European ATM Service Description for the ArrivalManagementInformation Service

Document information	
Project Title	Information Service Modelling deliverables
Project Number	08.03.10
Project Manager	NORACON
Deliverable Name	European ATM Service Description for the ArrivalManagementInformation Service
Deliverable ID	D65
Edition	00.04.01
Template Version	02.00.02
Task contributors	
DFS, EUROCONTROL, NORACON, NATMIG, FINMECCANICA, FREQUENTIS, THALES, ENAIRE, DSNA, INDRA, SEAC and ENAV	

Abstract

The definition of standardised Arrival Management services supports the application of Arrival Management by multiple stakeholders through a common picture of the traffic situation at the congested airport.

There are operational requirements indicating that arrival sequence information determined by the AMAN is required by upstream ATSUs (in extended horizon scenarios) in addition consumption requirements indicate to deliver Arrival Planning

Information (i.e. information related to the airborne trajectory segment of inbound flights) to several stakeholders.

The latter aspect has been addressed by the second edition of the service design.

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Rational for rejection

Document History

Edition	Date	Status	Author	Justification
00.01.00	30/04/2014	First Version	[redacted]	
00.01.04	30/04/2014	Update		Update after review, Incorporation of comments stated at the SMT 3 Meeting
00.02.00	30/05/2014	Final		Minor updates to prepare for final delivery.
00.02.01	12/09/2014	Revised		Figure Updates after SJU Assessment
00.03.00	15/11/2015	Final		Major service redesign
00.03.01	21/01/2016	Update		Minor changes according to SJU comments
00.04.00	05/05/2016	Final		Final deliverable for ISRM 2.0
00.04.01	20/07/2016	Final update		Updated according to 08.03.10-D65 SJU Assessment report reponse

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Executive summary

The application of Arrival Management is capable of minimizing environmental impact / fuel burn, optimizing runway throughput, optimizing ATC workload share and more generally leads to more efficient flight trajectories.

To this end, Arrival Management support tools (“AMANs”) compute an optimal (internal) set of trajectories to produce proposed advisories for individual flights and flight sequence information specific to runway thresholds and relevant significant points. This information can either be actioned by ATCOs to initiate delay absorption measures or used by IT systems to base further processing on this information.

The Information Exchange Requirements developed by OFA 04.01.02 in the context of OI step TS-305A indicate the need to share the information described above between Destination and Satellite Airport Towers, other Airport Stakeholders, Approach and En Route Control Centres.

Therefore the first version of the service design, published in ISRM version 1.3, described the logical structure of a service to disseminate Arrival Management Information, mainly addressing AMAN advisories and sequence information, i.e. information describing a specific set of inbound flights for traffic synchronization purposes.

As the set of SESAR Step 1 OSEDs has matured, it is increasingly becoming clear that several other OI steps also rely on the availability of Arrival Management Information. That is, there are now also explicit requirements to consume this information. These requirements imply minor modifications of the previously designed interface.

It should also be noted that these requirements are strongly influenced by the notion of “AOP-NOP integration”. Specifically, some of the information orchestrated by the AOP for provisioning to the NOP is supposedly obtained from “Local ATC / AMAN”. Therefore, the enhanced service design presented in this document also covers implicitly the requirements of the NOP for “Arrival Planning Information” as far as the primary source of this information is ATC.

A second version of the service design was developed and the service payload was, in accordance with the AOP/NOP terminology, subsumed under the term “Arrival Planning Information”. This interface complements the previously designed one by providing planning information related to the airborne trajectory segment of individual inbound flights for onward (i.e. turnaround and departure) planning purposes.

Out of scope: OI Step TS-0309 “Integration of Departure and Arrival Management”

This OI step stipulates a system-level integration of AMAN and DMAN functionality. Its requirements have led to the design of the “Runway Mixed Sequence Service”. Clearly, there is conceptual overlap between the two services.

This Service Design makes no attempt at consolidation of the service interfaces. Rather, it is assumed that either a “coupled AMAN-DMAN system” or an “AMAN system” will be deployed to manage the inbound flow at a given airport.

1 Introduction

1.1 Purpose of the document

The purpose of this Service Description Document (SDD) is to provide a description of the services designed within SESAR.

The purpose of the SDD is to provide a complete design description of each service, to describe the services to such a level that it is possible to make decisions on the implementation of the services in activities such as Service Implementation and evolution planning. The document serves as a complement to a model based description and supports the configuration management process by providing well-defined baselines.

1.2 Intended readership

This service description document is intended to be read by Enterprise Architects, Service Architects, Information Architects, System Engineers and Developers in pursuing architecting, design and development activities.

1.3 Inputs from other projects

- DEL-05.06.04-D35 final OSED [13] for OI Step TS-205-A.
- OFA 04.01.02 has developed the SPR and INTEROP documents for OI Step TS-305-A [9].
- OSED of OFA 05.01.01 [10]
- 05.06.07 –D15 OSED [14]
- 05.06.07 –D16 INTEROP [15]

1.4 Glossary of terms

NA

1.5 Acronyms and Terminology

1.5.1 Acronyms

Term	Definition
ADD	Architecture Description Document
AMAN	Arrival Manager
AOR	Area of Responsibility
API	Arrival Planning Information
AOI	Area of Interest
APTT	AMAN Planned Threshold Time
ATM	Air Traffic Management

Term	Definition
E-ATMS	European Air Traffic Management System
FAA	Federal Aviation Administration
IER	Information Exchange Requirement
ISRM	Information Service Reference Model
NAF	NATO Architecture Framework
NSOV	NATO Service Oriented View
NOV	NATO Operational View
NSV	NATO System View
OSED	Operational Service and Environment Definition
QoS	Quality of Service
SDD	Service Description Document
SESAR	Single European Sky ATM Research Programme
SESAR Programme	The programme which defines the Research and Development activities and Projects for the SJU.
SJU	SESAR Joint Undertaking (Agency of the European Commission)
SJU Work Programme	The programme which addresses all activities of the SESAR Joint Undertaking Agency.
SoaML	Service Oriented Architecture Modelling Language
SWIM	System Wide Information Management
TMA	Terminal Manoeuvring Area
UML	Unified Modelling Language
V&V	Validation and Verification

1.5.2 Terminology

Term	Definition	Source
Capability	The collective ability to deliver a specified type of effect or a specified course of action. Within the context of the SESAR Programme a capability is therefore the ability to support the delivery of a specific operational concept to an agreed level of performance.	Common working meeting between B41 EA study and B43 T5

Term	Definition	Source
Capability Configuration	A combination of organisational aspects (with their competencies) and equipment that combine to provide a capability. A Capability Configuration represents a recognisable set of resources (technical systems, human roles, and physical assets) derived from a generic stakeholder organisation. Note: Capability Configuration is a term used in NAF. The equivalent SoaML stereotype to be used is Participant. Also see note in Node term definition.	B43 ADD
Node	A logical entity that performs Operational Activities specified independently of any physical realisation e.g. a stakeholder type providing and/or consuming operational information within a network of others. Note: Node is a term used in NAF. The equivalent SoaML stereotype to be used is Participant. Be aware that the original intention of SoaML is that Participants are physical items and not logical constructs. Service architects must indicate whether the Participant is a logical (Node) or a physical (Capability Configuration) construct.	Common working meeting between B41 EA study and B43 T5
Service	The contractual provision of something (a non-physical object), by one, for the use of one or more others. Services involve interactions between providers and consumers, which may be performed in a digital form (data exchanges) or through voice communication or written processes and procedures.	B43 T5 study
Service attribute	A Service Attribute defines a property of a service. Examples: Response time, Frequency of invocation, Message Exchange Pattern.	B43 T5 study
Service contract	A service contract represents an agreement between the stakeholders involved for how a service is to be provided and consumed.	B43 T5 study
Service function	A Service function describes what functionality is needed to provide or consume a service; it is the trigger for or is triggered by the Service interactions. A Service function can be automated to different extents depending on the context e.g. a Service function supporting a complex activity may need more automation than a Service function for a simple activity. Note: The equivalent SoaML stereotype is Capability, in WP8 Foundation documentation referred to as Service Capability.	B43 T5 study
Service interaction	A Service interaction is a description of an information exchange between ATM stakeholders' systems which can potentially be automated; phone calls / voice exchanges are considered as non-automated service interactions. In considering automated interactions, a service interaction is described by several modelling artefacts depicting the static and dynamic behaviour of a service. This includes service	B43 T5 study

Term	Definition	Source
	operations, data messages model and interaction behaviour.	
Service interface	The mechanism by which a service communicates. Service providers and consumers need to implement service interfaces to be able to collaborate. A service interface includes service operations that enable access to the functionality of the services identified, as well as the data used in the service interaction.	B43 T5 study

2 Service identification

Name	ArrivalManagementInformation
ID	B4143932-31FD-41bc-B60D-905F4AD43FBD
Version	2.0
Keywords	AMAN Sequence, TTL/TTG, API
Architect(s)	Service Architect: [redacted] DFS Information Architect: [redacted] DFS

Lifecycle status	Date	References
Identified	30/04/2014	See reference [7]
Allocated		Not yet allocated
Designed	05/05/2015	This document
Validated	28/02/2015	See reference [16]
IOC	*Date for Initial Operational Capability*	*Reference to technical enabler hosting the service in the ATM master plan*
FOC	*Date for Full Operational Capability*	*Reference to technical enabler hosting the service in the ATM master plan*

3 Operational and Business context

For the ArrivalInformationManagement Service the document “DEL-05 06 07-D15 OSED” [14] and “DEL-05.06.07-D16 SPR INTEROP” [15] represents an extract of Information Requirements of the OSED. Those documents addresses three main stakeholders for AMAN management information,

- a stakeholder ATSU controlling a flight to the TMA in view of the AMAN implementation,
- the destination airport for which AMAN sequences the flights,
- a satellite airport which is an airport within the E-AMAN (extended AMAN) horizon.

The documents don’t specify a specific payload per stakeholder and it also doesn’t provide constraints or rules for a more detailed modelling of the domain of interest according to stakeholder needs which would offer the ability to more explicitly define the information exchange per stakeholder.

Therefore it was decided to use a mechanism to filter the certain information needs out of a superset of AMAN Sequence Information until subsequent versions of the OSED will provide a clearer picture on a more specific stakeholder payload.

The first version of the service design had two purposes:

- to fulfil the top-down requirements as provided by SESAR 1
- to be validated by prototype used by Validation Exercise EXE-05.06.07-VP-695, namely the BARCO AMAN System on the provider side at Heathrow TMA

Therefore the SESAR derived payloads of SVA005 have been amended where needed according to the payload extensions needed by the BARCO prototype. In some cases, where actually no elements stipulated by the prototype have been available in the AIRM, AIRM CRs were created and have been traced to the service model.

The material presented below originates from the OSED created by project 05.06.07 [14]. From a documentation point of view, it is difficult to disentangle the human and system roles contributing to the Use Cases, as the partitioning (as well as the actual role involved) may depend on local implementation choices. Therefore in the representation of the IERs the “Issuer” and “Addressee” column are filled using “mixed entities” defined in the following table:

Issuer / Addressee	Constituent CONOPS/DOD/OSED Roles	Constituent Systems
Arrival Management	Sequence Manager	AMAN Tool
Stakeholder ATSU	Executive Controller in TMA or Enroute Center Planning Controller in TMA or Enroute Center Flow Management Position (i.e. any approach and upstream enroute sector, within the same center or in other centers)	Center FDPS / Controller HMI
Satellite Airport (i.e. Departure Airport within AMAN Horizon)	Tower Clearance Delivery Controller Tower Runway Controller	Tower FDPS and HMI Airport CDM System
Destination Airport	Tower Runway Controller	Tower FDPS and HMI Airport CDM System
Aircraft	Flight Crew	a/c systems

Table 1: Roles and corresponding systems

Information Exchanges

The following figure provides an overview of all information exchanges described in 5.6.4 D35 [13]. The information exchanges highlighted in red indicate the scope of the service activity. Numbers refer to the identifiers used in the tabular description of the requirements.

The additional information exchanges required for CTA operations (-110/-120/-130) are outlined below for completeness of the diagram from an OFA perspective. They are however not in scope of the present OSED and service activity.

There is also an interaction between the “Satellite” Airport and the a/c to pass the departure time (which takes into account the arrival management information). This is airport specific and therefore not in scope of the OFA.

Interactions with the Network Manager are planned to be considered in a Step 2 OI step.

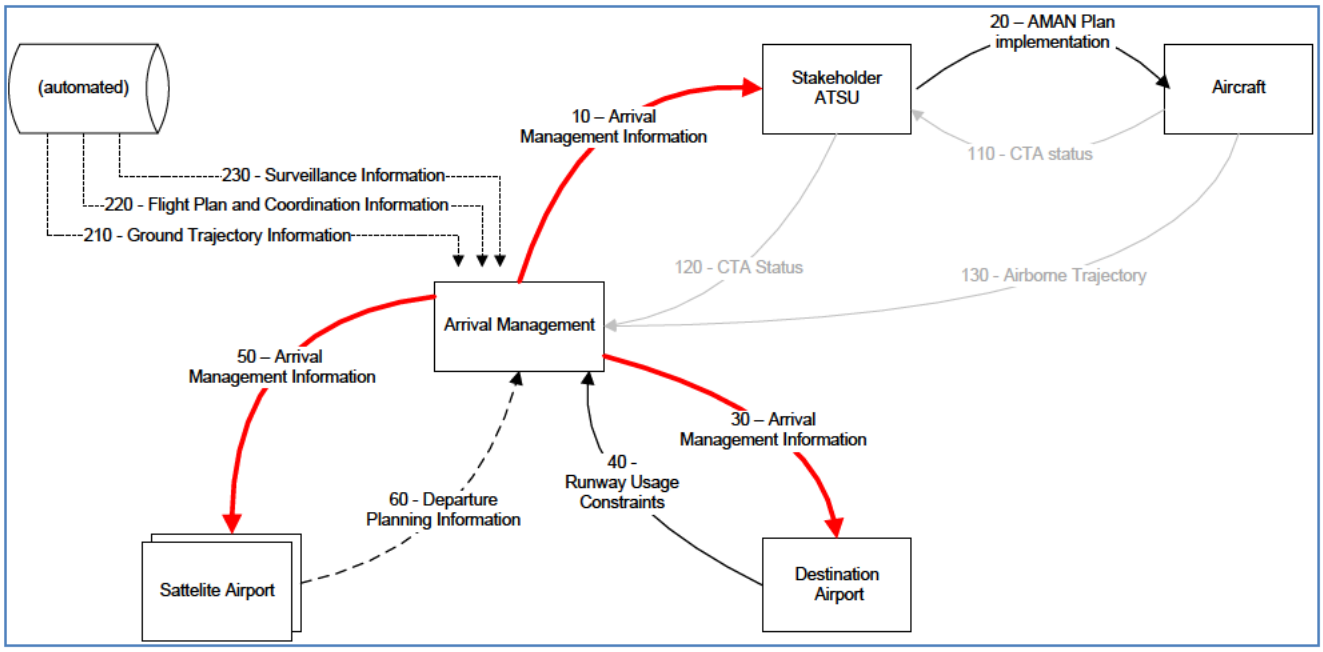

Figure 1: Overview of Information Flows / IERs in scope of OFA 04.01.02 (Step 1)

Arrival Planning Information

The second version of the service design took into account new requirements provided by the OFAs 4.1.2 and 5.1.1, which indicated, that in addition to the AMAN advisory and AMAN sequence information also information needs to be delivered which is similar to the API message transferred between the AOP and NOP Systems. The following figure illustrates the information flows around the CDM-airport.

