EUROCONTROL Specification for SWIM Service Description

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EUROCONTROL

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Abstract

This specification contains requirements for service descriptions, describing information services, in the context of System Wide Information Management (SWIM).

Keywords

Service Description	Service	Interoperability	SWIM
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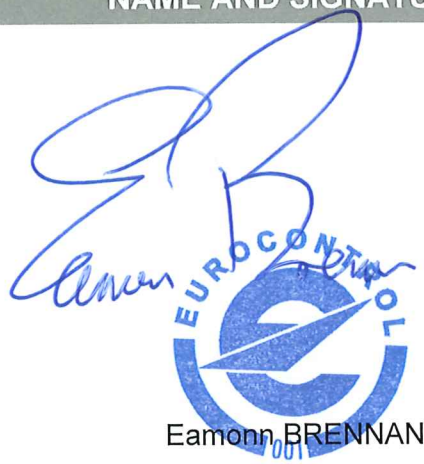
Director General	 Eamonn BRENNAN	15/3/22

DOCUMENT CHANGE RECORD

The following table records the complete history of the successive editions of the present document.

EDITION NUMBER	EDITION DATE	REASON FOR CHANGE	PAGES AFFECTED
0.1	31 Mar 2017	Released for Specification Package consistency review	All
0.2	18 May 2017	Update following internal review	All
1.0	01 December 2017	Released Issue	All
2.0	15 March 2022	Update following global developments on SWIM (see Annex C for detailed changes)	All

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EXECUTIVE SUMMARY

This specification contains requirements for service descriptions in the context of System Wide Information Management (SWIM) in Europe.

Service descriptions describe implemented information services.

The requirements focus on the minimum content of a service description to be produced by an information service provider. The content includes a description of what a service does, how a service works, how to access a service, and other information for consuming a service. This means that the service description contains the information needed by an information service consumer to use, or consider using, the service.

1. Introduction

1.1 Purpose

This specification contains requirements for service descriptions in the context of System Wide Information Management (SWIM) in Europe.

Service descriptions describe implemented information services.

The requirements focus on the minimum content of a service description to be produced by an information service provider. The content includes a description of what a service does, how a service works, how to access a service, and other information for consuming a service.

This means that the service description contains the information needed by an information service consumer to use, or consider using, the service.

1.2 Scope

This specification considers which information needs to be provided to service consumers about implemented services, i.e., service instances.

This specification does not cover the information needs of service providers, for example, to implement a service. In addition, this specification does not identify a list of services to be implemented and does not cover governance aspects.

Further complementary requirements to the present specification exist: the EUROCONTROL Specification for SWIM Information Definition [RD 3] contains requirements for creating information definitions that conform to the ATM Information Reference Model; the EUROCONTROL Specification for SWIM Technical Infrastructure Yellow Profile [RD 4] contains requirements on the suite of technological choices concerning service interface binding aspects.

1.3 Applicability

The Common Project Regulation (CP1) [RD 1] [1] says that SWIM "*should enable the development, implementation and evolution of services for information exchange through standards, infrastructure and governance enabling the management of information and its exchange between operational stakeholders via interoperable services.*" It lists four ATM sub-functionalities concerning information exchanges:

1. aeronautical information exchange;
2. meteorological information exchange;
3. cooperative network information exchange; and
4. flight information exchange.

The Common Project Regulation (CP1) requires that service implementations in support of the information exchanges "*comply with applicable SWIM specifications*" (see sections 5.1.3, 5.1.4, 5.1.5 and 5.1.6 of the Annex to the Common Project Regulation (CP1)).

This specification is to be treated as one of the applicable SWIM specifications.

This specification can also be adopted outside of the specific Common Project context by those seeking to achieve the benefits of SWIM. For example, meeting the requirements will ensure that a service description can also be seen as an ICAO Information Service Overview [RD 12].

[1] The Common Project Regulation [RD 1] repeals the Pilot Common Project Regulation [RD 2] that was used in the previous edition of this specification.

This specification is expected to be applied by service providers when describing the services that they offer.

1.4 Target audience

The target audience for the specification includes, but is not limited to:

- operational stakeholders implementing services supporting the exchange of information over SWIM. This audience includes:
  - business experts procuring systems and services;
  - technical experts designing and implementing systems and services; and
  - operational experts using systems and services to fulfil operational needs.
- oversight authorities.

1.5 Conventions

EUROCONTROL Specifications are *voluntary* in status; however drafting conventions include 'normative' language to indicate which requirements must be complied with in order to claim compliance with the specification. Drafting conventions are used to indicate these requirements.

The following conventions are used in this EUROCONTROL Specification:

- "**Shall**"- indicates a statement of specification, the compliance with which is mandatory to achieve the implementation of this EUROCONTROL Specification.
- "**Should**" - indicates a recommendation or best practice, which may or may not be satisfied by all systems claiming conformity to this EUROCONTROL Specification.
- "**May**" - indicates an optional element.

Numbers within square brackets are used to identify reference documents listed in Section 8 e.g. [1] identifies the first document referenced in Section 8.

Annex A to this specification provides the conformity checklist indicating, per requirement, the level of implementation to be achieved – see tables 4 and 5.

Each requirement is detailed in a table with the following structure.

Title	Title of the requirement, used as a short name for the requirement for mnemonic and readability purposes.
Identifier	Unique identifier of the requirement.
Requirement	Statement expressing the requirement.
Rationale	Justification of the existence of the requirement.
Verification	Quality characteristics to be assessed when inspecting a service description with regards to the requirement. Each requirement will indicate the verification method to cover the following characteristics: • Completeness • Consistency • Correctness
Examples/Notes	Examples in support of the requirement or additional notes to clarify the requirement. The examples and the notes are informative.

Table 1 – Requirement structure

1.6 Abbreviations and acronyms

Abbreviation	Term
AIRM	ATM Information Reference Model
AIXM	Aeronautical Information Exchange Model
AMQP	Advanced Message Queuing Protocol
ASBU	Aviation System Block Upgrade
ATM	Air Traffic Management
BPM	Business Process Management
BPMN	Business Process Modelling Notation
CP1	Common Project 1
ERAF	EUROCONTROL Advisory Framework
EU	European Union
EUROCAE	European Organisation for Civil Aviation Equipment
ICAO	International Civil Aviation Organization
ICAO IMP	International Civil Aviation Organization Information Management Panel
ICT	Information and Communication Technology
IER	Information Exchange Requirement
IR	Implementing Regulation
ISO	International Organization for Standardization
ISO/IEC	International Organization for Standardization / International Electrotechnical Committee
IWXXM	ICAO Meteorological Information Exchange Model
MTOM	Message Transmission Optimization Mechanism
NM	Network Manager
OASIS	Organization for the Advancement of Structured Information Standards
OSED	Operational Service and Environment Definition

Abbreviation	Term
PCP	Pilot Common Project
REST	Representational state transfer
SESAR	Single European Sky ATM Research
SLA	Service Level Agreement
SOA	Service Oriented Architecture
SOAP	Simple Object Access Protocol
SPR	Safety and Performance Requirements
SWAL	Software Assurance Level
SWIM	System Wide Information Management
TI	Technical Infrastructure
TLS	Transport Level Security
UML	Unified Modeling Language
URL	Uniform Resource Locator
W3C	World Wide Web Consortium
WADL	Web Application Description Language
WSDL	Web Services Description Language
XML	Extensible Markup Language
XSD	XML Schema Definition

Table 2 – List of abbreviations

1.7 Definitions

Term	Definition	Source
Accountability	The degree to which the actions of an entity can be traced uniquely to the entity.	ISO/IEC 25010:2011[RD 8]
application message exchange pattern	A Message Exchange Pattern that describes the information interactions at application level and that is implemented using SWIM TI primitive MEPs.	SWIM Glossary [RD 11]
Authenticity	The degree to which the identity of a subject or resource can be proved to be the one claimed.	ISO/IEC 25010:2011[RD 8]

