Criterion ID	Technical Validation Exercise #03 Success Criterion	Technical Validation Exercise #03 Validation Results	Technical Validation Exercise #03 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-SEC.0021	End-to-end HMAC based message level integrity and authenticity for uplink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-SEC.0085	Following steps are successfully completed:- The responder creates and sends an additional AMQP 1.0 annotated response message for the same requestor with HMAC AMQP footer containing only HMAC-Algorithm, HMAC-Target and HMAC-Digest.- The response message is delivered to the intended requestor that successfully validates the authenticity and integrity of the message relying on delivered HMAC AMQP footer and cached HMAC-Secret from previous response messages.	Not planned	N/A

Technical Validation Exercise #03 Technical Validation Objective ID	Technical Validation Exercise #03 Technical Validation Objective Title	Technical Validation Exercise #03 Success Criterion ID	Technical Validation Exercise #03 Success Criterion	Technical Validation Exercise #03 Validation Results	Technical Validation Exercise #03 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-SEC.0021	End-to-end HMAC based message level integrity and authenticity for uplink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-SEC.0086	Following steps are successfully completed:- The requestor creates and sends an additional AMQP 1.0 annotated request message for the same responder with HMAC AMQP footer containing HMAC-Algorithm, HMAC-Target, HMAC-Digest and the new shared secret.- The request message is delivered to the intended responder that successfully validates the authenticity and integrity of the message relying on delivered HMAC AMQP footer replacing cached HMAC-Secret.	Not planned	OK

Technical Validation Exercise #03 Technical Validation Objective ID	Technical Validation Exercise #03 Technical Validation Objective Title	Technical Validation Exercise #03 Success Criterion ID	Technical Validation Exercise #03 Success Criterion	Technical Validation Exercise #03 Validation Results	Technical Validation Exercise #03 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-SEC.0021	End-to-end HMAC based message level integrity and authenticity for uplink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-SEC.0087	Following steps are successfully completed: - The responder creates and sends an AMQP 1.0 annotated response message with HMAC AMQP footer with value containing HMAC-Algorithm, HMAC-Target, HMAC-Digest and HMAC-Secret for the requestor.- While in transit the response message data section is modified.- The response message is delivered to the intended requestor that, relying on delivered HMAC AMQP footer, recognizes that the authenticity and integrity of the message have been violated.- The requestor discards the message and the event is logged in accordance with the applicable audit policy.	Not planned	OK

Technical Validation Exercise #03 Technical Validation Objective ID	Technical Validation Exercise #03 Technical Validation Objective Title	Technical Validation Exercise #03 Success Criterion ID	Technical Validation Exercise #03 Success Criterion	Technical Validation Exercise #03 Validation Results	Technical Validation Exercise #03 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-SEC.0022	End-to-end HMAC based message level integrity and authenticity for uplink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-SEC.0088	Following steps are successfully completed:- The publisher creates and publishes an AMQP 1.0 annotated publication message with HMAC AMQP footer with value containing HMAC-Algorithm, HMAC-Target, HMAC-Digest and HMAC-Secret for two or more subscribers.- The publication message is delivered to the intended subscribers validate the authenticity and integrity of the message relying on delivered HMAC AMQP footer.	Not planned	OK

Technical Validation Exercise #03 Technical Validation Objective ID	Technical Validation Exercise #03 Technical Validation Objective Title	Technical Validation Exercise #03 Success Criterion ID	Technical Validation Exercise #03 Success Criterion	Technical Validation Exercise #03 Validation Results	Technical Validation Exercise #03 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-SEC.0022	End-to-end HMAC based message level integrity and authenticity for uplink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-SEC.0089	Following steps are successfully completed:- The publisher creates and publishes an additional AMQP 1.0 annotated publication message for the same subscribers with HMAC AMQP footer containing only HMAC-Algorithm, HMAC-Target and HMAC-Digest.- The publication message is delivered to the intended subscribers that successfully validate the authenticity and integrity of the message relying on delivered HMAC AMQP footer and cached HMAC-Secret from previous messages.	Not planned	N/A

Technical Validation Exercise #03 Technical Validation Objective ID	Technical Validation Exercise #03 Technical Validation Objective Title	Technical Validation Exercise #03 Success Criterion ID	Technical Validation Exercise #03 Success Criterion	Technical Validation Exercise #03 Validation Results	Technical Validation Exercise #03 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-SEC.0022	End-to-end HMAC based message level integrity and authenticity for uplink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-SEC.0090	Following steps are successfully completed:- An additional subscriber ("new_sub") successfully subscribes to the topic.- The publisher creates and publishes an additional AMQP 1.0 annotated publication message with HMAC AMQP footer containing HMAC-Algorithm, HMAC-Target, HMAC-Digest and only the HMAC-Secret for the new subscriber.- The publication message is delivered to all the subscribers and in particular to the new one that successfully validates the authenticity and integrity of the message relying on delivered HMAC AMQP footer.- The other subscribers successfully validate the authenticity and integrity of the message relying on delivered HMAC AMQP footer and cached HMAC-Secret from previous messages.	Not planned	N/A

Technical Validation Exercise #03 Technical Validation Objective ID	Technical Validation Exercise #03 Technical Validation Objective Title	Technical Validation Exercise #03 Success Criterion ID	Technical Validation Exercise #03 Success Criterion	Technical Validation Exercise #03 Validation Results	Technical Validation Exercise #03 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-SEC.0022	End-to-end HMAC based message level integrity and authenticity for uplink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-SEC.0091	Following steps are successfully completed:- The publisher creates and publishes an additional AMQP 1.0 annotated publication message with HMAC AMQP footer containing also the new shared secret.- The publication message is delivered to the intended subscribers that successfully validate the authenticity and integrity of the message relying on delivered HMAC AMQP footer and replacing the cached HMAC-Secret.	Not planned	OK

Technical Validation Exercise #03 Technical Validation Objective ID	Technical Validation Exercise #03 Technical Validation Objective Title	Technical Validation Exercise #03 Success Criterion ID	Technical Validation Exercise #03 Success Criterion	Technical Validation Exercise #03 Validation Results	Technical Validation Exercise #03 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-SEC.0022	End-to-end HMAC based message level integrity and authenticity for uplink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-SEC.0092	Following steps are successfully completed: -The publisher creates and publishes an additional AMQP 1.0 annotated publication message for the same subscribers with HMAC AMQP footer containing HMAC-Algorithm, HMAC-Target, HMAC-Digest and HMAC-Secret.- While in transit the publication message data section is modified.- The publication message is delivered to the intended subscribers that, relying on delivered HMAC AMQP footer, recognize that the authenticity and integrity of the message have been violated.- The subscribers discards the message and the event is logged in accordance with the applicable audit policy.	Not planned	OK

Technical Validation Exercise #03 Technical Validation Objective ID	Technical Validation Exercise #03 Technical Validation Objective Title	Technical Validation Exercise #03 Success Criterion ID	Technical Validation Exercise #03 Success Criterion	Technical Validation Exercise #03 Validation Results	Technical Validation Exercise #03 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-SEC.0023	End-to-end HMAC based message level integrity and authenticity for downlink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-SEC.0088	Following steps are successfully completed:- The publisher creates and publishes an AMQP 1.0 annotated publication message with HMAC AMQP footer with value containing HMAC-Algorithm, HMAC-Target, HMAC-Digest and HMAC-Secret for two or more subscribers.- The publication message is delivered to the intended subscribers validate the authenticity and integrity of the message relying on delivered HMAC AMQP footer.	Not planned	OK

Technical Validation Exercise #03 Technical Validation Objective ID	Technical Validation Exercise #03 Technical Validation Objective Title	Technical Validation Exercise #03 Success Criterion ID	Technical Validation Exercise #03 Success Criterion	Technical Validation Exercise #03 Validation Results	Technical Validation Exercise #03 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-SEC.0023	End-to-end HMAC based message level integrity and authenticity for downlink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-SEC.0089	Following steps are successfully completed:- The publisher creates and publishes an additional AMQP 1.0 annotated publication message for the same subscribers with HMAC AMQP footer containing only HMAC-Algorithm, HMAC-Target and HMAC-Digest.- The publication message is delivered to the intended subscribers that successfully validate the authenticity and integrity of the message relying on delivered HMAC AMQP footer and cached HMAC-Secret from previous messages.	Not planned	N/A

Technical Validation Exercise #03 Technical Validation Objective ID	Technical Validation Exercise #03 Technical Validation Objective Title	Technical Validation Exercise #03 Success Criterion ID	Technical Validation Exercise #03 Success Criterion	Technical Validation Exercise #03 Validation Results	Technical Validation Exercise #03 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-SEC.0023	End-to-end HMAC based message level integrity and authenticity for downlink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-SEC.0090	Following steps are successfully completed:- An additional subscriber ("new_sub") successfully subscribes to the topic.- The publisher creates and publishes an additional AMQP 1.0 annotated publication message with HMAC AMQP footer containing HMAC-Algorithm, HMAC-Target, HMAC-Digest and only the HMAC-Secret for the new subscriber.- The publication message is delivered to all the subscribers and in particular to the new one that successfully validates the authenticity and integrity of the message relying on delivered HMAC AMQP footer.- The other subscribers successfully validate the authenticity and integrity of the message relying on delivered HMAC AMQP footer and cached HMAC-Secret from previous messages.	Not planned	N/A

Technical Validation Exercise #03 Technical Validation Objective ID	Technical Validation Exercise #03 Technical Validation Objective Title	Technical Validation Exercise #03 Success Criterion ID	Technical Validation Exercise #03 Success Criterion	Technical Validation Exercise #03 Validation Results	Technical Validation Exercise #03 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-SEC.0023	End-to-end HMAC based message level integrity and authenticity for downlink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-SEC.0091	Following steps are successfully completed:- The publisher creates and publishes an additional AMQP 1.0 annotated publication message with HMAC AMQP footer containing also the new shared secret.- The publication message is delivered to the intended subscribers that successfully validate the authenticity and integrity of the message relying on delivered HMAC AMQP footer and replacing the cached HMAC-Secret.	Not planned	OK

Technical Validation Exercise #03 Technical Validation Objective ID	Technical Validation Exercise #03 Technical Validation Objective Title	Technical Validation Exercise #03 Success Criterion ID	Technical Validation Exercise #03 Success Criterion	Technical Validation Exercise #03 Validation Results	Technical Validation Exercise #03 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-SEC.0023	End-to-end HMAC based message level integrity and authenticity for downlink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-SEC.0092	Following steps are successfully completed: -The publisher creates and publishes an additional AMQP 1.0 annotated publication message for the same subscribers with HMAC AMQP footer containing HMAC-Algorithm, HMAC-Target, HMAC-Digest and HMAC-Secret.- While in transit the publication message data section is modified.- The publication message is delivered to the intended subscribers that, relying on delivered HMAC AMQP footer, recognize that the authenticity and integrity of the message have been violated.- The subscribers discards the message and the event is logged in accordance with the applicable audit policy.	Not planned	OK

Technical Validation Exercise #03 Technical Validation Objective ID	Technical Validation Exercise #03 Technical Validation Objective Title	Technical Validation Exercise #03 Success Criterion ID	Technical Validation Exercise #03 Success Criterion	Technical Validation Exercise #03 Validation Results	Technical Validation Exercise #03 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-SEC.0024	End-to-end digital signature based message level integrity and authenticity for uplink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-SEC.0093	Following steps are successfully completed:- The requestor creates and sends an AMQP 1.0 annotated request message with DSGN AMQP footer with value containing DSGN-Algorithm, DSGN-Target and DSGN-Signature.- The request message is delivered to the intended responder that successfully validates the authenticity and integrity of the message relying on delivered DSGN AMQP footer.	Not planned	N/A

Technical Validation Exercise #03 Technical Validation Objective ID	Technical Validation Exercise #03 Technical Validation Objective Title	Technical Validation Exercise #03 Success Criterion ID	Technical Validation Exercise #03 Success Criterion	Technical Validation Exercise #03 Validation Results	Technical Validation Exercise #03 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-SEC.0024	End-to-end digital signature based message level integrity and authenticity for uplink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-SEC.0094	Following steps are successfully completed: - The responder creates and sends an AMQP 1.0 annotated response message with DSGN AMQP footer with value containing DSGN-Algorithm, DSGN-Target and DSGN-Signature.- The response message is delivered to the intended requestor that successfully validates the authenticity and integrity of the message relying on delivered DSGN AMQP footer.	Not planned	N/A

Technical Validation Exercise #03 Technical Validation Objective ID	Technical Validation Exercise #03 Technical Validation Objective Title	Technical Validation Exercise #03 Success Criterion ID	Technical Validation Exercise #03 Success Criterion	Technical Validation Exercise #03 Validation Results	Technical Validation Exercise #03 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-SEC.0024	End-to-end digital signature based message level integrity and authenticity for uplink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-SEC.0095	Following steps are successfully completed: - The responder creates and sends an AMQP 1.0 annotated response message with DSGN AMQP footer with value containing DSGN-Algorithm, DSGN-Target and DSGN-Signature.- While in transit the response message data section is modified.- The response message is delivered to the intended requestor that, relying on delivered DSGN AMQP footer, recognizes that the authenticity and integrity of the message have been violated.- The requestor discards the message and the event is logged in accordance with the applicable audit policy.	Not planned	N/A

Technical Validation Exercise #03 Technical Validation Objective ID	Technical Validation Exercise #03 Technical Validation Objective Title	Technical Validation Exercise #03 Success Criterion ID	Technical Validation Exercise #03 Success Criterion	Technical Validation Exercise #03 Validation Results	Technical Validation Exercise #03 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-SEC.0025	End-to-end digital signature based message level integrity and authenticity for uplink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-SEC.0096	Following steps are successfully completed:- The publisher creates and publishes an AMQP 1.0 annotated publication message with DSGN AMQP footer with value containing DSGN-Algorithm, DSGN-Target and DSGN-Signature.- The publication message is delivered to the intended subscribers that successfully validate the authenticity and integrity of the message relying on delivered DSGN AMQP footer.	Not planned	N/A

Technical Validation Exercise #03 Technical Validation Objective ID	Technical Validation Exercise #03 Technical Validation Objective Title	Technical Validation Exercise #03 Success Criterion ID	Technical Validation Exercise #03 Success Criterion	Technical Validation Exercise #03 Validation Results	Technical Validation Exercise #03 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-SEC.0025	End-to-end digital signature based message level integrity and authenticity for uplink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-SEC.0097	Following steps are successfully completed: - The publisher creates and publishes an AMQP 1.0 annotated publication message with DSGN AMQP footer with value containing DSGN-Algorithm, DSGN-Target and DSGN-Signature.- While in transit the publication message data section is modified.- The publication message is delivered to the intended subscribers that, relying on delivered DSGN AMQP footer, recognize that the authenticity and integrity of the message have been violated.- The subscribers discard the message and the event is logged in accordance with the applicable audit policy.	Not planned	N/A

Technical Validation Exercise #03 Technical Validation Objective ID	Technical Validation Exercise #03 Technical Validation Objective Title	Technical Validation Exercise #03 Success Criterion ID	Technical Validation Exercise #03 Success Criterion	Technical Validation Exercise #03 Validation Results	Technical Validation Exercise #03 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-SEC.0026	End-to-end digital signature based message level integrity and authenticity for downlink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-SEC.0096	Following steps are successfully completed:- The publisher creates and publishes an AMQP 1.0 annotated publication message with DSGN AMQP footer with value containing DSGN-Algorithm, DSGN-Target and DSGN-Signature.- The publication message is delivered to the intended subscribers that successfully validate the authenticity and integrity of the message relying on delivered DSGN AMQP footer.	Not planned	N/A

Technical Validation Exercise #03 Technical Validation Objective ID	Technical Validation Exercise #03 Technical Validation Objective Title	Technical Validation Exercise #03 Success Criterion ID	Technical Validation Exercise #03 Success Criterion	Technical Validation Exercise #03 Validation Results	Technical Validation Exercise #03 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-SEC.0026	End-to-end digital signature based message level integrity and authenticity for downlink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-SEC.0097	Following steps are successfully completed: - The publisher creates and publishes an AMQP 1.0 annotated publication message with DSGN AMQP footer with value containing DSGN-Algorithm, DSGN-Target and DSGN-Signature.- While in transit the publication message data section is modified.- The publication message is delivered to the intended subscribers that, relying on delivered DSGN AMQP footer, recognize that the authenticity and integrity of the message have been violated.- The subscribers discard the message and the event is logged in accordance with the applicable audit policy.	Not planned	N/A

Table 24: Technical Validation Results Exercise 3

Details on Exercise#03 validation results are provided in the following sections.

C.3.2 Results on technical feasibility

All Exercise#03 validation objectives deal with technical feasibility.

Scenario tests, as shown in C.1.3, addressed the feasibility of performance, reliability, and security areas in the context of SWIM PP MEPs. Results are detailed below.

C.3.2.1.Performance efficiency

Summary on Exercise#03 Performance efficiency validation results against technical validation objectives are provided in the section C.1.3.

Technical validation objectives for the performance category targeted by Exercise#03 are divided in message sequence delivery testing (OBJ-17.01-TRL6-TVALP-PERF.0001 to OBJ-17.01-TRL6-TVALP-PERF.0008), SWIM PP load testing (OBJ-17.01-TRL6-TVALP-PERF.0009 to OBJ-17.01-TRL6-TVALP-PERF.0024). These test results is discussed in the following sections.

a. message sequence delivery tests

Basic Exercise#03 test scenario method is to check the order of messages delivery to the recipient with respect to the FIFO and the priority ordering used by the sending entity.

Scenario are based on two air and ground paired applications, one being simulated, the second being operated on an Aircraft representative bench, as shown below:

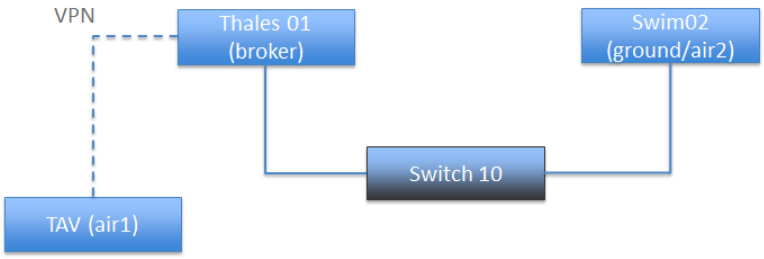


Figure 48: Exercise#03 V&V platform configuration for sequencing delivery tests

The following table lists the run scenario along with the test results:

Scenario	Scenario description	Test Result
FIFO RR Uplink	Ground applications are disconnected. Air applications send 10 requests (1 mg/s, Priority 4). Ground applications are connected, and creation-time is used to evaluate delivery sequences for requests and responses over all applications (air & ground).	Success
FIFO RR Downlink	Air applications are disconnected. Ground applications send 10 requests (1 mg/s, Priority 4). Air applications are connected, and creation-time is used to evaluate delivery sequences for requests and responses over all applications (air & ground).	Success

FIFO PS Uplink	Air applications are subscribed to a topic, and disconnected. Ground applications send 10 publications (1 mg/s, Priority 4). Air applications are connected, and creation-time is used to evaluate delivery sequences of published messages in air applications.	Success
FIFO PS Downlink	Ground applications are subscribed to a topic, and disconnected. Air applications send 10 publications (1 mg/s, Priority 4). Ground applications are connected, and creation-time is used to evaluate delivery sequences for published messages in ground applications.	Success
Priority RR Uplink	Ground applications are disconnected. Air applications send 10 requests (1 mg/s, priority increasing). Ground applications are connected, and creation-time is used to evaluate delivery sequences for requests and responses over all applications (air & ground).	Success
Priority RR Downlink	Air applications are disconnected. Ground applications send 10 requests (1 mg/s, priority increasing). Air applications are connected, and creation-time is used to evaluate delivery sequences for requests and responses over all applications (air & ground).	Success
Priority PS Uplink	Air applications are subscribed to a topic, and disconnected. Ground applications send 10 publications (1 mg/s, priority increasing). Air applications are connected, and creation-time is used to evaluate delivery sequences of published messages in air applications.	Success
Priority PS Downlink	Ground applications are subscribed to a topic, and disconnected. Air applications send 10 publications (1 mg/s, priority increasing). Ground applications are connected, and creation-time is used to evaluate delivery sequences for published messages in ground applications.	Success

Table 25: Exercise#03 Technical sequencing delivery tests Results

b. load tests

Basic Exercise#03 test scenario method consists in emulating 500 instances of airborne applications constrained by air/ground networking (limited to 512Kbps by simulation) and 500 instances of ground applications constrained by ground/ground networking (limited to 2Mbps by simulation).

The Exercise#03 V&V platform is therefore configured as shown below:

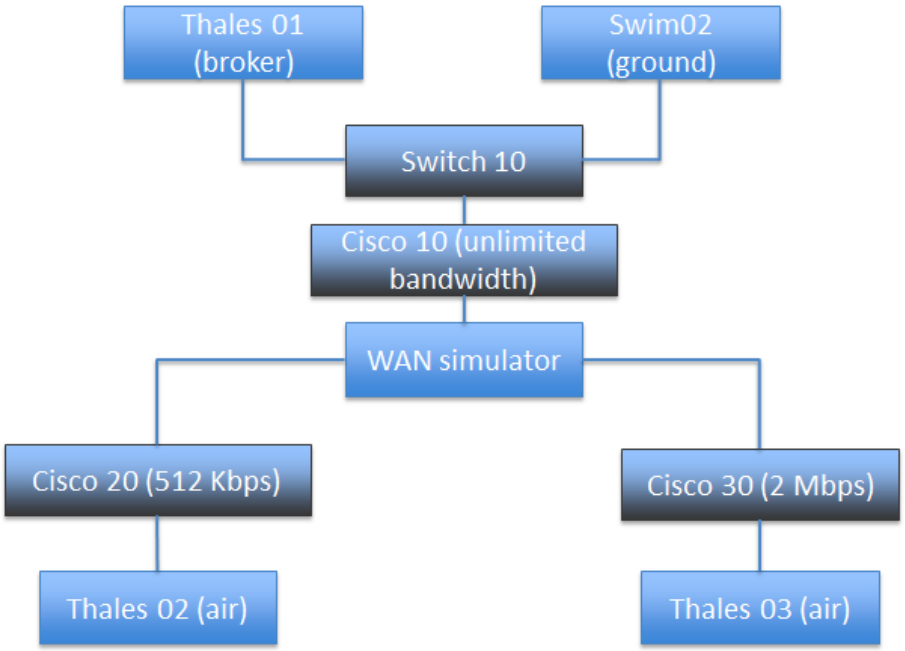


Figure 49: Exercise#03 V&V platform configuration for load tests

Applications messaging traffic behaviour is as follows:

Ground	Air
Time to live: 2h, priority 4, textual payload size according to the message distribution category.	
Receive Downlink PS information. **Publish Uplink PS information.** **Answer to aircraft request.** **Send request to aircraft, wait for answers.**	Publish Downlink PS information. Receive Uplink PS information. Answer to ground request. Send request to ground, wait for answers.
Uplink RR : 2 mg/h per A/C (2 request + 2 response) **Uplink PS : 3 mg/h per A/C (after subscription)**	Downlink RR : 2 mg/h (2 request + 2 response) Downlink PS : 4 mg/h (after subscription)

Table 26: Exercise#03 Load tests' Applications messaging's traffic behaviour

The run scenario resulting figures, depending on exercised aircrafts number and maximum message size allowed per category, have been sorted by PP SWIM system segments (aircraft inflight, aircraft on ground, ground access point) and by SWIM PP MEP direction (uplink, downlink messaging).

For clarity, the following drawings focus on these run scenario figures, up to 20 aircrafts, and up to the maximum message size per category:

- First set shows variation of message exchanges transit time when the aircrafts number increase, for several message sizes.

- Second set shows variation of message exchanges transit time when the message size increase, for several numbers of aircraft supported.