The blue arrows represent the information provided by the Arrival Management System. ATC is the originator of this information. Subsequently it can be used by

- the AOP to be aggregated for CDM purposes or the AOP/NOP communication,
- the tower of the destination airport to be synchronised with the E-AMAN,
- the satellite airport for the sake of synchronising their departures planned to arrive at the destination airport supported by the AMAN.

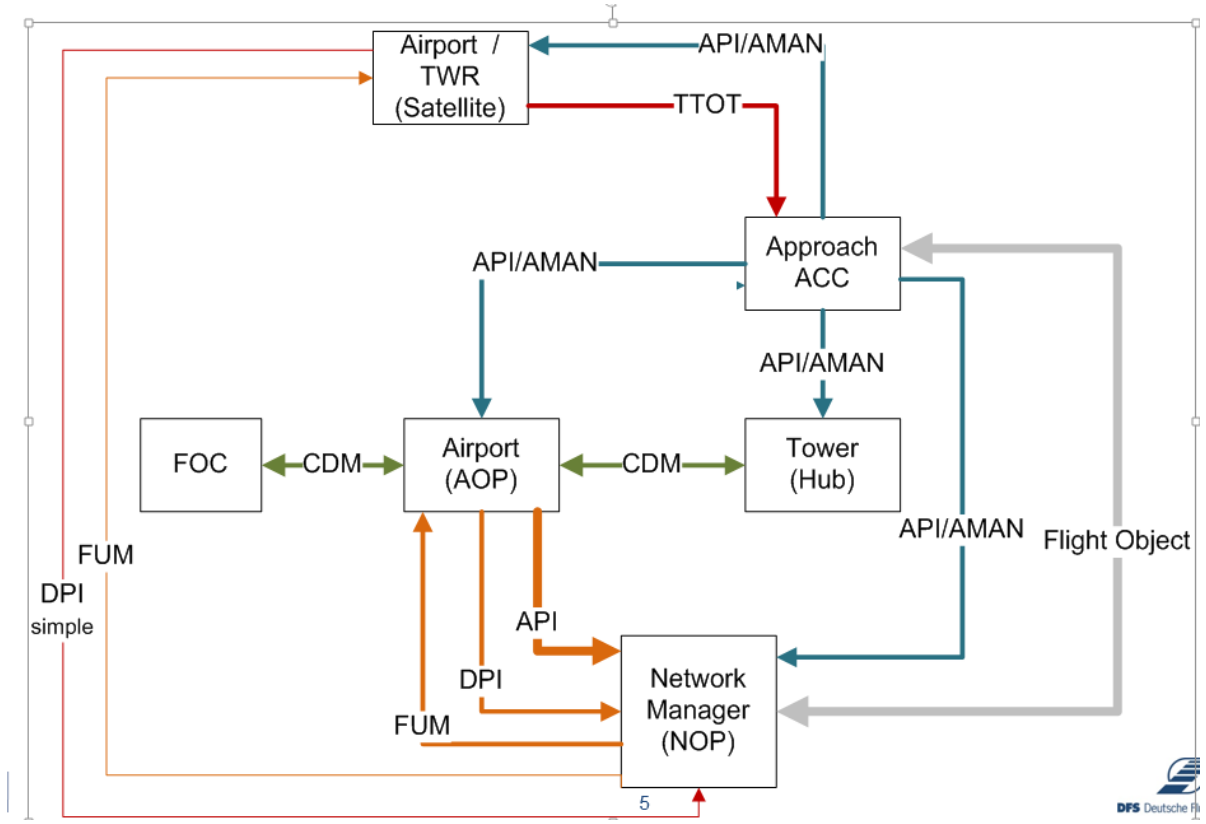

Figure 2: Information flow around the airport

3.1 Information Exchange Requirements

The final OSED of OFA 05.01.01 [10] contains consumer requirements for the flow of Arrival Management Information as described by IER-5.6.4-IERS-0032-0030. This OSED does not only contain delta information but covers the baseline (which in this case is today's Airport CDM), meaning that the interface description is comprehensive.

Identifier	Information Exchange name	Information Element	Provider	Consumer	Comments
IER-5.6.4-IERS-0032-0010	Arrival Management Information	Arrival Management Information Items of Interest may depend on airspace structure (FIR, sector, route, fix, …) receiving role, … (see New Information Elements)	Arrival Management	Stakeholder ATSU	
IER-5.6.4-IERS-0032-0030	Arrival Management Information	*Arrival Management Information* *Items of Interest may be* • *Landing Time* • *Runway (when AMAN manages multiple runway)* (see New Information Elements)	*Arrival Management*	*Destination Airport*	
IER-5.6.4-IERS-0032-0050	Arrival Management Information	Arrival Management Information. Depending on implementation, items of interest may be • Time To Lose on the ground / Delay Share assigned • APTT at destination • Time over Metering Fix (see New Information Elements)	Arrival Management	Satellite Airport	

Table 2: AMAN Information (Advisory and Sequence)

Identifier	Name	Issuer	Intended Addressees	Information Element	Involved Operational Activities	Interaction Rules and Policy	Satisfied DOD Requirement Identifier
IER-06.05.04-OSED-FLTP.0106	AIAT	AMAN; (Local ATC service provider -TMA Ctrl)	NOP; AOP	AIAT - Actual Initial Approach Fix Time - or metering Fix To be exchanged in combination with: FL ID DOF RWYARR STAR	ST planning & Exec. phase	Transmission rules - Interaction frequency : <ad hoc> If no AMAN available than the AIAT is provided by the local ATC service provider – TMA Ctrl. *Available to the AOP through the NOP*	REQ-06.02-DOD-6200.0081<Partial>; REQ-06.02-DOD-6200.0083<Partial>
IER-06.05.04-OSED-FLTP.0107	ASET	AMAN; (Local ATC service provider -TMA Ctrl)	AOP	ASET – Actual Stack Entry Time. Time when the aircraft joined the air holding stack To be exchanged in combination with: FL ID DOF Stack identifier RWYARR	ST planning & Exec. phase	Transmission rules - Interaction frequency : <ad hoc> If no AMAN available than the ASET is provided by the local ATC service provider – TMA Ctrl.	REQ-06.02-DOD-6200.0081<Partial>; REQ-06.02-DOD-6200.0083<Partial>
IER-06.05.04-OSED-FLTP.0108	ASXT	AMAN; (Local ATC service provider -TMA Ctrl)	AOP	ASXT – Actual Stack eXit Time. Time when the aircraft departed the air holding stack To be exchanged in combination with: FL ID DOF Stack identifier RWYARR	ST planning & Exec. phase	Transmission rules - Interaction frequency : <ad hoc> If no AMAN available than the ASXT is provided by the local ATC service provider – TMA Ctrl.	REQ-06.02-DOD-6200.0081<Partial>; REQ-06.02-DOD-6200.0083<Partial>
IER-06.05.04-OSED-FLTP.0109	AFAT	AMAN; (Local ATC service provider -TMA Ctrl)	AOP	AFAT - Actual Time at the Final Approach Fix or Final Metering Fix point To be exchanged in combination with: FL ID DOF FAF identifier RWYARR	ST planning & Exec. phase	Transmission rules - Interaction frequency : <ad hoc> If no AMAN available than the AFAT is provided by the local ATC service provider – TMA Ctrl.	REQ-06.02-DOD-6200.0081<Partial>; REQ-06.02-DOD-6200.0083<Partial>
IER-06.05.04-OSED-FLTP.0202	TLDT	AMAN; (Local ATC service provider – TMA Ctrl)	NOP; AOP	TLDT - Target Landing Time To be exchanged in combination with: FL ID DOF RWYARR	ST planning & Exec. phase	If no AMAN available then the TLDT is provided by the local ATC service provider – TMA Ctrl. Available to the NOP through the AOP	REQ-06.02-DOD-6200.0081<Partial>; REQ-06.02-DOD-6200.0083<Partial>
IER-06.05.04-OSED-PERF.0207	Arrival Separation	AMAN	AOP	measure for arrival spacing efficiency Actual Landing Spacing versus minimum required Landing Separation (for pre-defined time frames)	Post Flight Phase		REQ-06.02-DOD-6200.0084<Partial>

IER-06.05.04-OSED-FLTP.0004	Flight Status – FIR	Local ATC service provider	NOP; AOP	Within FIR boundary - The aircraft has entered local FIR in which the relevant airport is located To be exchanged in combination with: FL ID DOF Date and time of FIR entry FIR identifier (same as FSA message)	ST planning & Exec. phase	Transmission rules - Interaction frequency : <ad hoc> *Available to the NOP through the AOP*	REQ-06.02-DOD-6200.0081<Partial>; REQ-06.02-DOD-6200.0083<Partial>
IER-06.05.04-OSED-FLTP.0022	Flight Status – IDH	Local ATC service provider	NOP; AOP	Indefinite Holding - Flight in indefinite holding, unable to continue approach To be exchanged in combination with: FL ID DOF Date and time of first status – IDH exchange	ST planning & Exec. phase	Transmission rules - Interaction type : <Collaborative> *Available to the NOP through the AOP*	REQ-06.02-DOD-6200.0081<Partial>; REQ-06.02-DOD-6200.0083<Partial>
IER-06.05.04-OSED-FLTP.0005	Flight Status - TMA	Local ATC service provider	NOP; AOP	Within TMA Boundary - The aircraft has entered local TMA To be exchanged in combination with: FL ID DOF Date and time of TMA entry (AIAT) TMA identifier (same as FSA message)	ST planning & Exec. phase	Transmission rules - Interaction frequency : <ad hoc> *Available to the NOP through the AOP*	REQ-06.02-DOD-6200.0081<Partial>; REQ-06.02-DOD-6200.0083<Partial>
IER-06.05.04-OSED-FLTP.0006	Flight Status - FNL	Local ATC service provider	NOP; AOP	On Final Approach - The aircraft has got to the FAF or FAP (Final Approach Fix point) and proceeds to fly the final approach segment towards the airport To be exchanged in combination with: FL ID DOF Date and time at FAF/FAP (AFAT) FAF/FAP identifier	ST planning & Exec. phase	Transmission rules - Interaction frequency : <ad hoc> *Available to the NOP through the AOP*	REQ-06.02-DOD-6200.0081<Partial>; REQ-06.02-DOD-6200.0083<Partial>
IER-06.05.04-OSED-FLTP.0024	Flight Status – GOA	Local ATC service provider	NOP; AOP	Go-around - Flight has made a go around To be exchanged in combination with: FL ID DOF Date and time of first status – GOA exchange	ST planning & Exec. phase	Transmission rules - Interaction type : <Collaborative> *Available to the NOP through the AOP*	REQ-06.02-DOD-6200.0081<Partial>; REQ-06.02-DOD-6200.0083<Partial>

IER-06.05.04-OSED-FLTP.0521	TTA Status Proposed	Local ATC service provider; (AO)	NOP; AOP	TTA - Target Time of Arrival (status Proposed) for inbound flight To be exchanged in combination with: FL ID DOF RWYARR	Medium term planning	Transmission rules - Interaction type : <Collaborative> Available to the NOP through the AOP	REQ-06.02-DOD-6200.0081<Partial>; REQ-06.02-DOD-6200.0083<Partial>; REQ-06.02-DOD-6200.0086<Partial>
IER-06.05.04-OSED-FLTP.0523	TTA Status Revised	Local ATC service provider; (AO)	NOP; AOP	TTA - Target Time of Arrival (status Revised) for inbound flight To be exchanged in combination with: FL ID DOF RWYARR	ST planning & Exec. phase	Transmission rules - Interaction type : <Collaborative> Available to the NOP through the AOP	REQ-06.02-DOD-6200.0081<Partial>; REQ-06.02-DOD-6200.0083<Partial>; REQ-06.02-DOD-6200.0086<Partial>
IER-06.05.04-OSED-FLTP.0104	TIAT	Local ATC service provider -TMA ctrl)	NOP; AOP	TIAT - Target Initial Approach Fix or metering fix - point on the STAR To be exchanged in combination with: FL ID DOF RWYARR STAR	ST planning & Exec. phase	Available to the AOP through the NOP	REQ-06.02-DOD-6200.0081<Partial>; REQ-06.02-DOD-6200.0083<Partial>
IER-06.05.04-OSED-FLTP.0502	RWYARR	Local ATC service provider - Apt Twr	NOP; AOP	Runway Identifier of the assigned Runway to be used for Arrival To be exchanged in combination with: FL ID DOF	ST planning & Exec. phase	Transmission rules - Interaction frequency : <ad hoc> Available to the NOP through the AOP	REQ-06.02-DOD-6200.0081<Partial>; REQ-06.02-DOD-6200.0083<Partial>
IER-06.05.04-OSED-FLTP.0505	STAR	Local ATC service provider -TMA Ctrl	NOP; AOP	Standard Terminal Arrival Route identifier To be exchanged in combination with: FL ID DOF RWYARR	ST planning & Exec. phase	Transmission rules - Interaction frequency : <ad hoc> Available to the NOP through the AOP	REQ-06.02-DOD-6200.0081<Partial>; REQ-06.02-DOD-6200.0083<Partial>
IER-06.05.04-OSED-FLTP.0507	RWY_Exit	Local ATC service provider -Apt Twr	AOP	Runway Exit identifier - Runway Exit to be used - assigned / agreed runway exit. To be exchanged in combination with: FL ID DOF RWYARR	ST planning & Exec. phase	The RWY_Exit initially equals the assigned / agreed runway exit to be used. After ending the flight the RWY Exit equals the actual runway exit used.	REQ-06.02-DOD-6200.0081<Partial>; REQ-06.02-DOD-6200.0083<Partial>