Term	Definition	Source
Availability	The degree to which a service is operational and accessible when required for use.	SWIM Glossary [RD 11]
Capacity	The maximum rate at which a service can process transactions and the maximum message size of responses. Note: Measurements can include the number of items that can be stored, the number of concurrent users, the communication bandwidth, throughput of transactions, and size of messages.	SWIM Glossary [RD 11]
collaborative validation	A validation of service jointly carried out by the service provider together with service users.	SWIM Glossary [RD 11]
Completeness	The degree to which the content contains the expected information.	Adapted from ISO/IEC 25012:2008 [RD 6]
Confidentiality	The degree to which a service ensures that data are accessible only to those authorized to have access.	SWIM Glossary [RD 11]
Consistency	The degree to which the content is free from contradiction and is coherent within itself and with referenced resources.	Adapted from ISO/IEC 25012:2008 [RD 6]
consumer side interface	A service interface, required by the service, which is implemented by the service consumer.	-
Correctness	The degree to which the content correctly represents the true value.	Adapted from ISO/IEC 25012:2008 – Accuracy [RD 6]
data format	A structure of data elements, records and files arranged to meet standards, specifications or data quality requirements.	SWIM Glossary [RD 11]
independent validation	A validation of service carried out by an independent authority.	SWIM Glossary [RD 11]
information definition	A formal representation of information concepts or data concepts.	-
information exchange requirement	A specification of the information that is to be exchanged.	SWIM Glossary [RD 11]
information service	A type of service that provides an ATM information sharing capability.	SWIM Glossary [RD 11]
Integrity	An expression of the assurance that a system, product or component prevents unauthorized access to, or modification of, an information service interface or information.	SWIM Glossary [RD 11]

Term	Definition	Source
interface binding	Specification of the protocols and data formats to be used in transmitting messages defined by the associated interface. Note: Two systems that implement the same interface binding are considered technically interoperable and are able to connect to each other and exchange information. There are two types of interface bindings to be distinguished based on their position in the TCP/IP protocol: service bindings and network bindings. Service bindings specify the service interface protocols (e.g. protocols to interface with the applications, such as HTTP and AMQP). Network bindings specify the transport and network related protocols that will be used to exchange data over the network (e.g. TCP, IP v4/v6).	SWIM Glossary [RD 11]
Interoperability	The ability of information and communication technology (ICT) systems and of the business processes they support to exchange data and to enable the sharing of information and knowledge.	SWIM Glossary [RD 11]
Message	A discrete unit of communication intended by the source for consumption by a given recipient or group of recipients. Note: The term message refers to a unit of information exchange between systems that communicate via information services. Although there are similarities, no direct comparison should be made with the term message used in other ICAO documents (e.g. CPDLC message).	SWIM Glossary [RD 11]
message exchange pattern	A template that describes relationships of multiple messages exchanged between interacting components to accomplish a single complete information exchange.	SWIM Glossary [RD 11]
non-repudiation	The degree to which actions or events can be proven to have taken place, so that the events or actions cannot be repudiated later.	ISO/IEC 25010:2011[RD 8]
operational need	The operational context in which a service is used.	-
operational stakeholders	Civil and military: airspace users, air navigation service providers and airport operators. *Note: The operational stakeholders are identified in the Appendix to the Implementing Regulation.*	EU Implementing Regulation No 409/2013 [RD 7]
Protocol	A set of semantic and syntactic rules for exchanging information.	SWIM Glossary [RD 11]
provider side interface	A service interface which is implemented by the service provider.	-
quality of service	The degree or level of confidence that the performance of a service meets users requirements.	SWIM Glossary [RD 11]
real-world effect	The ultimate purpose associated with the interaction with the service.	-

Term	Definition	Source
Recoverability	The degree to which, in the event of an interruption or a failure, the desired state of the service can be re-established.	SWIM Glossary [RD 11]
Security	The degree to which a service protects information and data so that persons or other products or systems have the degree of data access appropriate to their types and levels of authorization. It includes confidentiality, integrity, non-repudiation, accountability, authenticity.	SWIM Glossary [RD 11]
self validation	A validation of service carried out by the service provider.	SWIM Glossary [RD 11]
semantic correspondence	The relation between a concept in an information definition and the AIRM. *Note: A semantic correspondence takes the form of a mapping to AIRM concepts based on their meanings, an out-of-scope declaration or a reference to a change request.*	-
Service	A mechanism to enable access to one or more capabilities using a prescribed interface. Note: In the context of system wide information management, the notion of service addresses machine-to-machine interaction based on service oriented architecture principles, and is not to be confused with the notion of service as used in ICAO provisions referring to business services such as AIS, ATS, etc.	SWIM Glossary [RD 11]
service category	A class of services which share a common feature.	SWIM Glossary [RD 11]
service consumer	An entity which seeks to satisfy a particular need through the use of capabilities offered by means of a service.	SWIM Glossary [RD 11]
service description	Information needed in order to use, or consider using, a service.	SWIM Glossary [RD 11]
service function	A type of activity describing the functionality of a service.	SWIM Glossary [RD 11]
service instance	The service deployed into a running ICT system.	SWIM Glossary [RD 11]
service interface	The means by which the underlying capabilities of a service are accessed.	SWIM Glossary [RD 11]
service operation	Specification of a transformation or query that an object may be called to execute.	SWIM Glossary [RD 11]
service policy	A constraint governing one or more services.	-
service provider	An entity (person or organization) that offers the use of capabilities by means of a service.	SWIM Glossary [RD 11]
SWIM TI	A technical infrastructure conformant to one or more SWIM TI specifications (e.g. SWIM TI YP Specification).	-

Term	Definition	Source
SWIM TI Profile	Specification defining an implementation of the SWIM TI. Multiple SWIM TI Profiles can coexist, each of them focused on the implementation of technical infrastructure but with different scope and applicability.	-
time behaviour	A measurement of the processing times of a service. Note: This parameter may be expressed as an indication of a maximum time needed for the service provider to complete the request, measured from the time instant the service provider receives the request to the time instant the service provider sends the response or makes it available.	SWIM Glossary [RD 11]
user validation	A validation of service carried out by service users.	SWIM Glossary [RD 11]

Table 3 – List of terms with definition

1.8 Reference material

[RD 1] Commission Implementing Regulation (EU) No 2021/116 of 1 February 2021 on the establishment of the Common Project One supporting the implementation of the European Air Traffic Management Master Plan

[RD 2] Commission Implementing Regulation (EU) No 716/2014 of 27 June 2014 on the establishment of the Pilot Common Project supporting the implementation of the European Air Traffic Management Master Plan

[RD 3] EUROCONTROL Specification for SWIM Information Definition, Ed. 1.0, 01 December 2017

[RD 4] EUROCONTROL Specification for SWIM Technical Infrastructure Yellow Profile, Ed. 1.1,

[RD 5] AIRM Abbreviations https://airm.aero/viewer/1.0.0/contextual-model-abbreviations-with-supplements.html

[RD 6] International Organization for Standardization – ISO/IEC 25012:2008 Software engineering — Software product Quality Requirements and Evaluation (SQuaRE) — Data quality model

[RD 7] Commission Implementing Regulation (EU) No 409/2013 of 3 May 2013 on the definition of common projects, the establishment of governance and the identification of incentives supporting the implementation of the European Air Traffic Management Master Plan

[RD 8] International Organization for Standardization - ISO/IEC 25010:2011 – Systems and software engineering – Systems and Software Quality Requirements and Evaluation (SQuaRE) – System and Software quality models

[RD 9] Aeronautical Information Exchange Model (AIXM), www.aixm.aero

[RD 10] ICAO Meteorological Information Exchange Model (IWXXM) https://schemas.wmo.int/iwxxm/

[RD 11] SWIM Glossary, https://reference.swim.aero/glossary.html

[RD 12] PANS-IM, draft

[RD 13] Service Categories, https://reference.swim.aero/information-services/service-categories.html

[RD 14] OGC Filter Encoding Standard 2.0, https://www.ogc.org/standards/filter

[RD 15] ISO/IEC 25010:2011

[RD 16] Systems and software engineering — Systems and software Quality Requirements and Evaluation (SQuaRE) — System and software quality models, https://www.iso.org/standard/35733.html#:~:text=ISO%2FIEC%2025010%3A2011%20defines,a%20particular%20context%20of%20use.&text=The%20model%20is%20applicable%20to%20both%20computer%20systems%20and%20software%20products.