- **Message exchanges Transit Time (s) by aircrafts number Variation**

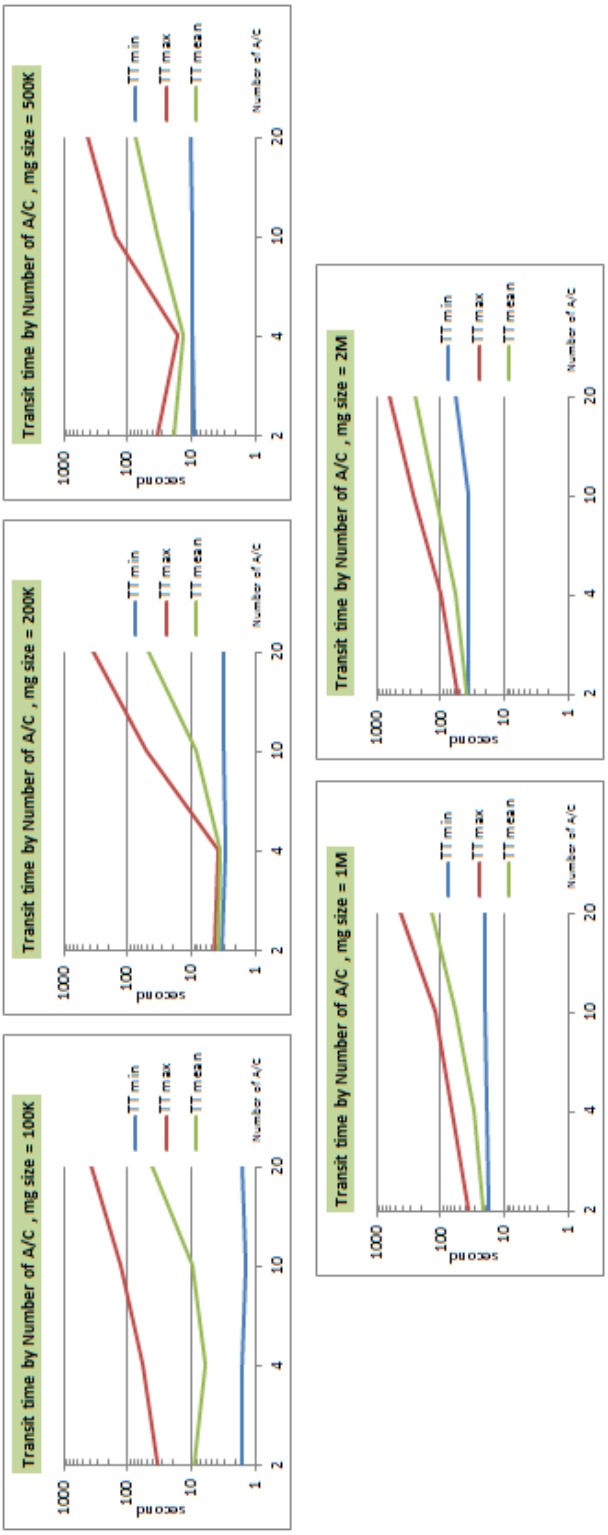


Figure 50: Downlink (A/C Inflight to Ground) Transit Time figures by A/C number

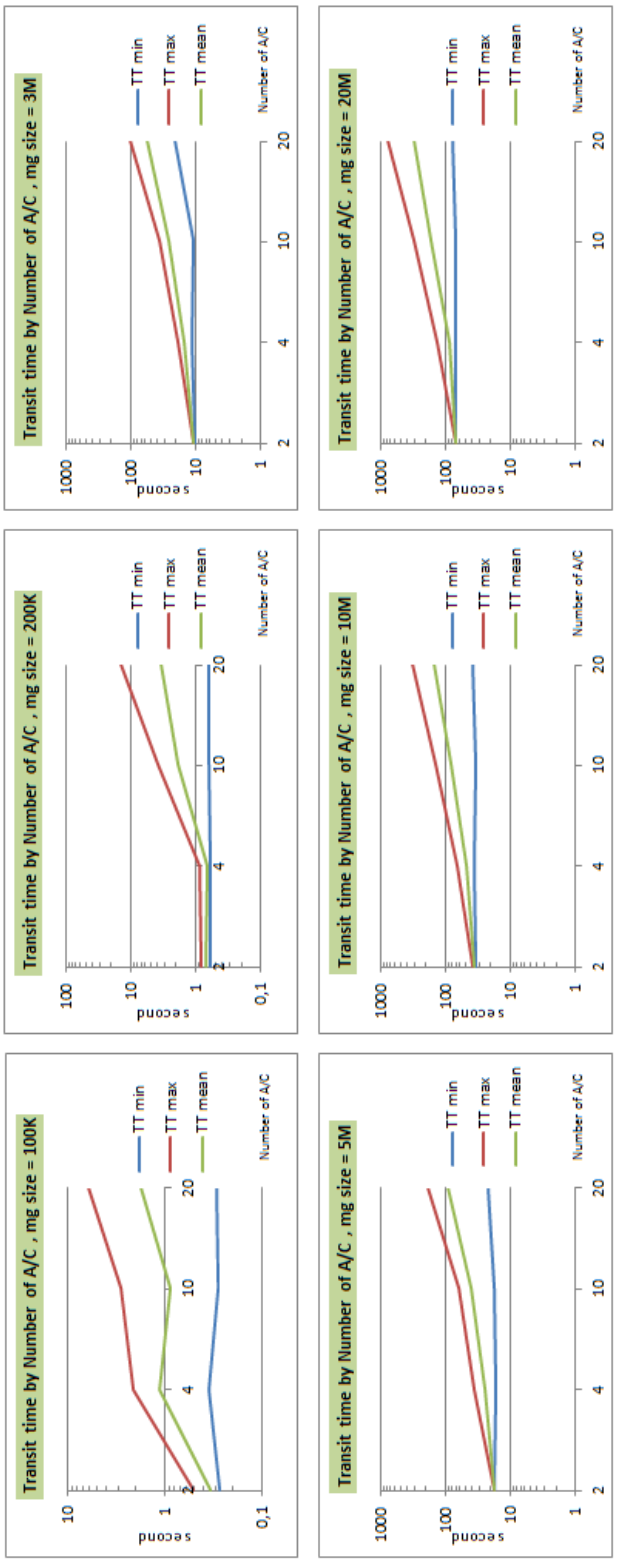


Figure 51: Downlink (A/C on Ground to Ground) Transit Time figures by A/C number

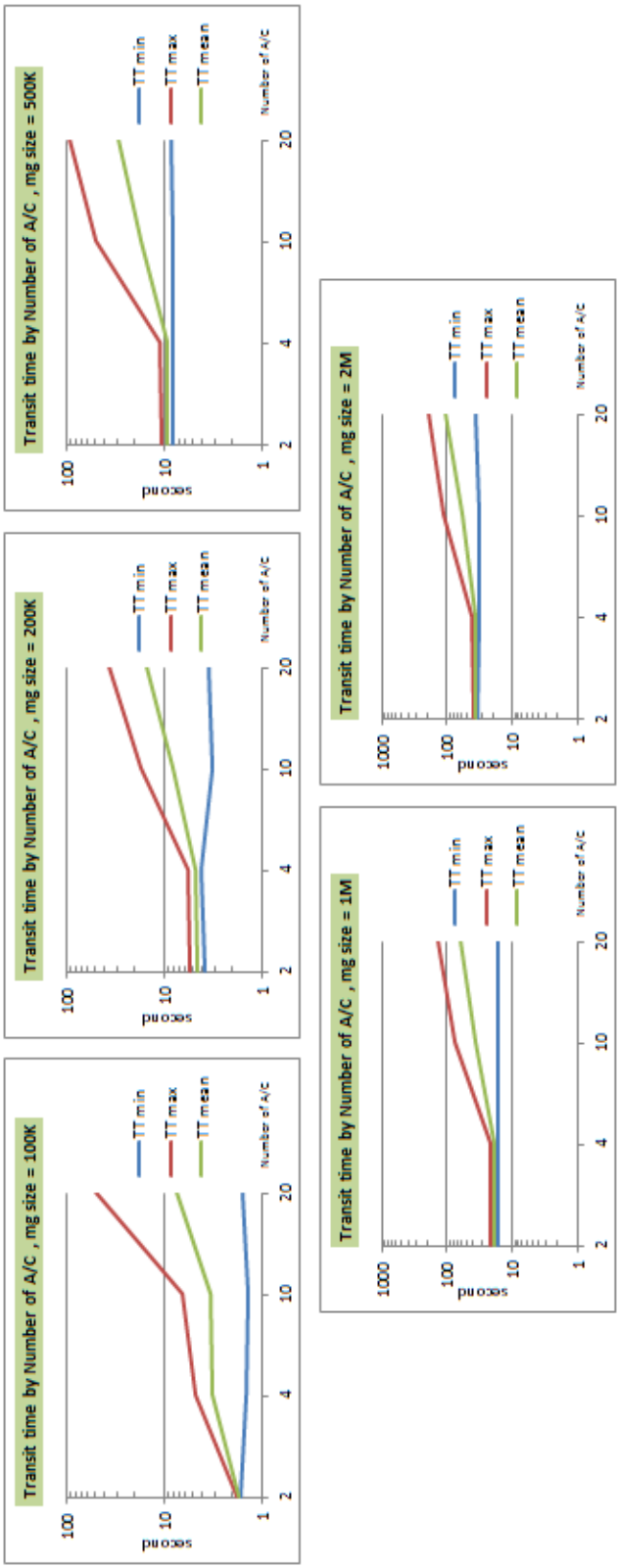


Figure 52: Uplink (Ground to A/C Inflight) Transit Time figures by A/C number

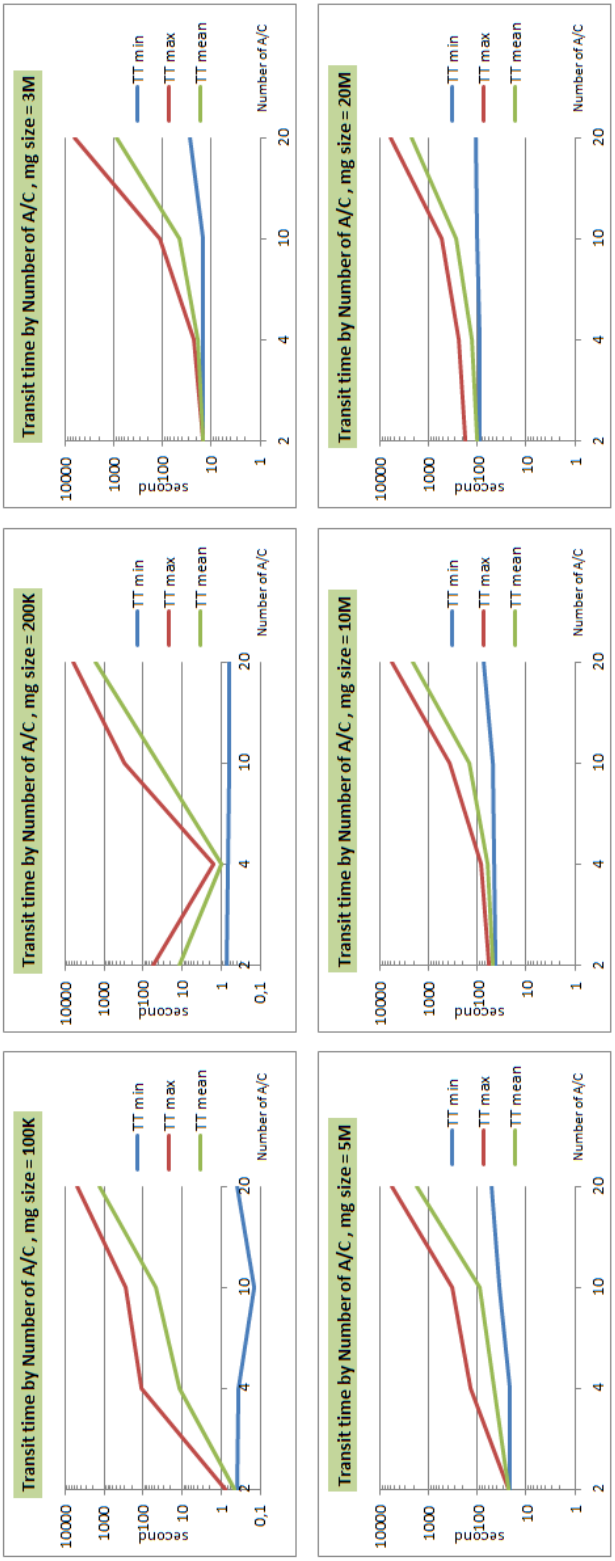


Figure 53: Uplink (Ground to A/C on Ground) Transit Time figures by A/C number

This drawings sorted by message size, shows transit delays variation when the number of aircrafts increase (half of them being on ground). Analysis of these transit delays' figures is provided in section C.3.4.1.

- **Message exchanges Transit Time (s) by message sizes Variation**

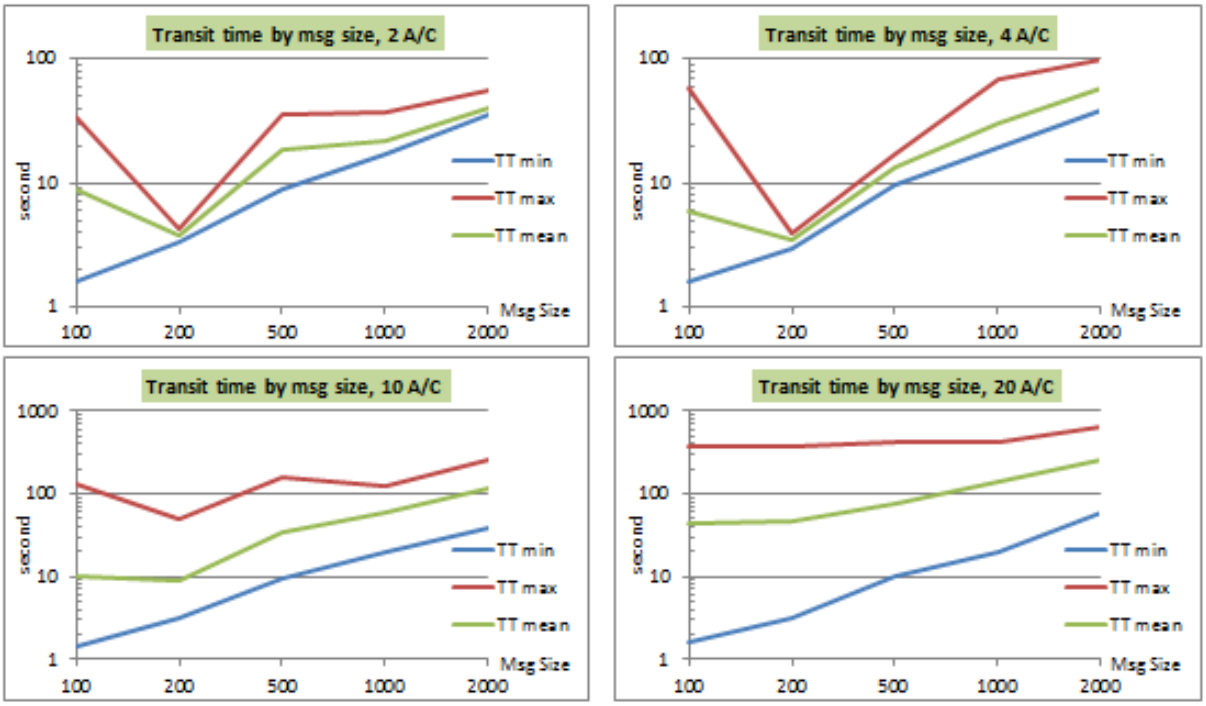


Figure 54: Downlink (Inflight to Ground) Transit Time figures by message size

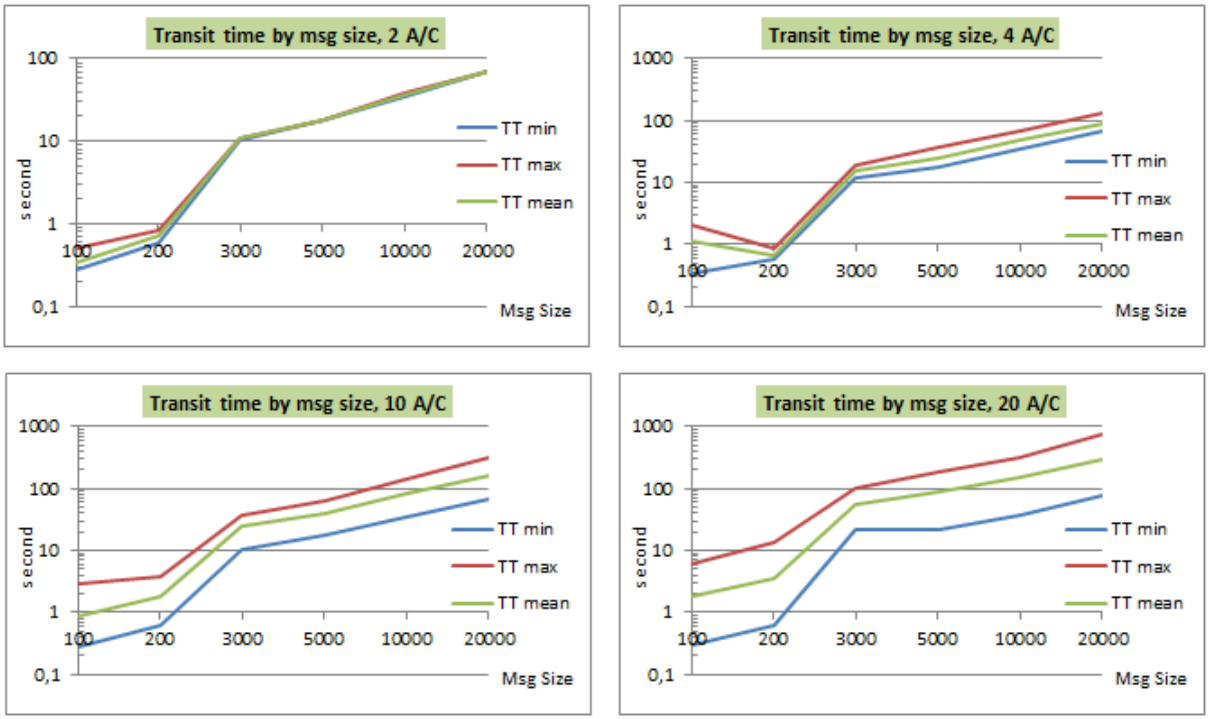


Figure 55: Downlink (A/C on Ground to Ground) Transit Time figures by message size

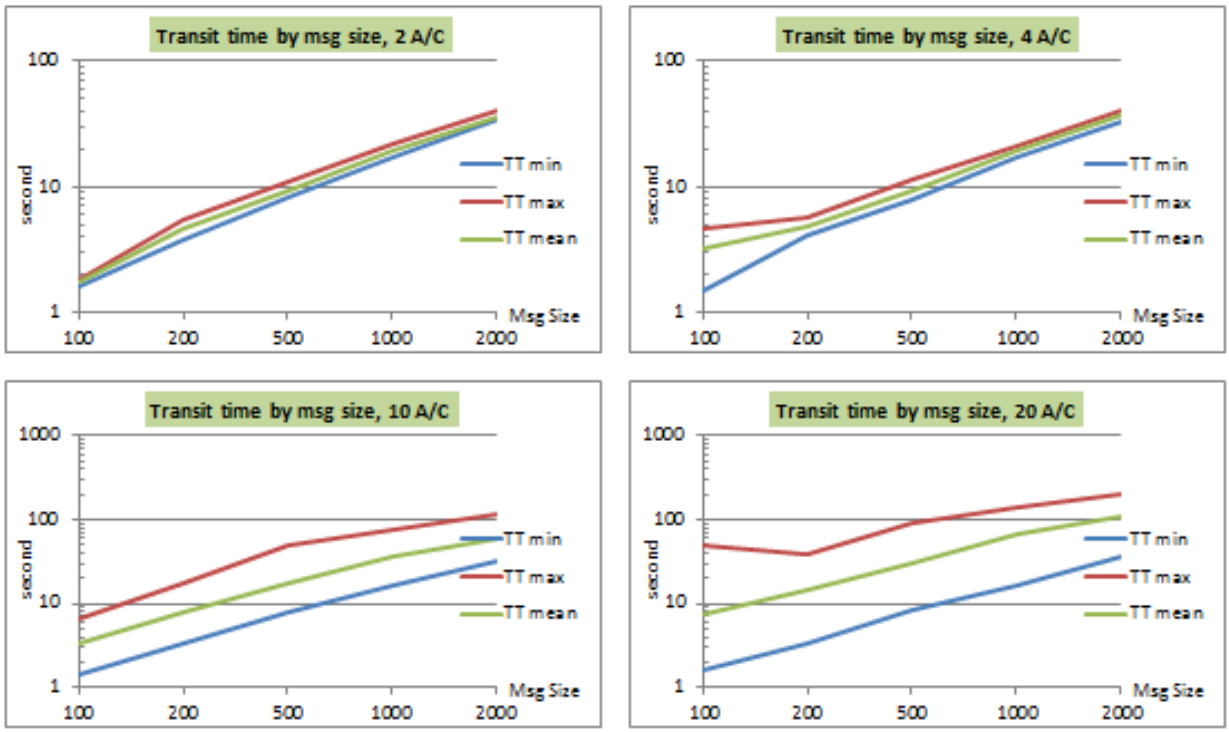


Figure 56: Uplink (Ground to Inflight) Transit Time figures by message size

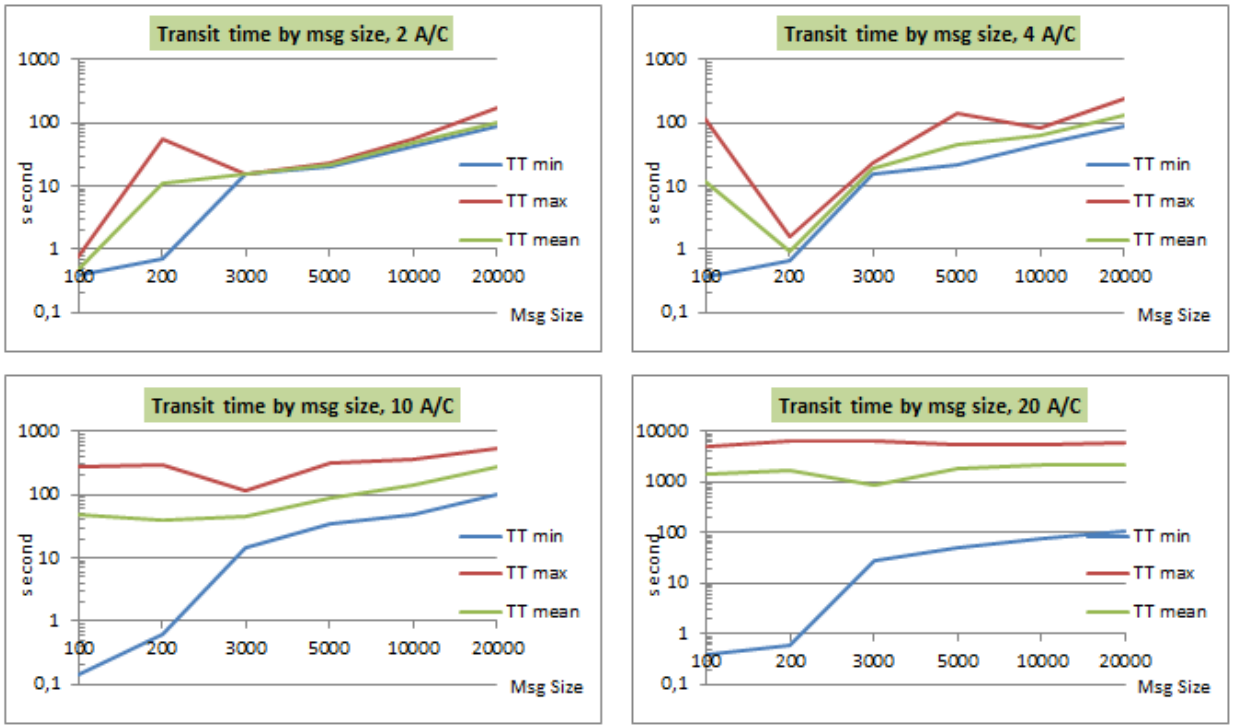


Figure 57: Uplink (Ground to on Ground) Transit Time figure by message size

This drawings sorted by number of supported A/Cs, shows transit delays variation when the exchanged message size increase. Analysis of these transit delays' figures is provided in section C.3.4.1.

C.3.2.2.Reliability efficiency

Technical validation objectives for the reliability category, along with the associated success criteria targeted by Exercise#03 are listed in TVALP [44] §5.3.3. Summary on Exercise#03 Reliability efficiency validation results against technical validation objectives are provided in the section C.3.1.

This test scenario method consists in establishing a connection between an Air and Ground SWIM node, issuing a message on it, abruptly terminating the connection at different levels, then wait for the Air node to re-establishes it, and for the peer node to consume the message.

Scenarios are based on air and ground paired applications, as shown below:

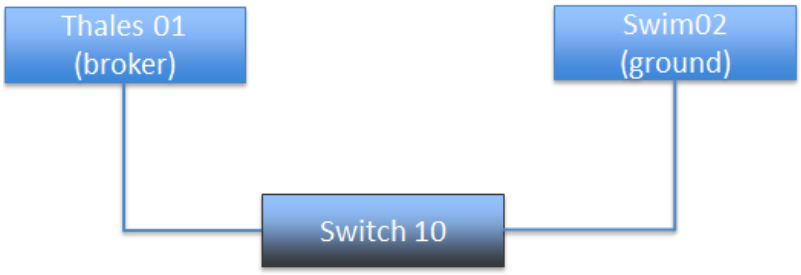


Figure 58: Exercise#03 V&V platform configuration for reliability tests

The following table lists the run scenario along with the test results:

Scenario	Scenario description	Test Result
At least once Uplink RR	Ground application sends a request to the SWIM node. A disconnection is initiated at : ○ SWIM node level ○ Network level ○ Ground peer level Periodical tries to reestablish the connection are made, until it succeeds. Request message is consumed and a response is sent. A disconnection is initiated at : ○ SWIM node level ○ Network level Periodical tries to reestablish the connection are made, until it succeeds. Response message is consumed.	Success
At least once Downlink RR	Air application sends a request to the SWIM node. A disconnection is initiated at : ○ SWIM node level ○ Network level ○ Ground peer level Periodical tries to reestablish the connection are made, until it succeeds. Request message is consumed and a response is sent. A disconnection is initiated at : ○ SWIM node level ○ Network level Periodical tries to reestablish the connection are made, until it succeeds. Response message is consumed.	Success

At least once Uplink PS	Air application is subscribed to a ground topic. Ground application sends a publication for that topic on the SWIM node. A disconnection is initiated at : ○ SWIM node level ○ Network level ○ Ground peer level Periodical tries to reestablish the connection are made, until it succeeds. publication message is consumed	Success
At least once Downlink PS	Ground application is subscribed to an air topic. Air application sends a publication for that topic on the SWIM node. A disconnection is initiated at : ○ SWIM node level ○ Network level ○ Ground peer level Periodical tries to reestablish the connection are made, until it succeeds. publication message is consumed	Success

Table 27: Exercise#03 Technical reliability tests Results

C.3.2.3.Security characteristic

Technical validation objectives for the basic security controls, along with the associated success criteria targeted by Exercise#03 are listed in TVALP [44] §5.3.3. Summary on Exercise#03 Security validation results against technical validation objectives are provided in the section C.3.1.

This test scenario method consists in a specific test applications and SWIM nodes able to generate and send corrupted, malformed, overloaded, or expired messages, over the Exercise#03 SWIM PP system. Configured policy is to filter out any message improperly formatted or not related to the three Exercise#03 services: T/M Meteo, Position Reporting, or Free Text:

- Malformed message are based on setting absolute-expiry-time and creation-time inconsistent properties.
- Load limits are set to 140 characters on board and 100 characters on ground for the free text service.
- A single A/G connection limit is allowed by aircraft.