-06.05.04-OSED-FLTP.0023	Flight Status – DIV	AOC; (Local ATC service provider); (NM)	NOP; AOP	Diverted - Flight has been diverting To be exchanged in combination: FL ID DOF Date and time of first status – DIV exchange	ST planning & Exec. phase	Transmission rules - Interaction type : <Collaborative> If diversion is initiated outside the area of responsibility of the European network, the status – DIV is provided by the AOC. Available to the AOP through the NOP If diversion is initiated within the Area of responsibility of the European network the status – DIV is provided by the NOP. Available to the AOP through the NOP If diversion is initiated within local FIR or local TMA the status – DIV is provided by the local ATC service provider to the NOP Available to the NOP through the AOP	REQ-06.02-DOD-6200.0081<Partial>; REQ-06.02-DOD-6200.0083<Partial>
IER-06.05.04-OSED-FLTP.0201	ELDT	AOC; (NM); (Local ATC service provider – ACC / TMA Ctrl)	NOP; AOP	ELDT - Estimated Landing Time. The estimated time that an aircraft will touchdown on the runway. To be exchanged in combination with: FL ID DOF RWYARR	ST planning & Exec. phase	The ELDT is initially provided by the AOC. From the moment the Aircraft is within the area of responsibility of the (European Network) the ELDT is provided by the NOP. *Available to the AOP through the NOP* When the Aircraft enters the area of responsibility of the local ATC service provider (FIR or TMA) the ELDT is provided by the Local ATC service provider. *Available to the NOP through the AOP*	REQ-06.02-DOD-6200.0081<Partial>; REQ-06.02-DOD-6200.0083<Partial>
IER-06.05.04-OSED-FLTP.0203	ALDT	A-SMGCS; (Local ATC service provider – Apt Twr)	AOP; NOP	ALDT - Actual Landing Time To be exchanged in combination with: FL ID DOF RWYARR	ST planning & Exec. phase	Transmission rules - Interaction frequency : <ad hoc> The ALDT is provided by the A-SMGCS system. If no A-SMGCS system available the ALDT is provided by the Local ANSP system *Available to the NOP through the AOP*	REQ-06.02-DOD-6200.0081<Partial>; REQ-06.02-DOD-6200.0083<Partial>
IER-06.05.04-OSED-FLTP.0505	STAR	Local ATC service provider -TMA Ctrl	NOP; AOP	Standard Terminal Arrival Route identifier To be exchanged in combination with: FL ID DOF RWYARR	ST planning & Exec. phase	Transmission rules - Interaction frequency : <ad hoc> *Available to the NOP through the AOP*	REQ-06.02-DOD-6200.0081<Partial>; REQ-06.02-DOD-6200.0083<Partial>
IER-06.05.04-OSED-FLTP.0507	RWY_Exit	Local ATC service provider -Apt Twr	AOP	Runway Exit identifier - Runway Exit to be used - assigned / agreed runway exit. To be exchanged in combination with: FL ID DOF RWYARR	ST planning & Exec. phase	The RWY_Exit initially equals the assigned / agreed runway exit to be used. After ending the flight the RWY Exit equals the actual runway exit used.	REQ-06.02-DOD-6200.0081<Partial>; REQ-06.02-DOD-6200.0083<Partial>

Table 3: AMAN IERs concerning API (Arrival Planning Information)

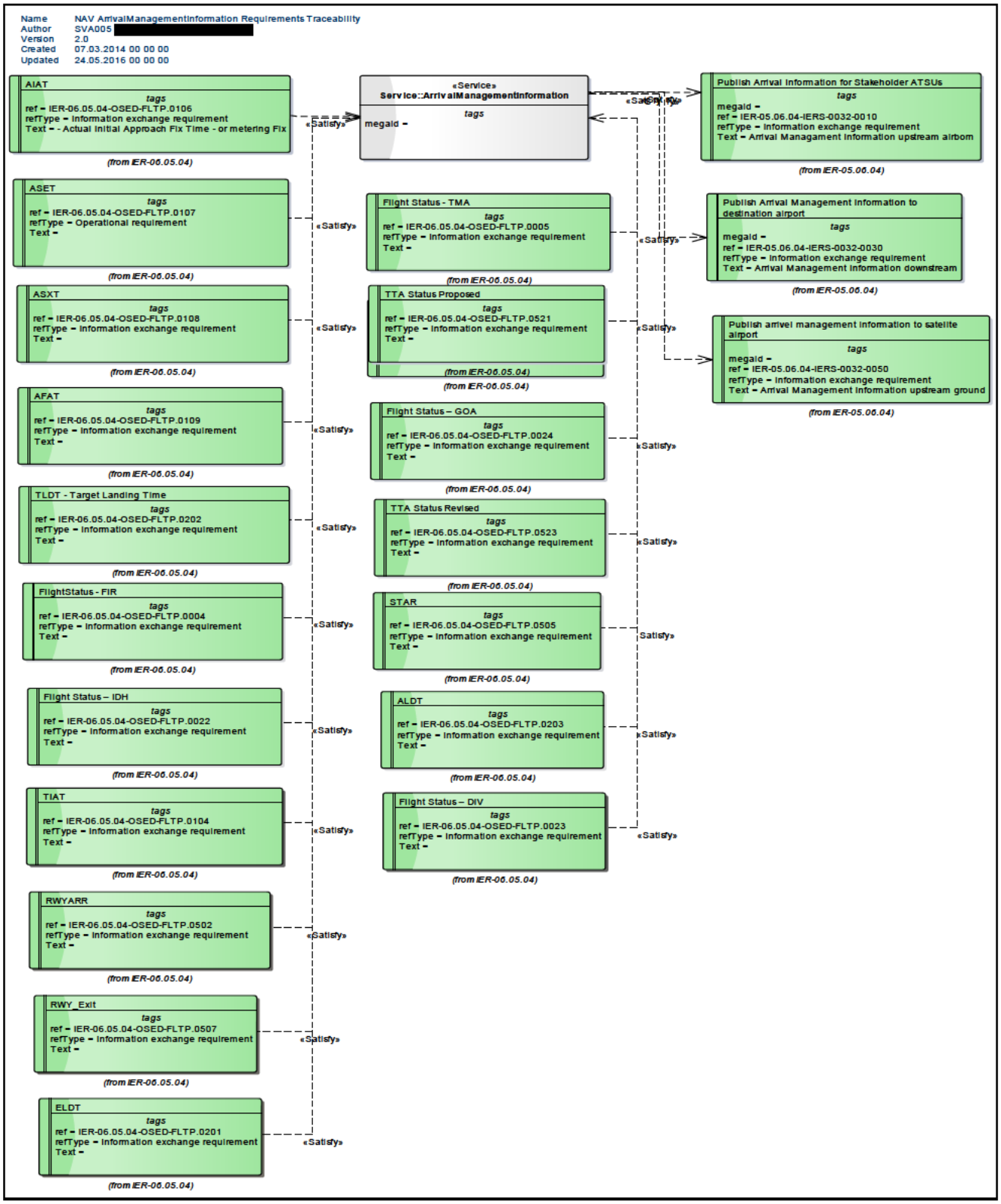

Figure 3: NAV ArrivalManagementInformation Requirements Traceability

Element Name	Author	Notes
AFAT	[redacted]	AFAT - Actual Time at the Final Approach Fix or Final Metering Fix point

	Element Tagged Value Name	Value
	ref	IER-06.05.04-OSED-FLTP.0109
	refType	Information exchange requirement
	Text	

Element Name	Author	Notes
AIAT	[redacted]	AIAT - Actual Initial Approach Fix Time - or metering Fix

	Element Tagged Value Name	Value
	ref	IER-06.05.04-OSED-FLTP.0106
	refType	Information exchange requirement
	Text	- Actual Initial Approach Fix Time - or metering Fix

Element Name	Author	Notes
ALDT	[redacted]	ALDT

	Element Tagged Value Name	Value
	ref	IER-06.05.04-OSED-FLTP.0203
	refType	Information exchange requirement
	Text	

Element Name	Author	Notes
ASET	[redacted]	ASET – Actual Stack Entry Time. Time when the aircraft joined the air holding stack

	Element Tagged Value Name	Value
	ref	IER-06.05.04-OSED-FLTP.0107
	refType	Operational requirement
	Text	

Element Name	Author	Notes
ASXT	[redacted]	ASXT – Actual Stack eXit Time. Time when the aircraft departed the air holding stack

	Element Tagged Value Name	Value
	ref	IER-06.05.04-OSED-FLTP.0108
	refType	Information exchange requirement
	Text	

Element Name	Author	Notes
ELDT	[redacted]	ELDT

	Element Tagged Value Name	Value
	ref	IER-06.05.04-OSED-FLTP.0201
	refType	Information exchange requirement
	Text	

Element Name	Author	Notes
Flight Status - FNL	[redacted]	Flight Status - FNL

	Element Tagged Value Name	Value
	ref	IER-06.05.04-OSED-FLTP.0006
	refType	Information exchange requirement
	Text	

Element Name	Author	Notes
Flight Status - TMA	[redacted]	Flight Status - TMA

	Element Tagged Value Name	Value
	ref	IER-06.05.04-OSED-FLTP.0005
	refType	Information exchange requirement
	Text	

Element Name	Author	Notes
Flight Status – DIV	[redacted]	Flight Status – DIV

	Element Tagged Value Name	Value
	ref	IER-06.05.04-OSED-FLTP.0023
	refType	Information exchange requirement
	Text	

Element Name	Author	Notes
Flight Status – GOA	[redacted]	Flight Status – GOA

	Element Tagged Value Name	Value
	ref	IER-06.05.04-OSED-FLTP.0024
	refType	Information exchange requirement
	Text	

Element Name	Author	Notes
Flight Status – IDH	[redacted]	Flight Status – IDH

	Element Tagged Value Name	Value
	ref	IER-06.05.04-OSED-FLTP.0022
	refType	Information exchange requirement
	Text	

Element Name	Author	Notes
FlightStatus - FIR	[redacted]	FIR boundary reached

	Element Tagged Value Name	Value
	ref	IER-06.05.04-OSED-FLTP.0004
	refType	Information exchange requirement
	Text	

Element Name	Author	Notes
Probabilistic winds aloft forecast, wind direction	[redacted]	Probabilistic winds aloft forecast

	Element Tagged Value Name	Value
	ref	IER-06.05.04-OSED-MET2.0014
	refType	Information exchange requirement
	Text	

Element Name	Author	Notes
Probabilistic winds aloft forecast, wind speed	[redacted]	Probabilistic winds aloft forecast

	Element Tagged Value Name	Value
	ref	IER-06.05.04-OSED-MET2.0013
	refType	Information exchange requirement
	Text	

Element Name	Author	Notes
RWYARR	[redacted]	RWYARR

	Element Tagged Value Name	Value
	ref	IER-06.05.04-OSED-FLTP.0502
	refType	Information exchange requirement
	Text	

Element Name	Author	Notes
RWY_Exit	[redacted]	RWY_Exit

	Element Tagged Value Name	Value
	ref	IER-06.05.04-OSED-FLTP.0507

	refType	Information exchange requirement	
	Text		
Element Name		Author	Notes
STAR		[redacted]	STAR
	Element Tagged Value Name	Value	
	ref	IER-06.05.04-OSED-FLTP.0505	
	refType	Information exchange requirement	
	Text		
Element Name		Author	Notes
TIAT		[redacted]	TIAT
	Element Tagged Value Name	Value	
	ref	IER-06.05.04-OSED-FLTP.0104	
	refType	Information exchange requirement	
	Text		
Element Name		Author	Notes
TLDT - Target Landing Time		[redacted]	TLDT - Target Landing Time
	Element Tagged Value Name	Value	
	ref	IER-06.05.04-OSED-FLTP.0202	
	refType	Information exchange requirement	
	Text		
Element Name		Author	Notes
TTA Status Proposed		[redacted]	TTA Status Proposed
	Element Tagged Value Name	Value	
	ref	IER-06.05.04-OSED-FLTP.0521	
	refType	Information exchange requirement	
	Text		
Element Name		Author	Notes
TTA Status Revised		[redacted]	TTA Status Revised
	Element Tagged Value Name	Value	
	ref	IER-06.05.04-OSED-FLTP.0523	
	refType	Information exchange requirement	
	Text		

Table 4: Requirements tracing

3.2 Other Requirements

3.2.1 Non-Functional Requirements

NA

3.2.2 Relevant Industrial Standards

NA

3.2.3 Nodes

This chapter shows the Service to Nodes Mapping diagram relevant to this service as shown below.

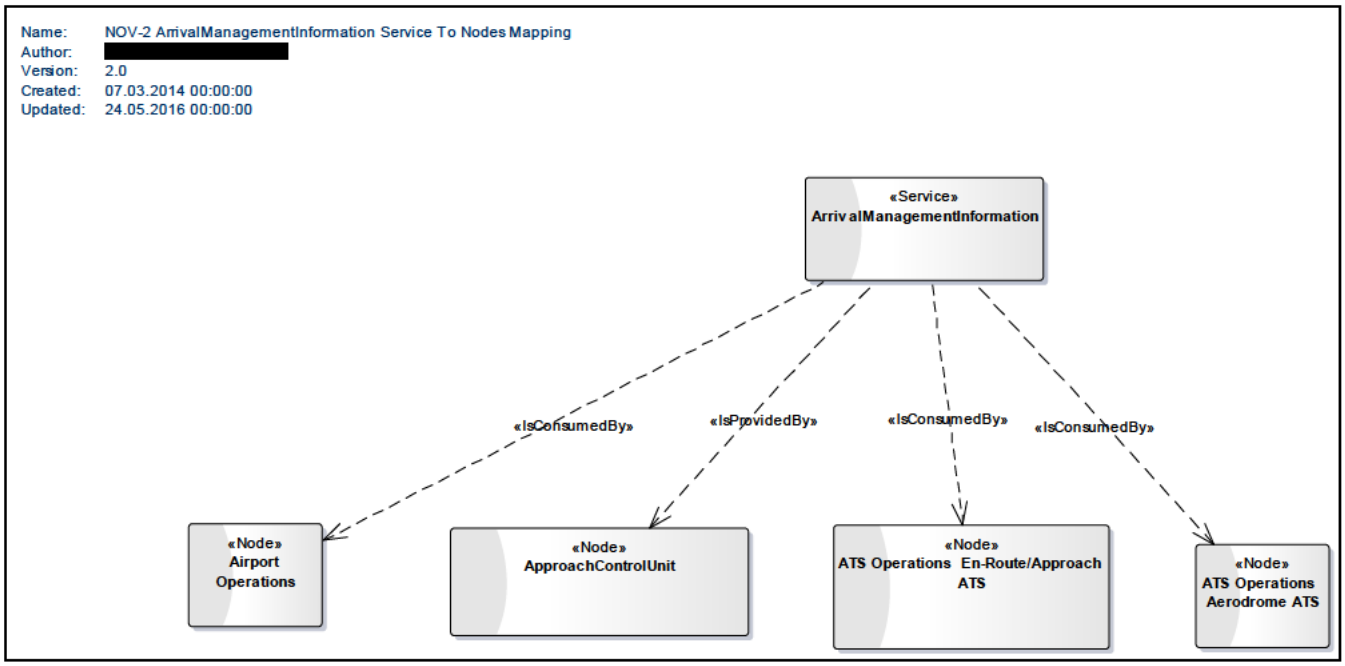

Figure 4: NOV-2 ArrivalManagementInformation Service to Nodes Mapping diagram

4 Service overview

4.1 Service Taxonomy

The service taxonomy is described in the ISRM Service Portfolio document [21].