1.9 Document structure

Chapter 1 introduces this document, including scope, applicability and target audience. Chapter 2 gives the conformance statements. Chapter 3 lists the requirements addressing service descriptions. Annex A gives details on update procedures. Annex B summarises the requirements to be met when assessing conformity to this specification. Annex C give more information on amendments to the specification.

1.10 Maintenance of the Specification

This EUROCONTROL Specification has been developed under the EUROCONTROL Standards development process and is maintained by EUROCONTROL in line with the EUROCONTROL Standards Development Procedures. This process is summarised in Annex A.

2. Conformance

The conformity checklist table is available in Annex B. It is provided in support of assessing conformance with this specification.

3. Requirements

3.1 General Service Description Requirements

3.1.1 Service Description Coverage

Title	Service description coverage
Identifier	SWIM-SERV-010
Requirement	A service description **shall** describe a single service.
Rationale	The readability of any service description is improved by keeping it focussed on one service.
Verification	Completeness: Not Applicable. Consistency: Not Applicable. Correctness: Verify that one and only one service is described.
Examples/Notes	Note: The specification covers implemented services, i.e., service instances. A service instance is the service deployed into a running ICT system. Note: The term 'service' is used as shorthand for 'service instance' in this specification.

3.1.2 Service Description Language

Title	Service description language
Identifier	SWIM-SERV-020
Requirement	The textual descriptions in a service description **shall** be written in English using the spelling listed as the primary British spelling when conflicting spellings exist.
Rationale	By using a single reference language, the risk of translation ambiguities when comparing service descriptions is removed.
Verification	Completeness: Not Applicable. Consistency: Not Applicable. Correctness: Verify that the textual descriptions are correct British English.
Examples/Notes	Note: This requirement does not apply to implementation details that are reflected in the content of the service description, e.g., service operation names.

3.1.3 Service Description Identification

Title	Service description identification
Identifier	SWIM-SERV-030
Requirement	A service description **shall** include: • a title by which the service description is known; • an edition; and

	• a reference date for use in citing the service description.
Rationale	This requirement supports the identification and citation of a service description.
Verification	Completeness: Verify that the 3 elements are included. Consistency: Not Applicable. Correctness: Not Applicable.
Examples/Notes	Example service description identification: • "Flight Management service description, edition 20.0, 14 Mar 2016". Note: The edition of the service description is not to be confused with the version of the service. A service description can evolve to a new edition while still describing the same service version.

3.2 General Service Information

3.2.1 Service Identification

Title	Service identification
Identifier	SWIM-SERV-040
Requirement	A service description **shall** include: • the name of the service; and • the version of the service.
Rationale	This requirement ensures that a specific version of a service from a service provider can be uniquely identified. It makes clear what the subject of the service description is. It enables the identification and referencing of the service being described.
Verification	Completeness: Verify that the 2 elements are included Consistency: Not Applicable. Correctness: Not Applicable.
Examples/Notes	Example service identifications: • "TargetOffBlockTimeSetting service, version 1.3.0"; • "FlightManagement service, version 20.0". Note: To improve readability across service descriptions, it is best practice to apply following conventions for a service name: • the name provides an indication of the purpose of the information service; • be a maximum of five words in length; • be represented using UpperCamelCase, and not use snake_case; and • not end with the 'service' suffix. Note: It is a best practice for the service version to be provided in numerical format (n.n[.n]).

3.2.2 Service Abstract

Title	Service abstract
Identifier	SWIM-SERV-050
Requirement	A service description **shall** include a short textual description summarising the service.
Rationale	A good abstract is valuable, in particular during service discovery. The abstract, by ensuring an understanding of the service, supports the decisions on whether the service is suitable for use in a particular situation.
Verification	Completeness: Verify that the element is included. Consistency: Not Applicable. Correctness: Not Applicable.
Examples/Notes	Note: It is best practice for the abstract to include the information domain(s) covered by the information service, the operational need being addressed by the information service, the intended use of the information service, and the intended consumer audience for the information service.

3.3 Service Provider and Contact Information

3.3.1 Service Provider

Title	Service provider
Identifier	SWIM-SERV-060
Requirement	A service description **shall** include the following information about the service provider: • name; • abbreviated name (if applicable); and • description of the organisation responsible for the service.
Rationale	Knowing the service provider is essential to business experts.
Verification	Completeness: Verify that the elements are included. Consistency: Not Applicable. Correctness: Not Applicable.
Examples/Notes	Example: Donlon Airport Operator, the operator in charge of Donlon Airport. Note: Consider including information on provider certification when relevant for the service being described (e.g., for a Meteorological service).

3.3.2 Provider Point of Contact

Title	Provider point of contact
Identifier	SWIM-SERV-070

Requirement	A service description **should** include information about where additional information on the service can be obtained, including: • name; • contact information; and • role.
Rationale	This provides the service consumer with a link to be used if more information on the service is needed and details on where to require access. Point of contact allows getting additional information regarding the service.
Verification	Completeness: Not Applicable. Consistency: Not Applicable. Correctness: If provided, check that the information is correct.
Examples/Notes	Note: The additional information could be more technical information on the service. It is best practice to provide a link to where the information is found. Example contact information: • email address; • postal address; • phone number; • URL. Note: The point of contact's name is usually that of a role acting as a single point of contact rather than the name of a specific person. Example: • "Customer Relations, to request access to the service, http://www.donlon-airport.com/swim/service-request";

3.3.3 Support Availability

Title	Support availability
Identifier	SWIM-SERV-080
Requirement	A service description **should** include information about the support offered to service consumers, including: • name; • contact information; and • role of those responsible for providing support.
Rationale	This information is essential to allow service consumers to understand the type of support to expect.
Verification	Completeness: Not Applicable. Consistency: Not Applicable. Correctness: If provided, check that the information is correct.
Examples/Notes	Example contact information:

	• email address; • postal address; • phone number; • URL. Note: The point of contact's name is usually that of a role acting as a single point of contact rather than the name of a specific person. Example: • "Service Desk, to report incidents on services in operation, contact [24/7] +693 555 01 service-desk@donlon-airport.com". Example: "No support available"

3.4 Service Characteristics

3.4.1 Geographical Extent of Information

Title	Geographical extent of information
Identifier	SWIM-SERV-090
Requirement	A service description **shall** include information about the geographical coverage of the exchanged information service payload.
Rationale	This allows information service consumers to understand the geographical coverage of the information being provided. This enables the assessment of the use of the service.
Verification	Completeness: Verify that the element is included. Consistency: Not Applicable. Correctness: Not Applicable.
Examples/Notes	Note: The geographical extent may be expressed in terms such as of ICAO region, FIR, Aerodrome or a geographical bounding box. Note: This requirement concerns the exchanged information service payload, not the applicability of the service itself.

3.4.2 Service Categories

Title	Service categories
Identifier	SWIM-SERV-100
Requirement	A service description **shall** include the service categories to which the service belongs and, if applicable, reference the service categorisation schemes used.
Rationale	Service category information allows discovering services by a series of classification criteria. This requirement supports decision making in terms of service suitability in relation to a particular usage context.
Verification	Completeness: Verify that a service category is present. Consistency: Not applicable. Correctness: Not Applicable.