Scenarios are based on air and ground paired applications, as shown below:

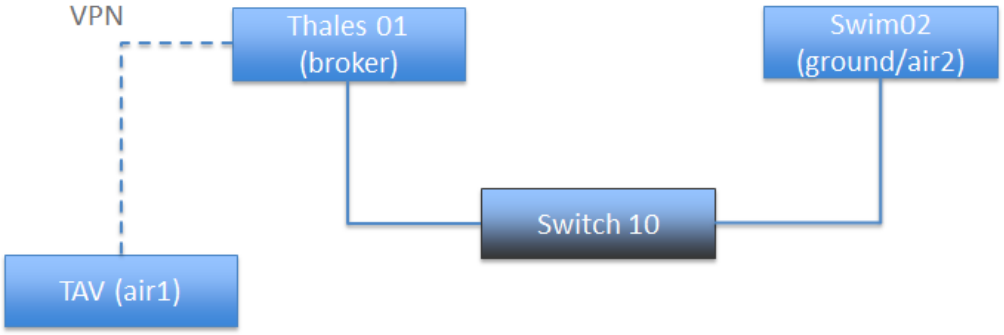


Figure 59: Exercise#03 V&V platform configuration for security tests

The following table lists the run scenario along with the test results:

Scenario	Scenario description	Test Result
Basic SWIM Nodes queue screening security	Air application sends a request message with an invalid property. The message is filtered out by the SWIM node. Air application sends a request message with valid properties. The message is consumed by the peer node. Ground application sends a request message with an invalid property. The message is filtered out by the SWIM node. Ground application sends a request message with valid properties. The message is consumed by the peer node.	Success
Basic SWIM Nodes topic screening security	Air application is subscribed to a MET topic, Ground application subscribes to POSREP topic. Air application sends publication message with an invalid property. The message is filtered out by the SWIM node. Air application sends publication message with valid properties. The message is consumed by the peer node. Ground application sends publication message with an invalid property. The message is filtered out by the SWIM node. Ground application sends publication message with valid properties. The message is consumed by the peer node.	Success

SWIM Nodes queue overload protection	Air application sends two FREETEXT messages (one small, and one overloaded). Large message is filtered out. Small message is consumed by the peer node. Ground application sends two FREETEXT messages (one small, and one overloaded). Large message is filtered out. Small message is consumed by the peer node.	Success
SWIM Nodes topic overload protection	Air application is subscribed to a MET topic, Ground application subscribes to POSREP topic. Air application sends two POSREP messages (one small, and one overloaded). Large message is filtered out. Small message is consumed by the peer node. Ground application sends two MET messages (one small, and one overloaded). Large message is filtered out. Small message is consumed by the peer node.	Success
SWIM Nodes connections limits	Air SWIM Node attempts to create a second AMQP connection with the Ground SWIM Node. The connection is not established, attempt is logged on the ground SWIM node.	Success
mutual authentication and basic certificate revocation check	SWIM Nodes mutual authentication fails for each of the following conditions: • TLS1.1 configured on one Node • Auto signed certificate is used • Expired certificate is used • revoked certificate is used and listed in the local CRL • Ground Nodes CRL is invalid	Success
CRL update	Failing SWIM Nodes mutual authentication succeeds after SWIM Node CRL update, on Air, on Ground, on both.	Success
OCSP update	Ground application mutual authenticated with ground SWIM Node with a certificate checked though OCSP. Ground application mutual authentication with ground SWIM Node rejected with a certificate checked though OCSP as revoked.	Success
SWIM Nodes queue authorization	Only Air Application POSREP is allowed to access SWIM Nodes posrep RR configured queues. Only Ground application MET is allowed to access SWIM Nodes Taf/Metar RR configured queues.	Success
SWIM Nodes topic authorization	Both Air Application POSREP and Ground application MET are allowed to access the subscription queue. Only Air Application POSREP is allowed to access SWIM Nodes posrep PS configured queues. Only Ground application MET is allowed to access SWIM Nodes Taf/Metar PS configured queues.	Success

message queue and topic lifecycle management	Creation of POSREP, MET, FREETEXT air and ground RR message queues on SWIM Nodes, POSREP, MET air and ground PS message queues on SWIM Nodes. Successful exchanges of RR POSREP, MET, FREETEXT messages between applications, and publication of posrep and taf/metar messages. Deletion of POSREP, MET, FREETEXT air and ground message queues on SWIM Nodes. Air and Ground applications are no longer able to exchange messages.	Success
RR HMAC based message	Air Application sends a request to the Ground application with a footer containing a hashed authentication that validates it. Ground Application sends a response to the Air application with a footer containing a hashed authentication that validates it. Air Application sends a request to the Ground application with a footer containing a hashed authentication that validates it. Ground Application sends a response to the Air application with a footer containing a wrong hashed authentication that discards it.	Success
Uplink PS HMAC based message	Ground Application is subscribed to the POSREP service. Air Application sends a publication to the Ground application with a footer containing a hashed authentication that validates it. Air Application sends a publication to the Ground application with a footer containing a wrong hashed authentication that discards it.	Success
Downlink PS HMAC based message	Air Application is subscribed to the MET service. Ground Application sends a publication to the Air application with a footer containing a hashed authentication that validates it. Ground Application sends a publication to the Air application with a footer containing a wrong hashed authentication that discards it.	Success

Table 28: Exercise#03 Technical security tests Results

C.3.3 Results per KPA

KPAs impact assessment for this technological solution is provided in the TVALP [44] §4.3.1. As stated, specific KPA targets have not been allocated to PJ17.01 solution technical validation objectives. Therefore, Exercise#03 is not able to provide results per KPA.

C.3.4 Analysis of Exercise 3 Results per Technical Validation objective

Mains Exercise#03 results in term of feasibility impacts are synthetized below.

Deployment choice: Several kinds of deployment are possible over SWIM PP.

The Exercise#03 deployment choice does allowed successful PS-MEPs and RR-MEPs exchanges between an Air node integrated over an avionics bench and a Ground node interconnected with ground aeronautical service. This type of deployment was based on the following main characteristics:

- Aircraft subscriptions were realised on ground over the aircraft operator facility, in order to not alter crew resource monitoring (CRM) and its associated workload on board. Subscriptions artefacts' are then statically configured on pilot's C-PED during the pre-flight briefing phase.
- Air Node integrated in avionics system implemented a pulling method consuming ground queued messages. This allows to better respect the flight phases traffic restrictions, avionics determinism and associated constraints at an increased latency cost.
- Ground Node integrated in a single SWIM PP access point supported a pushing method for consuming air queued messages. This allows the ground to consume the air queued messages as soon as the aircraft establishes the transport connection.
- A single network configuration was retained (configurable bandwidth characteristics over TLS1.3 over IPv4) using a deployment comprised of one single ground access point hosting connected to remote operational services (aeronautical weather distribution and aircraft position reporting).

Test scenario: Some adaptations were made on the exercise scenario involved in performance and security validation objectives.

- Load conditions characterization defined in the TS [40] §4.3.4.3 was not reachable given the network bandwidth limitation to 512 Kbps required by TS latency requirements (referring to technical objectives OBJ-17.01-TRL6-TVALP-PERF.0009 to OBJ-17.01-TRL6-TVALP-PERF.0024).

  Thus, characterisation has been refined to a 2h observation period and a message rate of five messages per hour for each service for 1000 A/C, half on ground and half on air.
- Security was ensured at transport, session, and SWIM nodes levels. Introducing security features at TI level would require definition for a SOC interface. Therefore, all security artefacts were managed locally on the PP SWIM nodes.

Exercise#03 test tools and adapted scenario procedure allowed to successfully evaluate all foreseen validation objectives targeted in the TVALP [44] §5.3.3. The following sections provide the Exercise#03 analysis of the validation results per validation objective group.

C.3.4.1.Performance efficiency characteristic Technical Validation Objectives

Exercise#03 tests results, as shown in C3.2, did not identified limitations on messages delivery or prioritisation objectives, but have identified some limitation in term of performance efficiency of a single ground access point serving simultaneously multiple aircrafts.

Transit Time figures variation by A/C number drawings sorted by message size shows transit delays when the number of aircrafts increase (half of them being on ground). Analysis of these transit delays' figures highlights the following behaviour:

- Messaging transit delay is depending on networking limitations (512 Kbps in flight, 1Mbps on ground). Obviously, recorded transit times have been best when the aircrafts were grounded than for the in-flight ones.
- The chosen bandwidth limitation for the required message distribution schema does not allow the foreseen 1000 connected A/C during the test run time (2h), as out of delays messages filtering began to appear for 20 connected A/Cs.
  This was recognised during the prototype test phase as being directly caused by the networking limitation in term of allocated bandwidth.
- Recorded variation in transit delay time shows minimum and maximum delays, with a gradient increasing while the number of aircrafts increases. This is the result of first sent messages being only limited by the available bandwidth while when next ones being queued in the TI, the transit delay up to the queues' limitations increased.
  This gradient between Min and Max transit delay can be seen as representative of the latency introduced in the system by queueing methods.
- Downlink transit delay times are consistently higher than Uplink ones. This may be a conjunction of a system made around a single ground access point serving all aircrafts and a difference in the choice of messages' consumption method (pull versus push).

Transit Time figures variation by message size sorted by number of supported A/Cs, shows transit delays when the exchanged message size increases. Analysis of these transit delays' figures highlights the following behaviour:

- Messaging transit delay is depending on networking limitations (512 Kbps in flight, 1Mbps on ground). Increasing the message size directly impacts the transit times especially while the aircraft is in-flight, mainly due to a resulting increase in air/ground communication transit time.
- Number of exchanged messages increase with the traffic distribution, which explains why the gradient between min and max transit delays increase with the number of aircrafts connected. Queuing time on the single ground access point increase up to the configured test limits finally leading to messages exceeding the time to live delays being filtered out.
  As already seen in the above analysis, the selected message distribution does not allow reaching required categories time performance for more than 20 A/C, whatever the messaging size category.
- Difference between min and max transit times remains comparable while the message size augments. This shows that queuing delays become preponderant while the message size augments.

C.3.4.2.Reliability efficiency Technical Validation Objectives

The Exercise#03 coverage for reliability efficiency was planned for an at-least-one guaranty delivery. Even if some requirements were not implemented on the Air SWIM node, that do not report event log over the SWIM TI -according to A811 [50] and A852 [51] standards-, all targeted technical and functional aspects were successfully tested.

C.3.4.3.Security characteristic Technical Validation Objectives

The Exercise#03 coverage for security was planned for the basic core PP SWIM profile.

Some security requirements were not implemented on the Air SWIM node:

- Audit: Air SWIM node not reporting event log over the SWIM TI according to A852 [51] standard,
- Authentication: Air SWIM node solely supports TLS1.3 and does not allow fall-back to an older protocol version, although the Ground SWIM node supports TLS1.3 and fall-back to TLS1.2.
- Revocation: Air SWIM node supports local CRL managed under avionics configuration management and does not support OCSP based revocation mechanisms, although the Ground SWIM node does support it.
- Resources' Lifecycle management: Air SWIM node Resources' Lifecycle management is based on static settings managed under avionics configuration management. Thus, Exercise#03 Air queues, topic, subscriptions, etc. are made on ground for the pre-flight flight phase and are not managed on-board.

However, despite these deployment choices, all basic security technical and functional aspects were successfully tested.

C.3.5 Unexpected Behaviours/Results

Performance efficiency validations had shown limits to the PP SWIM system load, as deployed by Exercise#03.

It has been recognized during the prototype development phase that TS chosen messages' distribution categories figures were not compatible with the networking limitations, especially on the A/G segment. Decision was made, at that stage, to keep the TS goal figures and evaluate the system performance given the Exercise#03 deployment choice.

Details on Exercise#03 performance load test results are provided in the section 0.

C.3.6 Confidence in Results of Validation Exercise 3

C.3.6.1.Level of significance/limitations of Technical Validation Exercise Results

Exercise#3 validation results are contributing to the project solution validation in term of:

- Functional and technical requirement coverage
- Technical validation objectives
- PP SWIM deployment over a single ground access point evaluation
- TS Requirements : requirement completeness

During the development phase, some requirements were discussed with improvement suggestion by the development team.

- 13 requirement text change on the PP core profile. 7 of them on the security category, 4 on the performance category, and 2 on the interface one.

  From those, validation feasibility on performance requirement (and associated technical objectives) for message size less than 20MB was found. It was agreed at solution level to not change the objectives' figure and report the results found (refer to section C.3.4.1).

- 6 requirements attribute change on the PP advanced profile for the reliability category. All of them to change the segment allocation.

As the technical feasibility has been demonstrated, a high level of significance is assumed.

As described in TVALP Exercise#3 scope [44] §5.3, the main limitation of this technical validation results is linked to the environmental representativeness of SWIM AP segments. Therefore one cannot conclude from Exercice#3 how the SWIM AP segments will be working precisely in operation, (i.e. in a real world context) without evaluating an explicit deployment choice.

Exercise#3 validation has the following limitations:

- Messaging through a single ground SWIM AP node has been considered.
- No interactions' evaluations with other SWIM profiles through some sort of gateway
- No interactions evaluations with network operation (NOC), and security operation (SOC) centres
- No life data, e.g. no live data from a real aeronautical service. Human performance was not evaluated in that matter.
- No real aeronautical communication paths between the ground facilities and aircrafts (a TCP/IP WAN simulator was used to mitigate)

C.3.6.2.Quality of Technical Validation Exercises Results

All Exercise#3 validation activities went as planed and as described in TVALP [44].

- Air and Ground prototypes developments met the TS [40] targeted requirements, as resulting from Exercise#3 PJ.17-01 TRL6 TVALP [44] §5.3 objectives' coverage.
- V&V platform deployment and integration went as planned.
- Test scenario development, integration, and execution went as planned.
- Run test phase was successfully performed in Eurocontrol (Bretigny) and Thales Avionics (Toulouse) facilities.
- Test results evaluation went as planned.

C.3.6.3.Significance of Technical Validation Exercises Results

PP SWIM Technical feasibility has been addressed for the Exercise #3 deployment choice and significant TS [40] requirement coverage is provided.

As planed in TVALP [44], Exercise#3 validation was performed in emulated and simulated environments. Therefore, the results have only a limited significance for real environments in terms of:

- Cockpit environment. Although Exercise#3 exercised some validation test in an aircraft representative environment, hazards analysis and human factor analysis were not addressed for the chosen deployment choice. Thus airworthiness for normal, abnormal, emergency, maintenance procedures including allowed phases of the flight are not evaluated.
- Airspace type (class A, B, C, D, and E): Route (ER), Terminal Manoeuvre Area (TMA), Arrival and Departure (ARR/DEP), Taxiing (Airport) were assimilated in Exercise#3 validation to a single homogeneous air to ground environment.
- Data communication capability and performance: Although PP SWIM reliability was evaluated; Aeronautical communication, public communication, and private communication (PMR) were simulated in Exercise#3 validation.

C.3.7 Conclusions

This section provides a summary of the conclusions raised by Exercise #3 validation activities results analysed in §C.3.4.

C.3.7.1.Conclusions on technical feasibility

It is technically feasible to implement the PJ17.01 SWIM PP TS [40].

The Exercise #3 technical validation results validate the targeted TS requirements related to reliability and security and most of the performance technical validation objectives.

Although PP SWIM system load testing did not reach the required performance figures, this is not impacting technical feasibility, as the global system performance is closely depending on deployment choices that directly impact how the load is distributed within the system's segments. In particular, attention should be driven on the ground SWIM node and ground access point performances that were central segments in the Exercise #3 system's deployment choice.

C.3.7.2.Conclusions on performance assessments

As a WAN emulator and dummy applications were used to simulate aeronautical operations, Exercise#3 figures and metrics results should not be considered to conclude on SWIM PP performance when operated over real aeronautical environments.

C.3.8 Recommendations

Given the Exercise #3 Technical Validation conclusions, it is recommended to address the following points:

- Consider system deployment, and address global interfaces to external systems, such as SWIM PP administration (registry, roles, access, …), Network Operating Centre (NOC), Security Operating Centre (SOC), safety based recording, …
- Assess real aeronautical services operations: consider real or representative aircraft avionics, consider real aeronautical communication links, and consider live aeronautical data, allowing:
    - A human factor analysis against a global operational use concept and an airworthiness evaluation of crew human performance impacts when operating over PP SWIM on-board.
    - A global hazard analysis, supporting airworthiness evaluation for safety related operations over the SWIM PP.

Appendix D Technical Validation Exercise #04 Report

D.1 Summary of the Technical Validation Exercise #04 Plan

EXE4 TRL6 plan is described in the PJ.17-01 TRL6 TVALP §5.4 [44].

D.1.1 Technical Validation Exercise #04 description and scope

EXE4 aims at demonstrating the technical interoperability at Purple Profile level of uplink and downlink advisory information (weather, aeronautical) information sharing in technical oriented scenarios involving prototypes from different industrial members. These technical scenarios involve Purple Profile SWIM Node prototypes (both ground and aircraft) and emulated Purple Profile enabled applications (both uplink and downlink), and they are defined to demonstrate the technical interoperability of core elements of the Purple Profile. Furthermore A/G network infrastructure layer will be based on PJ.14.02.04 prototypes. In terms of dependencies and relationships, EXE4 depends on EXE-17.01-TRL6-TVALP-EXE1.0001 (§5.1), EXE-17.01-TRL6-TVALP-EXE2.0002 (§5.2) and PJ.14.02.04 EXEs (D5.1.030 – Initial Technical Validation Plan).

Further details are provided in PJ.17-01 TRL6 TVALP §5.4.1 [44].

D.1.2 Summary of Exercise 4 Technical Validation Objectives and success criteria

EXE4 technical validation objectives and success criteria summary is provided in PJ.17-01 TRL6 TVALP §5.4.3 [44].

D.1.3 Summary of Technical Validation Exercise #04 Validation scenarios

EXE4 validation scenarios are described in PJ.17-01 TRL6 TVALP §5.4.4 [44].

D.1.4 Summary Technical Validation Exercise #04 Assumptions

In accordance with PJ.17-01 TRL6 TVALP §5.4.5 [44], no assumptions concerning the validation activities have been recorded.

D.2 Deviation from the planned activities

Table 29 provides the deviations in terms of EXE4 technical validation objectives coverage with respect to what was as planned in the TVALP [44]. For completeness, the table includes planned coverage (refer to Table 10) and when applicable deviations are highlighted and justified.

Technical Validation Objective ID	Success Criterion ID	EXE4	EXE4 Justification
OBJ-17.01-TRL6-TVALP-PERF.0001	CRT-17.01-TRL6-TVALP-PERF.0001	No deviation	N/A
OBJ-17.01-TRL6-TVALP-PERF.0002	CRT-17.01-TRL6-TVALP-PERF.0002	No deviation	N/A

Technical Validation Objective ID	Success Criterion ID	EXE4	EXE4 Justification
OBJ-17.01-TRL6-TVALP-PERF.0003	CRT-17.01-TRL6-TVALP-PERF.0003	No deviation	N/A
OBJ-17.01-TRL6-TVALP-PERF.0004	CRT-17.01-TRL6-TVALP-PERF.0004	No deviation	N/A
OBJ-17.01-TRL6-TVALP-PERF.0005	CRT-17.01-TRL6-TVALP-PERF.0005	No deviation	N/A
OBJ-17.01-TRL6-TVALP-PERF.0005	CRT-17.01-TRL6-TVALP-PERF.0006	No deviation	N/A
OBJ-17.01-TRL6-TVALP-PERF.0006	CRT-17.01-TRL6-TVALP-PERF.0007	No deviation	N/A
OBJ-17.01-TRL6-TVALP-PERF.0006	CRT-17.01-TRL6-TVALP-PERF.0006	No deviation	N/A
OBJ-17.01-TRL6-TVALP-PERF.0007	CRT-17.01-TRL6-TVALP-PERF.0008	No deviation	N/A
OBJ-17.01-TRL6-TVALP-PERF.0007	CRT-17.01-TRL6-TVALP-PERF.0006	No deviation	N/A
OBJ-17.01-TRL6-TVALP-PERF.0008	CRT-17.01-TRL6-TVALP-PERF.0009	No deviation	N/A
OBJ-17.01-TRL6-TVALP-PERF.0008	CRT-17.01-TRL6-TVALP-PERF.0006	No deviation	N/A
OBJ-17.01-TRL6-TVALP-PERF.0009	CRT-17.01-TRL6-TVALP-PERF.0010	No deviation	N/A
OBJ-17.01-TRL6-TVALP-PERF.0010	CRT-17.01-TRL6-TVALP-PERF.0011	No deviation	N/A
OBJ-17.01-TRL6-TVALP-PERF.0011	CRT-17.01-TRL6-TVALP-PERF.0012	No deviation	N/A
OBJ-17.01-TRL6-TVALP-PERF.0012	CRT-17.01-TRL6-TVALP-PERF.0013	No deviation	N/A
OBJ-17.01-TRL6-TVALP-PERF.0013	CRT-17.01-TRL6-TVALP-PERF.0014	No deviation	N/A
OBJ-17.01-TRL6-TVALP-PERF.0014	CRT-17.01-TRL6-TVALP-PERF.0015	No deviation	N/A
OBJ-17.01-TRL6-TVALP-PERF.0015	CRT-17.01-TRL6-TVALP-PERF.0016	No deviation	N/A

Technical Validation Objective ID	Success Criterion ID	EXE4	EXE4 Justification
OBJ-17.01-TRL6-TVALP-PERF.0016	CRT-17.01-TRL6-TVALP-PERF.0017	No deviation	N/A
OBJ-17.01-TRL6-TVALP-PERF.0017	CRT-17.01-TRL6-TVALP-PERF.0018	No deviation	N/A
OBJ-17.01-TRL6-TVALP-PERF.0018	CRT-17.01-TRL6-TVALP-PERF.0019	No deviation	N/A
OBJ-17.01-TRL6-TVALP-PERF.0019	CRT-17.01-TRL6-TVALP-PERF.0020	No deviation	N/A
OBJ-17.01-TRL6-TVALP-PERF.0020	CRT-17.01-TRL6-TVALP-PERF.0021	No deviation	N/A
OBJ-17.01-TRL6-TVALP-PERF.0021	CRT-17.01-TRL6-TVALP-PERF.0022	No deviation	N/A
OBJ-17.01-TRL6-TVALP-PERF.0022	CRT-17.01-TRL6-TVALP-PERF.0023	No deviation	N/A
OBJ-17.01-TRL6-TVALP-PERF.0023	CRT-17.01-TRL6-TVALP-PERF.0024	No deviation	N/A
OBJ-17.01-TRL6-TVALP-PERF.0024	CRT-17.01-TRL6-TVALP-PERF.0025	No deviation	N/A
OBJ-17.01-TRL6-TVALP-PERF.0025	CRT-17.01-TRL6-TVALP-PERF.0026	No deviation	N/A
OBJ-17.01-TRL6-TVALP-PERF.0026	CRT-17.01-TRL6-TVALP-PERF.0027	No deviation	N/A
OBJ-17.01-TRL6-TVALP-REL.0001	CRT-17.01-TRL6-TVALP-REL.0001	No deviation	N/A
OBJ-17.01-TRL6-TVALP-REL.0001	CRT-17.01-TRL6-TVALP-REL.0002	No deviation	N/A
OBJ-17.01-TRL6-TVALP-REL.0001	CRT-17.01-TRL6-TVALP-REL.0026	No deviation	N/A
OBJ-17.01-TRL6-TVALP-REL.0001	CRT-17.01-TRL6-TVALP-REL.0003	No deviation	N/A
OBJ-17.01-TRL6-TVALP-REL.0001	CRT-17.01-TRL6-TVALP-REL.0004	No deviation	N/A
OBJ-17.01-TRL6-TVALP-REL.0001	CRT-17.01-TRL6-TVALP-REL.0027	No deviation	N/A

Technical Validation Objective ID	Success Criterion ID	EXE4	EXE4 Justification
OBJ-17.01-TRL6-TVALP-REL.0001	CRT-17.01-TRL6-TVALP-REL.0005	No deviation	N/A
OBJ-17.01-TRL6-TVALP-REL.0001	CRT-17.01-TRL6-TVALP-REL.0006	No deviation	N/A
OBJ-17.01-TRL6-TVALP-REL.0001	CRT-17.01-TRL6-TVALP-REL.0007	No deviation	N/A
OBJ-17.01-TRL6-TVALP-REL.0002	CRT-17.01-TRL6-TVALP-REL.0008	No deviation	N/A
OBJ-17.01-TRL6-TVALP-REL.0002	CRT-17.01-TRL6-TVALP-REL.0009	No deviation	N/A
OBJ-17.01-TRL6-TVALP-REL.0002	CRT-17.01-TRL6-TVALP-REL.0028	No deviation	N/A
OBJ-17.01-TRL6-TVALP-REL.0002	CRT-17.01-TRL6-TVALP-REL.0010	No deviation	N/A
OBJ-17.01-TRL6-TVALP-REL.0002	CRT-17.01-TRL6-TVALP-REL.0011	No deviation	N/A
OBJ-17.01-TRL6-TVALP-REL.0002	CRT-17.01-TRL6-TVALP-REL.0029	No deviation	N/A
OBJ-17.01-TRL6-TVALP-REL.0002	CRT-17.01-TRL6-TVALP-REL.0005	No deviation	N/A
OBJ-17.01-TRL6-TVALP-REL.0002	CRT-17.01-TRL6-TVALP-REL.0006	No deviation	N/A
OBJ-17.01-TRL6-TVALP-REL.0002	CRT-17.01-TRL6-TVALP-REL.0007	No deviation	N/A
OBJ-17.01-TRL6-TVALP-REL.0003	CRT-17.01-TRL6-TVALP-REL.0012	No deviation	N/A
OBJ-17.01-TRL6-TVALP-REL.0003	CRT-17.01-TRL6-TVALP-REL.0013	No deviation	N/A
OBJ-17.01-TRL6-TVALP-REL.0003	CRT-17.01-TRL6-TVALP-REL.0030	No deviation	N/A
OBJ-17.01-TRL6-TVALP-REL.0003	CRT-17.01-TRL6-TVALP-REL.0005	No deviation	N/A
OBJ-17.01-TRL6-TVALP-REL.0003	CRT-17.01-TRL6-TVALP-REL.0006	No deviation	N/A

Technical Validation Objective ID	Success Criterion ID	EXE4	EXE4 Justification
OBJ-17.01-TRL6-TVALP-REL.0003	CRT-17.01-TRL6-TVALP-REL.0007	No deviation	N/A
OBJ-17.01-TRL6-TVALP-REL.0004	CRT-17.01-TRL6-TVALP-REL.0014	No deviation	N/A
OBJ-17.01-TRL6-TVALP-REL.0004	CRT-17.01-TRL6-TVALP-REL.0015	No deviation	N/A
OBJ-17.01-TRL6-TVALP-REL.0004	CRT-17.01-TRL6-TVALP-REL.0031	No deviation	N/A
OBJ-17.01-TRL6-TVALP-REL.0004	CRT-17.01-TRL6-TVALP-REL.0005	No deviation	N/A
OBJ-17.01-TRL6-TVALP-REL.0004	CRT-17.01-TRL6-TVALP-REL.0006	No deviation	N/A
OBJ-17.01-TRL6-TVALP-REL.0004	CRT-17.01-TRL6-TVALP-REL.0007	No deviation	N/A
OBJ-17.01-TRL6-TVALP-REL.0005	CRT-17.01-TRL6-TVALP-REL.0016	No deviation	N/A
OBJ-17.01-TRL6-TVALP-REL.0005	CRT-17.01-TRL6-TVALP-REL.0017	No deviation	N/A
OBJ-17.01-TRL6-TVALP-REL.0005	CRT-17.01-TRL6-TVALP-REL.0032	No deviation	N/A
OBJ-17.01-TRL6-TVALP-REL.0005	CRT-17.01-TRL6-TVALP-REL.0018	No deviation	N/A
OBJ-17.01-TRL6-TVALP-REL.0005	CRT-17.01-TRL6-TVALP-REL.0019	No deviation	N/A
OBJ-17.01-TRL6-TVALP-REL.0005	CRT-17.01-TRL6-TVALP-REL.0033	No deviation	N/A
OBJ-17.01-TRL6-TVALP-REL.0005	CRT-17.01-TRL6-TVALP-REL.0005	No deviation	N/A
OBJ-17.01-TRL6-TVALP-REL.0005	CRT-17.01-TRL6-TVALP-REL.0006	No deviation	N/A
OBJ-17.01-TRL6-TVALP-REL.0005	CRT-17.01-TRL6-TVALP-REL.0007	No deviation	N/A
OBJ-17.01-TRL6-TVALP-REL.0006	CRT-17.01-TRL6-TVALP-REL.0020	No deviation	N/A