4.2 Service Levels (NfRs)

Non Functional Requirements are described in section 3.2.1.

4.3 Service Functions and Capabilities

The mapping to Operational Activities is as described in the following figure. The capability mapping is shown in combination with the interface definition in chapter 4.4.

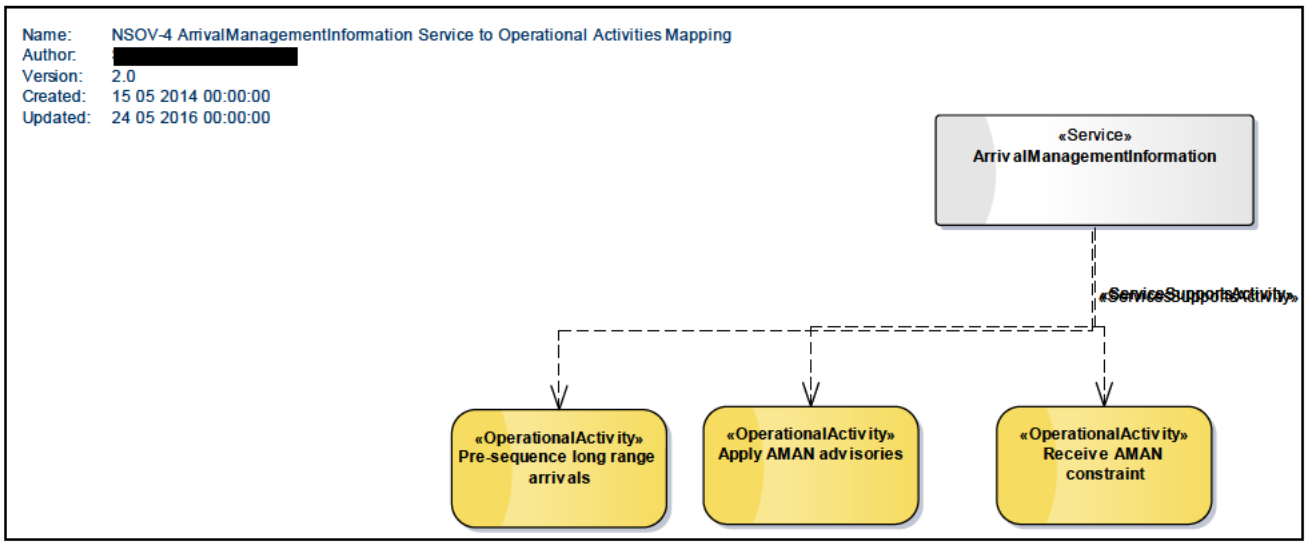

Figure 5: NSOV-4 ArrivalManagementInformation Service to Operational Activities Mapping diagram

4.4 Service Interfaces

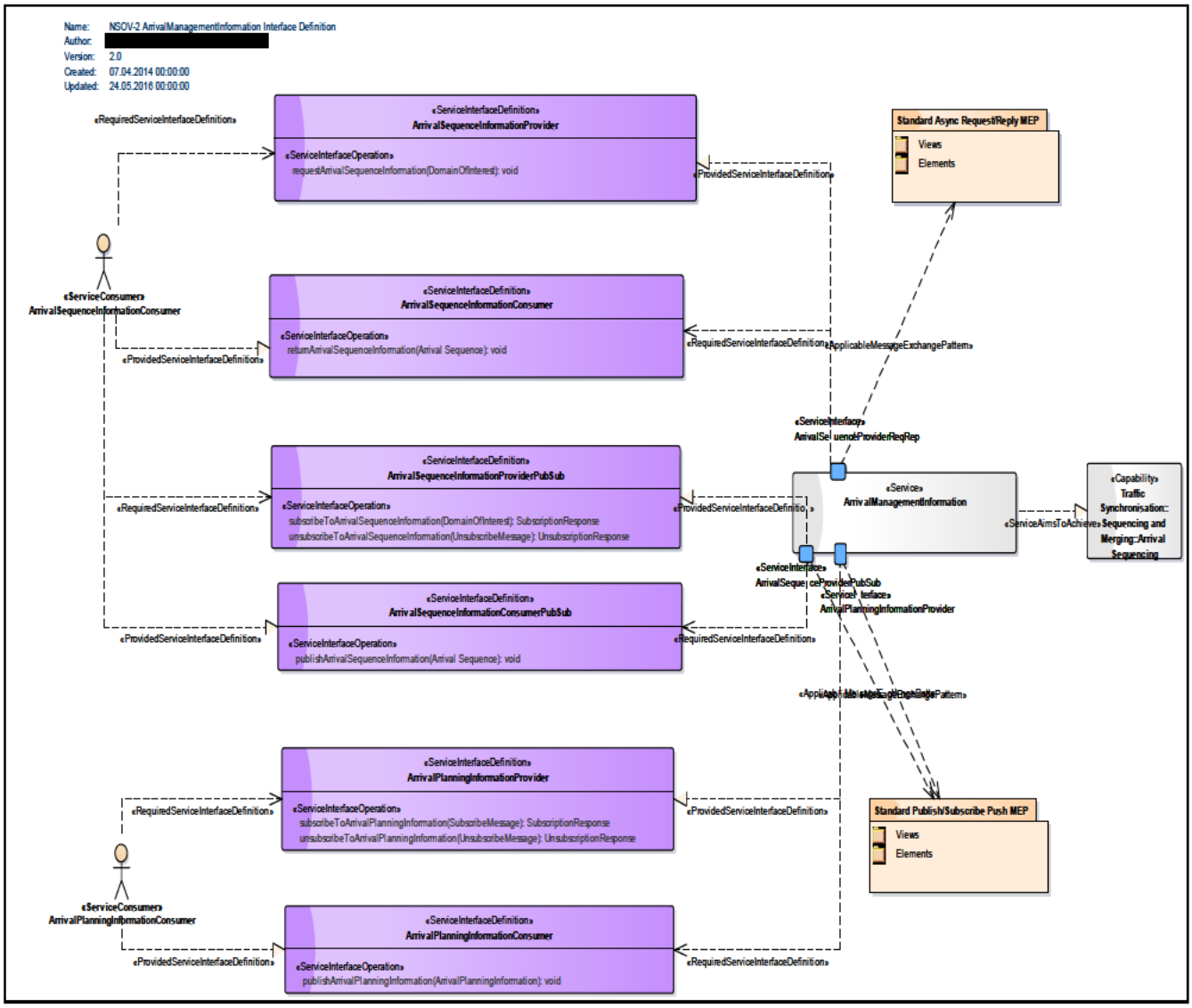

Figure 6: NSOV-2 ArrivalManagementInformation Interface Definition diagram

ServiceInterface	ServiceInterfaceDefinition	ServiceInterfaceOperation	Role
ArrivalSequenceProviderReqRep	ArrivalSequenceInformationProvider	requestArrivalSequenceInformation	Provided
	ArrivalSequenceInformationConsumer	returnArrivalSequenceInformation	Required
ArrivalSequenceProviderPubSub	ArrivalSequenceInformationProviderPubSub	subscripeToArrivalSequenceInformation	Provided
	ArrivalSequenceInformationProviderPubSub	unsubscribeToArrivalSequenceInformation	Provided
	ArrivalSequenceInformationConsumerPubSub	publishArrivalSequenceInformation	Required
ArrivalPlanningInformationProvider	ArrivalPlanningInformationProvider	subscribeToArrivalPlanningInformation	Provided
	ArrivalPlanningInformationProvider	unsubscribeToArrivalPlanningInformation	Provided
	ArrivalPlanningInformationConsumer	publishArrivalPlanningInformation	Required

Table 5: Service Interfaces

5 Service interface specifications

This chapter describes the details of each interface. The Service Interface specification only covers the static design description while the dynamic design (behaviour) is described in chapter 6.

The static interface description is vital since it describes how the interfaces shall be constructed.

Architectural elements applicable for this description are:

- Service Interfaces
- Service Interface Definitions
- Operations
  Function or procedures which enable programmatic communication with a Service via a Service interface.
- Parameters
  Constants or variables passed into or out of a Service interface as part of the execution of an Operation.

5.1 ServiceInterface ArrivalSequenceProviderReqRep

This service interface provides Arrival Management Information for a domain of interest (e.g. for a specific flight, for flights coming from a specified destination aerodrome, …).

The interface design is using a standard request/reply message exchange pattern.

5.1.1 Service Interface definition ArrivalSequenceInformationProvider

This interface is the providing interface to receive a request for arrival management information from the consumer.

5.1.1.1 Operation requestArrivalSequenceInformation

5.1.1.1.1 Operation Functionality

Operation to realise the request for arrival management information.

5.1.1.1.2 Operation Parameters

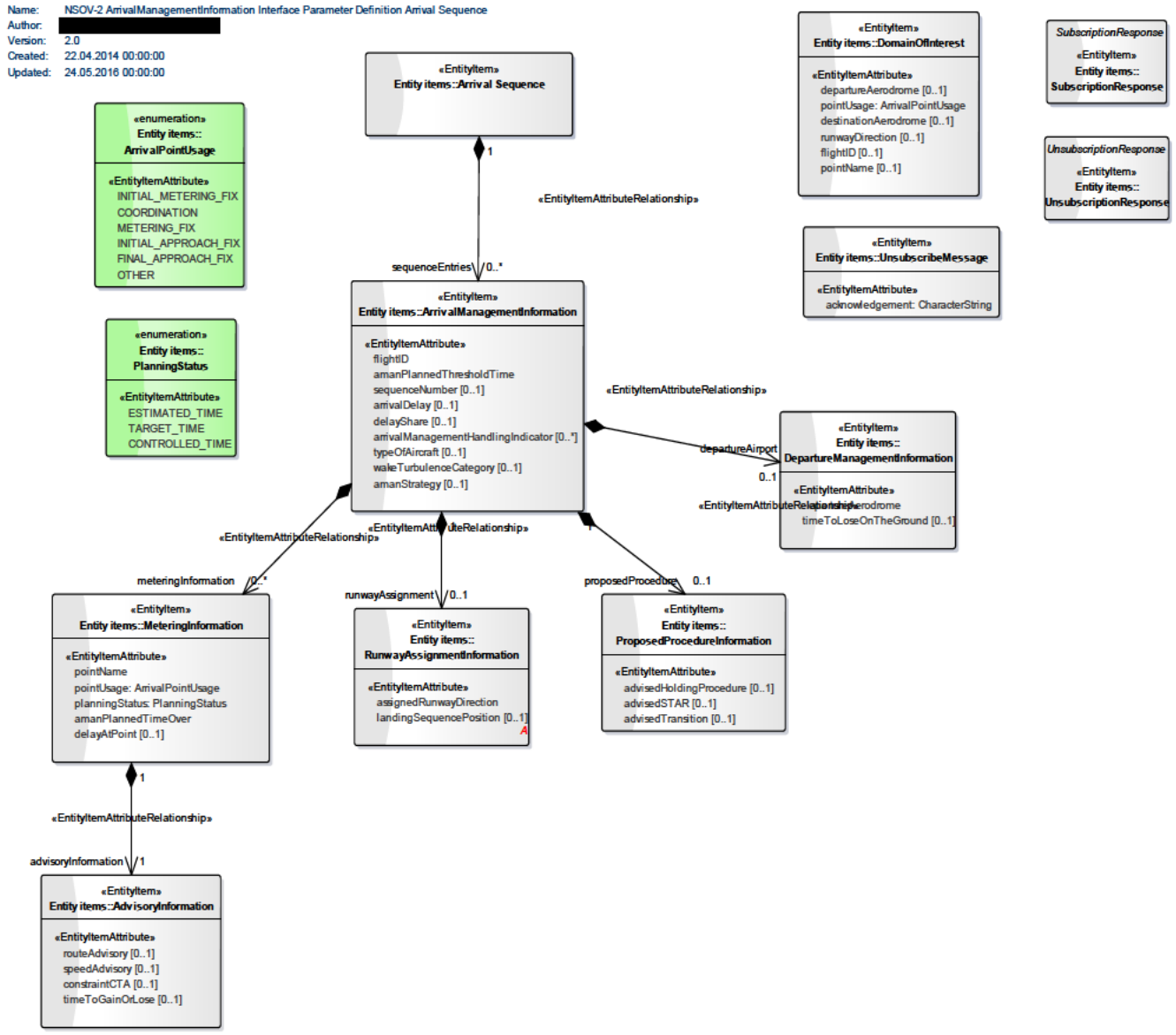

Figure 7: NSOV-2 ArrivalManagementInformation Interface Parameter Definition Arrival Sequence

The payload has been designed to allow access to the entire sequencing information produced by the AMAN tool, combined with the information about the sequencing status of the flight.

It is worth mentioning that all aggregations and many of the attributes are defined as optional. This is because depending on the DomainOfInterest of a given service consumer, only restricted subsets of the full payload will be operationally meaningful. It is operationally desirable not to transmit information that is not relevant to the recipient. Operational experts have only identified a minimum set of attributes as truly mandatory.

It is understood that in any specific service instance, a richer set of attributes will be specified as mandatory for the specific DomainOfInterest constellations supported by the service implementation. However, this is a configuration aspect that depends so much on local procedures that it cannot be standardised by the ISRM.

The CTA constraint is created by E-AMAN also for i4D. This information is needed by Upstream-ATUs (optional) as an alternative to the flight object.

Input Parameters

DomainOfInterest: A set of criteria to specify the information need of an upstream ACC for a particular situation in the context of AMAN extended horizon, to e.g. receive AMAN advisories for flights in their AOR or AOI.

Output Parameters

none

5.1.2 Service Interface definition ArrivalSequenceInformationConsumer

This interface is the consuming interface to receive the arrival management information from the provider.

5.1.2.1 Operation returnArrivalSequenceInformation

5.1.2.1.1 Operation Functionality

Operation to receive the arrival management information.

5.1.2.1.2 Operation Parameters

Input Parameters

Arrival sequence information according to the specified criteria (entity item “domainOfInterest”) previously submitted by the request.

ArrivalSequence: The payload of the service containing the information need of an upstream ACC for a particular situation in the context of AMAN extended horizon, e.g. AMAN advisories for flights in their AOR/AOI or containing the information need of a satellite airport.

5.2 ServiceInterface ArrivalSequenceProviderPubSub

This service interface provides Arrival Management Information for a domain of interest (e.g. for a specific flight, for flights coming from a specified destination aerodrome,).

The interface design is using a standard publish/subscribe message exchange pattern.

5.2.1 Service Interface definition ArrivalSequenceInformationProviderPubSub

This interface is the providing interface to receive a subscription for arrival management information from the consumer.

5.2.1.1 Operation subscribeToArrivalSequenceInformation

5.2.1.1.1 Operation Functionality

Operation to realise the subscription.