Examples/Notes	Note: The service category can be a keyword, a key phrase or a URI. It is best practice to use a URI taken from a published service categorisation scheme. Note: An ICAO Information Service Overview expects one or more of the following categories to be used: a) Flight information; and/or b) Aeronautical information; and/or c) Meteorological information; and/or d) Environment information; and/or e) Capacity, demand & flow information; and/or f) Surveillance information; and/or g) Other information Note: A set of service categorisation schemes is available at: https://reference.swim.aero/information-services/service-categories.html [RD 13]. However, it is acceptable to use other schemes.

3.4.3 Service Lifecycle Information

Title	Service lifecycle information
Identifier	SWIM-SERV-110
Requirement	A service description **shall** include information on the lifecycle stage that the service is currently in and, if applicable, qualifying dates.
Rationale	This requirement ensures that the service consumer can assess the lifecycle stage and make a decision on whether to use the service.
Verification	Completeness: Verify that the element is included Consistency: Not Applicable. Correctness: Not Applicable.
Examples/Notes	Example lifecycle stages include Operational, Prospective and Retired. Examples: • Operational since 2020-04-07 • Prospective until 2020-04-07 • Retired from 2040-04-07

3.4.4 Service Standard Reference

Title	Service standard reference
Identifier	SWIM-SERV-120
Requirement	**If** the service is based on a service standard the service description **shall** include: • a reference to the service standard to which the service adheres; • a statement on any implemented options of the service standard; and • a statement on any deviation from or addition to the service standard.

Rationale	The reference to standards is essential information, fostering reuse.
Verification	Completeness: Verify that the statement about adherence to a reference standard is included. Consistency: If the service adheres to a service standard, verify that the reference to the service standard is included. Correctness: Not Applicable.
Examples/Notes	Note: The term 'service standard' includes service definitions. Example service standard references: • "EUROCAE Arrival Sequence standardised service design, version 1.0" Note: this requirement concerns service standards. SWIM-SERV-260 concerns data formats such as "XML", SWIM-SERV-290 concerns information exchange standards such as "AIXM 5.1.1.

3.5 High-level Description of Service Offer

3.5.1 Operational Environment

Title	Operational environment
Identifier	SWIM-SERV-130
Requirement	A service description **shall** include or refer to information about: • the operational needs used in the development of the service; and/or • the capabilities offered by the service.
Rationale	Information about the operational environment is useful to get an understanding of the service. Information about the operational needs addressed by the service and the capabilities the service offers supports decision making in terms of service suitability within a particular operational context.
Verification	Completeness: Verify that operational environment information is included or referenced. Consistency:. Not applicable. Correctness:. Not applicable.
Examples/Notes	Example operational need: • The context is the Airport Collaborative Decision Making (A-CDM) concept as defined in Airport CDM Implementation Manual v4. In A-CDM it is important to allow A-CDM Partners to set the value of some milestones when necessary. The classical example is to allow the Aircraft Operator or the Ground Handler to set the Target Off-Block Time (TOBT) that indicates what is the target time for the aircraft to be ready for off-block. Setting the TOBT value is possible at many stages during the A-CDM process, as early as Milestone 2 (EOBT-2hr) up to and including Milestone 11 (Boarding starts). The Business Logic may involve validations such as: not accepting values in the past; not accepting a new value too close the

	existing one (there is a minimum change involved); Limiting the number of changes after TSAT has been issued. Note: When describing operational needs, it is best practice to add a reference to an operational concept document, or contextual description. Information about the information exchange requirements can be documented as part of the operational environment. Example IERs: • "It shall be possible for the end user to access up-to-date network weather forecasts (up to D-10) in the specified geographical areas (regional/sub-regional/local) or airports (e.g. snow situation), with variable granularity levels depending on the time horizon. (reference REQ-07.06.01-OSED-WX01.0010; source SESAR 1 OSED 07.06.01)"; • "To allow the Aircraft Operator or Ground Handler to set, update or delete the value of the Target Off-Block Time of a departing flight, in accordance with the operations involving Target Off-Block Time that take place between A-CDM Milestones 2 and 11 (derived from: Airport CDM Implementation Manual v4)". Example capability: • The service offers a flight plan retrieval capability. Note: Capabilities are supported by functions. These are described in SWIM-SERV-140.

3.5.2 Service Functions

Title	Service functions
Identifier	SWIM-SERV-140
Requirement	A service description **shall** include or refer to information about: • the functions offered by the service in support of its capabilities; and • their associated real-world effects.
Rationale	The functions provide business and operational experts with a business view of the interactions with the service without having to look at the interface details.
Verification	Completeness: Verify that the elements are included. Consistency: Verify that the functions and real-world effects are consistent with the operational needs. Correctness: Not Applicable.

<table>
<tr><td>Examples/Notes</td><td>Note: A function is a type of activity describing the functionality of a service. Every function usually (but not always) can be mapped to service operations; i.e., functions provide a “business view” and service operations provide a “technical view” of a particular service activity.

Note: A real-world effect is an ultimate purpose associated with the interaction with the service. It is the change that is relevant to and experience by the stakeholders. It generally has an operational impact. It may be the response to a request for information or the change in the state of some entities shared between the participants in the interaction.

Example functions and real-world effects:

<table>
<tr><th>function</th><th>real-world effect</th></tr>
<tr><td>Retrieve a list of flights</td><td>Information on the state of the network has been shared.</td></tr>
<tr><td>Allow service consumers to requests the latest available Pan European 3D RADAR data</td><td>Information has been shared; the service consumer gets the requested data.</td></tr>
<tr><td>Provide Departure Planning Information (DPI)</td><td>NM systems updated with the information; NM systems publish the resulting flight update.</td></tr>
<tr><td>Set Target Off-Block Time</td><td>The Target Off-Block Time (TOBT) value is defined.</td></tr>
</table>
</td></tr>
</table>

3.6 Limitations and Constraints on Using the Service

3.6.1 Service Access and Use Conditions

Title	Service access and use conditions
Identifier	SWIM-SERV-150
Requirement	A service description **shall** include or refer to information about the conditions which apply to accessing and using the service, including: • legal constraints; • service policies; and • service consumption constraints.
Rationale	This requirement ensures that a service consumer is aware of any restrictions on the access and use of the service. It is good practice to share business constraint information associated with the conditions of usage of the service.
Verification	Completeness: Verify that the elements included cover the required constraints and policies. Consistency: Not Applicable. Correctness: Not Applicable.
Examples/Notes	Example legal constraints: • Licenses to be bought;

	• Intellectual property rights to be respected. Example services policies: • Contingency policy; • Business policy(s) in terms of business rule or objective i.e. how the business is conducted; • Operational policy(s) (i.e. constraints and requirements for how services operate and interoperate at runtime) in terms of rules and guidelines. Operational policies are utility centric (handling operational characteristics) covering mainly; logging, messaging protocol and versioning. Normally standardised for a defined collection of services; • Technical policy(s). Technical policies can (if available) be provided in machine-readable format; • Versioning scheme used (e.g. major.minor[.fix]) and the compatibility guaranteed between different versions (e.g. backwards compatibility is guaranteed between minor versions but not for major); • Lifecycle policy applied to the service (e.g. to allow consumers to know that he is not investing on a soon to be retired service). Example service consumption constraints: • The maximum number of requests per time window allowed for a service consumer. Note: Additional use conditions could be diplomatic, geographical reasons, safety criticality and fees to be paid, for instance.

3.6.2 Security Constraints

Title	Security constraints
Identifier	SWIM-SERV-160
Requirement	A service description **shall** include or refer to information about the security constraints which apply to accessing and using the service.
Rationale	This requirement ensures that a service consumer is aware of any restrictions on the access and use of the service.
Verification	Completeness: Verify that the elements included cover the required security constraints. Consistency: Not Applicable. Correctness: Not Applicable.