Technical Validation Objective ID	Success Criterion ID	EXE4	EXE4 Justification
OBJ-17.01-TRL6-TVALP-REL.0006	CRT-17.01-TRL6-TVALP-REL.0021	No deviation	N/A
OBJ-17.01-TRL6-TVALP-REL.0006	CRT-17.01-TRL6-TVALP-REL.0034	No deviation	N/A
OBJ-17.01-TRL6-TVALP-REL.0006	CRT-17.01-TRL6-TVALP-REL.0022	No deviation	N/A
OBJ-17.01-TRL6-TVALP-REL.0006	CRT-17.01-TRL6-TVALP-REL.0011	No deviation	N/A
OBJ-17.01-TRL6-TVALP-REL.0006	CRT-17.01-TRL6-TVALP-REL.0035	No deviation	N/A
OBJ-17.01-TRL6-TVALP-REL.0006	CRT-17.01-TRL6-TVALP-REL.0005	No deviation	N/A
OBJ-17.01-TRL6-TVALP-REL.0006	CRT-17.01-TRL6-TVALP-REL.0006	No deviation	N/A
OBJ-17.01-TRL6-TVALP-REL.0006	CRT-17.01-TRL6-TVALP-REL.0007	No deviation	N/A
OBJ-17.01-TRL6-TVALP-REL.0007	CRT-17.01-TRL6-TVALP-REL.0023	No deviation	N/A
OBJ-17.01-TRL6-TVALP-REL.0007	CRT-17.01-TRL6-TVALP-REL.0024	No deviation	N/A
OBJ-17.01-TRL6-TVALP-REL.0007	CRT-17.01-TRL6-TVALP-REL.0036	No deviation	N/A
OBJ-17.01-TRL6-TVALP-REL.0007	CRT-17.01-TRL6-TVALP-REL.0005	No deviation	N/A
OBJ-17.01-TRL6-TVALP-REL.0007	CRT-17.01-TRL6-TVALP-REL.0006	No deviation	N/A
OBJ-17.01-TRL6-TVALP-REL.0007	CRT-17.01-TRL6-TVALP-REL.0007	No deviation	N/A
OBJ-17.01-TRL6-TVALP-REL.0008	CRT-17.01-TRL6-TVALP-REL.0025	No deviation	N/A
OBJ-17.01-TRL6-TVALP-REL.0008	CRT-17.01-TRL6-TVALP-REL.0038	No deviation	N/A
OBJ-17.01-TRL6-TVALP-REL.0008	CRT-17.01-TRL6-TVALP-REL.0037	No deviation	N/A

Technical Validation Objective ID	Success Criterion ID	EXE4	EXE4 Justification
OBJ-17.01-TRL6-TVALP-REL.0008	CRT-17.01-TRL6-TVALP-REL.0005	No deviation	N/A
OBJ-17.01-TRL6-TVALP-REL.0008	CRT-17.01-TRL6-TVALP-REL.0006	No deviation	N/A
OBJ-17.01-TRL6-TVALP-REL.0008	CRT-17.01-TRL6-TVALP-REL.0007	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0001	CRT-17.01-TRL6-TVALP-SEC.0001	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0001	CRT-17.01-TRL6-TVALP-SEC.0002	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0001	CRT-17.01-TRL6-TVALP-SEC.0003	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0001	CRT-17.01-TRL6-TVALP-SEC.0004	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0001	CRT-17.01-TRL6-TVALP-SEC.0008	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0001	CRT-17.01-TRL6-TVALP-SEC.0009	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0002	CRT-17.01-TRL6-TVALP-SEC.0001	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0002	CRT-17.01-TRL6-TVALP-SEC.0002	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0002	CRT-17.01-TRL6-TVALP-SEC.0003	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0002	CRT-17.01-TRL6-TVALP-SEC.0005	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0002	CRT-17.01-TRL6-TVALP-SEC.0006	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0002	CRT-17.01-TRL6-TVALP-SEC.0007	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0002	CRT-17.01-TRL6-TVALP-SEC.0008	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0002	CRT-17.01-TRL6-TVALP-SEC.0009	No deviation	N/A

Technical Validation Objective ID	Success Criterion ID	EXE4	EXE4 Justification
OBJ-17.01-TRL6-TVALP-SEC.0003	CRT-17.01-TRL6-TVALP-SEC.0010	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0003	CRT-17.01-TRL6-TVALP-SEC.0011	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0003	CRT-17.01-TRL6-TVALP-SEC.0012	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0003	CRT-17.01-TRL6-TVALP-SEC.0004	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0003	CRT-17.01-TRL6-TVALP-SEC.0008	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0003	CRT-17.01-TRL6-TVALP-SEC.0009	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0004	CRT-17.01-TRL6-TVALP-SEC.0010	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0004	CRT-17.01-TRL6-TVALP-SEC.0011	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0004	CRT-17.01-TRL6-TVALP-SEC.0012	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0004	CRT-17.01-TRL6-TVALP-SEC.0005	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0004	CRT-17.01-TRL6-TVALP-SEC.0006	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0004	CRT-17.01-TRL6-TVALP-SEC.0007	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0004	CRT-17.01-TRL6-TVALP-SEC.0008	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0004	CRT-17.01-TRL6-TVALP-SEC.0009	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0005	CRT-17.01-TRL6-TVALP-SEC.0013	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0005	CRT-17.01-TRL6-TVALP-SEC.0014	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0005	CRT-17.01-TRL6-TVALP-SEC.0015	No deviation	N/A

Technical Validation Objective ID	Success Criterion ID	EXE4	EXE4 Justification
OBJ-17.01-TRL6-TVALP-SEC.0005	CRT-17.01-TRL6-TVALP-SEC.0016	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0005	CRT-17.01-TRL6-TVALP-SEC.0017	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0005	CRT-17.01-TRL6-TVALP-SEC.0018	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0005	CRT-17.01-TRL6-TVALP-SEC.0019	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0006	CRT-17.01-TRL6-TVALP-SEC.0020	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0006	CRT-17.01-TRL6-TVALP-SEC.0021	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0006	CRT-17.01-TRL6-TVALP-SEC.0022	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0006	CRT-17.01-TRL6-TVALP-SEC.0016	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0006	CRT-17.01-TRL6-TVALP-SEC.0017	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0006	CRT-17.01-TRL6-TVALP-SEC.0018	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0006	CRT-17.01-TRL6-TVALP-SEC.0019	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0007	CRT-17.01-TRL6-TVALP-SEC.0013	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0007	CRT-17.01-TRL6-TVALP-SEC.0014	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0007	CRT-17.01-TRL6-TVALP-SEC.0015	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0007	CRT-17.01-TRL6-TVALP-SEC.0016	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0007	CRT-17.01-TRL6-TVALP-SEC.0017	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0007	CRT-17.01-TRL6-TVALP-SEC.0023	No deviation	N/A

Technical Validation Objective ID	Success Criterion ID	EXE4	EXE4 Justification
OBJ-17.01-TRL6-TVALP-SEC.0008	CRT-17.01-TRL6-TVALP-SEC.0020	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0008	CRT-17.01-TRL6-TVALP-SEC.0021	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0008	CRT-17.01-TRL6-TVALP-SEC.0022	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0008	CRT-17.01-TRL6-TVALP-SEC.0016	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0008	CRT-17.01-TRL6-TVALP-SEC.0017	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0008	CRT-17.01-TRL6-TVALP-SEC.0024	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0009	CRT-17.01-TRL6-TVALP-SEC.0025	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0009	CRT-17.01-TRL6-TVALP-SEC.0016	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0009	CRT-17.01-TRL6-TVALP-SEC.0026	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0010	CRT-17.01-TRL6-TVALP-SEC.0027	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0010	CRT-17.01-TRL6-TVALP-SEC.0016	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0010	CRT-17.01-TRL6-TVALP-SEC.0028	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0011	CRT-17.01-TRL6-TVALP-SEC.0029	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0011	CRT-17.01-TRL6-TVALP-SEC.0030	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0011	CRT-17.01-TRL6-TVALP-SEC.0031	Not covered	Taking into account the deployment schema for EXE4 (ground SWIM Node and ground applications provided by INDRA), it was not possible to cover this criteria. INDRA's prototypes does not support mutual authentication between Ground SWIM Node and ground applications.

Technical Validation Objective ID	Success Criterion ID	EXE4	EXE4 Justification
OBJ-17.01-TRL6-TVALP-SEC.0011	CRT-17.01-TRL6-TVALP-SEC.0032	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0011	CRT-17.01-TRL6-TVALP-SEC.0033	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0011	CRT-17.01-TRL6-TVALP-SEC.0034	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0011	CRT-17.01-TRL6-TVALP-SEC.0035	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0012	CRT-17.01-TRL6-TVALP-SEC.0036	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0012	CRT-17.01-TRL6-TVALP-SEC.0037	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0012	CRT-17.01-TRL6-TVALP-SEC.0038	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0013	CRT-17.01-TRL6-TVALP-SEC.0029	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0013	CRT-17.01-TRL6-TVALP-SEC.0030	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0013	CRT-17.01-TRL6-TVALP-SEC.0031	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0013	CRT-17.01-TRL6-TVALP-SEC.0032	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0013	CRT-17.01-TRL6-TVALP-SEC.0039	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0013	CRT-17.01-TRL6-TVALP-SEC.0040	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0013	CRT-17.01-TRL6-TVALP-SEC.0041	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0013	CRT-17.01-TRL6-TVALP-SEC.0042	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0014	CRT-17.01-TRL6-TVALP-SEC.0043	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0014	CRT-17.01-TRL6-TVALP-SEC.0044	No deviation	N/A

Technical Validation Objective ID	Success Criterion ID	EXE4	EXE4 Justification
OBJ-17.01-TRL6-TVALP-SEC.0014	CRT-17.01-TRL6-TVALP-SEC.0045	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0014	CRT-17.01-TRL6-TVALP-SEC.0046	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0014	CRT-17.01-TRL6-TVALP-SEC.0047	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0014	CRT-17.01-TRL6-TVALP-SEC.0048	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0015	CRT-17.01-TRL6-TVALP-SEC.0049	Fully covered	Capability supported also by INDRA prototype.
OBJ-17.01-TRL6-TVALP-SEC.0015	CRT-17.01-TRL6-TVALP-SEC.0050	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0015	CRT-17.01-TRL6-TVALP-SEC.0051	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0015	CRT-17.01-TRL6-TVALP-SEC.0052	Fully covered	Capability supported also by INDRA prototype.
OBJ-17.01-TRL6-TVALP-SEC.0015	CRT-17.01-TRL6-TVALP-SEC.0053	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0015	CRT-17.01-TRL6-TVALP-SEC.0054	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0015	CRT-17.01-TRL6-TVALP-SEC.0055	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0015	CRT-17.01-TRL6-TVALP-SEC.0056	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0015	CRT-17.01-TRL6-TVALP-SEC.0057	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0015	CRT-17.01-TRL6-TVALP-SEC.0058	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0016	CRT-17.01-TRL6-TVALP-SEC.0059	Fully covered	Capability supported also by INDRA prototype.
OBJ-17.01-TRL6-TVALP-SEC.0016	CRT-17.01-TRL6-TVALP-SEC.0060	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0016	CRT-17.01-TRL6-TVALP-SEC.0061	No deviation	N/A

Technical Validation Objective ID	Success Criterion ID	EXE4	EXE4 Justification
OBJ-17.01-TRL6-TVALP-SEC.0016	CRT-17.01-TRL6-TVALP-SEC.0062	Fully covered	Capability supported also by INDRA prototype.
OBJ-17.01-TRL6-TVALP-SEC.0016	CRT-17.01-TRL6-TVALP-SEC.0053	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0016	CRT-17.01-TRL6-TVALP-SEC.0054	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0016	CRT-17.01-TRL6-TVALP-SEC.0063	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0016	CRT-17.01-TRL6-TVALP-SEC.0064	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0016	CRT-17.01-TRL6-TVALP-SEC.0065	Fully covered	Capability supported also by INDRA prototype.
OBJ-17.01-TRL6-TVALP-SEC.0016	CRT-17.01-TRL6-TVALP-SEC.0066	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0017	CRT-17.01-TRL6-TVALP-SEC.0067	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0017	CRT-17.01-TRL6-TVALP-SEC.0068	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0017	CRT-17.01-TRL6-TVALP-SEC.0069	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0017	CRT-17.01-TRL6-TVALP-SEC.0070	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0017	CRT-17.01-TRL6-TVALP-SEC.0071	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0017	CRT-17.01-TRL6-TVALP-SEC.0072	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0017	CRT-17.01-TRL6-TVALP-SEC.0073	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0018	CRT-17.01-TRL6-TVALP-SEC.0074	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0018	CRT-17.01-TRL6-TVALP-SEC.0075	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0018	CRT-17.01-TRL6-TVALP-SEC.0076	No deviation	N/A

Technical Validation Objective ID	Success Criterion ID	EXE4	EXE4 Justification
OBJ-17.01-TRL6-TVALP-SEC.0018	CRT-17.01-TRL6-TVALP-SEC.0077	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0019	CRT-17.01-TRL6-TVALP-SEC.0078	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0019	CRT-17.01-TRL6-TVALP-SEC.0079	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0019	CRT-17.01-TRL6-TVALP-SEC.0080	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0019	CRT-17.01-TRL6-TVALP-SEC.0081	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0020	CRT-17.01-TRL6-TVALP-SEC.0078	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0020	CRT-17.01-TRL6-TVALP-SEC.0079	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0020	CRT-17.01-TRL6-TVALP-SEC.0080	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0020	CRT-17.01-TRL6-TVALP-SEC.0081	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0021	CRT-17.01-TRL6-TVALP-SEC.0082	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0021	CRT-17.01-TRL6-TVALP-SEC.0083	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0021	CRT-17.01-TRL6-TVALP-SEC.0084	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0021	CRT-17.01-TRL6-TVALP-SEC.0085	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0021	CRT-17.01-TRL6-TVALP-SEC.0086	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0021	CRT-17.01-TRL6-TVALP-SEC.0087	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0022	CRT-17.01-TRL6-TVALP-SEC.0088	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0022	CRT-17.01-TRL6-TVALP-SEC.0089	No deviation	N/A

Technical Validation Objective ID	Success Criterion ID	EXE4	EXE4 Justification
OBJ-17.01-TRL6-TVALP-SEC.0022	CRT-17.01-TRL6-TVALP-SEC.0090	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0022	CRT-17.01-TRL6-TVALP-SEC.0091	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0022	CRT-17.01-TRL6-TVALP-SEC.0092	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0023	CRT-17.01-TRL6-TVALP-SEC.0088	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0023	CRT-17.01-TRL6-TVALP-SEC.0089	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0023	CRT-17.01-TRL6-TVALP-SEC.0090	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0023	CRT-17.01-TRL6-TVALP-SEC.0091	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0023	CRT-17.01-TRL6-TVALP-SEC.0092	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0024	CRT-17.01-TRL6-TVALP-SEC.0093	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0024	CRT-17.01-TRL6-TVALP-SEC.0094	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0024	CRT-17.01-TRL6-TVALP-SEC.0095	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0025	CRT-17.01-TRL6-TVALP-SEC.0096	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0025	CRT-17.01-TRL6-TVALP-SEC.0097	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0026	CRT-17.01-TRL6-TVALP-SEC.0096	No deviation	N/A
OBJ-17.01-TRL6-TVALP-SEC.0026	CRT-17.01-TRL6-TVALP-SEC.0097	No deviation	N/A

Table 29: Deviations in terms of PJ.17-01 TRL6 EXE4 technical validation objectives coverage

More details about deviations and validation results are provided in D.3.

D.3 Technical Validation Exercise #04 Validation Results

D.3.1 Summary of Technical Validation Exercise #04 Results

The solution scenarios (technical oriented) for EXE4 do not refer to specific reference scenario(s): the technical scenarios is a sub-set of the scenarios defined for both EXE-17.01-TRL6-TVALP-EXE1.0002 and EXE-17.01-TRL6-TVALP-EXE2.0001.

The technical scenarios sub-set has been identified taking into account the purpose of EXE4: to increase the confidence level in the validation results in terms of technical interoperability of core Purple Profile capabilities and design.

Taking into account the above, the technical scenarios involve following prototypes:

- Application layer:
  - LDO Emulated aircraft and ground SWIM enabled applications.
  - INDRA Emulated ground SWIM enabled applications.
  - INDRA data provider tool integrated with ICARO.
- SWIM-TI layer:
  - LDO Aircraft and Ground SWIM Nodes.
  - INDRA Ground SWIM Node.
- Network layer:
  - PJ14.02.04 FCI prototype (HON Aircraft Router integrating LDO AeroMACS and INDRA SATCOM links).
- Certification authority/PKI:
  - LDO CA

The technical interoperability scenarios have been executed over following deployment:

- INDRA Purple Profile enabled ground applications connected to INDRA Ground SWIM Node.
- LDO Air SWIM Node connected to INDRA Ground SWIM Node.
- LDO Purple Profile enabled aircraft applications connected to LDO Air SWIM Node.

In the table below, the Purple Profile enabled SWIM services used in these scenarios are described.

Service name	Service description	Uplink / Downlink	Payload

Ground Echo	This service is provided by the ground and consumed by the air. The responder just replies with the text message sent by the requestor. No message level security, no compression.	Uplink	Text for both request and response
Air Echo	This service is provided by the air and consumed by the ground. The responder just replies with the text message sent by the requestor. No message level security, no compression.	Downlink	Text for both request and response
Subscription Management (air subscribes to ground)	Purple Profile Subscription management federation between Air and Ground SWIM Node subscription handlers. Message level security (digital signature) is required. This is disabled on the LDO prototypes side. The topic used for testing is "topic://ground.dnotam".	Uplink (Air subscribing to ground topic)	XML for both request and response
Subscription Management (ground subscribes to air)	Purple Profile Subscription management federation between Air and Ground SWIM Node subscription handlers. Message level security (digital signature) is required. This is disabled on the LDO prototypes side. The topic used for testing is "topic://air.meteoprobe".	Downlink (Ground subscribing to air topic)	XML for both request and response
D-NOTAM	This is a Publish/Subscribe service provided by the ground (publisher) and consumed by the air (subscriber). In accordance with active subscriptions publication messages are routed to air and ground subscribers. No message level security, no compression. This service concerns publication messages related to the topic "ground.dnotam" handled by the subscription management (see above).	Uplink	AIXM 5.1 (XML). No XML validation. If enabled the reference XSD has to be shared at design time.

METEOPROBE	This is a Publish/Subscribe service provided by the air (publisher) and consumed by the ground (subscriber). In accordance with active subscriptions publication messages are routed to air and ground subscribers. No message level security, no compression. This service concerns publication messages related to the topic "air.meteoprobe" handled by the subscription management (see above).	Downlink	XML. No XML validation. If enabled the reference XSD has to be shared at design time.

Table 30: EXE4 Purple Profile enabled SWIM services

Table 31~~Table 31~~ provides a summary of the EXE4 validation results per validation objective.

- OK: technical validation objective achieves the expectations (exercise results achieve success criteria).
- NOK: technical validation objective does not achieve the expectations (exercise results do not achieve success criteria).
- Partially OK: technical validation objective achieves the expectations to a certain extent. The reasons why the technical validation objective is not fully achieved have been recorded in table below.

EXE4 requirements coverage is provided in Appendix J.

Technical Validation Exercise #04 Technical Validation Objective ID	Technical Validation Exercise #04 Technical Validation Objective Title	Technical Validation Exercise #04 Success Criterion ID	Technical Validation Exercise #04 Success Criterion	Technical Validation Exercise #04 Validation Results	Technical Validation Exercise #04 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-PERF.0001	FIFO message queue level ordering guarantees QoS for uplink service	CRT-17.01-TRL6-TVALP-PERF.0001	Messages sent by the ground sender are received in the same FIFO order by the aircraft application.	FIFO ordering has been successfully validated for messages exchanged for the two uplink (P/S and R/R) and two downlink (P/S and R/R) services.	OK
OBJ-17.01-TRL6-TVALP-PERF.0002	FIFO message queue level ordering guarantees QoS for downlink service	CRT-17.01-TRL6-TVALP-PERF.0002	Messages sent by the air sender are received in the same FIFO order by the ground application.	FIFO ordering has been successfully validated for messages exchanged for the two uplink (P/S and R/R) and two downlink (P/S and R/R) services.	OK
OBJ-17.01-TRL6-TVALP-PERF.0003	FIFO message topic level ordering guarantees QoS for uplink service	CRT-17.01-TRL6-TVALP-PERF.0003	Messages published by the ground publisher are received in the same FIFO order by the aircraft application(s).	FIFO ordering has been successfully validated for messages exchanged for the two uplink (P/S and R/R) and two downlink (P/S and R/R) services.	OK
OBJ-17.01-TRL6-TVALP-PERF.0004	FIFO message topic level ordering guarantees QoS for downlink service	CRT-17.01-TRL6-TVALP-PERF.0004	Messages published by the air publisher(s) are received in the same FIFO order by the ground application(s).	FIFO ordering has been successfully validated for messages exchanged for the two uplink (P/S and R/R) and two downlink (P/S and R/R) services.	OK
OBJ-17.01-TRL6-TVALP-PERF.0005	Message priority message queue level ordering guarantees QoS for uplink service	CRT-17.01-TRL6-TVALP-PERF.0005	The ground sender sends messages with different priorities and the aircraft application receives them ordered according to the priority (best effort).	Not planned	N/A

Technical Validation Exercise #04 Technical Validation Objective ID	Technical Validation Exercise #04 Technical Validation Objective Title	Technical Validation Exercise #04 Success Criterion ID	Technical Validation Exercise #04 Success Criterion	Technical Validation Exercise #04 Validation Results	Technical Validation Exercise #04 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-PERF.0005	Message priority message queue level ordering guarantees QoS for uplink service	CRT-17.01-TRL6-TVALP-PERF.0006	Messages with the same priority are received with FIFO ordering.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-PERF.0006	Message priority message queue level ordering guarantees QoS for downlink service	CRT-17.01-TRL6-TVALP-PERF.0007	The air sender sends messages with different priorities and the ground application receives them ordered according to the priority (best effort).	Not planned	N/A
OBJ-17.01-TRL6-TVALP-PERF.0006	Message priority message queue level ordering guarantees QoS for downlink service	CRT-17.01-TRL6-TVALP-PERF.0006	Messages with the same priority are received with FIFO ordering.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-PERF.0007	Message priority topic level ordering guarantees QoS for uplink service	CRT-17.01-TRL6-TVALP-PERF.0008	The ground publisher publishes messages with different priorities and the aircraft applications receive them ordered according to the priority (best effort).	Not planned	N/A

Technical Validation Exercise #04 Technical Validation Objective ID	Technical Validation Exercise #04 Technical Validation Objective Title	Technical Validation Exercise #04 Success Criterion ID	Technical Validation Exercise #04 Success Criterion	Technical Validation Exercise #04 Validation Results	Technical Validation Exercise #04 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-PERF.0007	Message priority topic level ordering guarantees QoS for uplink service	CRT-17.01-TRL6-TVALP-PERF.0006	Messages with the same priority are received with FIFO ordering.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-PERF.0008	Message priority message topic level ordering guarantees QoS for downlink service	CRT-17.01-TRL6-TVALP-PERF.0009	The air publisher publishes messages with different priorities and the ground applications receive them ordered according to the priority (best effort).	Not planned	N/A
OBJ-17.01-TRL6-TVALP-PERF.0008	Message priority message topic level ordering guarantees QoS for downlink service	CRT-17.01-TRL6-TVALP-PERF.0006	Messages with the same priority are received with FIFO ordering.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-PERF.0009	End to end message latency for Category A uplink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-PERF.0010	The measured end to end message latency for Category A uplink Request/Response Purple Profile enabled SWIM services is <= 20s for 95% of the messages and <= 40s for 98% of the messages in the reference measurement conditions.	Not planned	N/A

Technical Validation Exercise #04 Technical Validation Objective ID	Technical Validation Exercise #04 Technical Validation Objective Title	Technical Validation Exercise #04 Success Criterion ID	Technical Validation Exercise #04 Success Criterion	Technical Validation Exercise #04 Validation Results	Technical Validation Exercise #04 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-PERF.0010	End to end message latency for Category A downlink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-PERF.0011	The measured end to end message latency for Category A downlink Request/Response Purple Profile enabled SWIM services is <= 20s for 95% of the messages and <= 40s for 98% of the messages in the reference measurement conditions.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-PERF.0011	End to end message latency for Category B uplink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-PERF.0012	The measured end to end message latency for Category B uplink Request/Response Purple Profile enabled SWIM services is <= 30s for 95% of the messages and <= 60s for 98% of the messages in the reference measurement conditions.	Not planned	N/A

Technical Validation Exercise #04 Technical Validation Objective ID	Technical Validation Exercise #04 Technical Validation Objective Title	Technical Validation Exercise #04 Success Criterion ID	Technical Validation Exercise #04 Success Criterion	Technical Validation Exercise #04 Validation Results	Technical Validation Exercise #04 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-PERF.0012	End to end message latency for Category B downlink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-PERF.0013	The measured end to end message latency for Category B downlink Request/Response Purple Profile enabled SWIM services is <= 30s for 95% of the messages and <= 60s for 98% of the messages in the reference measurement conditions.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-PERF.0013	End to end message latency for Category C uplink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-PERF.0014	The measured end to end message latency for Category C uplink Request/Response Purple Profile enabled SWIM services is <= 50s for 95% of the messages and <= 100s for 98% of the messages in the reference measurement conditions.	Not planned	N/A

Technical Validation Exercise #04 Technical Validation Objective ID	Technical Validation Exercise #04 Technical Validation Objective Title	Technical Validation Exercise #04 Success Criterion ID	Technical Validation Exercise #04 Success Criterion	Technical Validation Exercise #04 Validation Results	Technical Validation Exercise #04 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-PERF.0014	End to end message latency for Category C downlink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-PERF.0015	The measured end to end message latency for Category C downlink Request/Response Purple Profile enabled SWIM services is <= 50s for 95% of the messages and <= 100s for 98% of the messages in the reference measurement conditions.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-PERF.0015	End to end message latency for Category D uplink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-PERF.0016	The measured end to end message latency for Category D uplink Request/Response Purple Profile enabled SWIM services is <= 60s for 95% of the messages and <= 120s for 98% of the messages in the reference measurement conditions.	Not planned	N/A

Technical Validation Exercise #04 Technical Validation Objective ID	Technical Validation Exercise #04 Technical Validation Objective Title	Technical Validation Exercise #04 Success Criterion ID	Technical Validation Exercise #04 Success Criterion	Technical Validation Exercise #04 Validation Results	Technical Validation Exercise #04 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-PERF.0016	End to end message latency for Category D downlink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-PERF.0017	The measured end to end message latency for Category D downlink Request/Response Purple Profile enabled SWIM services is <= 60s for 95% of the messages and <= 120s for 98% of the messages in the reference measurement conditions.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-PERF.0017	End to end message latency for Category A uplink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-PERF.0018	The measured end to end message latency for Category A uplink Publish/Subscribe Purple Profile enabled SWIM services is <= 20s for 95% of the messages and <= 40s for 98% of the messages in the reference measurement conditions.	Not planned	N/A