5.2.1.1.2 Operation Parameters

Input Parameters

DomainOfInterest: A set of criteria to specify the information need of an upstream ACC for a particular situation in the context of AMAN extended horizon, to e.g. receive AMAN advisories for flights in their AOR or AOI (same as in chapter 5.1.1.1.1).

Output Parameter

SubscriptionResponse

5.2.1.2 Operation unsubscribeToArrivalSequenceInformation

5.2.1.2.1 Operation Functionality

Operation to realise the unsubscription.

5.2.1.2.2 Operation Parameters

Input Parameters

UnsubsrcibeMessage

Output Parameter

UnsubscriptionResponse

5.2.2 Service Interface definition ArrivalSequenceInformationConsumerPubSub

This interface is the consuming interface to receive the arrival management information from the provider.

5.2.2.1 Operation publishArrivalSequenceInformation

5.2.2.1.1 Operation Functionality

Operation on the consumer side to receive the arrival management information.

5.2.2.1.2 Operation Parameters

Input Parameters

ArrivalSequence: arrival sequence information according to the specified criteria within the subscription.

The same as in chapter 5.1.2.1.1.

5.3 ServiceInterface ArrivalPlanningInformationProvider

This service interface provides arrival planning information for a domain of interest (for a specific flight, a specified destination aerodrome or an assigned arrival runway).

The interface design is using a standard publish/subscribe message exchange pattern.

5.3.1 Service Interface definition ArrivalPlanningInformationProvider

This interface is the providing interface to receive a subscription for arrival planning information from the consumer.

5.3.1.1 Operation subscribeToArrivalPlanningInformation ,

5.3.1.1.1 Operation Functionality

Operation to realise the subscription.

5.3.1.1.2 Operation Parameters

Input Parameters

SubscribeMessage: The content represents a set of criteria to specify the information need.

Output Parameter

SubscriptionResponse (same as in chapter 5.2.1.1.1)

5.3.1.2 Operation unsubscribeToArrivalSequenceInformation

5.3.1.2.1 Operation Functionality

Operation to realise the unsubscription.

5.3.1.2.2 Operation Parameters

Input Parameters

UnsubscribeMessage (same as in chapter 5.2.1.2.1)

Output Parameter

UnsubscriptionResponse (same as in chapter 5.2.1.2.1)

5.3.2 Service Interface definition ArrivalPlanningInformationConsumer

This interface is the consuming interface to receive the arrival planning information from the provider.

5.3.2.1 Operation publishArrivalPlanningInformation

5.3.2.1.1 Operation Functionality

Operation to receive the arrival planning information.

5.3.2.1.2 Operation Parameters

Input Parameters

ArrivalPlanningInformation: arrival planning information according to the specified criteria within the subscription.

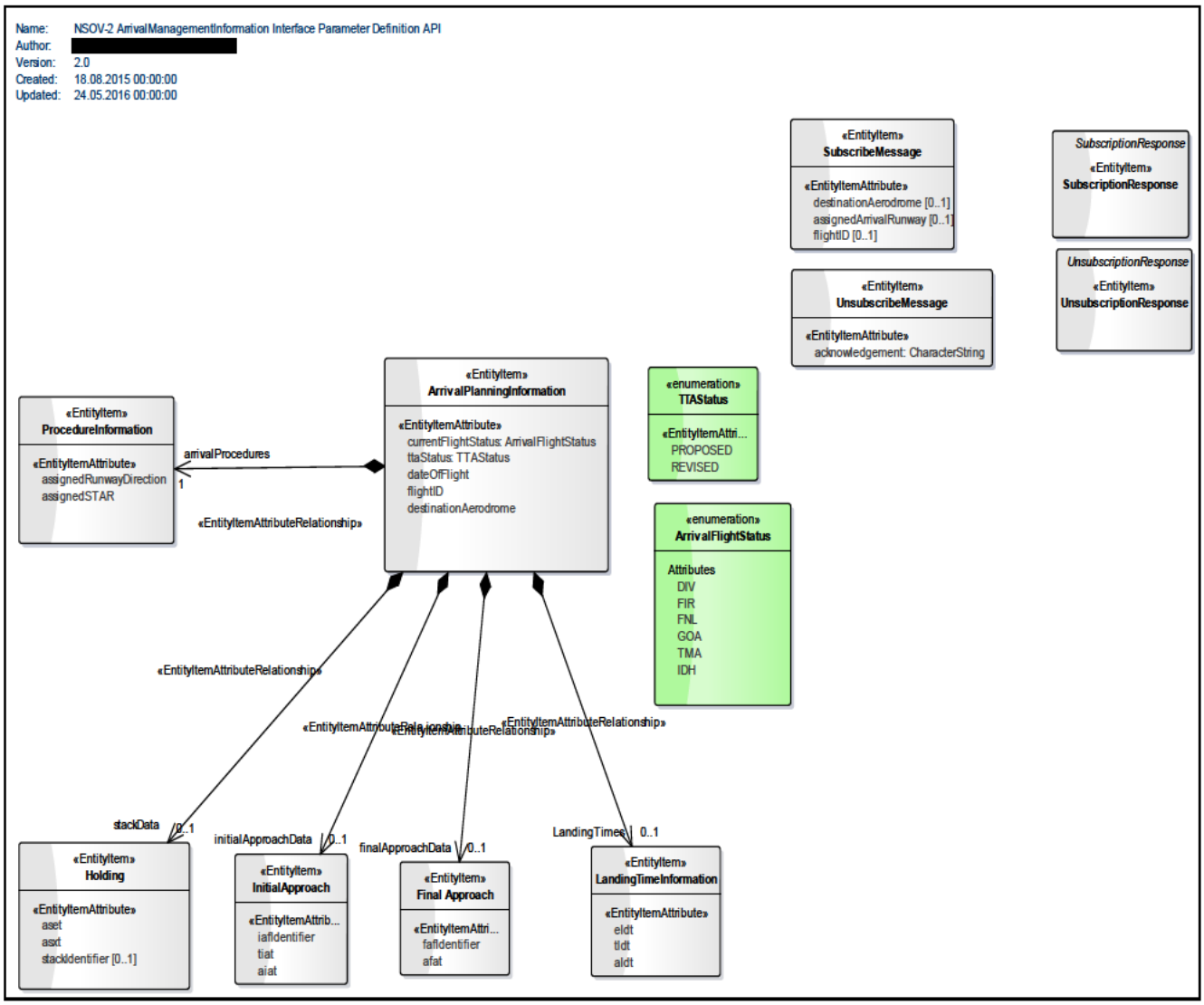

Figure 8: NSOV-2 ArrivalManagementInformation Interface Parameter Definition API

5.4 Payloads

The previously described Interfaces have been designed to deliver arrival sequence related information and arrival planning related information. Within this chapter a comprehensive list of all elements used is provided.

Element Name	Author	Notes
AdvisoryInformation	[redacted]	Consists of attributes concerning the AMAN advisories which might be given for a particular flight.

Attribute Name	Type	Notes
routeAdvisory		Routs advisory, see AIRM definition

Tagged Value Name	Value
CLDMSemanticTrace	urn:x-ses:sesarju:airm:v410:ConsolidatedLogicalDataModel:SubjectFields:AirTrafficOperations:TrafficSynchronization:ArrivalManagement:ArrivalManagementAdvisory@advisedRoute
IMDefinitionTrace	urn:x-ses:sesarju:airm:v410:InformationModel:SubjectFields:AirTrafficOperations:TrafficSynchronization:ArrivalManagement:AMANRouteAdvisory

Attribute Name	Type	Notes
speedAdvisory		see AIRM Definition The speed advisory published by the AMAN

Tagged Value Name	Value
CLDMContextTrace	urn:x-ses:sesarju:airm:v410:ConsolidatedLogicalDataModel:SubjectFields:AirTrafficOperations:TrafficSynchronization:ArrivalManagement:ArrivalManagementAdvisory@speedAdvisoryReferenceType
CLDMSemanticTrace	urn:x-ses:sesarju:airm:v410:ConsolidatedLogicalDataModel:SubjectFields:AirTrafficOperations:TrafficSynchronization:ArrivalManagement:ArrivalManagementAdvisory@speedAdvisoryValue
IMDefinitionTrace	urn:x-ses:sesarju:airm:v410:InformationModel:SubjectFields:AirTrafficOperations:TrafficSynchronization:ArrivalManagement:AMANSpeedAdvisory

Attribute Name	Type	Notes
constraintCTA		Controlled time constraint proposed by the AMAN

Tagged Value Name	Value
CLDMContextTrace	urn:x-ses:sesarju:airm:v410:ConsolidatedLogicalDataModel:SubjectFields:AirTrafficOperations:TrafficSynchronization:ArrivalManagement:LandingSequence@arrivalManagementStrategy
CLDMSemanticTrace	urn:x-ses:sesarju:airm:v410:ConsolidatedLogicalDataModel:SubjectFields:Flight:Trajectory:ControlledTimeOver
IMDefinitionTrace	urn:x-ses:sesarju:airm:v410:InformationModel:SubjectFields:Flight:Trajectory:ControlledTimeOfArrival

	Attribute Name	Type	Notes
	timeToGainOrLose		An arrival management advisories in form of the amount of time that a flight is supposed to lose or gain to arrive at the Metering Fix to land at the AMAN planned threshold time.

	Tagged Value Name	Value
	CLDMSemanticTrace	urn:x-ses:sesarju:airm:v410:ConsolidatedLogicalDataModel:SubjectFields:AirTrafficOperations:TrafficSynchronization:ArrivalManagement:ArrivalManagementAdvisory@timeToGainOrLose
	IMDefinitionTrace	urn:x-ses:sesarju:airm:v410:InformationModel:SubjectFields:AirTrafficOperations:TrafficSynchronization:ArrivalManagement:TimeToGainOrLose

Element Name	Author	Notes
Arrival Sequence	[redacted]	The Set of Arrival management Information Items (Flight specific) returned by a request specifying the domain of interest.

Element Name	Author	Notes
ArrivalManagementInformation	[redacted]	Contains information on single flights and their position in the landing sequence. Information relevant to all AMAN information users AMAN Planned Threshold time (APTT) as determined by the AMAN optimization algorithm Status of the sequencing (i.e. to what extent is the flight constrained by ATC)? Status of the progress of sequencing (i.e. what is the current status of the process towards fitting the flight into the sequence.

	Attribute Name	Type	Notes
	flightID		The identification of the flight. This can be any of the specific keys defined as specialization of “FlightIdentifier”

	Tagged Value Name	Value
	CLDMSemanticTrace	urn:x-ses:sesarju:airm:v410:ConsolidatedLogicalDataModel:SubjectFields:Flight:Flight@identifier

	Attribute Name	Type	Notes
	amanPlannedThresholdTime		Abbreviation: APTT synonyms: Optimal Time of Arrival (OTA) The time, calculated by the Arrival Manager tool, at which the aircraft is planned to cross the runway threshold This is also the landing time shown to the Controller on the AMAN timeline.

	Tagged Value Name	Value	
	CLDMContextTrace	urn:x-ses:sesarju:airm:v410:ConsolidatedLogicalDataModel:SubjectFields:Common:Codelists:CodePlanningStatusType@CALCULATED	
	CLDMContextTrace	urn:x-ses:sesarju:airm:v410:ConsolidatedLogicalDataModel:SubjectFields:Flight:FlightEvent:OverArrivalPoint@landingThresholdPoint	
	CLDMSemanticTrace	urn:x-ses:sesarju:airm:v410:ConsolidatedLogicalDataModel:SubjectFields:Flight:FlightEvent:OverArrivalPoint@time	
	IMDefinitionTrace	urn:x-ses:sesarju:airm:v410:InformationModel:SubjectFields:Flight:FlightEvent:AMANPlannedThresholdTime	
Attribute Name	Type	Notes	
sequenceNumber		*The ordinal number describing the position of a flight in the temporal sequence of threshold crossings.* *This is fixed for a given flight when the sequence is frozen, it does NOT change when the first plane lands.* *This is required to improve situational awareness by directly showing the ordering of flights, see REQ-5.6.4-REQS-0028-0690*	
	Tagged Value Name	Value	
	CLDMSemanticTrace	urn:x-ses:sesarju:airm:v410:ConsolidatedLogicalDataModel:SubjectFields:AirTrafficOperations:TrafficSynchronization:ArrivalManagement:LandingSequencing@landingSequencePosition	
Attribute Name	Type	Notes	
arrivalDelay		*The difference between times APTT (i.e. time over landing threshold point calculated by the AMAN) and ETA (as per the latest available flight plan available in the AMAN ATSU's FDPS).*	
	Tagged Value Name	Value	
	CLDMSemanticTrace	urn:x-ses:sesarju:airm:v410:ConsolidatedLogicalDataModel:SubjectFields:Flight:Trajectory:DelayApportionment@totalTimeToLoseOrGain	
Attribute Name	Type	Notes	
delayShare		The delay sharing strategy is defined as the order in which the delay is successively attributed and the maximum value that can be absorbed for each band.	
	Tagged Value Name	Value	
	CLDMSemanticTrace	urn:x-ses:sesarju:airm:v410:ConsolidatedLogicalDataModel:SubjectFields:Flight:Trajectory:PartialDelayApportionment@partialTimeToLoseOrGain	

	Attribute Name	Type	Notes
	arrivalManagementHandlingIndicator		Descriptors of the status of a flight in the sequencing process, as required to give the executive controller appropriate situational awareness, e.g. “Presequenced, “CTA accepted”,
	Tagged Value Name	Value	
	CLDMSemanticTrace	urn:x-ses:sesarju:airm:v410:ConsolidatedLogicalDataModel:SubjectFields:AirTrafficOperations:Codelists:CodeAMANStatusType	
	Attribute Name	Type	Notes
	typeOfAircraft		Aircraft Type
	Tagged Value Name	Value	
	CLDMSemanticTrace	urn:x-ses:sesarju:airm:v410:ConsolidatedLogicalDataModel:SubjectFields:Aircraft:AircraftType@icaoIdentifier	
	IMDefinitionTrace	urn:x-ses:sesarju:airm:v410:InformationModel:SubjectFields:Aircraft:AircraftType	
	Attribute Name	Type	Notes
	wakeTurbulenceCategory		wake Turbulence Category
	Tagged Value Name	Value	
	CLDMSemanticTrace	urn:x-ses:sesarju:airm:v410:ConsolidatedLogicalDataModel:SubjectFields:Aircraft:AircraftCategory@wakeTurbulenceCategory	
	IMDefinitionTrace	urn:x-ses:sesarju:airm:v410:InformationModel:SubjectFields:Aircraft:WakeTurbulenceCategory	
	Attribute Name	Type	Notes
	amanStrategy		*The name of the set of operational rules and procedures underlying the AMAN tool optimisation algorithm. The strategy implements the trade-off between the goals of equity, high throughput, and trajectory efficiency which has agreed between the stakeholders*
	Tagged Value Name	Value	
	CLDMSemanticTrace	urn:x-ses:sesarju:airm:v410:ConsolidatedLogicalDataModel:SubjectFields:AirTrafficOperations:TrafficSynchronization:ArrivalManagement:LandingSequence@arrivalManagementStrategy	
	IMDefinitionTrace	urn:x-ses:sesarju:airm:v410:InformationModel:SubjectFields:AirTrafficOperations:TrafficSynchronization:ArrivalManagement:ArrivalManagementStrategy	

Element Name	Author	Notes
ArrivalPlanningInformation	[redacted]	Container for Arrival Planning (API) Information.