Examples/Notes	Example security constraints:
	• Authentication:
	  ○ Statement of the authentication mechanisms used on consumer and provider side;
	  ○ Statement of the failed authentication constraints;
	  ○ Identity tokens;
	• Authorisation:
	  ○ Statement on the authorisation mechanism used;
	  ○ Credentials used for the authorisation;
	  ○ Levels of authorisation;

	• Confidentiality:
	  ○ Statement of the confidentiality offered by the service (e.g. message, transport, network, none…);
	  ○ Elements of the payload whose confidentiality is required or provided (whole payload, body, specific sub-elements…);
	  ○ Cryptographic algorithms and key sizes;
	• Integrity:
	  ○ Statement of the integrity offered by the service (e.g. message, transport, network, none…);
	  ○ Elements of the payload whose integrity is required or provided (whole payload, body, specific sub-elements…);
	  ○ Cryptographic algorithms and key sizes.

3.6.3 Additional Technical Information for the Service Consumer

Title	Additional technical information for the service consumer
Identifier	SWIM-SERV-170
Requirement	**If** technical constraints to be taken into account by a service consumer when developing a consuming client are known, a service description **shall** include or refer to information about the technical constraints.
Rationale	Knowing and satisfying the pre-requisite constraints of a service facilitate good use of the service, such as benefiting from the indicated quality of service statements. This requirement supports decision making in terms of assessing the implication, costs and feasibility, of using the service.
Verification	Completeness: Not Applicable. Consistency: If provided, verify that the information corresponds to the described service. Correctness: Not Applicable.
Examples/Notes	Note: technical constraints affect the consumer of the service. The consumer may have to implement certain software/hardware to be able to access the service. Example technical constraints: minimum bandwidth, receipt of a minimum message size.

3.7 Quality Aspects

3.7.1 Quality of Service

Title	Quality of service
Identifier	SWIM-SERV-180
Requirement	A service description **shall** include or refer to information about the minimum quality of service offered with regards to: • performance; • reliability; and

	• security.
Rationale	This is a key criterion in deciding to use the service. Statements on the quality of service are typically included in the formal arrangements made between the service provider and a service consumer when contracting to use the service. The information in the service description informs contract negotiations between consumers and providers.
Verification	Completeness: Verify that quality statements are included in the service description. Consistency: Not Applicable. Correctness: Not Applicable.
Examples/Notes	Example performance includes: • Capacity of a service • Time behaviour of a service Example reliability includes: • Availability of a service • Recoverability of a service Example security includes: • Confidentiality of a service • Integrity of a service Note: A list of parameters can be found in ISO 25010 [RD 16]. Note: The **availability** is typically expressed as a percentage representing the ratio between minimum target uptime versus maximum uptime. The service provider needs to describe the service outages he intends to mask/alleviate. The availability information needs to be expressed for various situations, e.g., planned and unplanned outages. The service provider needs to describe the schedule of planned outages. Example of availability: ≥ 99.95 % of Continuous Operations. Note: The **time behaviour** expressing the delay to process a service request could include: delay in seconds, percentage of messages, message size. Example of response time: 2s delay for 95% of messages of average size 1MB, with no compression. Example of response time: max 3s response to complete a service request, measured from the time the service provider agent receives the request to the time the service provider transmits the response. Note: The **capacity** is typically expressed as a number of service requests that the service can accommodate within the given time period. Example of throughput: 200 service requests per minute. Note: **Integrity** and **confidentiality** may be ensured at network, transport and/or message level. Integrity ensures that errors or attacks will not lead to damage to the state of the information service, including service interfaces and information. Confidentiality ensures that an

	unauthorized user will not be able to access and understand protected exchanged information. A statement can be given that mechanisms to ensure integrity and confidentiality have been implemented. Example of integrity and confidentiality: Integrity and confidentiality mechanisms have been implemented. Note: the mechanisms are documented under requirement SWIM-SERV-160. Note: It is a good practice to describe the measuring conditions of the quality of service figures given.

3.7.2 Source of Information

Title	Source of information
Identifier	SWIM-SERV-190
Requirement	A service description **should** include information about: • the source(s) of the information provided; and • detail any modifications that have been applied to the information.
Rationale	This provides service consumers with background on the source and modifications that have been applied. This will provide confidence in the quality of the information.
Verification	Completeness: Not Applicable. Consistency: Not Applicable. Correctness: If provided, check that the information is correct.
Examples/Notes	Example: • Airport Survey Ltd, data processed to satisfy the requirements for an aerodrome mapping database. Example when the service receives information from the service consumer: • The service will receive information from the service consumer.

3.7.3 Service Validation Information

Title	Service validation information
Identifier	SWIM-SERV-200
Requirement	A service description **shall** include or refer to information about the validation that has occurred indicating: • whether a validation of the service, including the quality of the service, has been performed; and if so, • the method used; • the summary of the validation steps performed; • the results achieved; and • how the service consumer may obtain the validation evidence.

Rationale	This requirement ensures the service description contains sufficient statements on the testing done to enable the consumer to have confidence in the service's ability to deliver the declared capabilities and in the quality of the service.
Verification	Completeness: Verify that the validation statement is included. Consistency: If validation has been performed, verify that the statement includes the method and the results of the validation. Correctness: Not Applicable.
Examples/Notes	Example service validation statement: • "The service has not been validated yet". It is a best practice to use at least at one of the following methods that are listed in the ICAO Information Service Overview: • independent validation; • collaborative validation; • user validation; • self-validation.

3.8 Behaviour of the Service

3.8.1 Application Message Exchange Pattern

Title	Application message exchange pattern
Identifier	SWIM-SERV-210
Requirement	A service description **shall** include or refer to information about the application message exchange pattern(s) used by the service.
Rationale	The message exchange pattern helps understanding how the information interaction with the service works.
Verification	Completeness: Verify that the information is included. Consistency: Verify that the information is consistent with the selected service interface binding. Correctness: Not Applicable.
Examples/Notes	Note: Typical message exchange patterns (as from the SWIM Technical Infrastructure Yellow Profile [RD 4]): • Request/Reply (synchronous or asynchronous); • Publish/Subscribe (Push or Pull); • One Way (also known as Fire and Forget).

3.8.2 Service Behaviour

Title	Service behaviour
Identifier	SWIM-SERV-220
Requirement	A service description **shall** include or refer to information about the typical behaviour of the service.
Rationale	This requirement facilitates the understanding of the service behaviour

	to support operational processes.
Verification	Completeness: Verify that the behaviour information is included and covers the errors handling as well. Consistency: Verify that the names of the interfaces, service operations and exchanged information are consistent with the interface definitions. Correctness: Not Applicable.
Examples/Notes	It is best practice for the overview of the service behaviour to describe the typical workflow, e.g., that operation *x* needs to be called before operation *y* can be used. Note: More details on the service behaviour can be provided as part of the model view in SWIM-SERV-330. Examples of what to include in the more detailed service behaviour: • The behaviour under normal conditions; • The behaviour with incorrect input data (e.g., out of range or incorrect data type); • The use of error messages, and error handling in general; • The list of error codes and expected effects; • The list of other services that are used

3.8.3 Service Monitoring

Title	Service monitoring
Identifier	SWIM-SERV-230
Requirement	**If** a service monitoring mechanism is available to service consumers, a service description **shall** describe how to use the service monitoring mechanism.
Rationale	Allow the service consumer to use the available mechanism and monitor the service.
Verification	Completeness: If a service monitoring mechanism is available, verify that the information is included. Consistency: Not Applicable. Correctness: Not Applicable.
Examples/Notes	Examples: Monitoring the availability of the service (e.g. by heartbeat); monitoring response time.