Technical Validation Exercise #04 Technical Validation Objective ID	Technical Validation Exercise #04 Technical Validation Objective Title	Technical Validation Exercise #04 Success Criterion ID	Technical Validation Exercise #04 Success Criterion	Technical Validation Exercise #04 Validation Results	Technical Validation Exercise #04 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-PERF.0018	End to end message latency for Category A downlink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-PERF.0019	The measured end to end message latency for Category A downlink Publish/Subscribe Purple Profile enabled SWIM services is <= 20s for 95% of the messages and <= 40s for 98% of the messages in the reference measurement conditions.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-PERF.0019	End to end message latency for Category B uplink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-PERF.0020	The measured end to end message latency for Category B uplink Publish/Subscribe Purple Profile enabled SWIM services is <= 30s for 95% of the messages and <= 60s for 98% of the messages in the reference measurement conditions.	Not planned	N/A

Technical Validation Exercise #04 Technical Validation Objective ID	Technical Validation Exercise #04 Technical Validation Objective Title	Technical Validation Exercise #04 Success Criterion ID	Technical Validation Exercise #04 Success Criterion	Technical Validation Exercise #04 Validation Results	Technical Validation Exercise #04 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-PERF.0020	End to end message latency for Category B downlink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-PERF.0021	The measured end to end message latency for Category B downlink Publish/Subscribe Purple Profile enabled SWIM services is <= 30s for 95% of the messages and <= 60s for 98% of the messages in the reference measurement conditions.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-PERF.0021	End to end message latency for Category C uplink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-PERF.0022	The measured end to end message latency for Category C uplink Publish/Subscribe Purple Profile enabled SWIM services is <= 50s for 95% of the messages and <= 100s for 98% of the messages in the reference measurement conditions.	Not planned	N/A

Technical Validation Exercise #04 Technical Validation Objective ID	Technical Validation Exercise #04 Technical Validation Objective Title	Technical Validation Exercise #04 Success Criterion ID	Technical Validation Exercise #04 Success Criterion	Technical Validation Exercise #04 Validation Results	Technical Validation Exercise #04 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-PERF.0022	End to end message latency for Category C downlink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-PERF.0023	The measured end to end message latency for Category C downlink Publish/Subscribe Purple Profile enabled SWIM services is <= 50s for 95% of the messages and <= 100s for 98% of the messages in the reference measurement conditions.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-PERF.0023	End to end message latency for Category D uplink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-PERF.0024	The measured end to end message latency for Category D uplink Publish/Subscribe Purple Profile enabled SWIM services is <= 60s for 95% of the messages and <= 120s for 98% of the messages in the reference measurement conditions.	Not planned	N/A

Technical Validation Exercise #04 Technical Validation Objective ID	Technical Validation Exercise #04 Technical Validation Objective Title	Technical Validation Exercise #04 Success Criterion ID	Technical Validation Exercise #04 Success Criterion	Technical Validation Exercise #04 Validation Results	Technical Validation Exercise #04 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-PERF.0024	End to end message latency for Category D downlink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-PERF.0025	The measured end to end message latency for Category C downlink Publish/Subscribe Purple Profile enabled SWIM services is <= 60s for 95% of the messages and <= 120s for 98% of the messages in the reference measurement conditions.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-PERF.0025	On-the-fly compression QoS for uplink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-PERF.0026	Response messages sent by the ground responder are compressed and uncompressed on-the-fly by the Ground-Air SWIM Nodes pair, without violating message integrity, and received by the aircraft application.	Not planned	N/A

Technical Validation Exercise #04 Technical Validation Objective ID	Technical Validation Exercise #04 Technical Validation Objective Title	Technical Validation Exercise #04 Success Criterion ID	Technical Validation Exercise #04 Success Criterion	Technical Validation Exercise #04 Validation Results	Technical Validation Exercise #04 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-PERF.0026	On-the-fly compression QoS for uplink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-PERF.0027	Publication messages sent by the ground publisher are compressed and uncompressed on-the-fly by the Ground-Air SWIM Nodes pair, without violating message integrity, and received by the aircraft application.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-REL.0001	End-to-end at-least-once delivery guarantees QoS for uplink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0001	A request message from aircraft requestor is received at least once by the ground responder although, while routing the request message, a connection establishment failure event (successfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	Not planned	N/A

Technical Validation Exercise #04 Technical Validation Objective ID	Technical Validation Exercise #04 Technical Validation Objective Title	Technical Validation Exercise #04 Success Criterion ID	Technical Validation Exercise #04 Success Criterion	Technical Validation Exercise #04 Validation Results	Technical Validation Exercise #04 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-REL.0001	End-to-end at-least-once delivery guarantees QoS for uplink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0002	A request message from aircraft requestor is received at least once by the ground responder although, while routing the request message, an abnormal disconnection event due to transient network error (successfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-REL.0001	End-to-end at-least-once delivery guarantees QoS for uplink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0026	A request message from aircraft requestor is received at least once by the ground responder although, while routing the request message, an abnormal disconnection event due to ground peer restart (successfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	Not planned	N/A

Technical Validation Exercise #04 Technical Validation Objective ID	Technical Validation Exercise #04 Technical Validation Objective Title	Technical Validation Exercise #04 Success Criterion ID	Technical Validation Exercise #04 Success Criterion	Technical Validation Exercise #04 Validation Results	Technical Validation Exercise #04 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-REL.0001	End-to-end at-least-once delivery guarantees QoS for uplink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0003	A response message from the ground responder is received at least once by the aircraft requestor although, while routing the response message, a connection establishment failure event (successfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-REL.0001	End-to-end at-least-once delivery guarantees QoS for uplink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0004	A response message from the ground responder is received at least once by the aircraft requestor although, while routing the response message, an abnormal disconnection event due to transient network error (successfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	Not planned	N/A

Technical Validation Exercise #04 Technical Validation Objective ID	Technical Validation Exercise #04 Technical Validation Objective Title	Technical Validation Exercise #04 Success Criterion ID	Technical Validation Exercise #04 Success Criterion	Technical Validation Exercise #04 Validation Results	Technical Validation Exercise #04 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-REL.0001	End-to-end at-least-once delivery guarantees QoS for uplink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0027	A response message from the ground responder is received at least once by the aircraft requestor although, while routing the response message, an abnormal disconnection event due to ground peer restart (successfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-REL.0001	End-to-end at-least-once delivery guarantees QoS for uplink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0005	Message not delivered failure event is logged and traced because, while routing the message, a connection establishment failure event (unsuccessfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	Not planned	N/A

Technical Validation Exercise #04 Technical Validation Objective ID	Technical Validation Exercise #04 Technical Validation Objective Title	Technical Validation Exercise #04 Success Criterion ID	Technical Validation Exercise #04 Success Criterion	Technical Validation Exercise #04 Validation Results	Technical Validation Exercise #04 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-REL.0001	End-to-end at-least-once delivery guarantees QoS for uplink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0006	Message not delivered failure event is logged and traced because, while routing the message, an abnormal disconnection event (unsuccessfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-REL.0001	End-to-end at-least-once delivery guarantees QoS for uplink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0007	Message not delivered failure event is logged and traced because, while handling abnormal disconnection or connection establishment failure events at Air-Ground SWIM Nodes connection level, the message expires.	Not planned	N/A

Technical Validation Exercise #04 Technical Validation Objective ID	Technical Validation Exercise #04 Technical Validation Objective Title	Technical Validation Exercise #04 Success Criterion ID	Technical Validation Exercise #04 Success Criterion	Technical Validation Exercise #04 Validation Results	Technical Validation Exercise #04 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-REL.0002	End-to-end at-least-once delivery guarantees QoS for downlink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0008	A request message from ground requestor is received at least once by the aircraft responder although, while routing the request message, a connection establishment failure event (successfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-REL.0002	End-to-end at-least-once delivery guarantees QoS for downlink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0009	A request message from ground requestor is received at least once by the aircraft responder although, while routing the request message, an abnormal disconnection event due to transient network error (successfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	Not planned	N/A

Technical Validation Exercise #04 Technical Validation Objective ID	Technical Validation Exercise #04 Technical Validation Objective Title	Technical Validation Exercise #04 Success Criterion ID	Technical Validation Exercise #04 Success Criterion	Technical Validation Exercise #04 Validation Results	Technical Validation Exercise #04 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-REL.0002	End-to-end at-least-once delivery guarantees QoS for downlink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0028	A request message from ground requestor is received at least once by the aircraft responder although, while routing the request message, an abnormal disconnection event due to ground peer restart (successfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-REL.0002	End-to-end at-least-once delivery guarantees QoS for downlink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0010	A response message from the aircraft responder is received at least once by the ground requestor although, while routing the response message, a connection establishment failure event (successfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	Not planned	N/A

Technical Validation Exercise #04 Technical Validation Objective ID	Technical Validation Exercise #04 Technical Validation Objective Title	Technical Validation Exercise #04 Success Criterion ID	Technical Validation Exercise #04 Success Criterion	Technical Validation Exercise #04 Validation Results	Technical Validation Exercise #04 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-REL.0002	End-to-end at-least-once delivery guarantees QoS for downlink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0011	A response message from the aircraft responder is received at least once by the ground requestor although, while routing the response message, an abnormal disconnection event due to transient network error (successfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-REL.0002	End-to-end at-least-once delivery guarantees QoS for downlink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0029	A response message from the aircraft responder is received at least once by the ground requestor although, while routing the response message, an abnormal disconnection event due to ground peer restart (successfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	Not planned	N/A

Technical Validation Exercise #04 Technical Validation Objective ID	Technical Validation Exercise #04 Technical Validation Objective Title	Technical Validation Exercise #04 Success Criterion ID	Technical Validation Exercise #04 Success Criterion	Technical Validation Exercise #04 Validation Results	Technical Validation Exercise #04 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-REL.0002	End-to-end at-least-once delivery guarantees QoS for downlink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0005	Message not delivered failure event is logged and traced because, while routing the message, a connection establishment failure event (unsuccessfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-REL.0002	End-to-end at-least-once delivery guarantees QoS for downlink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0006	Message not delivered failure event is logged and traced because, while routing the message, an abnormal disconnection event (unsuccessfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	Not planned	N/A

Technical Validation Exercise #04 Technical Validation Objective ID	Technical Validation Exercise #04 Technical Validation Objective Title	Technical Validation Exercise #04 Success Criterion ID	Technical Validation Exercise #04 Success Criterion	Technical Validation Exercise #04 Validation Results	Technical Validation Exercise #04 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-REL.0002	End-to-end at-least-once delivery guarantees QoS for downlink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0007	Message not delivered failure event is logged and traced because, while handling abnormal disconnection or connection establishment failure events at Air-Ground SWIM Nodes connection level, the message expires.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-REL.0003	End-to-end at-least-once delivery guarantees QoS for uplink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0012	A publication message from ground publisher is received at least once by the aircraft subscriber although, while routing the message, a connection establishment failure event (successfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	Not planned	N/A

Technical Validation Exercise #04 Technical Validation Objective ID	Technical Validation Exercise #04 Technical Validation Objective Title	Technical Validation Exercise #04 Success Criterion ID	Technical Validation Exercise #04 Success Criterion	Technical Validation Exercise #04 Validation Results	Technical Validation Exercise #04 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-REL.0003	End-to-end at-least-once delivery guarantees QoS for uplink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0013	A publication message from ground publisher is received at least once by the aircraft subscriber although, while routing the message, an abnormal disconnection event due to transient network error (successfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-REL.0003	End-to-end at-least-once delivery guarantees QoS for uplink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0030	A publication message from ground publisher is received at least once by the aircraft subscriber although, while routing the message, an abnormal disconnection event due to ground peer restart (successfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	Not planned	N/A

Technical Validation Exercise #04 Technical Validation Objective ID	Technical Validation Exercise #04 Technical Validation Objective Title	Technical Validation Exercise #04 Success Criterion ID	Technical Validation Exercise #04 Success Criterion	Technical Validation Exercise #04 Validation Results	Technical Validation Exercise #04 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-REL.0003	End-to-end at-least-once delivery guarantees QoS for uplink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0005	Message not delivered failure event is logged and traced because, while routing the message, a connection establishment failure event (unsuccessfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-REL.0003	End-to-end at-least-once delivery guarantees QoS for uplink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0006	Message not delivered failure event is logged and traced because, while routing the message, an abnormal disconnection event (unsuccessfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	Not planned	N/A

Technical Validation Exercise #04 Technical Validation Objective ID	Technical Validation Exercise #04 Technical Validation Objective Title	Technical Validation Exercise #04 Success Criterion ID	Technical Validation Exercise #04 Success Criterion	Technical Validation Exercise #04 Validation Results	Technical Validation Exercise #04 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-REL.0003	End-to-end at-least-once delivery guarantees QoS for uplink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0007	Message not delivered failure event is logged and traced because, while handling abnormal disconnection or connection establishment failure events at Air-Ground SWIM Nodes connection level, the message expires.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-REL.0004	End-to-end at-least-once delivery guarantees QoS for downlink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0014	A publication message from aircraft publisher is received at least once by the ground subscriber although, while routing the message, a connection establishment failure event (successfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	Not planned	N/A

Technical Validation Exercise #04 Technical Validation Objective ID	Technical Validation Exercise #04 Technical Validation Objective Title	Technical Validation Exercise #04 Success Criterion ID	Technical Validation Exercise #04 Success Criterion	Technical Validation Exercise #04 Validation Results	Technical Validation Exercise #04 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-REL.0004	End-to-end at-least-once delivery guarantees QoS for downlink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0015	A publication message from aircraft publisher is received at least once by the ground subscriber although, while routing the message, an abnormal disconnection event due to transient network error (successfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-REL.0004	End-to-end at-least-once delivery guarantees QoS for downlink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0031	A publication message from aircraft publisher is received at least once by the ground subscriber although, while routing the message, an abnormal disconnection event due to ground peer restart (successfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	Not planned	N/A

Technical Validation Exercise #04 Technical Validation Objective ID	Technical Validation Exercise #04 Technical Validation Objective Title	Technical Validation Exercise #04 Success Criterion ID	Technical Validation Exercise #04 Success Criterion	Technical Validation Exercise #04 Validation Results	Technical Validation Exercise #04 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-REL.0004	End-to-end at-least-once delivery guarantees QoS for downlink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0005	Message not delivered failure event is logged and traced because, while routing the message, a connection establishment failure event (unsuccessfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-REL.0004	End-to-end at-least-once delivery guarantees QoS for downlink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0006	Message not delivered failure event is logged and traced because, while routing the message, an abnormal disconnection event (unsuccessfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	Not planned	N/A

Technical Validation Exercise #04 Technical Validation Objective ID	Technical Validation Exercise #04 Technical Validation Objective Title	Technical Validation Exercise #04 Success Criterion ID	Technical Validation Exercise #04 Success Criterion	Technical Validation Exercise #04 Validation Results	Technical Validation Exercise #04 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-REL.0004	End-to-end at-least-once delivery guarantees QoS for downlink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0007	Message not delivered failure event is logged and traced because, while handling abnormal disconnection or connection establishment failure events at Air-Ground SWIM Nodes connection level, the message expires.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-REL.0005	End-to-end exactly-once delivery guarantees QoS for uplink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0016	A request message from aircraft requestor is received exactly once by the ground responder although, while routing the request message, a connection establishment failure event (successfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	Not planned	N/A

Technical Validation Exercise #04 Technical Validation Objective ID	Technical Validation Exercise #04 Technical Validation Objective Title	Technical Validation Exercise #04 Success Criterion ID	Technical Validation Exercise #04 Success Criterion	Technical Validation Exercise #04 Validation Results	Technical Validation Exercise #04 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-REL.0005	End-to-end exactly-once delivery guarantees QoS for uplink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0017	A request message from aircraft requestor is received exactly once by the ground responder although, while routing the request message, an abnormal disconnection event due to transient network error (successfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-REL.0005	End-to-end exactly-once delivery guarantees QoS for uplink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0032	A request message from aircraft requestor is received exactly once by the ground responder although, while routing the request message, an abnormal disconnection event due to ground peer restart (successfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	Not planned	N/A

Technical Validation Exercise #04 Technical Validation Objective ID	Technical Validation Exercise #04 Technical Validation Objective Title	Technical Validation Exercise #04 Success Criterion ID	Technical Validation Exercise #04 Success Criterion	Technical Validation Exercise #04 Validation Results	Technical Validation Exercise #04 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-REL.0005	End-to-end exactly-once delivery guarantees QoS for uplink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0018	A response message from the ground responder is received exactly once by the aircraft requestor although, while routing the response message, a connection establishment failure event (successfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-REL.0005	End-to-end exactly-once delivery guarantees QoS for uplink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0019	A response message from the ground responder is received exactly once by the aircraft requestor although, while routing the response message, an abnormal disconnection event due to transient network error (successfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	Not planned	N/A

Technical Validation Exercise #04 Technical Validation Objective ID	Technical Validation Exercise #04 Technical Validation Objective Title	Technical Validation Exercise #04 Success Criterion ID	Technical Validation Exercise #04 Success Criterion	Technical Validation Exercise #04 Validation Results	Technical Validation Exercise #04 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-REL.0005	End-to-end exactly-once delivery guarantees QoS for uplink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0033	A response message from the ground responder is received exactly once by the aircraft requestor although, while routing the response message, an abnormal disconnection event due to ground peer restart (successfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-REL.0005	End-to-end exactly-once delivery guarantees QoS for uplink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0005	Message not delivered failure event is logged and traced because, while routing the message, a connection establishment failure event (unsuccessfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	Not planned	N/A

Technical Validation Exercise #04 Technical Validation Objective ID	Technical Validation Exercise #04 Technical Validation Objective Title	Technical Validation Exercise #04 Success Criterion ID	Technical Validation Exercise #04 Success Criterion	Technical Validation Exercise #04 Validation Results	Technical Validation Exercise #04 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-REL.0005	End-to-end exactly-once delivery guarantees QoS for uplink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0006	Message not delivered failure event is logged and traced because, while routing the message, an abnormal disconnection event (unsuccessfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-REL.0005	End-to-end exactly-once delivery guarantees QoS for uplink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0007	Message not delivered failure event is logged and traced because, while handling abnormal disconnection or connection establishment failure events at Air-Ground SWIM Nodes connection level, the message expires.	Not planned	N/A

Technical Validation Exercise #04 Technical Validation Objective ID	Technical Validation Exercise #04 Technical Validation Objective Title	Technical Validation Exercise #04 Success Criterion ID	Technical Validation Exercise #04 Success Criterion	Technical Validation Exercise #04 Validation Results	Technical Validation Exercise #04 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-REL.0006	End-to-end exactly-once delivery guarantees QoS for downlink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0020	A request message from ground requestor is received exactly once by the aircraft responder although, while routing the request message, a connection establishment failure event (successfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-REL.0006	End-to-end exactly-once delivery guarantees QoS for downlink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0021	A request message from ground requestor is received exactly once by the aircraft responder although, while routing the request message, an abnormal disconnection event due to transient network error (successfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	Not planned	N/A

Technical Validation Exercise #04 Technical Validation Objective ID	Technical Validation Exercise #04 Technical Validation Objective Title	Technical Validation Exercise #04 Success Criterion ID	Technical Validation Exercise #04 Success Criterion	Technical Validation Exercise #04 Validation Results	Technical Validation Exercise #04 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-REL.0006	End-to-end exactly-once delivery guarantees QoS for downlink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0034	A request message from ground requestor is received exactly once by the aircraft responder although, while routing the request message, an abnormal disconnection event due to ground peer restart (successfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-REL.0006	End-to-end exactly-once delivery guarantees QoS for downlink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0022	A response message from the aircraft responder is received exactly once by the ground requestor although, while routing the response message, a connection establishment failure event (successfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	Not planned	N/A

Technical Validation Exercise #04 Technical Validation Objective ID	Technical Validation Exercise #04 Technical Validation Objective Title	Technical Validation Exercise #04 Success Criterion ID	Technical Validation Exercise #04 Success Criterion	Technical Validation Exercise #04 Validation Results	Technical Validation Exercise #04 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-REL.0006	End-to-end exactly-once delivery guarantees QoS for downlink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0011	A response message from the aircraft responder is received exactly once by the ground requestor although, while routing the response message, an abnormal disconnection event due to transient network error (successfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-REL.0006	End-to-end exactly-once delivery guarantees QoS for downlink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0035	A response message from the aircraft responder is received exactly once by the ground requestor although, while routing the response message, an abnormal disconnection event due to ground peer restart (successfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	Not planned	N/A

Technical Validation Exercise #04 Technical Validation Objective ID	Technical Validation Exercise #04 Technical Validation Objective Title	Technical Validation Exercise #04 Success Criterion ID	Technical Validation Exercise #04 Success Criterion	Technical Validation Exercise #04 Validation Results	Technical Validation Exercise #04 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-REL.0006	End-to-end exactly-once delivery guarantees QoS for downlink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0005	Message not delivered failure event is logged and traced because, while routing the message, a connection establishment failure event (unsuccessfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-REL.0006	End-to-end exactly-once delivery guarantees QoS for downlink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0006	Message not delivered failure event is logged and traced because, while routing the message, an abnormal disconnection event (unsuccessfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	Not planned	N/A

Technical Validation Exercise #04 Technical Validation Objective ID	Technical Validation Exercise #04 Technical Validation Objective Title	Technical Validation Exercise #04 Success Criterion ID	Technical Validation Exercise #04 Success Criterion	Technical Validation Exercise #04 Validation Results	Technical Validation Exercise #04 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-REL.0006	End-to-end exactly-once delivery guarantees QoS for downlink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0007	Message not delivered failure event is logged and traced because, while handling abnormal disconnection or connection establishment failure events at Air-Ground SWIM Nodes connection level, the message expires.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-REL.0007	End-to-end exactly-once delivery guarantees QoS for uplink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0023	A publication message from ground publisher is received exactly once by the aircraft subscriber although, while routing the message, a connection establishment failure event (successfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	Not planned	N/A

Technical Validation Exercise #04 Technical Validation Objective ID	Technical Validation Exercise #04 Technical Validation Objective Title	Technical Validation Exercise #04 Success Criterion ID	Technical Validation Exercise #04 Success Criterion	Technical Validation Exercise #04 Validation Results	Technical Validation Exercise #04 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-REL.0007	End-to-end exactly-once delivery guarantees QoS for uplink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0024	A publication message from ground publisher is received exactly once by the aircraft subscriber although, while routing the message, an abnormal disconnection event due to transient network error (successfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-REL.0007	End-to-end exactly-once delivery guarantees QoS for uplink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0036	A publication message from ground publisher is received exactly once by the aircraft subscriber although, while routing the message, an abnormal disconnection event due to ground peer restart (successfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	Not planned	N/A

Technical Validation Exercise #04 Technical Validation Objective ID	Technical Validation Exercise #04 Technical Validation Objective Title	Technical Validation Exercise #04 Success Criterion ID	Technical Validation Exercise #04 Success Criterion	Technical Validation Exercise #04 Validation Results	Technical Validation Exercise #04 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-REL.0007	End-to-end exactly-once delivery guarantees QoS for uplink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0005	Message not delivered failure event is logged and traced because, while routing the message, a connection establishment failure event (unsuccessfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-REL.0007	End-to-end exactly-once delivery guarantees QoS for uplink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0006	Message not delivered failure event is logged and traced because, while routing the message, an abnormal disconnection event (unsuccessfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	Not planned	N/A

Technical Validation Exercise #04 Technical Validation Objective ID	Technical Validation Exercise #04 Technical Validation Objective Title	Technical Validation Exercise #04 Success Criterion ID	Technical Validation Exercise #04 Success Criterion	Technical Validation Exercise #04 Validation Results	Technical Validation Exercise #04 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-REL.0007	End-to-end exactly-once delivery guarantees QoS for uplink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0007	Message not delivered failure event is logged and traced because, while handling abnormal disconnection or connection establishment failure events at Air-Ground SWIM Nodes connection level, the message expires.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-REL.0008	End-to-end exactly-once delivery guarantees QoS for downlink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0025	A publication message from aircraft publisher is received exactly once by the ground subscriber although, while routing the message, a connection establishment failure event (successfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	Not planned	N/A

Technical Validation Exercise #04 Technical Validation Objective ID	Technical Validation Exercise #04 Technical Validation Objective Title	Technical Validation Exercise #04 Success Criterion ID	Technical Validation Exercise #04 Success Criterion	Technical Validation Exercise #04 Validation Results	Technical Validation Exercise #04 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-REL.0008	End-to-end exactly-once delivery guarantees QoS for downlink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0038	A publication message from aircraft publisher is received exactly once by the ground subscriber although, while routing the message, an abnormal disconnection event due to transient network error (successfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-REL.0008	End-to-end exactly-once delivery guarantees QoS for downlink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0037	A publication message from aircraft publisher is received exactly once by the ground subscriber although, while routing the message, an abnormal disconnection event due to ground peer restart (successfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	Not planned	N/A

Technical Validation Exercise #04 Technical Validation Objective ID	Technical Validation Exercise #04 Technical Validation Objective Title	Technical Validation Exercise #04 Success Criterion ID	Technical Validation Exercise #04 Success Criterion	Technical Validation Exercise #04 Validation Results	Technical Validation Exercise #04 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-REL.0008	End-to-end exactly-once delivery guarantees QoS for downlink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0005	Message not delivered failure event is logged and traced because, while routing the message, a connection establishment failure event (unsuccessfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-REL.0008	End-to-end exactly-once delivery guarantees QoS for downlink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0006	Message not delivered failure event is logged and traced because, while routing the message, an abnormal disconnection event (unsuccessfully handled via the automatic retry policy) occurs at Air-Ground SWIM Nodes connection level.	Not planned	N/A

Technical Validation Exercise #04 Technical Validation Objective ID	Technical Validation Exercise #04 Technical Validation Objective Title	Technical Validation Exercise #04 Success Criterion ID	Technical Validation Exercise #04 Success Criterion	Technical Validation Exercise #04 Validation Results	Technical Validation Exercise #04 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-REL.0008	End-to-end exactly-once delivery guarantees QoS for downlink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-REL.0007	Message not delivered failure event is logged and traced because, while handling abnormal disconnection or connection establishment failure events at Air-Ground SWIM Nodes connection level, the message expires.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-SEC.0001	Basic message screening security controls for message queue based information exchange	CRT-17.01-TRL6-TVALP-SEC.0001	Different message screening policies are successfully configured for two or more message queues.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-SEC.0001	Basic message screening security controls for message queue based information exchange	CRT-17.01-TRL6-TVALP-SEC.0002	Message screening policies are enforced on message queues used by Purple Profile enabled sender applications.	Not planned	N/A