	Attribute Name	Type	Notes
	currentFlightStatus	ArrivalFlightStatus	Current Flight Status
	Tagged Value Name	Value	
	CLDMSemanticTrace	CLDM out of scope	
	Attribute Name	Type	Notes
	ttaStatus	TTAStatus	Status of TTA

	Tagged Value Name	Value	
	CLDMSemanticTrace	CLDM_out_of_scope	
	Attribute Name	Type	Notes
	dateOfFlight		Date of flight execution.
	Tagged Value Name	Value	
	CLDMSemanticTrace	urn:x-ses:sesarju:airm:v410:ConsolidatedLogicalDataModel:SubjectFields:Flight:Flight@dateOfDeparture	
	Attribute Name	Type	Notes
	flightID		Flight ID
	Tagged Value Name	Value	
	CLDMSemanticTrace	urn:x-ses:sesarju:airm:v410:ConsolidatedLogicalDataModel:SubjectFields:Flight:Flight@identifier	
	Attribute Name	Type	Notes
	destinationAerodrome		Destination Airport.
	Tagged Value Name	Value	
	CLDMContextTrace	urn:x-ses:sesarju:airm:v410:ConsolidatedLogicalDataModel:SubjectFields:Flight:Flight@destinationAerodrome	
	CLDMSemanticTrace	urn:x-ses:sesarju:airm:v410:ConsolidatedLogicalDataModel:SubjectFields:BaseInfrastructure:AerodromeInfrastructure:Aerodrome@locationIndicatorICAO	
Element Name	Author	Notes	
DepartureManagementInformation	[redacted]	Contains departure information for a given flight.	
	Attribute Name	Type	Notes
	departureAerodrome		The aerodrome (within the AMAN horizon) from which the flight is scheduled to depart.
	Tagged Value Name	Value	
	CLDMContext	urn:x-ses:sesarju:airm:v410:ConsolidatedLogicalDataModel:SubjectFields:Flight:Flight@departureAerodrome	
	CLDMSemanticTrace	urn:x-ses:sesarju:airm:v410:ConsolidatedLogicalDataModel:SubjectFields:BaseInfrastructure:AerodromeInfrastructure:Aerodrome@locationIndicatorICAO	
	Attribute Name	Type	Notes
	timeToLoseOnTheGround		Time To Loose on the ground
	Tagged Value Name	Value	
	CLDMSemanticTrace	urn:x-ses:sesarju:airm:v410:ConsolidatedLogicalDataModel:SubjectFields:AirTrafficOperations:TrafficSynchronization:ArrivalManagement:ArrivalManagementAdvisory@timeToLoseOrGainOnTheGround	
Element Name	Author	Notes	
DomainOfInterest	[redacted]	The set of criteria to specify information concerning a specific operational situation or use case in the context of AMAN extended horizon to be supported by Arrival Management Information e.g. AMAN advisories.	
	Attribute Name	Type	Notes
	departureAerodrome		The aerodrome (within the AMAN horizon) from which the flight is scheduled to depart.

	Tagged Value Name	Value
	CLDMContext	urn:x-ses:sesarju:airm:v410:ConsolidatedLogicalDataModel:SubjectFields:Flight:Flight@departureAerodrome
	CLDMSemanticTrace	urn:x-ses:sesarju:airm:v410:ConsolidatedLogicalDataModel:SubjectFields:BaseInfrastructure:AerodromeInfrastructure:Aerodrome@locationIndicatorICAO

	Attribute Name	Type	Notes
	pointUsage	ArrivalPointUsage	Fix Point usage

	Tagged Value Name	Value
	CLDMSemanticTrace	CLDM out of scope

	Attribute Name	Type	Notes
	destinationAerodrome		Destination Aerodrome

	Tagged Value Name	Value
	CLDMContext	urn:x-ses:sesarju:airm:v410:ConsolidatedLogicalDataModel:SubjectFields:Flight:Flight@destinationAerodrome
	CLDMSemanticTrace	urn:x-ses:sesarju:airm:v410:ConsolidatedLogicalDataModel:SubjectFields:BaseInfrastructure:AerodromeInfrastructure:Aerodrome@locationIndicatorICAO

	Attribute Name	Type	Notes
	runwayDirection		runway mode of operation

	Tagged Value Name	Value
	CLDMSemanticTrace	urn:x-ses:sesarju:airm:v410:ConsolidatedLogicalDataModel:SubjectFields:BaseInfrastructure:AerodromeInfrastructure:RunwayDirection@designator
	IMDefinitionTrace	urn:x-ses:sesarju:airm:v410:InformationModel:SubjectFields:BaseInfrastructure:AerodromeInfrastructure:RunwayDirection

	Attribute Name	Type	Notes
	flightID		flight Identifier

	Tagged Value Name	Value
	CLDMSemanticTrace	urn:x-ses:sesarju:airm:v410:ConsolidatedLogicalDataModel:SubjectFields:Flight:Flight@identifier

	Attribute Name	Type	Notes
	pointName		The published name of the significant point for which the metering information is provided

	Tagged Value Name	Value
	CLDMSemanticTrace	urn:x-ses:sesarju:airm:v410:ConsolidatedLogicalDataModel:SubjectFields:AirspaceInfrastructure:AirspaceInfrastructurePoint:SignificantPoint@designator

Element Name	Author	Notes
Final Approach	[redacted]	On Final Approach - The aircraft has got to the FAF or FAP (Final Approach Fix point) and proceeds to fly the final approach segment towards the airport

	Attribute Name	Type	Notes
	fafIdentifier		Final Approach Fix Point Identifier

	Tagged Value Name	Value
	CLDMContextTrace	urn:x-ses:sesarju:airm:v410:ConsolidatedLogicalDataModel:SubjectFields:Flight:FlightEvent:OverArrivalPoint@finalApproachFix
	CLDMSemanticTrace	urn:x-ses:sesarju:airm:v410:ConsolidatedLogicalDataModel:SubjectFields:AirspaceInfrastructure:AirspaceInfrastructurePoint:SignificantPoint@designator

	Attribute Name	Type	Notes
	afat		Actual Time at the Final Approach Fix or Final Metering Fix point.

	Tagged Value Name	Value
	CLDMContextTrace	urn:x-ses:sesarju:airm:v410:ConsolidatedLogicalDataModel:SubjectFields:Common:Codelists:CodePlanningStatusType@ACTUAL
	CLDMContextTrace	urn:x-ses:sesarju:airm:v410:ConsolidatedLogicalDataModel:SubjectFields:Flight:FlightEvent:OverArrivalPoint@finalApproachFix
	CLDMSemanticTrace	urn:x-ses:sesarju:airm:v410:ConsolidatedLogicalDataModel:SubjectFields:Flight:FlightEvent:OverArrivalPoint@time

Element Name	Author	Notes
Holding	[redacted]	Holding

	Attribute Name	Type	Notes
	aset		Actual Stack Entry Time. Time when the aircraft joined the air holding stack.

	Tagged Value Name	Value
	CLDMContextTrace	urn:x-ses:sesarju:airm:v410:ConsolidatedLogicalDataModel:SubjectFields:Flight:Codelists:CodeFlightPhaseType@APPROACH_HOLDING_PHASE
	CLDMContextTrace	urn:x-ses:sesarju:airm:v410:ConsolidatedLogicalDataModel:SubjectFields:Common:Codelists:CodePlanningStatusType@ACTUAL
	CLDMSemanticTrace	urn:x-ses:sesarju:airm:v410:ConsolidatedLogicalDataModel:SubjectFields:Flight:FlightPhase:FlightPhase@startTime

	Attribute Name	Type	Notes
	asxt		Actual Stack exit Time. Time when the aircraft departed the air holding stack.

	Tagged Value Name	Value
	CLDMContextTrace	urn:x-ses:sesarju:airm:v410:ConsolidatedLogicalDataModel:SubjectFields:Flight:Codelists:CodeFlightPhaseType@APPROACH_HOLDING_PHASE
	CLDMContextTrace	urn:x-ses:sesarju:airm:v410:ConsolidatedLogicalDataModel:SubjectFields:Common:Codelists:CodePlanningStatusType@ACTUAL
	CLDMSemanticTrace	urn:x-ses:sesarju:airm:v410:ConsolidatedLogicalDataModel:SubjectFields:Flight:FlightPhase:FlightPhase@endTime

	Attribute Name	Type	Notes

	stackIdentifier		The identifier of the Holding procedure that is used to stack the aircraft.

Tagged Value Name	Value
CLDMSemanticTrace	urn:x-ses:sesarju:airm:v410:ConsolidatedLogicalDataModel:SubjectFields:Flight:FlightPhase:FlightPhase@holdingPattern

Element Name	Author	Notes
InitialApproach	[redacted]	Initial Approach

	Attribute Name	Type	Notes
	iafIdentifier		Identifier of initial approach fix.

Tagged Value Name	Value
CLDMContextTrace	urn:x-ses:sesarju:airm:v410:ConsolidatedLogicalDataModel:SubjectFields:AirspaceInfrastructure:Codelists:CodePointUsageType@INITIAL_APPROACH_FIX
CLDMSemanticTrace	urn:x-ses:sesarju:airm:v410:ConsolidatedLogicalDataModel:SubjectFields:AirspaceInfrastructure:AirspaceInfrastructurePoint:SignificantPoint@designator

	Attribute Name	Type	Notes
	tiat		TIAT - Target Initial Approach Fix Time. In this interface, the value calculated by the AMAN.

Tagged Value Name	Value
CLDMContextTrace	urn:x-ses:sesarju:airm:v410:ConsolidatedLogicalDataModel:SubjectFields:Common:Codelists:CodePlanningStatusType@TARGET
CLDMContextTrace	urn:x-ses:sesarju:airm:v410:ConsolidatedLogicalDataModel:SubjectFields:Flight:FlightEvent:OverArrivalPoint@initialApproachFix
CLDMSemanticTrace	urn:x-ses:sesarju:airm:v410:ConsolidatedLogicalDataModel:SubjectFields:Flight:FlightEvent:OverArrivalPoint@time

	Attribute Name	Type	Notes
	aiat		Actual Initial Approach Fix Time

Tagged Value Name	Value
CLDMContext	urn:x-ses:sesarju:airm:v410:ConsolidatedLogicalDataModel:SubjectFields:Common:Codelists:CodePlanningStatusType@ACTUAL
CLDMContextTrace	urn:x-ses:sesarju:airm:v410:ConsolidatedLogicalDataModel:SubjectFields:Flight:FlightEvent:OverArrivalPoint@initialApproachFix
CLDMSemanticTrace	urn:x-ses:sesarju:airm:v410:ConsolidatedLogicalDataModel:SubjectFields:Flight:FlightEvent:OverArrivalPoint@time

Element Name	Author	Notes
LandingTimeInformation	[redacted]	Landing Time Information to be stepwise updated

	Attribute Name	Type	Notes
	eldt		ELDT - Estimated Landing Time. The estimated time that an aircraft will touchdown on the runway.

	Tagged Value Name	Value
	CLDMContextTrace	urn:x-ses:sesarju:airm:v410:ConsolidatedLogicalDataModel:SubjectFields:Common:Codelists:CodePlanningStatusType@ESTIMATED
	CLDMSemanticTrace	urn:x-ses:sesarju:airm:v410:ConsolidatedLogicalDataModel:SubjectFields:Flight:FlightEvent:Landing@time
	IMDefinitionTrace	urn:x-ses:sesarju:airm:v410:InformationModel:SubjectFields:Flight:FlightEvent:EstimatedLandingTime

	Attribute Name	Type	Notes
	tldt		TLDT - Target Landing Time

	Tagged Value Name	Value
	CLDMContextTrace	urn:x-ses:sesarju:airm:v410:ConsolidatedLogicalDataModel:SubjectFields:Common:Codelists:CodePlanningStatusType@TARGET
	CLDMSemanticTrace	urn:x-ses:sesarju:airm:v410:ConsolidatedLogicalDataModel:SubjectFields:Flight:FlightEvent:Landing@time
	IMDefinitionTrace	urn:x-ses:sesarju:airm:v410:InformationModel:SubjectFields:Flight:FlightEvent:TargetLandingTime

	Attribute Name	Type	Notes
	aldt		ALDT - Actual Landing Time.

	Tagged Value Name	Value
	CLDMContextTrace	urn:x-ses:sesarju:airm:v410:ConsolidatedLogicalDataModel:SubjectFields:Common:Codelists:CodePlanningStatusType@ACTUAL
	CLDMSemanticTrace	urn:x-ses:sesarju:airm:v410:ConsolidatedLogicalDataModel:SubjectFields:Flight:FlightEvent:Landing@time
	IMDefinitionTrace	urn:x-ses:sesarju:airm:v410:InformationModel:SubjectFields:Flight:FlightEvent:ActualLandingTime

Element Name	Author	Notes
MeteringInformation	[redacted]	Consists of attribute concerning the metering point in view for which AMAN advisory might be given. This provides the additional information relevant for ATSUs but not Airports, namely times, planning stati and advisories for fixes used in arrival management.