3.9 Service Implementation and Structural Details

3.9.1 Service Interfaces

Title	Service interfaces
Identifier	SWIM-SERV-240
Requirement	A service description **shall** include or refer to information about the exposed service interfaces, including for each service interface: • the name of the service interface;

	• a textual description of the service interface including its purpose; • an indication that the interface is a provider side interface or a consumer side interface; and • for a provider side interface, the fully qualified network address at which the interface can be accessed.
Rationale	This information facilitates the unambiguous identification of the interface, the understanding of its purpose, and the location to access it.
Verification	Completeness: Verify that the list of interfaces is included; verify that the name, description and indication are included for each interface. Consistency: For each provider side interface, verify that the network address is provided. Correctness: Not Applicable.
Examples/Notes	Note: To improve readability across service descriptions, it is best practice to apply the following conventions for a service interface name • be represented using UpperCamelCase; and • use the <noun> <role> pattern where <noun> is a topic related to the service and <role> describes the roles in a composition/interaction sequence, based on the Message Exchange Pattern that is used. Example service interface names: FlightPlanCoordinator, FlightPlanSubmitter, ForecastProvider, ForecastConsumer, ClearanceRequester, ClearanceManager, PreDepartureSequencer, FlightInformationPublisher, AlertListener. Note: It is best practice to provide, in addition, the network address(es) for accessing the service instance(s) that can be used for testing and development purposes.

3.9.2 SWIM TI Profile and Interface Bindings

Title	SWIM TI Profile and interface bindings
Identifier	SWIM-SERV-250
Requirement	A service description **shall** include or refer to information about the profile and interface bindings for each service interface, including: • the selected SWIM TI Profile and its version; • a reference to a service interface binding as specified in the selected SWIM TI Profile; • a reference to a network interface binding as specified in the selected SWIM TI Profile; and • references to additionally supported requirements as specified in the selected SWIM TI Profile.
Rationale	To support the concept of interoperability between the service provider and service consumer, the SWIM TI Profiles only allow a certain set of technical solutions, which can be chosen by the service designer. This is used by technical experts to assess feasibility to implement.
Verification	Completeness: Verify that the reference information is provided for

	each provider side and consumer side interface. Consistency: Verify that the selected service interface binding, network interface binding and additionally supported requirements are consistent with the selected SWIM TI Profile and version. Correctness: Not Applicable.
Examples/Notes	Note: If configuration options are available in the service interface binding, it is best practice to document them (e.g. use of GZIP compression, Message Transmission Optimization Mechanism (MTOM) encoding). Example additionally supported requirements: • "SWIM-TIYP-0092, SWIM-TIYP-0098".

3.9.3 Service Interface Protocols and Data Format

Title	Service interface protocols and data format
Identifier	SWIM-SERV-260
Requirement	A service description **shall** include or refer to information about: • the service interface protocols (including name and version); and • data format to be used.
Rationale	Makes explicit within the service description what the protocols are.
Verification	Completeness: Verify that all relevant protocols and versions are listed; verify that the information is provided for each provider side and consumer side interface. Consistency: Verify that the protocols are consistent with the selected interface binding. Correctness: Not Applicable.
Examples/Notes	Note: The list of supported protocols are the ones corresponding to the selected interface binding. The supported versions of the protocols need to be declared. E.g. version of the Transport Level Security (TLS). Note: Data format examples include XML and JSON.

3.9.4 Service Operations

Title	Service operations
Identifier	SWIM-SERV-270
Requirement	A service description **shall** include or refer to information about the exposed service operations including: • the name of the service operation; and • a description of the intent and the results of the service operation.
Rationale	The consumer needs to know which service operations are available to be called for the expected result.
Verification	Completeness: Verify that all service operations are described.

	Consistency: Verify the service operations against the messaging technology needs. Correctness: Not Applicable.
Examples/Notes	Note: Service operations may be grouped under service interfaces. Note: To improve readability across service descriptions, it is best practice to apply following conventions for a service operation name: • include a verb and a noun; and • be represented using lowerCamelCase. Example service operation names: getAlerts; requestTrajectoryAnalysis; publishAirportMETInducedCapacity; setCoordinationAndTransferData; proposeARESDeActivation; setTargetOffBlockTime. Note: When the operations are used as defined by the protocol selected in SWIM-SERV-260 there is no need to list them in the service description. This covers, for example, the Open Geospatial Consortium's Web Feature Service that has standardised operations. Note: When a service operation has several input parameters, it is best practice to indicate the role of each parameter. Note: It may be considered to include information such as the expected number of elements to be exchanged and their frequencies.

3.9.5 Service Messages

Title	Service messages
Identifier	SWIM-SERV-280
Requirement	A service description **shall** include or refer to information about the messages that are exchanged by the service including input, output and error messages.
Rationale	The consumer needs to know which service messages are used.
Verification	Completeness: Verify that all service messages are described. Consistency: Not Applicable. Correctness: Not Applicable.
Examples/Notes	Note: Service messages may be linked to service operations. Example input message: TOBTSettingRequest. Message that provides the Target Off-Block Time value of a specific flight. Example output message: TOBTSettingResponse. Message that responds the validity of a previously sent TOBTSettingRequest message. Example error message: invalidFlight.

3.10 Information Aspects of the Service

3.10.1 Information Definition (Minimum)

Title	Information definition (minimum)
Identifier	SWIM-SERV-290
Requirement	A service description **shall** include or refer to the following information about the exchanged information service payload: • the name of the element; • the definition of the element; • the data type used by the element if applicable; and • the semantic correspondence of the element with the AIRM.
Rationale	This requirement ensures that the precise meaning of the exchanged information is shared by all parties of the information exchange.
Verification	Completeness: Verify that the service description describes all elements of the exchanged information and that the required details are provided. Consistency: Verify that the elements are consistent with each other and with the AIRM concepts used in the semantic correspondence. Correctness: Not Applicable.
Examples/Notes	Note: The service description must describe all elements of the exchanged information at all levels, down from the service operation parameters to attributes and data types. Note: It is best practice to base the information definition on the requirements found in the EUROCONTROL Specification for SWIM Information Definition [RD 3], ensuring that it contains the extra details required by this requirement. Note: The information definition can be provided by one or more reference, for example when using an AIRM conformant standardised information exchange models, such as Aeronautical Information Exchange Model 5.1.1 (AIXM) [RD 9] and ICAO Meteorological Information Exchange Model (IWXXM) 3.0.0 [RD 10]. Note: Data types are expected for, e.g., attributes of classes. The classes themselves tend not to have data types.

3.10.2 Information Definition (Extended)

Title	Information definition (extended)
Identifier	SWIM-SERV-300

Requirement	A service description **should** include or refer to information about the exchanged Information service payload including:
	• the cardinality applicable to the element, including whether the element is optional, conditional or mandatory in the exchange;
	• constraints applicable to the element, such as:
	  ○ value ranges;
	  ○ special values;
	  ○ character set restrictions; and

	• the structure and relevant relationships between the elements.
Rationale	This requirement ensures that the precise meaning of the exchanged information is shared by all parties of the information exchange.
Verification	Completeness: Not Applicable. Consistency: Not Applicable. Correctness: Not Applicable.
Examples/Notes	Note: This requirement covers the best practice for what should be in an information definition. However, it does not require that the information definition be replicated in the service description.

3.10.3 Filter Encoding

Title	Filter encoding
Identifier	SWIM-SERV-310
Requirement	**If** information service payload filtering is available, a service description **shall** include or refer to information about the filter encoding.
Rationale	This requirement ensures that the precise meaning of the filter expressions is understood.
Verification	Completeness: If filter expressions are applied, verify that the filter encoding is included. Consistency: Not Applicable. Correctness: Not Applicable.
Examples/Notes	Examples include indication of how to interpret and/or combine filters, including cases such as usage of wildcards, allowing and interpreting empty filters, combinations of filters in terms of logical expressions (e.g. implicit AND, implicit OR, explicit operator), etc. Note: It is possible to refer to standards in this case such as the OGC Filter Encoding Standard [RD 14].

3.11 Resources

3.11.1 Machine-Readable Service Interface

Title	Machine-readable service interface definition
Identifier	SWIM-SERV-320
Requirement	**If** the service interface binding specifies the use of machine-readable formats, a service description **shall** include or refer to a service interface definition in a machine-readable format using a standard service definition formalism/language.
Rationale	Enables consumer software components to be created.
Verification	Completeness: If the service interface binding supports it, verify that the required elements are included. Consistency: Verify that provided elements are consistent with the selected binding.

	Correctness: Not Applicable.