Technical Validation Exercise #04 Technical Validation Objective ID	Technical Validation Exercise #04 Technical Validation Objective Title	Technical Validation Exercise #04 Success Criterion ID	Technical Validation Exercise #04 Success Criterion	Technical Validation Exercise #04 Validation Results	Technical Validation Exercise #04 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-SEC.0001	Basic message screening security controls for message queue based information exchange	CRT-17.01-TRL6-TVALP-SEC.0003	Message screening policies are enforced on Ground SWIM Node side message queues used by Air SWIM Nodes to send/consume messages.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-SEC.0001	Basic message screening security controls for message queue based information exchange	CRT-17.01-TRL6-TVALP-SEC.0004	A malformed AMQP 1.0 annotated message with uncomplete or invalid message properties is filtered out by enforcing the message screening policy.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-SEC.0001	Basic message screening security controls for message queue based information exchange	CRT-17.01-TRL6-TVALP-SEC.0008	Events concerning the message screening policies enforcement are logged in accordance with applicable audit policy.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-SEC.0001	Basic message screening security controls for message queue based information exchange	CRT-17.01-TRL6-TVALP-SEC.0009	A message screening policy is successfully updated at run-time without restarting the Ground SWIM Node.	Not planned	N/A

Technical Validation Exercise #04 Technical Validation Objective ID	Technical Validation Exercise #04 Technical Validation Objective Title	Technical Validation Exercise #04 Success Criterion ID	Technical Validation Exercise #04 Success Criterion	Technical Validation Exercise #04 Validation Results	Technical Validation Exercise #04 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-SEC.0002	Advanced message screening security controls for message queue based information exchange	CRT-17.01-TRL6-TVALP-SEC.0001	Different message screening policies are successfully configured for two or more message queues.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-SEC.0002	Advanced message screening security controls for message queue based information exchange	CRT-17.01-TRL6-TVALP-SEC.0002	Message screening policies are enforced on message queues used by Purple Profile enabled sender applications.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-SEC.0002	Advanced message screening security controls for message queue based information exchange	CRT-17.01-TRL6-TVALP-SEC.0003	Message screening policies are enforced on Ground SWIM Node side message queues used by Air SWIM Nodes to send/consume messages.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-SEC.0002	Advanced message screening security controls for message queue based information exchange	CRT-17.01-TRL6-TVALP-SEC.0005	A malformed AMQP 1.0 annotated message with syntactically invalid message payload is filtered out by enforcing the message screening policy.	Not planned	N/A

Technical Validation Exercise #04 Technical Validation Objective ID	Technical Validation Exercise #04 Technical Validation Objective Title	Technical Validation Exercise #04 Success Criterion ID	Technical Validation Exercise #04 Success Criterion	Technical Validation Exercise #04 Validation Results	Technical Validation Exercise #04 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-SEC.0002	Advanced message screening security controls for message queue based information exchange	CRT-17.01-TRL6-TVALP-SEC.0006	A malformed AMQP 1.0 annotated message with unexpected message payload is filtered out by enforcing the message screening policy.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-SEC.0002	Advanced message screening security controls for message queue based information exchange	CRT-17.01-TRL6-TVALP-SEC.0007	A malicious AMQP 1.0 annotated message with malicious property/payload is filtered out by enforcing the message screening policy.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-SEC.0002	Advanced message screening security controls for message queue based information exchange	CRT-17.01-TRL6-TVALP-SEC.0008	Events concerning the message screening policies enforcement are logged in accordance with applicable audit policy.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-SEC.0002	Advanced message screening security controls for message queue based information exchange	CRT-17.01-TRL6-TVALP-SEC.0009	A message screening policy is successfully updated at run-time without restarting the Ground SWIM Node.	Not planned	N/A

Technical Validation Exercise #04 Technical Validation Objective ID	Technical Validation Exercise #04 Technical Validation Objective Title	Technical Validation Exercise #04 Success Criterion ID	Technical Validation Exercise #04 Success Criterion	Technical Validation Exercise #04 Validation Results	Technical Validation Exercise #04 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-SEC.0003	Basic message screening security controls for message topic based information exchange	CRT-17.01-TRL6-TVALP-SEC.0010	Different message screening policies are successfully configured for two or more message topics.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-SEC.0003	Basic message screening security controls for message topic based information exchange	CRT-17.01-TRL6-TVALP-SEC.0011	Message screening policies are enforced on message topics used by Purple Profile enabled publisher applications.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-SEC.0003	Basic message screening security controls for message topic based information exchange	CRT-17.01-TRL6-TVALP-SEC.0012	Message screening policies are enforced on Ground SWIM Node side message topics used by Air SWIM Nodes to publish/consume messages.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-SEC.0003	Basic message screening security controls for message topic based information exchange	CRT-17.01-TRL6-TVALP-SEC.0004	A malformed AMQP 1.0 annotated message with uncomplete or invalid message properties is filtered out by enforcing the message screening policy.	Not planned	N/A

Technical Validation Exercise #04 Technical Validation Objective ID	Technical Validation Exercise #04 Technical Validation Objective Title	Technical Validation Exercise #04 Success Criterion ID	Technical Validation Exercise #04 Success Criterion	Technical Validation Exercise #04 Validation Results	Technical Validation Exercise #04 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-SEC.0003	Basic message screening security controls for message topic based information exchange	CRT-17.01-TRL6-TVALP-SEC.0008	Events concerning the message screening policies enforcement are logged in accordance with applicable audit policy.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-SEC.0003	Basic message screening security controls for message topic based information exchange	CRT-17.01-TRL6-TVALP-SEC.0009	A message screening policy is successfully updated at run-time without restarting the Ground SWIM Node.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-SEC.0004	Advanced message screening security controls for message topic based information exchange	CRT-17.01-TRL6-TVALP-SEC.0010	Different message screening policies are successfully configured for two or more message topics.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-SEC.0004	Advanced message screening security controls for message topic based information exchange	CRT-17.01-TRL6-TVALP-SEC.0011	Message screening policies are enforced on message topics used by Purple Profile enabled publisher applications.	Not planned	N/A

Technical Validation Exercise #04 Technical Validation Objective ID	Technical Validation Exercise #04 Technical Validation Objective Title	Technical Validation Exercise #04 Success Criterion ID	Technical Validation Exercise #04 Success Criterion	Technical Validation Exercise #04 Validation Results	Technical Validation Exercise #04 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-SEC.0004	Advanced message screening security controls for message topic based information exchange	CRT-17.01-TRL6-TVALP-SEC.0012	Message screening policies are enforced on Ground SWIM Node side message topics used by Air SWIM Nodes to publish/consume messages.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-SEC.0004	Advanced message screening security controls for message topic based information exchange	CRT-17.01-TRL6-TVALP-SEC.0005	A malformed AMQP 1.0 annotated message with syntactically invalid message payload is filtered out by enforcing the message screening policy.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-SEC.0004	Advanced message screening security controls for message topic based information exchange	CRT-17.01-TRL6-TVALP-SEC.0006	A malformed AMQP 1.0 annotated message with unexpected message payload is filtered out by enforcing the message screening policy.	Not planned	N/A

Technical Validation Exercise #04 Technical Validation Objective ID	Technical Validation Exercise #04 Technical Validation Objective Title	Technical Validation Exercise #04 Success Criterion ID	Technical Validation Exercise #04 Success Criterion	Technical Validation Exercise #04 Validation Results	Technical Validation Exercise #04 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-SEC.0004	Advanced message screening security controls for message topic based information exchange	CRT-17.01-TRL6-TVALP-SEC.0007	A malicious AMQP 1.0 annotated message with malicious property/payload is filtered out by enforcing the message screening policy.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-SEC.0004	Advanced message screening security controls for message topic based information exchange	CRT-17.01-TRL6-TVALP-SEC.0008	Events concerning the message screening policies enforcement are logged in accordance with applicable audit policy.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-SEC.0004	Advanced message screening security controls for message topic based information exchange	CRT-17.01-TRL6-TVALP-SEC.0009	A message screening policy is successfully updated at run-time without restarting the Ground SWIM Node.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-SEC.0005	Maximum message size overload protection security controls for message queue based information exchange	CRT-17.01-TRL6-TVALP-SEC.0013	Different overload protection policies are successfully configured for two or more message queues.	Not planned	N/A

Technical Validation Exercise #04 Technical Validation Objective ID	Technical Validation Exercise #04 Technical Validation Objective Title	Technical Validation Exercise #04 Success Criterion ID	Technical Validation Exercise #04 Success Criterion	Technical Validation Exercise #04 Validation Results	Technical Validation Exercise #04 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-SEC.0005	Maximum message size overload protection security controls for message queue based information exchange	CRT-17.01-TRL6-TVALP-SEC.0014	Overload protection policies are enforced on message queues used by Purple Profile enabled sender applications.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-SEC.0005	Maximum message size overload protection security controls for message queue based information exchange	CRT-17.01-TRL6-TVALP-SEC.0015	Overload protection policies are enforced on Ground SWIM Node side message queues used by Air SWIM Nodes to send/consume messages.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-SEC.0005	Maximum message size overload protection security controls for message queue based information exchange	CRT-17.01-TRL6-TVALP-SEC.0016	Events concerning the overload protection policies enforcement are logged in accordance with applicable audit policy.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-SEC.0005	Maximum message size overload protection security controls for message queue based information exchange	CRT-17.01-TRL6-TVALP-SEC.0017	An overload protection policy is successfully updated at run-time without restarting the Ground SWIM Node.	Not planned	N/A

Technical Validation Exercise #04 Technical Validation Objective ID	Technical Validation Exercise #04 Technical Validation Objective Title	Technical Validation Exercise #04 Success Criterion ID	Technical Validation Exercise #04 Success Criterion	Technical Validation Exercise #04 Validation Results	Technical Validation Exercise #04 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-SEC.0005	Maximum message size overload protection security controls for message queue based information exchange	CRT-17.01-TRL6-TVALP-SEC.0018	An AMQP 1.0 annotated message exceeding maximum message size is rejected by enforcing the overload protection policy, the sender is notified and the event routed according to the applicable context-based routing monitoring policy.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-SEC.0005	Maximum message size overload protection security controls for message queue based information exchange	CRT-17.01-TRL6-TVALP-SEC.0019	An AMQP 1.0 annotated message exceeding maximum message size is dropped by enforcing the overload protection policy and the event routed according to the applicable context-based routing monitoring policy.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-SEC.0006	Maximum message size overload protection security controls for message topic based information exchange	CRT-17.01-TRL6-TVALP-SEC.0020	Different overload protection policies are successfully configured for two or more message topics.	Not planned	N/A

Technical Validation Exercise #04 Technical Validation Objective ID	Technical Validation Exercise #04 Technical Validation Objective Title	Technical Validation Exercise #04 Success Criterion ID	Technical Validation Exercise #04 Success Criterion	Technical Validation Exercise #04 Validation Results	Technical Validation Exercise #04 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-SEC.0006	Maximum message size overload protection security controls for message topic based information exchange	CRT-17.01-TRL6-TVALP-SEC.0021	Overload protection policies are enforced on message topics used by Purple Profile enabled publisher applications.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-SEC.0006	Maximum message size overload protection security controls for message topic based information exchange	CRT-17.01-TRL6-TVALP-SEC.0022	Overload protection policies are enforced on Ground SWIM Node side message topics used by Air SWIM Nodes to publish/consume messages.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-SEC.0006	Maximum message size overload protection security controls for message topic based information exchange	CRT-17.01-TRL6-TVALP-SEC.0016	Events concerning the overload protection policies enforcement are logged in accordance with applicable audit policy.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-SEC.0006	Maximum message size overload protection security controls for message topic based information exchange	CRT-17.01-TRL6-TVALP-SEC.0017	An overload protection policy is successfully updated at run-time without restarting the Ground SWIM Node.	Not planned	N/A

Technical Validation Exercise #04 Technical Validation Objective ID	Technical Validation Exercise #04 Technical Validation Objective Title	Technical Validation Exercise #04 Success Criterion ID	Technical Validation Exercise #04 Success Criterion	Technical Validation Exercise #04 Validation Results	Technical Validation Exercise #04 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-SEC.0006	Maximum message size overload protection security controls for message topic based information exchange	CRT-17.01-TRL6-TVALP-SEC.0018	An AMQP 1.0 annotated message exceeding maximum message size is rejected by enforcing the overload protection policy, the sender is notified and the event routed according to the applicable context-based routing monitoring policy.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-SEC.0006	Maximum message size overload protection security controls for message topic based information exchange	CRT-17.01-TRL6-TVALP-SEC.0019	An AMQP 1.0 annotated message exceeding maximum message size is dropped by enforcing the overload protection policy and the event routed according to the applicable context-based routing monitoring policy.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-SEC.0007	Maximum message queue capacity overload protection security controls	CRT-17.01-TRL6-TVALP-SEC.0013	Different overload protection policies are successfully configured for two or more message queues.	Not planned	N/A

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OBJ-17.01-TRL6-TVALP-SEC.0007	Maximum message queue capacity overload protection security controls	CRT-17.01-TRL6-TVALP-SEC.0014	Overload protection policies are enforced on message queues used by Purple Profile enabled sender applications.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-SEC.0007	Maximum message queue capacity overload protection security controls	CRT-17.01-TRL6-TVALP-SEC.0015	Overload protection policies are enforced on Ground SWIM Node side message queues used by Air SWIM Nodes to send/consume messages.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-SEC.0007	Maximum message queue capacity overload protection security controls	CRT-17.01-TRL6-TVALP-SEC.0016	Events concerning the overload protection policies enforcement are logged in accordance with applicable audit policy.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-SEC.0007	Maximum message queue capacity overload protection security controls	CRT-17.01-TRL6-TVALP-SEC.0017	An overload protection policy is successfully updated at run-time without restarting the Ground SWIM Node.	Not planned	N/A

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OBJ-17.01-TRL6-TVALP-SEC.0007	Maximum message queue capacity overload protection security controls	CRT-17.01-TRL6-TVALP-SEC.0023	An attempt to send an AMQP 1.0 annotated message is rejected because maximum message queue capacity is exceeded.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-SEC.0008	Maximum message topic capacity overload protection security controls	CRT-17.01-TRL6-TVALP-SEC.0020	Different overload protection policies are successfully configured for two or more message topics.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-SEC.0008	Maximum message topic capacity overload protection security controls	CRT-17.01-TRL6-TVALP-SEC.0021	Overload protection policies are enforced on message topics used by Purple Profile enabled publisher applications.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-SEC.0008	Maximum message topic capacity overload protection security controls	CRT-17.01-TRL6-TVALP-SEC.0022	Overload protection policies are enforced on Ground SWIM Node side message topics used by Air SWIM Nodes to publish/consume messages.	Not planned	N/A

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OBJ-17.01-TRL6-TVALP-SEC.0008	Maximum message topic capacity overload protection security controls	CRT-17.01-TRL6-TVALP-SEC.0016	Events concerning the overload protection policies enforcement are logged in accordance with applicable audit policy.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-SEC.0008	Maximum message topic capacity overload protection security controls	CRT-17.01-TRL6-TVALP-SEC.0017	An overload protection policy is successfully updated at run-time without restarting the Ground SWIM Node.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-SEC.0008	Maximum message topic capacity overload protection security controls	CRT-17.01-TRL6-TVALP-SEC.0024	An attempt to publish an AMQP 1.0 annotated message is rejected because maximum message topic capacity is exceeded.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-SEC.0009	Consolidated connections limits overload protection security controls	CRT-17.01-TRL6-TVALP-SEC.0025	Maximum number of consolidated connections is successfully configured.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-SEC.0009	Consolidated connections limits overload protection security controls	CRT-17.01-TRL6-TVALP-SEC.0016	Events concerning the overload protection policies enforcement are logged in accordance with applicable audit policy.	Not planned	N/A

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OBJ-17.01-TRL6-TVALP-SEC.0009	Consolidated connections limits overload protection security controls	CRT-17.01-TRL6-TVALP-SEC.0026	An attempt to establish an AMQP 1.0 connection is rejected because the maximum number of consolidated connections is exceeded.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-SEC.0010	Concurrent connections limits per connecting entity overload protection security controls	CRT-17.01-TRL6-TVALP-SEC.0027	Maximum number of concurrent connections per connecting entity is successfully configured.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-SEC.0010	Concurrent connections limits per connecting entity overload protection security controls	CRT-17.01-TRL6-TVALP-SEC.0016	Events concerning the overload protection policies enforcement are logged in accordance with applicable audit policy.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-SEC.0010	Concurrent connections limits per connecting entity overload protection security controls	CRT-17.01-TRL6-TVALP-SEC.0028	An attempt to establish an AMQP 1.0 connection is rejected because the maximum number of concurrent connections for the connecting entity is exceeded.	Not planned	N/A

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OBJ-17.01-TRL6-TVALP-SEC.0011	Mutual authentication and basic certificate revocation status check security controls	CRT-17.01-TRL6-TVALP-SEC.0029	Amqps mutual authentication is enforced between aircraft application and Air SWIM Node.	Amqps mutual authentication between aircraft application and Air SWIM Node has been successfully validated.	OK
OBJ-17.01-TRL6-TVALP-SEC.0011	Mutual authentication and basic certificate revocation status check security controls	CRT-17.01-TRL6-TVALP-SEC.0030	Amqps mutual authentication is enforced between Air and Ground SWIM Node.	Amqps mutual authentication between Air and Ground SWIM Node has been successfully validated. LDO Air SWIM Node and INDRA ground SWIM node use X.509v3 certificates issued by LDO CA.	OK
OBJ-17.01-TRL6-TVALP-SEC.0011	Mutual authentication and basic certificate revocation status check security controls	CRT-17.01-TRL6-TVALP-SEC.0031	Amqps mutual authentication is enforced between Ground SWIM Node and ground application.	N/A	N/A
OBJ-17.01-TRL6-TVALP-SEC.0011	Mutual authentication and basic certificate revocation status check security controls	CRT-17.01-TRL6-TVALP-SEC.0032	Events concerning mutual authentication enforcement are logged in accordance with applicable audit policy.	For both INDRA and LDO prototypes, current audit solution is mainly based on logging capabilities. The result is partial OK because full and complete audit policy driven solution is not supported by the involved prototypes.	Partially OK

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OBJ-17.01-TRL6-TVALP-SEC.0011	Mutual authentication and basic certificate revocation status check security controls	CRT-17.01-TRL6-TVALP-SEC.0033	Amqps peers successfully mutual authenticate although one of the peer requires the fallback to TLS 1.2.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-SEC.0011	Mutual authentication and basic certificate revocation status check security controls	CRT-17.01-TRL6-TVALP-SEC.0034	Mutual authentication between amqps peers fails in all the following cases:- one of the peer requires the fallback to a TLS version lower than TLS 1.2.- peer's X.509v3 certificate is not trusted.- peer's X.509v3 certificate is expired.- peer's X.509v3 certificate has been revoked (it is included in the local CRL).- the local CRL is not the current CRL or the CRL scope is not appropriate and the authentication policy does not allow potentially revoked or compromised certificates.	Not planned	N/A

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OBJ-17.01-TRL6-TVALP-SEC.0011	Mutual authentication and basic certificate revocation status check security controls	CRT-17.01-TRL6-TVALP-SEC.0035	Amqps peers successfully mutual authenticate although the local CRL is not the current CRL or the CRL scope is not appropriate because the authentication policy allows potentially revoked or compromised certificate.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-SEC.0012	CRL update mechanisms	CRT-17.01-TRL6-TVALP-SEC.0036	The CRL used by SWIM Node is successfully updated via administrative interface.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-SEC.0012	CRL update mechanisms	CRT-17.01-TRL6-TVALP-SEC.0037	The CRL used by SWIM Node is not the current CRL and it is successfully updated on-the-fly via the HTTP CDP.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-SEC.0012	CRL update mechanisms	CRT-17.01-TRL6-TVALP-SEC.0038	A delta-CRL is used to successfully update the CRL used by SWIM Node.	Not planned	N/A

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OBJ-17.01-TRL6-TVALP-SEC.0013	Mutual authentication with OCSP certificate revocation status check security controls	CRT-17.01-TRL6-TVALP-SEC.0029	Amqps mutual authentication is enforced between aircraft application and Air SWIM Node.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-SEC.0013	Mutual authentication with OCSP certificate revocation status check security controls	CRT-17.01-TRL6-TVALP-SEC.0030	Amqps mutual authentication is enforced between Air and Ground SWIM Node.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-SEC.0013	Mutual authentication with OCSP certificate revocation status check security controls	CRT-17.01-TRL6-TVALP-SEC.0031	Amqps mutual authentication is enforced between Ground SWIM Node and ground application.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-SEC.0013	Mutual authentication with OCSP certificate revocation status check security controls	CRT-17.01-TRL6-TVALP-SEC.0032	Events concerning mutual authentication enforcement are logged in accordance with applicable audit policy.	Not planned	N/A

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OBJ-17.01-TRL6-TVALP-SEC.0013	Mutual authentication with OCSP certificate revocation status check security controls	CRT-17.01-TRL6-TVALP-SEC.0039	Amqps peer's certificate revocation status is retrieved from the OCSP response, and the authentication is successfully completed because the certificate is not revoked.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-SEC.0013	Mutual authentication with OCSP certificate revocation status check security controls	CRT-17.01-TRL6-TVALP-SEC.0040	Amqps peer's certificate revocation status is retrieved from the OCSP response, and the authentication fails because the certificate has been revoked.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-SEC.0013	Mutual authentication with OCSP certificate revocation status check security controls	CRT-17.01-TRL6-TVALP-SEC.0041	OCSP responder URL is retrieved from pre-configured local resources.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-SEC.0013	Mutual authentication with OCSP certificate revocation status check security controls	CRT-17.01-TRL6-TVALP-SEC.0042	OCSP responder URL is retrieved from location identified in the OCSP field in the Authority Information Access extension in the peer's certificate.	Not planned	N/A

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OBJ-17.01-TRL6-TVALP-SEC.0014	Mutual authentication with combined OCSP and CRL based certificate revocation status check security controls	CRT-17.01-TRL6-TVALP-SEC.0043	OCSP is configured and used as preferred certificate revocation status check mechanism disabling the fallback to CRL.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-SEC.0014	Mutual authentication with combined OCSP and CRL based certificate revocation status check security controls	CRT-17.01-TRL6-TVALP-SEC.0044	OCSP is configured as preferred certificate revocation status check mechanism but because the responder is not available and the fallback is enabled, the CRL is successfully used.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-SEC.0014	Mutual authentication with combined OCSP and CRL based certificate revocation status check security controls	CRT-17.01-TRL6-TVALP-SEC.0045	CRL is configured and used as preferred certificate revocation status check mechanism disabling the fallback to OCSP.	Not planned	N/A

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OBJ-17.01-TRL6-TVALP-SEC.0014	Mutual authentication with combined OCSP and CRL based certificate revocation status check security controls	CRT-17.01-TRL6-TVALP-SEC.0046	CRL is configured as preferred certificate revocation status check mechanism but because the CRL is not available/valid and the fallback is enabled, the OCSP is successfully used.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-SEC.0014	Mutual authentication with combined OCSP and CRL based certificate revocation status check security controls	CRT-17.01-TRL6-TVALP-SEC.0047	Amqps peers successfully mutual authenticate although none of the combined certificate revocation status mechanisms are available but the authentication policy allows potentially revoked or compromised certificate.	Not planned	N/A

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OBJ-17.01-TRL6-TVALP-SEC.0014	Mutual authentication with combined OCSP and CRL based certificate revocation status check security controls	CRT-17.01-TRL6-TVALP-SEC.0048	Mutual authentication between amqps peers fails because none of the combined certificate revocation status mechanisms are available and the authentication policy does not allow potentially revoked or compromised certificate.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-SEC.0015	Authorization security controls for message queue based information exchange	CRT-17.01-TRL6-TVALP-SEC.0049	Different authorization policies are successfully configured for two or more message queues.	Authorization policies enforced at message queue level.	OK
OBJ-17.01-TRL6-TVALP-SEC.0015	Authorization security controls for message queue based information exchange	CRT-17.01-TRL6-TVALP-SEC.0050	Authorization policies are enforced on message queue used by Purple Profile enabled sender applications.	Authorization policies successfully enforced on the message queue side used by aircraft sender applications.	OK
OBJ-17.01-TRL6-TVALP-SEC.0015	Authorization security controls for message queue based information exchange	CRT-17.01-TRL6-TVALP-SEC.0051	Authorization policies are enforced on message queue used by Purple Profile enabled receiver applications.	Authorization policies successfully enforced on the message queue side used by aircraft receiver applications.	OK

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OBJ-17.01-TRL6-TVALP-SEC.0015	Authorization security controls for message queue based information exchange	CRT-17.01-TRL6-TVALP-SEC.0052	Authorization policies are enforced on Ground SWIM Node side message queue used by Air SWIM Nodes to send/receive messages.	Authorization policies enforced at message queue level on the Ground SWIM node side.	OK
OBJ-17.01-TRL6-TVALP-SEC.0015	Authorization security controls for message queue based information exchange	CRT-17.01-TRL6-TVALP-SEC.0053	Events concerning the authorization policies enforcement are logged in accordance with applicable audit policy.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-SEC.0015	Authorization security controls for message queue based information exchange	CRT-17.01-TRL6-TVALP-SEC.0054	An authorization policy is successfully updated at run-time without restarting the Ground SWIM Node.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-SEC.0015	Authorization security controls for message queue based information exchange	CRT-17.01-TRL6-TVALP-SEC.0055	An attempt to send a message to a queue is authorized because the sending entity is successfully authenticated with sender role for that queue.	Authorization policies successfully enforced based on authentication and roles.	OK

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OBJ-17.01-TRL6-TVALP-SEC.0015	Authorization security controls for message queue based information exchange	CRT-17.01-TRL6-TVALP-SEC.0056	An attempt to send a message to a queue is not authorized because the authenticated sending entity has not assigned the sender role for that queue.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-SEC.0015	Authorization security controls for message queue based information exchange	CRT-17.01-TRL6-TVALP-SEC.0057	An attempt to receive a message from a queue is authorized because the receiving entity is successfully authenticated with receiver role for that queue.	Authorization policies successfully enforced based on authentication and roles.	OK
OBJ-17.01-TRL6-TVALP-SEC.0015	Authorization security controls for message queue based information exchange	CRT-17.01-TRL6-TVALP-SEC.0058	An attempt to receive a message from a queue is not authorized because the authenticated receiving entity has not assigned the receiver role for that queue.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-SEC.0016	Authorization security controls for message topic based information exchange	CRT-17.01-TRL6-TVALP-SEC.0059	Different authorization policies are successfully configured for two or more message topics.	Authorization policies enforced at message topic level on the Ground SWIM node side.	OK

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OBJ-17.01-TRL6-TVALP-SEC.0016	Authorization security controls for message topic based information exchange	CRT-17.01-TRL6-TVALP-SEC.0060	Authorization policies are enforced on message topic used by Purple Profile enabled publisher applications.	Authorization policies successfully enforced on the message topic side used by aircraft publisher applications.	OK
OBJ-17.01-TRL6-TVALP-SEC.0016	Authorization security controls for message topic based information exchange	CRT-17.01-TRL6-TVALP-SEC.0061	Authorization policies are enforced on message topic used by Purple Profile enabled subscriber applications.	Authorization policies successfully enforced on the message topic side used by aircraft subscriber applications.	OK
OBJ-17.01-TRL6-TVALP-SEC.0016	Authorization security controls for message topic based information exchange	CRT-17.01-TRL6-TVALP-SEC.0062	Authorization policies are enforced on Ground SWIM Node side message topic used by Air SWIM Nodes to publish/consume messages.	Authorization policies enforced at message topic level on the Ground SWIM node side.	OK
OBJ-17.01-TRL6-TVALP-SEC.0016	Authorization security controls for message topic based information exchange	CRT-17.01-TRL6-TVALP-SEC.0053	Events concerning the authorization policies enforcement are logged in accordance with applicable audit policy.	Not planned	N/A