	Attribute Name	Type	Notes
	pointName		The published name of the significant point for which the metering information is provided

	Tagged Value Name	Value
	CLDMSemanticTrace	urn:x-ses:sesarju:airm:v410:ConsolidatedLogicalDataModel:SubjectFields:AirspaceInfrastructure:AirspaceInfrastructurePoint:SignificantPoint@designator

	Attribute Name	Type	Notes
	pointUsage	ArrivalPointUsage	Point usage

	Tagged Value Name	Value
	CLDMSemanticTrace	CLDM_out_of_scope

	Attribute Name	Type	Notes
	planningStatus	PlanningStatus	Planning status
	Tagged Value Name	Value	
	CLDMSemanticTrace	CLDM_out_of_scope	
	Attribute Name	Type	Notes
	amanPlannedTimeOver		Abbreviation: APTO Synonyms: optimalTimeOver The time, computed by the Arrival Manager tool, at which the aircraft is predicted to be over a significant point (in particular, the metering point).
	Tagged Value Name	Value	
	CLDMContextTrace	urn:x-ses:sesarju:airm:v410:ConsolidatedLogicalDataModel:SubjectFields:Common:Codelists:CodePlanningStatusType@CALCULATED	
	CLDMSemanticTrace	urn:x-ses:sesarju:airm:v410:ConsolidatedLogicalDataModel:SubjectFields:Flight:FlightEvent:OverArrivalPoint@time	
	Attribute Name	Type	Notes
	delayAtPoint		Delay at Point
	Tagged Value Name	Value	
	CLDMSemanticTrace	urn:x-ses:sesarju:airm:v410:ConsolidatedLogicalDataModel:SubjectFields:Flight:FlightEvent:OverArrivalPoint@delay	

Element Name	Author	Notes
ProcedureInformation	[redacted]	Procedure Information
Attribute Name	Type	Notes
assignedRunwayDirection		Runway direction
Tagged Value Name	Value	
CLDMContextTrace	urn:x-ses:sesarju:airm:v410:ConsolidatedLogicalDataModel:SubjectFields:AirTrafficOperations:AerodromeOperations:ArrivalOperations@assignedArrivalRunway	
CLDMSemanticTrace	urn:x-ses:sesarju:airm:v410:ConsolidatedLogicalDataModel:SubjectFields:BaseInfrastructure:AerodromeInfrastructure:RunwayDirection@designator	
Attribute Name	Type	Notes
assignedSTAR		Standard Terminal Arrival Route Identifier
Tagged Value Name	Value	
CLDMContextTrace	urn:x-ses:sesarju:airm:v410:ConsolidatedLogicalDataModel:SubjectFields:AirTrafficOperations:AerodromeOperations:ArrivalOperations@star	
CLDMSemanticTrace	urn:x-ses:sesarju:airm:v410:ConsolidatedLogicalDataModel:SubjectFields:AirspaceInfrastructure:RouteAndProcedure:StandardInstrumentArrival@designator	

Element Name	Author	Notes
ProposedProcedureInformation	[redacted]	Optionally, the AMAN may provide the controller with recommendations for using a specific procedure on a flight to implement the sequence (i.e. the

		sequence has been optimized using a specific course of action that requires controller intervention).

Attribute Name	Type	Notes
advisedHoldingProcedure		Controller advised Holding Procedere

Tagged Value Name	Value
CLDMContextTrace	urn:x-ses:sesarju:airm:v410:ConsolidatedLogicalDataModel:SubjectFields:AirTrafficOperations:TrafficSynchronization:ArrivalManagement:ArrivalManagementAdvisory@advisedHolding
CLDMSemanticTrace	urn:x-ses:sesarju:airm:v410:ConsolidatedLogicalDataModel:SubjectFields:AirspaceInfrastructure:RouteAndProcedure:HoldingProcedure@identifier

Attribute Name	Type	Notes
advisedSTAR		Advised landing Procedure

Tagged Value Name	Value
CLDMContextTrace	urn:x-ses:sesarju:airm:v410:ConsolidatedLogicalDataModel:SubjectFields:AirTrafficOperations:TrafficSynchronization:ArrivalManagement:ArrivalManagementAdvisory@advisedSTAR
CLDMSemanticTrace	urn:x-ses:sesarju:airm:v410:ConsolidatedLogicalDataModel:SubjectFields:AirspaceInfrastructure:RouteAndProcedure:StandardInstrumentArrival@designator

Attribute Name	Type	Notes
advisedTransition		advised tranistion

Tagged Value Name	Value
CLDMContextTrace	urn:x-ses:sesarju:airm:v410:ConsolidatedLogicalDataModel:SubjectFields:AirTrafficOperations:TrafficSynchronization:ArrivalManagement:ArrivalManagementAdvisory@advisedTransition
CLDMSemanticTrace	urn:x-ses:sesarju:airm:v410:ConsolidatedLogicalDataModel:SubjectFields:AirspaceInfrastructure:RouteAndProcedure:ProcedureTransition@identifier

Element Name	Author	Notes
RunwayAssignmentInformation	[redacted]	This information in conjunction with the Landing Sequence Information provides the “Airport view” of the AMAN sequenced: which runway is the flight sequenced to, and what is his position in the sequence?

Attribute Name	Type	Notes
assignedRunwayDirection		Indicator of runway and runway direction assigned to the flight

Tagged Value Name	Value
CLDMContextTrace	urn:x-ses:sesarju:airm:v410:ConsolidatedLogicalDataModel:SubjectFields:AirTrafficOperations:AerodromeOperations:ArrivalOperations@assignedArrivalRunway
CLDMSemanticTrace	urn:x-ses:sesarju:airm:v410:ConsolidatedLogicalDataModel:SubjectFields:BaseInfrastructure:AerodromeInfrastructur

		e:RunwayDirection@designator	
	Attribute Name	Type	Notes
	landingSequencePosition		The position of the flight in the runway sequence (i.e. number of a/c to land before this a/c plus 1)The position of the flight in the runway sequence (i.e. number of a/c to land before this a/c plus 1)
	Tagged Value Name	Value	
	CLDMSemanticTrace	urn:x-ses:sesarju:airm:v410:ConsolidatedLogicalDataModel:SubjectFields:AirTrafficOperations:TrafficSynchronization:ArrivalManagement:LandingSequencing@landingSequencePosition	
Element Name	Author	Notes	
SubscribeMessage	[redacted]	Subscribe Message	
	Attribute Name	Type	Notes
	destinationAerodrome		Destination Airport
	Tagged Value Name	Value	
	CLDMContextTrace	urn:x-ses:sesarju:airm:v410:ConsolidatedLogicalDataModel:SubjectFields:Flight:Flight@destinationAerodrome	
	CLDMSemanticTrace	urn:x-ses:sesarju:airm:v410:ConsolidatedLogicalDataModel:SubjectFields:BaseInfrastructure:AerodromeInfrastructure:Aerodrome@locationIndicatorICAO	
	Attribute Name	Type	Notes
	assignedArrivalRunway		assigned arrival Runway
	Tagged Value Name	Value	
	CLDMContextTrace	urn:x-ses:sesarju:airm:v410:ConsolidatedLogicalDataModel:SubjectFields:AirTrafficOperations:AerodromeOperations:ArrivalOperations@assignedArrivalRunway	
	CLDMSemanticTrace	urn:x-ses:sesarju:airm:v410:ConsolidatedLogicalDataModel:SubjectFields:BaseInfrastructure:AerodromeInfrastructure:RunwayDirection@designator	
	Attribute Name	Type	Notes
	flightID		Flight ID
	Tagged Value Name	Value	
	CLDMSemanticTrace	urn:x-ses:sesarju:airm:v410:ConsolidatedLogicalDataModel:SubjectFields:Flight:Flight@identifier	
Element Name	Author	Notes	
SubscriptionResponse	[redacted]	subscription response	
Element Name	Author	Notes	
UnsubscribeMessage	[redacted]	Unsubscribe Message	
	Attribute Name	Type	Notes
	acknowledgement	CharacterString	acknowledegment
	Tagged Value Name	Value	
	CLDMSemanticTrace	CLDM_out_of_scope	
Element Name	Author	Notes	
UnsubscriptionResponse	[redacted]	unsubscription response	
Element Name	Author	Notes	

ArrivalFlightStatus	[redacted]	This codelist is a subset of the full flight status list used by the Network Manager. Some stati correspond to stati in Airport CDM.

Attribute Name	Type	Notes
DIV		Diverted - Flight has been diverting.

Tagged Value Name	Value
CLDMSemanticTrace	CLDM_out_of_scope

Attribute Name	Type	Notes
FIR		Within FIR boundary - The aircraft has entered local FIR in which the relevant airport is located

Tagged Value Name	Value
CLDMSemanticTrace	CLDM_out_of_scope

Attribute Name	Type	Notes
FNL		On Final Approach - The aircraft has got to the FAF (Final Approach Fix) and proceeds to fly the final approach segment towards the airport

Tagged Value Name	Value
CLDMSemanticTrace	CLDM_out_of_scope

Attribute Name	Type	Notes
GOA		Go-around - Flight has initiated a go around

Tagged Value Name	Value
CLDMSemanticTrace	CLDM_out_of_scope

Attribute Name	Type	Notes
TMA		Within TMA Boundary - The aircraft has entered the local TMA

Tagged Value Name	Value
CLDMSemanticTrace	CLDM_out_of_scope

Attribute Name	Type	Notes
IDH		Indefinite Holding - Flight in indefinite holding, unable to continue approach

Tagged Value Name	Value
CLDMSemanticTrace	CLDM_out_of_scope

Element Name	Author	Notes
ArrivalPointUsage	[redacted]	Arrival point Usage

Attribute Name	Type	Notes
INITIAL_METERING_FIX		Initial metering fix

Tagged Value Name	Value
CLDMSemanticTrace	urn:x-ses:sesarju:airm:v410:ConsolidatedLogicalDataModel:SubjectFields:Flight:FlightEvent:OverArrivalPoint@initialMeteringFix
IMDefinitionTrace	urn:x-ses:sesarju:airm:v410:InformationModel:SubjectFields:AirTrafficOperations:TrafficSynchronization:ArrivalManagement:InitialMeteringFix

Attribute Name	Type	Notes
COORDINATION		see AIRM defiinition

Tagged Value Name	Value
CLDMSemanticTrace	urn:x-ses:sesarju:airm:v410:ConsolidatedLogicalDataModel:SubjectFields:AirTrafficOperations:TrafficSynchronization:Coordination:CoordinationConditions@coordinationPoint

	Attribute Name	Type	Notes
	METERING_FIX		metering fix
	Tagged Value Name	Value	
	CLDMSemanticTrace	urn:x-ses:sesarju:airm:v410:ConsolidatedLogicalDataModel:SubjectFields:Flight:FlightEvent:OverArrivalPoint@meteringFix	
	IMDefinitionTrace	urn:x-ses:sesarju:airm:v410:InformationModel:SubjectFields:AirTrafficOperations:TrafficSynchronization:MeteringFix	
	Attribute Name	Type	Notes
	INITIAL_APPROACH_FIX		Initial approach fix
	Tagged Value Name	Value	
	CLDMSemanticTrace	urn:x-ses:sesarju:airm:v410:ConsolidatedLogicalDataModel:SubjectFields:Flight:FlightEvent:OverArrivalPoint@initialApproachFix	
	IMDefinitionTrace	urn:x-ses:sesarju:airm:v410:InformationModel:SubjectFields:AirspaceInfrastructure:AirspaceInfrastructurePoint:InitialApproachFix	
	Attribute Name	Type	Notes
	FINAL_APPROACH_FIX		final approach fix
	Tagged Value Name	Value	
	CLDMSemanticTrace	urn:x-ses:sesarju:airm:v410:ConsolidatedLogicalDataModel:SubjectFields:Flight:FlightEvent:OverArrivalPoint@finalApproachFix	
	IMDefinitionTrace	urn:x-ses:sesarju:airm:v410:InformationModel:SubjectFields:AirspaceInfrastructure:AirspaceInfrastructurePoint:FinalApproachFix	
	Attribute Name	Type	Notes
	OTHER	CharacterString	other
	Tagged Value Name	Value	
	CLDMSemanticTrace	urn:x-ses:sesarju:airm:v410:ConsolidatedLogicalDataModel:SubjectFields:AirspaceInfrastructure:Codelists:CodePointUsageType	

Element Name	Author	Notes
PlanningStatus	[redacted]	Planning Status

	Attribute Name	Type	Notes
	ESTIMATED_TIME		Estimated time
	Tagged Value Name	Value	
	CLDMSemanticTrace	urn:x-ses:sesarju:airm:v410:ConsolidatedLogicalDataModel:SubjectFields:Common:Codelists:CodePlanningStatusType@ESTIMATED	
	Attribute Name	Type	Notes
	TARGET_TIME		Target Time
	Tagged Value Name	Value	
	CLDMSemanticTrace	urn:x-ses:sesarju:airm:v410:ConsolidatedLogicalDataModel:SubjectFields:Common:Codelists:CodePlanningStatusType@TARGET	

	Attribute Name	Type	Notes
	CONTROLLED_TIME		controlled time
	Tagged Value Name	Value	
	CLDMSemanticTrace	urn:x-ses:sesarju:airm:v410:ConsolidatedLogicalDataModel:SubjectFields:Flight:Trajectory:ControlledTimeOver	

Element Name	Author	Notes
TTAStatus	[redacted]	Status of target Time on Arrival.

	Attribute Name	Type	Notes
	PROPOSED		proposed status
	Tagged Value Name	Value	
	CLDMSemanticTrace	CR_563	

	Attribute Name	Type	Notes
	REVISED		revised status of TTA
	Tagged Value Name	Value	
	CLDMSemanticTrace	CR_563	

Element Name	Author	Notes
publication	[redacted]	

Element Name	Author	Notes
publication	[redacted]	

Element Name	Author	Notes
repetitive	[redacted]	

Element Name	Author	Notes
unsubsciption	[redacted]	

Element Name	Author	Notes
unsubsciption	[redacted]	

Element Name	Author	Notes
unsubscription	[redacted]	

Element Name	Author	Notes
ArrivalManagementInformation	[redacted]	Arrival Managers produce Arrival Information for Flights and Arrival Sequences to be used either by ATCOs displaying the need for delay absorption measures, or by IT systems to base further processing on this Information. Arrival Management Information in an extended horizon context needs to be provided to upstream ATSUs and regional airports. The service in addition offers arrival planning information (information related to the airborne trajectory segment of inbound flight). The payloads are strongly influenced by the notion of "AOP-NOP integration". Specifically, some of the information obtained from "Local ATC / AMAN" is supposedly orchestrated by the AOP for provisioning to the NOP. Therefore, this servise also covers implicitly the requirements of the NOP for

		"Arrival Planning Information" as far as the primary source of this information is ATC.
	Element Tagged Value Name	Value
	megaid	
Element Name	Author	Notes
ArrivalPlanningInformationConsumer	[redacted]	ArrivalPlanningInformationConsumer
Element Name	Author	Notes
ArrivalSequenceInformationConsumer	[redacted]	Executive Controller in TMA or Enroute Center Planning Controller in TMA or Enroute Center Flow Management Position (i.e. any approach and upstream enroute sector, within the same center or in other centers) Satellite Tower Destination Airport
Element Name	Author	Notes
ArrivalPlanningInformationConsumer	[redacted]	ArrivalPlanningInformationConsumer
	Element Tagged Value Name	Value
	megaid	
Element Name	Author	Notes
ArrivalPlanningInformationProvider	[redacted]	ArrivalPlanningInformationProvider
	Element Tagged Value Name	Value
	megaid	
Element Name	Author	Notes
ArrivalSequenceInformationConsumer	[redacted]	Interface to be implemented on the consumer side (the stakeholder ATSU) to achieve e.g. AMAN advisories.
	Element Tagged Value Name	Value
	megaid	
Element Name	Author	Notes
ArrivalSequenceInformationConsumerPubSub	[redacted]	ArrivalSequenceInformationConsumerPubSub
	Element Tagged Value Name	Value
	megaid	
Element Name	Author	Notes
ArrivalSequenceInformationProvider	[redacted]	The main purpose of this interface is to transmit AMAN advisory information like a route advisory or a time to lose to a downstream ACC in the context of the AMAN extended horizon to avoid holdings and to support an optimal sequencing of flights. In addition advisories can be provided to satellite airports and sequence information can be provided to the destination airport.
	Element Tagged Value Name	Value
	megaid	