Examples/Notes	Example machine-readable descriptions:
	• service descriptions:
	  ○ WSDL (e.g. if a Web Service binding using SOAP is selected);
	• message descriptions:
	  ○ XSD;
	  ○ Schematron Rules.
	Note: AMQP does not mandate a specific machine-readable format.
	Note: REST may use OpenAPI, WSDL 2.0 or WADL.

3.11.2 Model View

Title	Model view
Identifier	SWIM-SERV-330
Requirement	A service description **should**: • include or refer to a model view, expressed using a formal and standardised notation, that formalises the representation of the business logic of its service interfaces, service operations, service behaviour and exchanged information; and • declare the notation used to express the model view.
Rationale	Exposing the business logic of the service in a formalised notation and standardised notation allows operational and technical experts to understand how the service works and make comparisons.
Verification	Completeness: If the model view is provided, verify that the notation is declared; and verify that the model view fully covers service interfaces, service operations and exchanged information. Consistency: If the model view is provided, verify that the model view is consistent with the service description (e.g. same service operation name). Correctness: If the model view is provided, verify that the model view is aligned with the declared notation.
Examples/Notes	Note: It is recommended to use the UML and/or BPMN as notation. Note: The model view covers structural and activity diagrams when using UML as notation. Note: The model view may be included as part of the service standard required in SWIM-SERV-120.

3.11.3 Examples of Code

Title	Examples of code
Identifier	SWIM-SERV-340
Requirement	A service description **should** include or refer to examples of code exemplifying the implementation of the consuming service interface.
Rationale	Providing example code is a best practice to speed up prototyping.

Verification	Completeness: Not Applicable. Consistency: If provided, verify that the provided examples correspond to the described service. Correctness: Not Applicable.
Examples/Notes	Examples include source code in a given programming language, input and output messages.

3.11.4 Abbreviations and Acronyms

Title	Abbreviations and acronyms
Identifier	SWIM-SERV-350
Requirement	A service description **shall** include or refer to definitions for all the abbreviations and acronyms used in the service description.
Rationale	It is best practice to document all abbreviations and acronyms used in a document.
Verification	Completeness: Verify that all used acronyms and abbreviations are defined. Consistency: Verify that the abbreviations/acronyms and their definitions are used consistently in the service description and are consistent with those used in the information service payload. Correctness: Not Applicable.
Examples/Notes	It is best practice to use standard abbreviations and acronyms. Example sources for standard abbreviations and acronyms: • ATM: ICAO and AIRM • Non-ATM: ISO

ANNEX A - Specification Update Procedures

It is necessary to periodically check this EUROCONTROL Specification for consistency with referenced material. The Specification is also expected to evolve following real project and field experience.

The main objectives of a regular review are:

a) to improve the quality of the requirements (e.g. clarity, testability, etc.);
b) to verify that the level of detail published is adequate;
c) to ensure that the regulatory framework is properly reflected; and
d) to make all stakeholders, including industry, aware of the latest developments.

The update process for this EUROCONTROL Specification may be summarised as follows:

Stakeholders may provide change proposals either through existing working arrangements (e.g., established working groups) or by sending a formal Change Request (CR) to the generic email address: standardisation@eurocontrol.int

The CR needs to provide following minimum elements:

- Originator information (name, Organisation, contact details);
- Specification title, number and edition date;
- Page, chapter, section (sub-section) where the issue appears;
- Description of the issue and reason for change; and
- Specific change proposal text (incl. potential alternatives, if any).

Main steps towards a revised version:

- Agency (Standardisation unit) will assess each CR in coordination with content owners, classify the urgency and establish the CR impact category (major, minor or editorial);
- Agency will then prepare resolution proposal(s) and, if needed, discuss those with the originator and/or relevant working arrangements. Note: CR will be grouped into “change packages” to consider reasonable update cycles;
- Agreed changes will be integrated into a revised version “Proposed Issue” including a summarised list of changes; and
- Consultation will be performed in accordance with the CR impact category identified:
    - Major changes require full formal stakeholder consultation;
    - Minor changes need consultation at working layers (e.g., working group or Team); and
    - Editorial changes may be implemented directly at any stage though grouped with change packages.

Note: Identified errors which may cause potential problems when implementing, may be corrected directly via separate “Corrigendum”.

The Agency will apply this process in an objective and impartial way and will consult stakeholders as needed and in line with the formal Standards Development Process.

ANNEX B - Conformity Checklist

This annex summarises the requirements to be met when assessing conformity to this specification.

Table 5 lists each requirement in the specification using its identifier and title. It then states the level of implementation to be achieved (see Table 4). In some cases, the implementation is conditional which means that the requirement is to be implemented when the condition applies.

Level of Implementation	Operative verb used in the requirement
M = Mandatory	**shall**
M Cond = Mandatory (Conditional)	**If … shall**
R = Recommended	**should**
O = Optional[2]	**may**

Table 4 – Level of implementation

Identifier	Title	Level of Implementation
SWIM-SERV-010	Service description coverage	M
SWIM-SERV-020	Service description language	M
SWIM-SERV-030	Service description identification	M
SWIM-SERV-040	Service identification	M
SWIM-SERV-050	Service abstract	M
SWIM-SERV-060	Service provider	M
SWIM-SERV-070	Provider point of contact	R
SWIM-SERV-080	Support availability	R
SWIM-SERV-090	Geographical extent of information	M
SWIM-SERV-100	Service categories	M
SWIM-SERV-110	Service lifecycle information	M
SWIM-SERV-120	Service standard reference	M Cond
SWIM-SERV-130	Operational environment	M
SWIM-SERV-140	Service functions	M
SWIM-SERV-150	Service access and use conditions	M
SWIM-SERV-160	Security constraints	M
SWIM-SERV-170	Additional technical information for the service consumer	M Cond
SWIM-SERV-180	Quality of service	M
SWIM-SERV-190	Source of information	R
SWIM-SERV-200	Service validation information	M
SWIM-SERV-210	Application message exchange pattern	M
SWIM-SERV-220	Service behaviour	M

[2] The “O = Optional” level of implementation is not used in *Table 5 – Conformity checklist* in this edition of the specification.

Identifier	Title	Level of Implementation
SWIM-SERV-230	Service monitoring	M Cond
SWIM-SERV-240	Service interfaces	M
SWIM-SERV-250	SWIM TI Profile and interface bindings	M
SWIM-SERV-260	Service interface protocols and data format	M
SWIM-SERV-270	Service operations	M
SWIM-SERV-280	Service messages	M
SWIM-SERV-290	Information definition (minimum)	M
SWIM-SERV-300	Information definition (extended)	R
SWIM-SERV-310	Filter encoding	M Cond
SWIM-SERV-320	Machine-readable service interface definition	M Cond
SWIM-SERV-330	Model view	R
SWIM-SERV-340	Examples of code	R
SWIM-SERV-350	Abbreviations and acronyms	M

Table 5 – Conformity checklist

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ANNEX C – Amendments to the Specification

This edition of the specification was prepared with the assistance of the SWIM Service Community of Interest.

It takes into account:

- the feedback received on the previous edition based on real project and field experience;
- global developments in defining service metadata;
- updates to EU regulations; and
- the updated terms and definitions in the SWIM glossary.

Table 6 summarises the amendments applied to this edition in comparison to Edition 1.0.