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OBJ-17.01-TRL6-TVALP-SEC.0016	Authorization security controls for message topic based information exchange	CRT-17.01-TRL6-TVALP-SEC.0054	An authorization policy is successfully updated at run-time without restarting the Ground SWIM Node.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-SEC.0016	Authorization security controls for message topic based information exchange	CRT-17.01-TRL6-TVALP-SEC.0063	An attempt to publish a message to a topic is authorized because the publishing entity is successfully authenticated with publisher role for that topic.	Authorization policies successfully enforced based on authentication and roles.	OK
OBJ-17.01-TRL6-TVALP-SEC.0016	Authorization security controls for message topic based information exchange	CRT-17.01-TRL6-TVALP-SEC.0064	An attempt to publish a message to a topic is not authorized because the authenticated publishing entity has not assigned the publisher role for that topic.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-SEC.0016	Authorization security controls for message topic based information exchange	CRT-17.01-TRL6-TVALP-SEC.0065	An attempt to subscribe to a topic is authorized because the subscribing entity is successfully authenticated with subscriber role for that topic.	Authorization policies successfully enforced based on authentication and roles.	OK

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OBJ-17.01-TRL6-TVALP-SEC.0016	Authorization security controls for message topic based information exchange	CRT-17.01-TRL6-TVALP-SEC.0066	An attempt to subscribe to a topic is not authorized because the authenticated subscribing entity has not assigned the subscriber role for that topic.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-SEC.0017	Authorization security controls for message queue and topic lifecycle management	CRT-17.01-TRL6-TVALP-SEC.0067	An entity fails to connect to a message queue because the queue does not exist and the messaging resources lifecycle management is only authorized via administrative interfaces.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-SEC.0017	Authorization security controls for message queue and topic lifecycle management	CRT-17.01-TRL6-TVALP-SEC.0068	An entity fails to connect to a message topic because the topic does not exist and the messaging resources lifecycle management is only authorized via administrative interfaces.	Not planned	N/A

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OBJ-17.01-TRL6-TVALP-SEC.0017	Authorization security controls for message queue and topic lifecycle management	CRT-17.01-TRL6-TVALP-SEC.0069	A message queue is successfully created via administrative interface by an user with administrator role.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-SEC.0017	Authorization security controls for message queue and topic lifecycle management	CRT-17.01-TRL6-TVALP-SEC.0070	A message topic is successfully created via administrative interface by an user with administrator role.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-SEC.0017	Authorization security controls for message queue and topic lifecycle management	CRT-17.01-TRL6-TVALP-SEC.0071	A message queue is successfully deleted via administrative interface by an user with administrator role.	Not planned	N/A
OBJ-17.01-TRL6-TVALP-SEC.0017	Authorization security controls for message queue and topic lifecycle management	CRT-17.01-TRL6-TVALP-SEC.0072	A message topic is successfully deleted via administrative interface by an user with administrator role.	Not planned	N/A

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OBJ-17.01-TRL6-TVALP-SEC.0017	Authorization security controls for message queue and topic lifecycle management	CRT-17.01-TRL6-TVALP-SEC.0073	An user without administrator role fails to create/delete message queue/topic via administrative interface.	Not planned	N/A

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OBJ-17.01-TRL6-TVALP-SEC.0018	End-to-end confidentiality for uplink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-SEC.0074	Following steps are successfully completed:- The requestor creates and sends an AMQP 1.0 annotated request message with application-data section containing encrypted data and ENPT AMQP footer with value containing both Encryption-Algorithm and Encryption-Secret for the intender responder.- While the request message is in transit at SWIM nodes level, it is not possible to access/visualize sensitive information because both application data and shared secret are encrypted- The request message is delivered to the intended responder that successfully decrypts it relying on delivered ENPT AMQP footer.	Not planned	N/A

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OBJ-17.01-TRL6-TVALP-SEC.0018	End-to-end confidentiality for uplink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-SEC.0075	Following steps are successfully completed: -The responder creates and sends an AMQP 1.0 annotated response message with application-data section containing encrypted data and ENPT AMQP footer with value containing both Encryption-Algorithm and Encryption-Secret for the requestor.- While the response message is in transit at SWIM nodes level, it is not possible to access request/visualize sensitive information because both application data and shared secret are encrypted.- The response message is delivered to the intended requestor that successfully decrypts it relying on delivered ENPT AMQP footer.	Not planned	N/A

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OBJ-17.01-TRL6-TVALP-SEC.0018	End-to-end confidentiality for uplink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-SEC.0076	Following steps are successfully completed:- The requestor creates and sends an additional AMQP 1.0 annotated request message for the same responder with application-data section containing encrypted data and ENPT AMQP footer containing only the Encryption-Algorithm.- The request message is delivered to the intended responder that successfully decrypts it relying on delivered ENPT AMQP footer and cached Encryption-Secret from previous request messages.	Not planned	N/A

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OBJ-17.01-TRL6-TVALP-SEC.0018	End-to-end confidentiality for uplink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-SEC.0077	Following steps are successfully completed:- The requestor creates and sends an additional AMQP 1.0 annotated request message for the same responder with application-data section containing encrypted data and ENPT AMQP footer containing also a new Encryption-Secret.- The request message is delivered to the intended responder that successfully decrypts it relying on delivered ENPT AMQP footer replacing cached Encryption-Secret.	Not planned	N/A

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OBJ-17.01-TRL6-TVALP-SEC.0019	End-to-end confidentiality for uplink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-SEC.0078	Following steps are successfully completed:- The publisher creates and publishes an AMQP 1.0 annotated publication message with application-data section containing encrypted data and ENPT AMQP footer with value containing both Encryption-Algorithm and Encryption-Secret for two or more subscribers.- While the publication message is in transit at SWIM nodes level, it is not possible to access/visualize sensitive information because both application data and shared secret are encrypted.- The publication message is delivered to the intended subscribers that successfully decrypt it relying on delivered ENPT AMQP footer.	Not planned	N/A

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OBJ-17.01-TRL6-TVALP-SEC.0019	End-to-end confidentiality for uplink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-SEC.0079	Following steps are successfully completed:- The publisher creates and publishes an additional AMQP 1.0 annotated publication message for the same subscribers with application-data section containing encrypted data and ENPT AMQP footer containing only the Encryption-Algorithm.- The publication message is delivered to the intended subscribers that successfully decrypt it relying on delivered ENPT AMQP footer and cached Encryption-Secret from previous messages.	Not planned	N/A

Technical Validation Exercise #04 Technical Validation Objective ID	Technical Validation Exercise #04 Technical Validation Objective Title	Technical Validation Exercise #04 Success Criterion ID	Technical Validation Exercise #04 Success Criterion	Technical Validation Exercise #04 Validation Results	Technical Validation Exercise #04 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-SEC.0019	End-to-end confidentiality for uplink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-SEC.0080	Following steps are successfully completed:- An additional subscriber ("new_sub") successfully subscribes to the topic.- The publisher creates and publishes an additional AMQP 1.0 annotated publication message with application-data section containing encrypted data and ENPT AMQP footer containing the Encryption-Algorithm and only the Encryption-Secret for the new subscriber.- The publication message is delivered to all the subscribers and in particular to the new one that successfully decrypts the message relying on delivered ENPT AMQP footer.- The other subscribers successfully decrypt the message relying on delivered ENPT AMQP footer and cached Encryption-Secret from previous messages.	Not planned	N/A

Technical Validation Exercise #04 Technical Validation Objective ID	Technical Validation Exercise #04 Technical Validation Objective Title	Technical Validation Exercise #04 Success Criterion ID	Technical Validation Exercise #04 Success Criterion	Technical Validation Exercise #04 Validation Results	Technical Validation Exercise #04 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-SEC.0019	End-to-end confidentiality for uplink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-SEC.0081	Following steps are successfully completed:- The publisher creates and publishes an additional AMQP 1.0 annotated publication message with application-data section containing encrypted data and ENPT AMQP footer containing also a new Encryption-Secret.- The publication message is delivered to the intended subscribers that successfully decrypt it relying on delivered ENPT AMQP footer and replacing cached Encryption-Secret.	Not planned	N/A

Technical Validation Exercise #04 Technical Validation Objective ID	Technical Validation Exercise #04 Technical Validation Objective Title	Technical Validation Exercise #04 Success Criterion ID	Technical Validation Exercise #04 Success Criterion	Technical Validation Exercise #04 Validation Results	Technical Validation Exercise #04 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-SEC.0020	End-to-end confidentiality for downlink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-SEC.0078	Following steps are successfully completed:- The publisher creates and publishes an AMQP 1.0 annotated publication message with application-data section containing encrypted data and ENPT AMQP footer with value containing both Encryption-Algorithm and Encryption-Secret for two or more subscribers.- While the publication message is in transit at SWIM nodes level, it is not possible to access/visualize sensitive information because both application data and shared secret are encrypted.- The publication message is delivered to the intended subscribers that successfully decrypt it relying on delivered ENPT AMQP footer.	Not planned	N/A

Technical Validation Exercise #04 Technical Validation Objective ID	Technical Validation Exercise #04 Technical Validation Objective Title	Technical Validation Exercise #04 Success Criterion ID	Technical Validation Exercise #04 Success Criterion	Technical Validation Exercise #04 Validation Results	Technical Validation Exercise #04 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-SEC.0020	End-to-end confidentiality for downlink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-SEC.0079	Following steps are successfully completed:- The publisher creates and publishes an additional AMQP 1.0 annotated publication message for the same subscribers with application-data section containing encrypted data and ENPT AMQP footer containing only the Encryption-Algorithm.- The publication message is delivered to the intended subscribers that successfully decrypt it relying on delivered ENPT AMQP footer and cached eEncryption-Secret from previous messages.	Not planned	N/A

Technical Validation Exercise #04 Technical Validation Objective ID	Technical Validation Exercise #04 Technical Validation Objective Title	Technical Validation Exercise #04 Success Criterion ID	Technical Validation Exercise #04 Success Criterion	Technical Validation Exercise #04 Validation Results	Technical Validation Exercise #04 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-SEC.0020	End-to-end confidentiality for downlink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-SEC.0080	Following steps are successfully completed:- An additional subscriber ("new_sub") successfully subscribes to the topic.- The publisher creates and publishes an additional AMQP 1.0 annotated publication message with application-data section containing encrypted data and ENPT AMQP footer containing the Encryption-Algorithm and only the Encryption-Secret for the new subscriber.- The publication message is delivered to all the subscribers and in particular to the new one that successfully decrypts the message relying on delivered ENPT AMQP footer.- The other subscribers successfully decrypt the message relying on delivered ENPT AMQP footer and cached Encryption-Secret from previous messages.	Not planned	N/A

Technical Validation Exercise #04 Technical Validation Objective ID	Technical Validation Exercise #04 Technical Validation Objective Title	Technical Validation Exercise #04 Success Criterion ID	Technical Validation Exercise #04 Success Criterion	Technical Validation Exercise #04 Validation Results	Technical Validation Exercise #04 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-SEC.0020	End-to-end confidentiality for downlink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-SEC.0081	Following steps are successfully completed:- The publisher creates and publishes an additional AMQP 1.0 annotated publication message with application-data section containing encrypted data and ENPT AMQP footer containing also a new Encryption-Secret.- The publication message is delivered to the intended subscribers that successfully decrypt it relying on delivered ENPT AMQP footer and replacing cached Encryption-Secret.	Not planned	N/A

Technical Validation Exercise #04 Technical Validation Objective ID	Technical Validation Exercise #04 Technical Validation Objective Title	Technical Validation Exercise #04 Success Criterion ID	Technical Validation Exercise #04 Success Criterion	Technical Validation Exercise #04 Validation Results	Technical Validation Exercise #04 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-SEC.0021	End-to-end HMAC based message level integrity and authenticity for uplink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-SEC.0082	Following steps are successfully completed:- The requestor creates and sends an AMQP 1.0 annotated request message with HMAC AMQP footer with value containing HMAC-Algorithm, HMAC-Target, HMAC-Digest and HMAC-Secret for the intender responder.- The request message is delivered to the intended responder that successfully validates the authenticity and integrity of the message relying on delivered HMAC AMQP footer.	Not planned	N/A

Technical Validation Exercise #04 Technical Validation Objective ID	Technical Validation Exercise #04 Technical Validation Objective Title	Technical Validation Exercise #04 Success Criterion ID	Technical Validation Exercise #04 Success Criterion	Technical Validation Exercise #04 Validation Results	Technical Validation Exercise #04 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-SEC.0021	End-to-end HMAC based message level integrity and authenticity for uplink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-SEC.0083	Following steps are successfully completed: - The responder creates and sends an AMQP 1.0 annotated response message with HMAC AMQP footer with value containing HMAC-Algorithm, HMAC-Target, HMAC-Digest and HMAC-Secret for the requestor.- The response message is delivered to the intended requestor that successfully validates the authenticity and integrity of the message relying on delivered HMAC AMQP footer.	Not planned	N/A

Technical Validation Exercise #04 Technical Validation Objective ID	Technical Validation Exercise #04 Technical Validation Objective Title	Technical Validation Exercise #04 Success Criterion ID	Technical Validation Exercise #04 Success Criterion	Technical Validation Exercise #04 Validation Results	Technical Validation Exercise #04 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-SEC.0021	End-to-end HMAC based message level integrity and authenticity for uplink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-SEC.0084	Following steps are successfully completed:- The requestor creates and sends an additional AMQP 1.0 annotated request message for the same responder with HMAC AMQP footer containing only HMAC-Algorithm, HMAC-Target and HMAC-Digest.- The request message is delivered to the intended responder that successfully validates the authenticity and integrity of the message relying on delivered HMAC AMQP footer and cached HMAC-Secret from previous request messages.	Not planned	N/A

Technical Validation Exercise #04 Technical Validation Objective ID	Technical Validation Exercise #04 Technical Validation Objective Title	Technical Validation Exercise #04 Success Criterion ID	Technical Validation Exercise #04 Success Criterion	Technical Validation Exercise #04 Validation Results	Technical Validation Exercise #04 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-SEC.0021	End-to-end HMAC based message level integrity and authenticity for uplink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-SEC.0085	Following steps are successfully completed:- The responder creates and sends an additional AMQP 1.0 annotated response message for the same requestor with HMAC AMQP footer containing only HMAC-Algorithm, HMAC-Target and HMAC-Digest.- The response message is delivered to the intended requestor that successfully validates the authenticity and integrity of the message relying on delivered HMAC AMQP footer and cached HMAC-Secret from previous response messages.	Not planned	N/A

Technical Validation Exercise #04 Technical Validation Objective ID	Technical Validation Exercise #04 Technical Validation Objective Title	Technical Validation Exercise #04 Success Criterion ID	Technical Validation Exercise #04 Success Criterion	Technical Validation Exercise #04 Validation Results	Technical Validation Exercise #04 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-SEC.0021	End-to-end HMAC based message level integrity and authenticity for uplink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-SEC.0086	Following steps are successfully completed:- The requestor creates and sends an additional AMQP 1.0 annotated request message for the same responder with HMAC AMQP footer containing HMAC-Algorithm, HMAC-Target, HMAC-Digest and the new shared secret.- The request message is delivered to the intended responder that successfully validates the authenticity and integrity of the message relying on delivered HMAC AMQP footer replacing cached HMAC-Secret.	Not planned	N/A

Technical Validation Exercise #04 Technical Validation Objective ID	Technical Validation Exercise #04 Technical Validation Objective Title	Technical Validation Exercise #04 Success Criterion ID	Technical Validation Exercise #04 Success Criterion	Technical Validation Exercise #04 Validation Results	Technical Validation Exercise #04 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-SEC.0021	End-to-end HMAC based message level integrity and authenticity for uplink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-SEC.0087	Following steps are successfully completed: - The responder creates and sends an AMQP 1.0 annotated response message with HMAC AMQP footer with value containing HMAC-Algorithm, HMAC-Target, HMAC-Digest and HMAC-Secret for the requestor.- While in transit the response message data section is modified.- The response message is delivered to the intended requestor that, relying on delivered HMAC AMQP footer, recognizes that the authenticity and integrity of the message have been violated.- The requestor discards the message and the event is logged in accordance with the applicable audit policy.	Not planned	N/A

Technical Validation Exercise #04 Technical Validation Objective ID	Technical Validation Exercise #04 Technical Validation Objective Title	Technical Validation Exercise #04 Success Criterion ID	Technical Validation Exercise #04 Success Criterion	Technical Validation Exercise #04 Validation Results	Technical Validation Exercise #04 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-SEC.0022	End-to-end HMAC based message level integrity and authenticity for uplink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-SEC.0088	Following steps are successfully completed:- The publisher creates and publishes an AMQP 1.0 annotated publication message with HMAC AMQP footer with value containing HMAC-Algorithm, HMAC-Target, HMAC-Digest and HMAC-Secret for two or more subscribers.- The publication message is delivered to the intended subscribers validate the authenticity and integrity of the message relying on delivered HMAC AMQP footer.	Not planned	N/A

Technical Validation Exercise #04 Technical Validation Objective ID	Technical Validation Exercise #04 Technical Validation Objective Title	Technical Validation Exercise #04 Success Criterion ID	Technical Validation Exercise #04 Success Criterion	Technical Validation Exercise #04 Validation Results	Technical Validation Exercise #04 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-SEC.0022	End-to-end HMAC based message level integrity and authenticity for uplink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-SEC.0089	Following steps are successfully completed:- The publisher creates and publishes an additional AMQP 1.0 annotated publication message for the same subscribers with HMAC AMQP footer containing only HMAC-Algorithm, HMAC-Target and HMAC-Digest.- The publication message is delivered to the intended subscribers that successfully validate the authenticity and integrity of the message relying on delivered HMAC AMQP footer and cached HMAC-Secret from previous messages.	Not planned	N/A

Technical Validation Exercise #04 Technical Validation Objective ID	Technical Validation Exercise #04 Technical Validation Objective Title	Technical Validation Exercise #04 Success Criterion ID	Technical Validation Exercise #04 Success Criterion	Technical Validation Exercise #04 Validation Results	Technical Validation Exercise #04 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-SEC.0022	End-to-end HMAC based message level integrity and authenticity for uplink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-SEC.0090	Following steps are successfully completed:- An additional subscriber ("new_sub") successfully subscribes to the topic.- The publisher creates and publishes an additional AMQP 1.0 annotated publication message with HMAC AMQP footer containing HMAC-Algorithm, HMAC-Target, HMAC-Digest and only the HMAC-Secret for the new subscriber.- The publication message is delivered to all the subscribers and in particular to the new one that successfully validates the authenticity and integrity of the message relying on delivered HMAC AMQP footer.- The other subscribers successfully validate the authenticity and integrity of the message relying on delivered HMAC AMQP footer and cached HMAC-Secret from previous messages.	Not planned	N/A

Technical Validation Exercise #04 Technical Validation Objective ID	Technical Validation Exercise #04 Technical Validation Objective Title	Technical Validation Exercise #04 Success Criterion ID	Technical Validation Exercise #04 Success Criterion	Technical Validation Exercise #04 Validation Results	Technical Validation Exercise #04 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-SEC.0022	End-to-end HMAC based message level integrity and authenticity for uplink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-SEC.0091	Following steps are successfully completed:- The publisher creates and publishes an additional AMQP 1.0 annotated publication message with HMAC AMQP footer containing also the new shared secret.- The publication message is delivered to the intended subscribers that successfully validate the authenticity and integrity of the message relying on delivered HMAC AMQP footer and replacing the cached HMAC-Secret.	Not planned	N/A

Technical Validation Exercise #04 Technical Validation Objective ID	Technical Validation Exercise #04 Technical Validation Objective Title	Technical Validation Exercise #04 Success Criterion ID	Technical Validation Exercise #04 Success Criterion	Technical Validation Exercise #04 Validation Results	Technical Validation Exercise #04 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-SEC.0022	End-to-end HMAC based message level integrity and authenticity for uplink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-SEC.0092	Following steps are successfully completed: -The publisher creates and publishes an additional AMQP 1.0 annotated publication message for the same subscribers with HMAC AMQP footer containing HMAC-Algorithm, HMAC-Target, HMAC-Digest and HMAC-Secret.- While in transit the publication message data section is modified.- The publication message is delivered to the intended subscribers that, relying on delivered HMAC AMQP footer, recognize that the authenticity and integrity of the message have been violated.- The subscribers discards the message and the event is logged in accordance with the applicable audit policy.	Not planned	N/A

Technical Validation Exercise #04 Technical Validation Objective ID	Technical Validation Exercise #04 Technical Validation Objective Title	Technical Validation Exercise #04 Success Criterion ID	Technical Validation Exercise #04 Success Criterion	Technical Validation Exercise #04 Validation Results	Technical Validation Exercise #04 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-SEC.0023	End-to-end HMAC based message level integrity and authenticity for downlink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-SEC.0088	Following steps are successfully completed:- The publisher creates and publishes an AMQP 1.0 annotated publication message with HMAC AMQP footer with value containing HMAC-Algorithm, HMAC-Target, HMAC-Digest and HMAC-Secret for two or more subscribers.- The publication message is delivered to the intended subscribers validate the authenticity and integrity of the message relying on delivered HMAC AMQP footer.	Not planned	N/A

Technical Validation Exercise #04 Technical Validation Objective ID	Technical Validation Exercise #04 Technical Validation Objective Title	Technical Validation Exercise #04 Success Criterion ID	Technical Validation Exercise #04 Success Criterion	Technical Validation Exercise #04 Validation Results	Technical Validation Exercise #04 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-SEC.0023	End-to-end HMAC based message level integrity and authenticity for downlink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-SEC.0089	Following steps are successfully completed:- The publisher creates and publishes an additional AMQP 1.0 annotated publication message for the same subscribers with HMAC AMQP footer containing only HMAC-Algorithm, HMAC-Target and HMAC-Digest.- The publication message is delivered to the intended subscribers that successfully validate the authenticity and integrity of the message relying on delivered HMAC AMQP footer and cached HMAC-Secret from previous messages.	Not planned	N/A

Technical Validation Exercise #04 Technical Validation Objective ID	Technical Validation Exercise #04 Technical Validation Objective Title	Technical Validation Exercise #04 Success Criterion ID	Technical Validation Exercise #04 Success Criterion	Technical Validation Exercise #04 Validation Results	Technical Validation Exercise #04 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-SEC.0023	End-to-end HMAC based message level integrity and authenticity for downlink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-SEC.0090	Following steps are successfully completed:- An additional subscriber ("new_sub") successfully subscribes to the topic.- The publisher creates and publishes an additional AMQP 1.0 annotated publication message with HMAC AMQP footer containing HMAC-Algorithm, HMAC-Target, HMAC-Digest and only the HMAC-Secret for the new subscriber.- The publication message is delivered to all the subscribers and in particular to the new one that successfully validates the authenticity and integrity of the message relying on delivered HMAC AMQP footer.- The other subscribers successfully validate the authenticity and integrity of the message relying on delivered HMAC AMQP footer and cached HMAC-Secret from previous messages.	Not planned	N/A

Technical Validation Exercise #04 Technical Validation Objective ID	Technical Validation Exercise #04 Technical Validation Objective Title	Technical Validation Exercise #04 Success Criterion ID	Technical Validation Exercise #04 Success Criterion	Technical Validation Exercise #04 Validation Results	Technical Validation Exercise #04 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-SEC.0023	End-to-end HMAC based message level integrity and authenticity for downlink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-SEC.0091	Following steps are successfully completed:- The publisher creates and publishes an additional AMQP 1.0 annotated publication message with HMAC AMQP footer containing also the new shared secret.- The publication message is delivered to the intended subscribers that successfully validate the authenticity and integrity of the message relying on delivered HMAC AMQP footer and replacing the cached HMAC-Secret.	Not planned	N/A

Technical Validation Exercise #04 Technical Validation Objective ID	Technical Validation Exercise #04 Technical Validation Objective Title	Technical Validation Exercise #04 Success Criterion ID	Technical Validation Exercise #04 Success Criterion	Technical Validation Exercise #04 Validation Results	Technical Validation Exercise #04 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-SEC.0023	End-to-end HMAC based message level integrity and authenticity for downlink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-SEC.0092	Following steps are successfully completed: -The publisher creates and publishes an additional AMQP 1.0 annotated publication message for the same subscribers with HMAC AMQP footer containing HMAC-Algorithm, HMAC-Target, HMAC-Digest and HMAC-Secret.- While in transit the publication message data section is modified.- The publication message is delivered to the intended subscribers that, relying on delivered HMAC AMQP footer, recognize that the authenticity and integrity of the message have been violated.- The subscribers discards the message and the event is logged in accordance with the applicable audit policy.	Not planned	N/A

Technical Validation Exercise #04 Technical Validation Objective ID	Technical Validation Exercise #04 Technical Validation Objective Title	Technical Validation Exercise #04 Success Criterion ID	Technical Validation Exercise #04 Success Criterion	Technical Validation Exercise #04 Validation Results	Technical Validation Exercise #04 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-SEC.0024	End-to-end digital signature based message level integrity and authenticity for uplink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-SEC.0093	Following steps are successfully completed:- The requestor creates and sends an AMQP 1.0 annotated request message with DSGN AMQP footer with value containing DSGN-Algorithm, DSGN-Target and DSGN-Signature.- The request message is delivered to the intended responder that successfully validates the authenticity and integrity of the message relying on delivered DSGN AMQP footer.	Not planned	N/A

Technical Validation Exercise #04 Technical Validation Objective ID	Technical Validation Exercise #04 Technical Validation Objective Title	Technical Validation Exercise #04 Success Criterion ID	Technical Validation Exercise #04 Success Criterion	Technical Validation Exercise #04 Validation Results	Technical Validation Exercise #04 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-SEC.0024	End-to-end digital signature based message level integrity and authenticity for uplink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-SEC.0094	Following steps are successfully completed: - The responder creates and sends an AMQP 1.0 annotated response message with DSGN AMQP footer with value containing DSGN-Algorithm, DSGN-Target and DSGN-Signature.- The response message is delivered to the intended requestor that successfully validates the authenticity and integrity of the message relying on delivered DSGN AMQP footer.	Not planned	N/A

Technical Validation Exercise #04 Technical Validation Objective ID	Technical Validation Exercise #04 Technical Validation Objective Title	Technical Validation Exercise #04 Success Criterion ID	Technical Validation Exercise #04 Success Criterion	Technical Validation Exercise #04 Validation Results	Technical Validation Exercise #04 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-SEC.0024	End-to-end digital signature based message level integrity and authenticity for uplink Request/Response Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-SEC.0095	Following steps are successfully completed: - The responder creates and sends an AMQP 1.0 annotated response message with DSGN AMQP footer with value containing DSGN-Algorithm, DSGN-Target and DSGN-Signature.- While in transit the response message data section is modified.- The response message is delivered to the intended requestor that, relying on delivered DSGN AMQP footer, recognizes that the authenticity and integrity of the message have been violated.- The requestor discards the message and the event is logged in accordance with the applicable audit policy.	Not planned	N/A

Technical Validation Exercise #04 Technical Validation Objective ID	Technical Validation Exercise #04 Technical Validation Objective Title	Technical Validation Exercise #04 Success Criterion ID	Technical Validation Exercise #04 Success Criterion	Technical Validation Exercise #04 Validation Results	Technical Validation Exercise #04 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-SEC.0025	End-to-end digital signature based message level integrity and authenticity for uplink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-SEC.0096	Following steps are successfully completed:- The publisher creates and publishes an AMQP 1.0 annotated publication message with DSGN AMQP footer with value containing DSGN-Algorithm, DSGN-Target and DSGN-Signature.- The publication message is delivered to the intended subscribers that successfully validate the authenticity and integrity of the message relying on delivered DSGN AMQP footer.	Not planned	N/A

Technical Validation Exercise #04 Technical Validation Objective ID	Technical Validation Exercise #04 Technical Validation Objective Title	Technical Validation Exercise #04 Success Criterion ID	Technical Validation Exercise #04 Success Criterion	Technical Validation Exercise #04 Validation Results	Technical Validation Exercise #04 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-SEC.0025	End-to-end digital signature based message level integrity and authenticity for uplink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-SEC.0097	Following steps are successfully completed: - The publisher creates and publishes an AMQP 1.0 annotated publication message with DSGN AMQP footer with value containing DSGN-Algorithm, DSGN-Target and DSGN-Signature.- While in transit the publication message data section is modified.- The publication message is delivered to the intended subscribers that, relying on delivered DSGN AMQP footer, recognize that the authenticity and integrity of the message have been violated.- The subscribers discard the message and the event is logged in accordance with the applicable audit policy.	Not planned	N/A

Technical Validation Exercise #04 Technical Validation Objective ID	Technical Validation Exercise #04 Technical Validation Objective Title	Technical Validation Exercise #04 Success Criterion ID	Technical Validation Exercise #04 Success Criterion	Technical Validation Exercise #04 Validation Results	Technical Validation Exercise #04 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-SEC.0026	End-to-end digital signature based message level integrity and authenticity for downlink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-SEC.0096	Following steps are successfully completed:- The publisher creates and publishes an AMQP 1.0 annotated publication message with DSGN AMQP footer with value containing DSGN-Algorithm, DSGN-Target and DSGN-Signature.- The publication message is delivered to the intended subscribers that successfully validate the authenticity and integrity of the message relying on delivered DSGN AMQP footer.	Not planned	N/A

Technical Validation Exercise #04 Technical Validation Objective ID	Technical Validation Exercise #04 Technical Validation Objective Title	Technical Validation Exercise #04 Success Criterion ID	Technical Validation Exercise #04 Success Criterion	Technical Validation Exercise #04 Validation Results	Technical Validation Exercise #04 Technical Validation Objective Status
OBJ-17.01-TRL6-TVALP-SEC.0026	End-to-end digital signature based message level integrity and authenticity for downlink Publish/Subscribe Purple Profile enabled SWIM services	CRT-17.01-TRL6-TVALP-SEC.0097	Following steps are successfully completed: - The publisher creates and publishes an AMQP 1.0 annotated publication message with DSGN AMQP footer with value containing DSGN-Algorithm, DSGN-Target and DSGN-Signature.- While in transit the publication message data section is modified.- The publication message is delivered to the intended subscribers that, relying on delivered DSGN AMQP footer, recognize that the authenticity and integrity of the message have been violated.- The subscribers discard the message and the event is logged in accordance with the applicable audit policy.	Not planned	N/A

Table 31: Technical Validation Results Exercise 4


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D.3.2 Results on technical feasibility

Main goal of this exercise was interoperability, which means that a limited set of validation objectives were taken into account for performance and security. Reliability was not in the scope since non-nominal case were not part of the validation.

Taking into account EXE4 validation results, both technical feasibility and technical interoperability have been proved. Leonardo Air SWIM Node and Indra Ground SWIM Node interoperate with minor issues during integration phase.

D.3.3 Results per KPA

In the context of this EXE, two main KPAs have been addressed: **Security** and **Global Interoperability**.

- **Security KPA**: design and validation activities carried out by PJ.17-01 concern more the "Implementation measures" focus area. EXE4 successfully implemented and validated basic but interoperable security controls (authentication, authorization) at Leonardo Air SWIM Node and Indra Ground SWIM Node connection level.
- **Global Interoperability**: this is the main objective for EXE4. Leonardo Air SWIM Node and Indra Ground SWIM Node interoperate with minor issues during integration phase. EXE4 demonstrated that this solution contributes positively to this KPA.

D.3.4 Analysis of Exercise 4 Results per Technical Validation objective

This section provides the EXE4 analysis of the validation results per validation objective group.

D.3.4.1.Performance efficiency characteristic Technical Validation Objectives

Performance validation objectives for EXE4 was restricted to Ordering Delivery Guarantees and these were satisfactory tested for both prototypes during validation. It should be noticed that this exercise had an interoperability goal and On-The-Fly Compression was considered an advanced capability.

D.3.4.2.Reliability efficiency Technical Validation Objectives

No reliability validation objectives were in the scope of this exercise since non-nominal cases were not considered.

D.3.4.3.Security characteristic Technical Validation Objectives

Security validation objectives for EXE4 were restricted to basic security measures like authentication and authorization between Leonardo Air SWIM Node and Indra Ground SWIM Node.

D.3.5 Unexpected Behaviours/Results

No unexpected behaviours or results in EXE4 validation.

D.3.6 Confidence in Results of Validation Exercise 4

D.3.6.1.Level of significance/limitations of Technical Validation Exercise Results

EXE4 scenarios and validation objectives coverage were limited to basic (but core) capabilities.

D.3.6.2.Quality of Technical Validation Exercises Results

Overall EXE4 results met the expectation: demonstrate technical interoperability, limited to core capabilities, between Leonardo Air SWIM Node and Indra Ground SWIM Node.

D.3.6.3.Significance of Technical Validation Exercises Results

EXE4 results allow to increase the level of confidence on the technical feasibility and completeness (technical interoperability) of the TS.

D.3.7 Conclusions

This section provides a summary of the conclusions raised by EXE4 validation activities results detailed in §D.3.4.

D.3.7.1.Conclusions on technical feasibility

Coverage of requirements was higher than expected. AMQP is versatile and the wide range of products that offer AMQP solutions could have led to some initial issues that were easily and quickly fixed during integration.

EXE4 had the opportunity to test communication over IPv6. This was discarded initially because Indra's prototype was not ready to do that, but during integration phase the prototype was improved and all the tests were done over IPv4 and IPv6. It must be highlighted that change to IPv6 was just a matter of configurations and no code modifications were needed.

Although there is no doubt about technical feasibility, and as it is recommended in next section, the use of JMS AP can raise some issues when used against a prototype that is not using it. This is easily fixable, but should be take into account in the specification.

D.3.7.2.Conclusions on performance assessments

Performance coverage on exercise 4 was limited due to the nature of this exercise. This exercise was focused on interoperability between SWIM Nodes from different partners, so time-behaviour was not in the scope of this exercise.

Performance coverage on this exercise was limited to Ordering Delivery Guarantees and On-The-Fly compression, which were successfully validated by both partners. The reason to choose these validation objectives as part of interoperability was because they are closely linked to bindings.

D.3.8 Recommendations

Based on experience from the two teams in the different phases of this prototype, but especially during development, some recommendations were identified. They are not key aspects for the technical feasibility, since it was already proved, but they would make a stronger architecture and a better defined specification.

- TS/IRS:

- (INDRA) Some minor issues were identified due the use of JMS QPID. These were easily solved during integration, but some additional specification should be added in order to prevent this in the future (refer to solution and EXEs level feedback in the requirements coverage spreadsheet in Appendix J).

- Execution
  - More ambitious tests with more partners involved, trying to identify more possible issues and including more realistic systems in the platform.

Appendix E Safety Assessment Report (SAR)

In accordance with the safety KPA assessment provided in TVALP §4.3.1 [44], no specific validation activities have been planned. Further considerations and safety requirements are provided in the TRL6 TS [40].

Appendix F Security Assessment Report (SecAR)

PJ.17-01 Security Assessment Report has been handed over as part of the TRL6 technical specification task. In particular following deliverables have been produced:

- PJ.17-01 D2.2.611, PJ.17-01 TRL6 Security Assessment Report – Part IIA [41],
- PJ.17-01 D2.2.612, PJ.17-01 TRL6 Security Assessment Report – Part IIB [42],
- PJ.17-01 D2.2.613, PJ.17-01 TRL6 Security Assessment Report – Part IIC [43].

Starting from the TRL6 SAR, technical security requirements have been specified in the TRL6 TS [40]. As described in §3.2.2, in the context of the TVALP task [44] dedicated technical validation objectives have been identified. Validation results concerning to these security related technical validation objectives are provided in §4.2.3.

Appendix G Human Performance Assessment Report (HPAR)

Not applicable.

Appendix H SESAR Technological Solution(s) Maturity Assessment

This appendix provides as attachment the maturity assessment of the PJ.17-01 solution based on SESAR2020 maturity assessment tool TRL6 criterions.



PJ17-01 TRL6
Maturity Assessment

Appendix I High level Economic Appraisal

This appendix provides a high level economic appraisal analysis carried out by applying a bottom-up approach (technological solution) limiting to the enabling functions provided by the solution.

Taking into account the above, relevant assumptions and limitations have been recorded and reported in §I.2.

I.1 Reference Scenarios

Reference scenarios are defined in the ED-151 §4.1 [38]. In particular this assessment following services are assessed in this analysis:

- AIS Services:
  - Uplink of (D-)NOTAM ("Aeronautical Update Service" in ED-151 [38]).
- MET Services:
  - Uplink of MET information. Due to the scope of this solution (limited to enabling advisory information sharing) only following uplink MET services are applicable (selected in accordance with Pilot Decision Support classifications defined in ED-151 §7.1 [38]):
    - Weather planning decision services (WPDSs) and applicable MET products/information illustrated in ED-151 §7.4 and §7.5 [38].
    - Weather near-term decision services (WNDSs) and applicable MET products/information illustrated in ED-151 §7.4 and §7.6 [38].
  - Downlink of aircraft MET observations for improving weather forecast like (Aircraft Observation and Reports in ED-151 §7.4 and §7.9 [38]).

This analysis focuses on the solution scenarios relying on reference/existing scenarios/operating methods illustrated in the ED-151 [38].

I.2 Assumptions and limitations

Following assumptions have been made when describing and assessing the solution scenarios:

Identifier	Description
PJ.17-01-ASSUMPTION.01	In the context of PJ.17-01, transformation/bridging capability has been further discussed and the decision is that in the PJ.17-01 TS the "bridging" capabilities related to the adaptation towards ground Profiles (Yellow, Blue, Green, etc.) will not be specified. This is mainly to avoid coupling between SWIM Profiles and because of the complexity of a complete bridging for all the existing interface bindings. This decision introduces following assumptions: - Ground provided services of interest for the aircraft are provided over

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	Purple Profile <Service binding> options specified in this technical specification. - Ground provided services of interest for both the aircraft and ground systems are provided over multiple SWIM Profiles (Purple Profile for aircraft and whatever colour for other ground consumers). This requires that such bridging/transformations are implemented on the service provider side (no restrictions are provided in this TS on the what, how and how good).
PJ.17-01-ASSUMPTION.02	It is assumed that the CAs will be able to provide all the three bindings (LDAP CDP, HTTP CDP and OSCP).
PJ.17-01-ASSUMPTION.03	The Purple Profile messaging design includes handling of messages (not related to security purposes) based on identifiers for producer, consumer, service, etc. It is assumed that when moving to the SESAR deployment phase, a governed registry will be available to register applications, services, etc.
PJ.17-01-ASSUMPTION.04	Service specific message properties are assumed to be documented as part of the SWIM services design description.
PJ.17-01-ASSUMPTION.05	It is assumed that the technical design of a given PP enabled SWIM Service is built on one or more of the technical use cases identified in PP TS.
PJ.17-01-ASSUMPTION.06	It is assumed IP-based Air/ground network infrastructure is available.

Table 32: PJ.17-01 High level Economic Appraisal assumptions

Following limitations apply to solution scenarios assessment:

Identifier	Description
PJ.17-01-LIMITATION.01	Impact assessment of the IP-based Air/ground network infrastructure is out of scope.
PJ.17-01-LIMITATION.02	Impact assessment of the use and deploy of Identity management / CA(s) is out of scope.
PJ.17-01-LIMITATION.03	Impact assessment carried out by applying a bottom-up approach (technological solution) limiting to the enabling functions provided by the solution.
PJ.17-01-LIMITATION.04	Impact assessment of new/updated standards, regulations, and procedures is out of scope.

Table 33: PJ.17-01 High level Economic Appraisal limitations

I.3 Solution Scenarios

The solution scenario(s) consists in deploying the Purple Profile infrastructure and using it as enabler for consuming and providing uplink and downlink (Purple Profile enabled SWIM) AIS and MET services part of the reference scenarios/services introduce above. In particular, the "delta" introduced by this solution consists in using as "Data link infrastructure" (ED-151 §5 [38]) the Purple Profile infrastructure with assumptions and limitations described in §I.2. Further relevant details to better characterize this delta are described in the solution TS §3 (SESAR Solution Impacts on Architecture) [40].

In accordance with reference scenarios and services, the following EATMA defined stakeholders (and related capabilities configuration) are taken into account in this analysis:

- **ANSP** (Air Navigation Service Provider):
  - Civil AIS Service Provider (National AIM Capability Configuration).
  - Civil MET Service Provider (Aerodrome ATM-MET, Local Aerodrome ATM-MET, and ATM-MET Capabilities Configuration).
- **AU** (Airspace User):
  - Civil Flight Operations Centre (Civil Flight Operations Centre Capability Configuration).
  - Civil Scheduled Aviation (Civil Aircraft Capability Configuration).
- **AO** (Airport Operator):
  - Civil APT operator (Aerodrome ATM-MET Capability Configuration).
- **NM** (Network Manager):
  - Regional AIM Capability Configuration.

For each reference scenario/service in scope of this analysis, the solution scenario(s) is(are) elaborated taking into account:

- Relationships between Purple Profile enabled SWIM services, operational data link modes, and Purple Profile technical use cases illustrated in the TS §3.1.1 [40].
- Technical options (QoS, etc.) illustrated in the TS [40] and linked to applicable Purple Profile technical use cases.
- Deployment options illustrated in the TS §4.2.3 [40].

By assessing the abovementioned elements, a qualitative impact assessment on the concerned stakeholders is provided:

- **Low**: the changes required on the stakeholder to contribute to the solution scenario are limited.
- **Medium**: the changes required on the stakeholder to contribute to the solution scenario are quite significant.

- **High**: the changes required on the stakeholder to contribute to the solution scenario are relevant.

I.3.1 Uplink of (D-)NOTAM (Aeronautical Update Service)

Following deployment options are available for Uplink of (D-)NOTAM over Purple Profile Request/Response MEP:

DEPLOY-OPT 1. : Air PP SWIM Node and Ground PP SWIM Node pair independent of the SWIM service being consumed by the A/C (deployment option).

DEPLOY-OPT 2. Air PP SWIM Node and Ground PP SWIM Node pair depends on the SWIM service being consumed by the A/C (deployment option).

DEPLOY-OPT 3. Request and Response message queues messaging resources deployed on Ground SWIM Node side

DEPLOY-OPT 4. Request and Response message queues messaging resources deployed on SWIM Service provider side.

Stakeholders/Capability configuration	Messaging role(s) / functions	DEPLOY-OPT 1		DEPLOY-OPT 2	
		DEPLOY-OPT 3	DEPLOY-OPT 4	DEPLOY-OPT 3	DEPLOY-OPT 4
Civil AIS Service Provider (National AIM Capability Configuration)	Responder	**Medium/low** (less significant because not responsible for the messaging resources)	**Medium**	**High** (Ground SWIM Node deployed in this CC)	**High** (in addition to the Ground SWIM Node also per-requestor messaging resources are deployed)
Network Manager (Regional AIM Capability Configuration)	Responder	**Medium/low** (less significant because not responsible for the messaging resources)	**Medium**	**High** (Ground SWIM Node deployed in this CC)	**High** (in addition to the Ground SWIM Node also per-requestor messaging resources are deployed)
Civil Flight Operations Centre (Civil Flight Operations Centre Capability Configuration	Request/Response messaging federation	**High** (Ground SWIM Node deployed in this CC)	**High** (in addition to the Ground SWIM Node also per-service resources are deployed)	**Medium**	**Medium**
Civil Scheduled Aviation (Civil Aircraft Capability	Request/Response messaging federation (Air	**High** (Air SWIM Node deployed	**High** (Air SWIM Node routing is configured to	**High** (Air SWIM Node deployed in	**High** (Air SWIM Node routing is configured to

Configuration)	SWIM Node	in this CC)	connect to the Ground SWIM Node assigned to the specific service)	this CC)	connect to the Ground SWIM Node assigned to the specific service)
	Requestor				

Table 34: Uplink of (D-)NOTAM over Purple Profile Request/Response MEP impact assessment

In addition to the above DEPLOY-OPT 1 and DEPLOY-OPT 2, following additional deployment options are available for Uplink of (D-)NOTAM over Purple Profile Publish/Subscribe MEP:

DEPLOY-OPT 5. Subscription management messaging resources and subscription handler entity deployed on Ground SWIM Node side

DEPLOY-OPT 6. Subscription management messaging resources and subscription handler entity deployed on SWIM Service provider side.

Stakeholders/Capability configuration	Messaging role(s) / functions	DEPLOY-OPT 1		DEPLOY-OPT 2	
		DEPLOY-OPT 5	DEPLOY-OPT 6	DEPLOY-OPT 5	DEPLOY-OPT 6
Civil AIS Service Provider (National AIM Capability Configuration)	Publisher, Subscription Handler	**Medium/low** (less significant because not responsible for the messaging resources)	**Medium**	**High** (Ground SWIM Node deployed in this CC)	**High** (in addition to the Ground SWIM Node also the subscription handler and per-subscriber messaging resources are deployed)
Network Manager (Regional AIM Capability Configuration)	Publisher, Subscription Handler	**Medium/low** (less significant because not responsible for the messaging resources)	**Medium**	**High** (Ground SWIM Node deployed in this CC)	**High** (in addition to the Ground SWIM Node also the subscription handler and per-subscriber messaging resources are deployed)
Civil Flight Operations Centre (Civil Flight Operations Centre Capability Configuration	Publish/Subscribe messaging federation	**High** (Ground SWIM Node deployed in this CC)	**High** (in addition to the Ground SWIM Node also per-service resources are deployed)	**Medium**	**Medium**
Civil Scheduled Aviation (Civil Aircraft Capability	Publish/Subscribe messaging federation (Air	**High** (Air SWIM Node deployed	**High** (Air SWIM Node routing is configured to	**High** (Air SWIM Node deployed in	**High** (Air SWIM Node routing is configured to

Configuration)	SWIM Node Subscriber, Publication consumer	in this CC)	connect to the Ground SWIM Node assigned to the specific service)	this CC)	connect to the Ground SWIM Node assigned to the specific service)

Table 35: Uplink of (D-)NOTAM over Purple Profile Publish/Subscribe MEP impact assessment

I.3.2 Uplink of MET information (Weather near-term decision service)

Following deployment options are available for Uplink of MET information over Purple Profile Request/Response MEP:

DEPLOY-OPT 1. : Air PP SWIM Node and Ground PP SWIM Node pair independent of the SWIM service being consumed by the A/C (deployment option).

DEPLOY-OPT 2. Air PP SWIM Node and Ground PP SWIM Node pair depends on the SWIM service being consumed by the A/C (deployment option).

DEPLOY-OPT 3. Request and Response message queues messaging resources deployed on Ground SWIM Node side

DEPLOY-OPT 4. Request and Response message queues messaging resources deployed on SWIM Service provider side.

Stakeholders/Capability configuration	Messaging role(s) / functions	DEPLOY-OPT 1		DEPLOY-OPT 2	
		DEPLOY-OPT 3	DEPLOY-OPT 4	DEPLOY-OPT 3	DEPLOY-OPT 4
Civil MET Service Provider (Aerodrome ATM-MET, Local Aerodrome ATM-MET, and ATM-MET Capabilities Configuration)	Responder	**Medium/low** (less significant because not responsible for the messaging resources)	**Medium**	**High** (Ground SWIM Node deployed in this CC)	**High** (in addition to the Ground SWIM Node also per-requestor messaging resources are deployed)
Civil APT operator (Aerodrome ATM-MET Capability Configuration)	Responder	**Medium/low** (less significant because not responsible for the messaging resources)	**Medium**	**High** (Ground SWIM Node deployed in this CC)	**High** (in addition to the Ground SWIM Node also per-requestor messaging resources are deployed)
Civil Flight Operations Centre (Civil Flight Operations Centre Capability Configuration)	Request/Response messaging federation	**High** (Ground SWIM Node deployed in this CC)	**High** (in addition to the Ground SWIM Node also per-service resources are	**Medium**	**Medium**

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			deployed)		
Civil Scheduled Aviation (Civil Aircraft Capability Configuration)	Request/Response messaging federation (Air SWIM Node) Requestor	**High** (Air SWIM Node deployed in this CC)	**High** (Air SWIM Node routing is configured to connect to the Ground SWIM Node assigned to the specific service)	**High** (Air SWIM Node deployed in this CC)	**High** (Air SWIM Node routing is configured to connect to the Ground SWIM Node assigned to the specific service)

Table 36: Uplink of MET information over Purple Profile Request/Response MEP impact assessment

In addition to the above DEPLOY-OPT 1 and DEPLOY-OPT 2, following additional deployment options are available for Uplink of MET information over Purple Profile Publish/Subscribe MEP:

DEPLOY-OPT 5. Subscription management messaging resources and subscription handler entity deployed on Ground SWIM Node side

DEPLOY-OPT 6. Subscription management messaging resources and subscription handler entity deployed on SWIM Service provider side.

Stakeholders/Capability configuration	Messaging role(s) / functions	DEPLOY-OPT 1		DEPLOY-OPT 2	
		DEPLOY-OPT 5	DEPLOY-OPT 6	DEPLOY-OPT 5	DEPLOY-OPT 6
Civil MET Service Provider (Aerodrome ATM-MET, Local Aerodrome ATM-MET, and ATM-MET Capabilities Configuration)	Publisher, Subscription Handler	**Medium/low** (less significant because not responsible for the messaging resources)	**Medium**	**High** (Ground SWIM Node deployed in this CC)	**High** (in addition to the Ground SWIM Node also the subscription handler and per-subscriber messaging resources are deployed)
Civil APT operator (Aerodrome ATM-MET Capability Configuration)	Publisher, Subscription Handler	**Medium/low** (less significant because not responsible for the messaging resources)	**Medium**	**High** (Ground SWIM Node deployed in this CC)	**High** (in addition to the Ground SWIM Node also the subscription handler and per-subscriber messaging resources are deployed)
Civil Flight Operations Centre (Civil Flight Operations Centre Capability Configuration)	Publish/Subscribe messaging federation	**High** (Ground SWIM Node deployed in this CC)	**High** (in addition to the Ground SWIM Node also per-service resources are	**Medium**	**Medium**

			deployed)		
Civil Scheduled Aviation (Civil Aircraft Capability Configuration)	Publish/Subscribe messaging federation (Air SWIM Node) Subscriber, Publication consumer	**High** (Air SWIM Node deployed in this CC)	**High** (Air SWIM Node routing is configured to connect to the Ground SWIM Node assigned to the specific service)	**High** (Air SWIM Node deployed in this CC)	**High** (Air SWIM Node routing is configured to connect to the Ground SWIM Node assigned to the specific service)

Table 37: Uplink of MET information over Purple Profile Publish/Subscribe MEP impact assessment

I.3.3 Downlink of aircraft MET observations (Aircraft Observation and Reports service)

For downlink of aircraft MET observations, following considerations are relevant:

- Publish/Subscribe MEP is considered relevant only for in-flight MET reports downlink.
- Request/Response MEP is considered relevant only for on-the-ground MET reports downlink.
- The SWIM service accessible by ground systems (subscribers, requestors) should be deployed in the Civil Flight Operations Centre (Civil Flight Operations Centre Capability Configuration) and it should allow to retrieve/subscribe to both per-aircraft and consolidated (multiple aircraft) MET reports.

Stakeholders/Capability configuration	Messaging role(s) / functions	Impact assessment
Civil Flight Operations Centre (Civil Flight Operations Centre Capability Configuration)	Request/Response messaging federation (Ground SWIM Node)	**High** (Deployment of Ground SWIM Node functions)
Civil Scheduled Aviation (Civil Aircraft Capability Configuration)	Request/Response messaging federation (Air SWIM Node)	**High** (Deployment of Air SWIM Node functions)
	Responder	**Medium** (Purple Profile enabled application related requirements)
Civil MET Service Provider (Aerodrome ATM-MET, Local Aerodrome ATM-MET, and ATM-MET Capabilities Configuration)	Requestor	**Medium** (Purple Profile enabled application related requirements)
Civil APT operator (Aerodrome ATM-MET Capability Configuration)	Requestor	**Medium** (Purple Profile enabled application related requirements)

Table 38: Downlink of MET information over Purple Profile Request/Response MEP impact assessment

Stakeholders/Capability configuration	Messaging role(s) / functions	Impact assessment

Civil Flight Operations Centre (Civil Flight Operations Centre Capability Configuration)	Publish/Subscribe messaging federation (Ground SWIM Node), Subscription Handler	**High** (Deployment of Air SWIM Node functions)
Civil Scheduled Aviation (Civil Aircraft Capability Configuration)	Publish/Subscribe messaging federation (Air SWIM Node), Subscription Handler	**High** (Deployment of Air SWIM Node functions)
	Publisher	**Medium** (Purple Profile enabled application related requirements)
Civil MET Service Provider (Aerodrome ATM-MET, Local Aerodrome ATM-MET, and ATM-MET Capabilities Configuration)	Subscriber, Publication consumer	**Medium** (Purple Profile enabled application related requirements)
Civil APT operator (Aerodrome ATM-MET Capability Configuration)	Subscriber, Publication consumer	**Medium** (Purple Profile enabled application related requirements)

Table 39: Downlink of MET information over Purple Profile Publish/Subscribe MEP impact assessment

Appendix J SESAR Technological Solution requirements and objectives coverage

This appendix provides solution level consolidation of requirements and objectives coverage.

- Spreadsheet containing EXEs and solution level technical validation objectives coverage:



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- Spreadsheet containing EXEs and solution level requirements coverage and assessment:



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Requirements Coverag

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