Section/Req.	Change	Justification
Executive Summary	Updated to reflect this edition.	
1.1. Purpose	Updated in line with Executive Summary.	
1.2 Scope	Clarified that implemented service means service instances.	Feedback received on previous edition.
1.3 Applicability	Updated to reflect the Common Project 1.	Reflect EU regulations.
1.4 Target audience	-	
1.5 Conventions	Update to new EUROCONTROL wording.	
1.6 Abbreviations and acronyms	Updated.	
1.7 Definitions	Updated definitions in line with SWIM Glossary. Added new definitions where required.	Consistency with SWIM glossary.
1.8 Reference material	Updated.	
1.9 Document structure	Updated.	
1.10 Maintenance of the Specification	Updated.	
2 Conformance	-	
SWIM-SERV-010	Added notes on how to interpret the word ‘service’ in the context of the specification.	Feedback received on previous edition.
SWIM-SERV-020	-	
SWIM-SERV-030	-	
SWIM-SERV-040	Updated rationale. Added best practice on service numbering format.	Feedback received on previous edition. Reflect global developments.
SWIM-SERV-050	Simplification to the wording of the requirement. Updated rationale. Added best practice on the content of the abstract.	Feedback received on previous edition. Reflect global developments.
SWIM-SERV-060	Text of the existing requirement was split. Requirement asks for abbreviated name of the organisation if applicable. The other requirements cover point of contact and support availability based on the existing notes.	Feedback received on previous edition.
SWIM-SERV-070	Covers the point of contact previously in SWIM-SERV-060.	Reflect global developments.

SWIM-SERV-080	Covers the support offered previously in SWIM-SERV-060.	Reflect global developments.
SWIM-SERV-090	New requirement.	Reflect global developments.
SWIM-SERV-100	Text of the requirement was updated to allow for more flexibility. It now uses service category schemes rather than a list hard-coded to the Pilot Common Project. Notes, etc. were updated accordingly.	Feedback received on previous edition. Reflect EU regulations.
SWIM-SERV-110	New requirement.	Reflect global developments.
SWIM-SERV-120	The requirement was made conditional, allowing the text to be simplified. Notes adder to give clarifications on the meaning of the requirement.	Feedback received on previous edition.
SWIM-SERV-130	Title changed. Text of requirement updated for clarity and to incorporate service capability. IERs removed from the requirement. Rationale, verification and notes, etc were updated accordingly.	Feedback received on previous edition.
SWIM-SERV-140	Title changed. Text of requirement updated. Examples updated.	Feedback received on previous edition.
SWIM-SERV-150	Requirement split – security constraints becoming a separate requirement. Examples, etc. updated to reflect the split.	Feedback received on previous edition.
SWIM-SERV-160	Covers security constraints previously part of SWIM-SERV-150. Some example security constraints were moved to SWIM-SERV-180.	Feedback received on previous edition.
SWIM-SERV-170	Title changed. Text of requirement updated to add clarity. Note added. Examples updated.	Feedback received on previous edition.
SWIM-SERV-180	Text of requirement updated to allow for more flexibility. Current list is moved to become examples of the parameters to record. Rationale updated to be more precise on the relationship with “formal arrangements”.	Reflect global developments. Feedback received on previous edition.
SWIM-SERV-190	New requirement	Reflect global developments.
SWIM-SERV-200	Title changed. Updated requirements to cover quality of service, the validation steps and where to obtain evidence of the validation. Added new best practice.	Reflect global developments.
SWIM-SERV-210	Title changed. Text of requirement updated for clarity and to allow for more than one message exchange pattern.	Feedback received on previous edition.
SWIM-SERV-220	Text of requirement changed to only request the typical behaviour. Notes and examples updated to give better guidance.	Feedback received on previous edition.
SWIM-SERV-230	-	

SWIM-SERV-240	Text of requirement updated to simplify	Feedback received on previous edition.
SWIM-SERV-250	Text of requirement updated to make it clear what is expected.	Feedback received on previous edition.
SWIM-SERV-260	Examples data formats added.	Feedback received on previous edition.
SWIM-SERV-270	The requirement was split to make service messages a separate requirement. Notes updated.	Feedback received on previous edition.
SWIM-SERV-280	This covers the messages previously covered by SWIM-SERV-270.	Feedback received on previous edition.
SWIM-SERV-290	Requirement split into mandatory elements (this requirement) and optional elements	Feedback received on previous edition.
SWIM-SERV-300	This covers the optional elements previously part of SWIM-SERV-290.	Feedback received on previous edition.
SWIM-SERV-310	Title changed. Requirement made conditional and updated for clarity. Notes updated.	Feedback received on previous edition.
SWIM-SERV-320	Note concerning REST updated.	Feedback received on previous edition.
SWIM-SERV-330	Text of requirement updated to remove mention of “conceptual parts”. Notes updated.	Feedback received on previous edition.
SWIM-SERV-340	Text of requirement updated to reflect SWIM glossary terms.	Consistency with SWIM glossary.
SWIM-SERV-350	Updated requirement to allow by reference and to remove the hard dependency on the AIRM abbreviation list.	Feedback received on previous edition.
Annex A	New Annex A added. Removed old Annex A as it is now integrated into the online supporting material.	
Annex B	Updated to reflect the new requirements and changes in level of implementation.	
Annex C	New Annex C (this annex) added. Removed old Annex C.	

Table 6 – Amendments list

Table 7 outlines the mapping of requirements from Edition 1.0 to Edition 2.0. It does not give details on any changes that have occurred to the text of the requirement between editions.

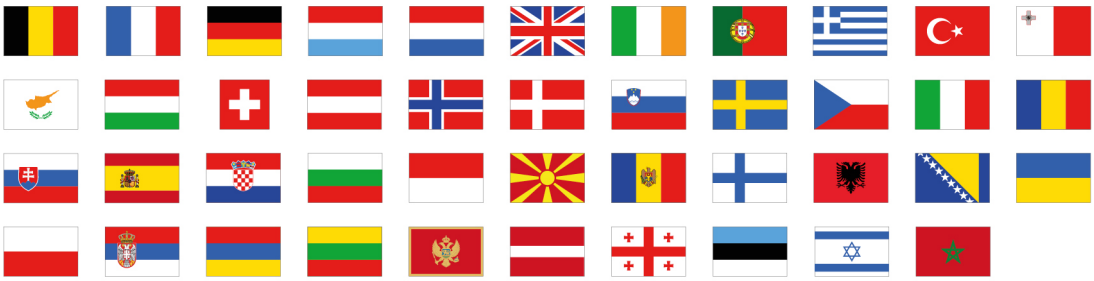
Identifier in Edition 1.0	Identifier in Edition 2.0
SWIM-SERV-001	SWIM-SERV-010
SWIM-SERV-002	SWIM-SERV-020
SWIM-SERV-003	SWIM-SERV-350
SWIM-SERV-004	*deleted*
SWIM-SERV-005	SWIM-SERV-030
SWIM-SERV-006	SWIM-SERV-040
SWIM-SERV-007	SWIM-SERV-050

Identifier in Edition 1.0	Identifier in Edition 2.0
SWIM-SERV-008	SWIM-SERV-060, SWIM-SERV-070 and SWIM-SERV-080
-	SWIM-SERV-090
SWIM-SERV-009	SWIM-SERV-100
-	SWIM-SERV-110
SWIM-SERV-010	SWIM-SERV-120
SWIM-SERV-011	SWIM-SERV-130
SWIM-SERV-012	SWIM-SERV-140
SWIM-SERV-013	SWIM-SERV-150 and SWIM-SERV-160
SWIM-SERV-014	SWIM-SERV-180
SWIM-SERV-015	SWIM-SERV-170
-	SWIM-SERV-190
SWIM-SERV-016	SWIM-SERV-240
SWIM-SERV-017	SWIM-SERV-210
SWIM-SERV-018	SWIM-SERV-250
SWIM-SERV-019	SWIM-SERV-260
SWIM-SERV-020	SWIM-SERV-320
SWIM-SERV-021	SWIM-SERV-270 and SWIM-SERV-280
SWIM-SERV-022	SWIM-SERV-290 and SWIM-SERV-300
SWIM-SERV-023	*deleted*
SWIM-SERV-024	SWIM-SERV-310
SWIM-SERV-025	SWIM-SERV-220
SWIM-SERV-026	SWIM-SERV-330
SWIM-SERV-027	SWIM-SERV-200
SWIM-SERV-028	SWIM-SERV-230
SWIM-SERV-029	SWIM-SERV-340

Table 7 – Mapping of requirements across editions

EUROCONTROL

SUPPORTING EUROPEAN AVIATION



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