Element Name		Author	Notes
ArrivalSequenceInformationProviderPubSub		[redacted]	ArrivalSequenceInformationProviderPubSub
	Element Tagged Value Name	Value	
	megaid		
Element Name		Author	Notes
arrivalManagementInforrmation		[redacted]	This figures are only indicative and not finalised yet. The normative information will be contained in the SPR/INTEROP.
	Element Tagged Value Name	Value	
	forEnvironment		
	megaid		

Table 6: Service payloads

6 Service dynamic behaviour

This chapter is used to describe the interactive behaviour between Services (orchestration) or Service Interfaces (interaction specification). Architectural elements applicable for this description are:

- Service Interaction Specifications
- Service State machines
- Service orchestration

6.1 Service Interface ArrivalPlanningInformationProvider

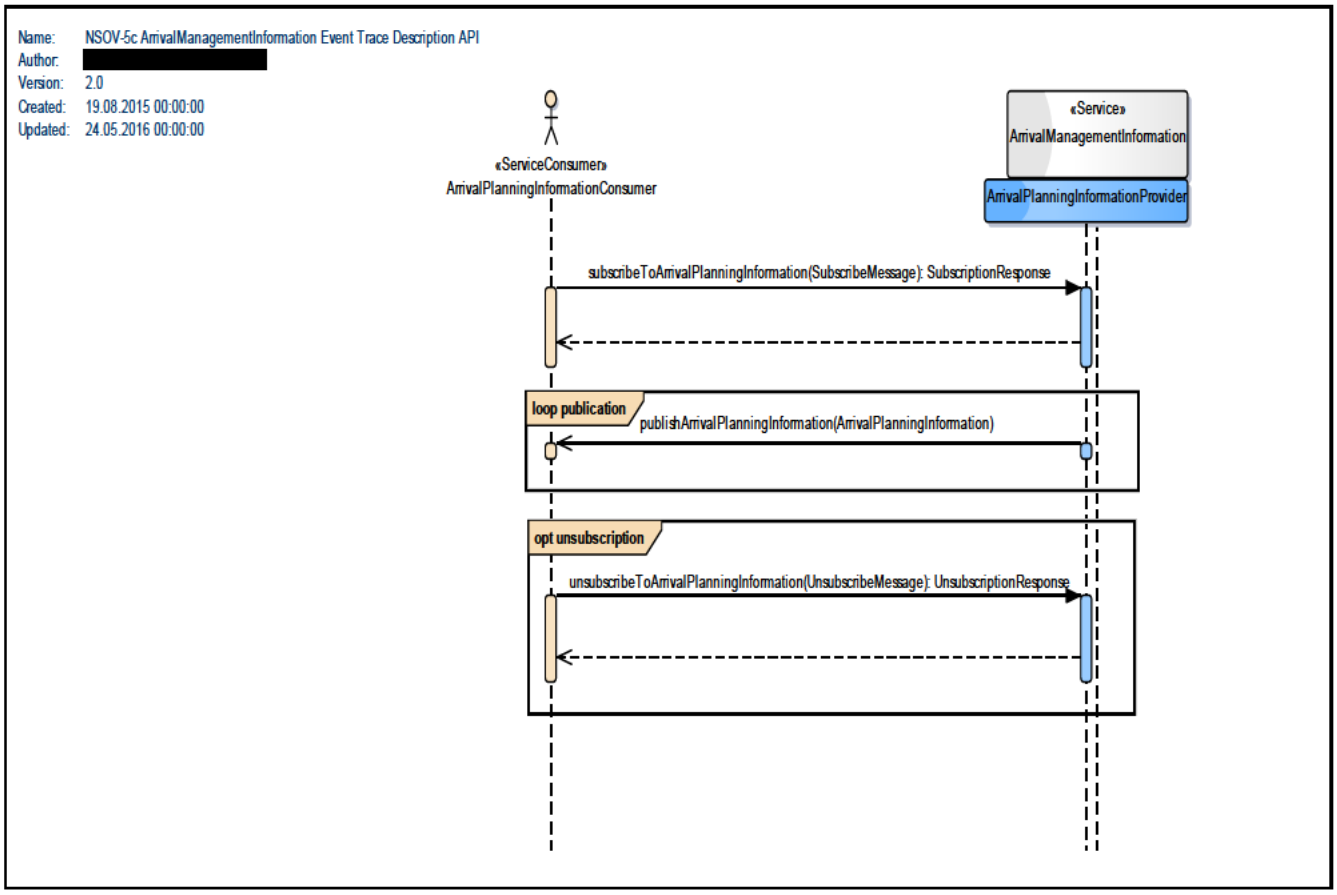

Figure 9: NSOV-5c ArrivalManagementInformation Event Trace Description (API)

6.2 Service Interface ArrivalSequenceProviderPubSub

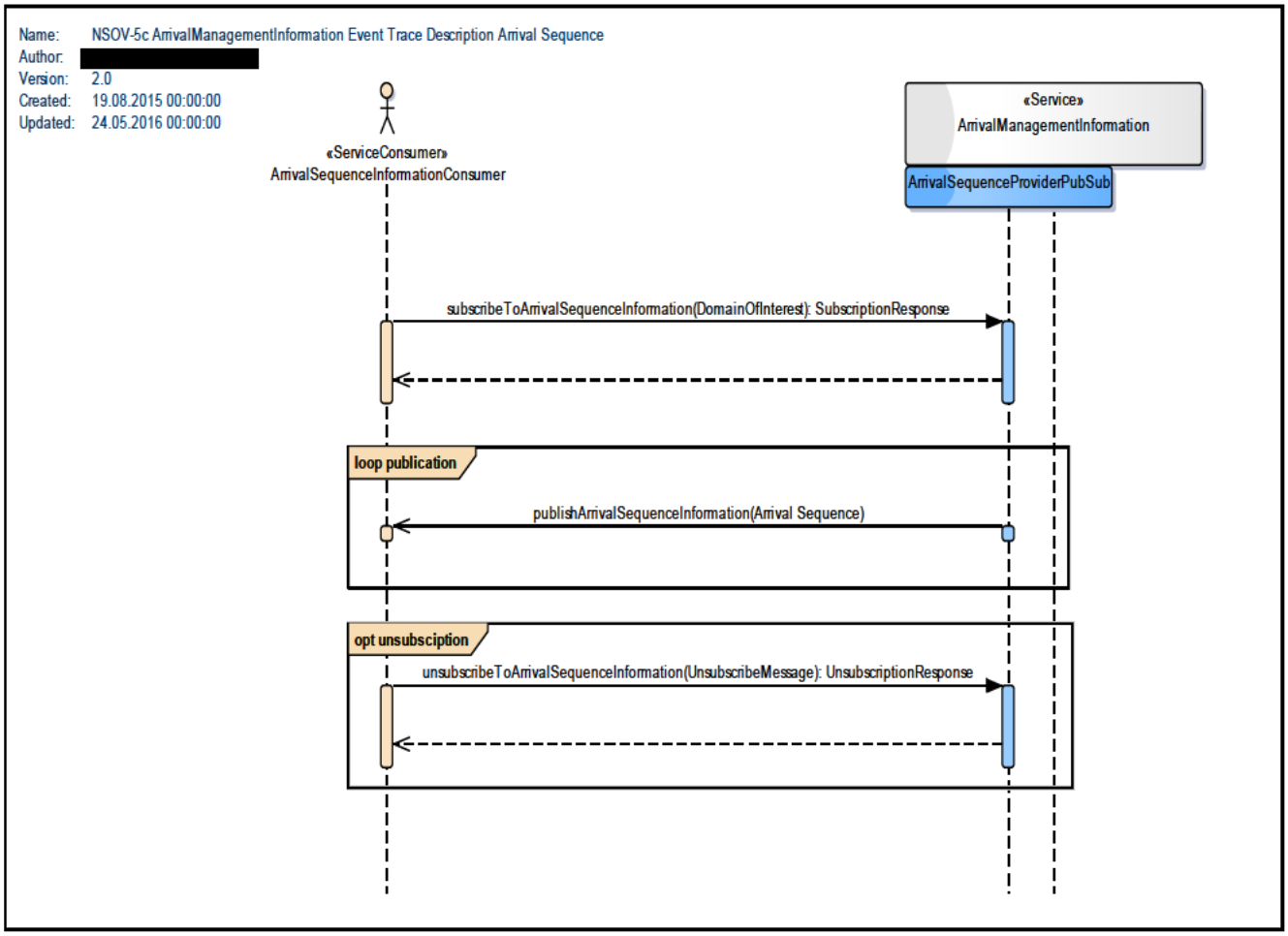

Figure 10: Mandatory NSOV-5c ArrivalManagementInformation Event Trace Description (Arrival Sequence Pub/Sub)

6.3 Service Interface ArrivalsequenceProviderReqRep

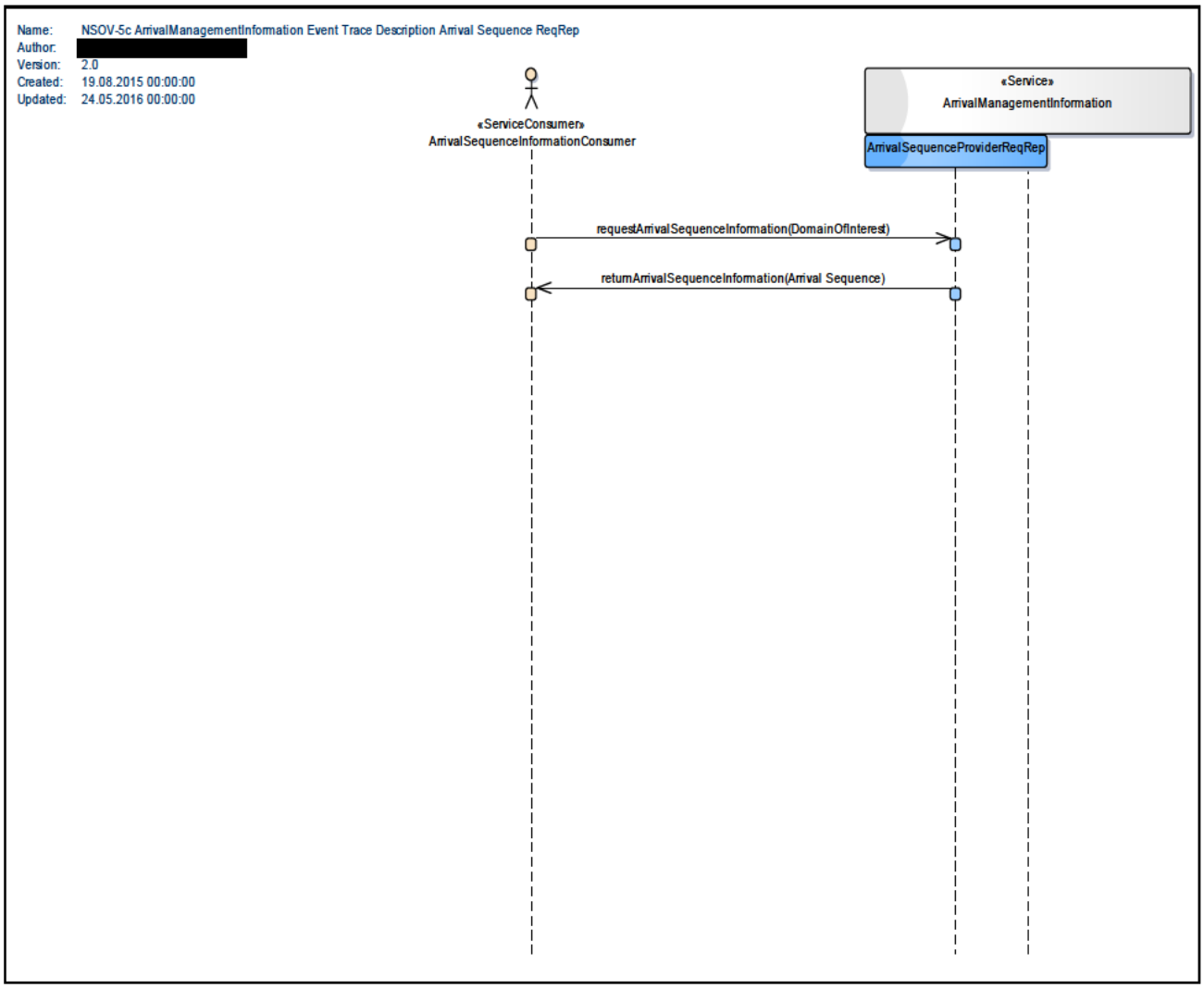

Figure 11: Mandatory NSOV-5c ArrivalManagementInformation Event Trace Description (Arrival Sequence Req/Rep)

7 Service provisioning (optional)

NA

8 Validation and Verification

8.1 Verification

Verification was performed relying on the ISRM foundation version 00.07.00.

8.1.1 Verification Results

Verification report:

Service name:	Designed Services - ArrivalManagementInformationService	Date of Service Creation:	20140123-09:56:42
Service version:	2	Version of Verification Rules:	00.07.00
Phase:	2	Date of Verification:	20160524-08:48:41
Owner of service:	[redacted]	Passes:	299
Name of verifier:		Failures:	
Overall comments:		Manual:	110
MDG Library Functions version:	29915	MDG ISRM Verification version	29993

The verification was performed via manual inspection and assisted by a script. The verification outcome is completely out of errors.

Verification reports are these files [22]:

- Designed_Services_-_ArrivalManagementInformationService.xls

8.2 Validation

The service instances of the Arrival Management Information Service (first service release) have been implemented for the Validation Exercise EXE-05.06.07-VP-695 performed by the SESAR project 05.06.07. This exercise focused on the exchange of AMAN advisory information between London Heathrow and ACC Reims. It used the BARCO AMAN System as the providing system.

The operational platform at Reims UAC used is called DSNA XMAN @ Reims UAC.

This platform was based on the legacy DSNA operational system (CAUTRA) with the XMAN prototype (AMAN part of the D08 prototype from the 10.9.2) and was connected with the operational platform of NATS. The D08 AMAN was modified to support EXE-05-06-07 VP 695 in its validation task and the adaptation to the Reims UAC operational environment.

The different requirements considered in the exercise were

HMI requirements:

- Timeline with all aircraft, FL and target time over the COP
- Quic look on FL 360 et 380, considering RFL or current altitude
- Flight filters, for instance by flight levels, considering RFL or current level
- Implementation: One central position (for FMP) + 6 control positions
- The tool should connect to web service to collect NATS AMAN information.
- Architecture and technology choices (SWIM)
- Requirements in WP14, SWIM-TI Technical Specification 2.0, are considered.
- Cross Border WAN View

NATS provided arrival data thanks to a web server and via PENS (public internet use possible).

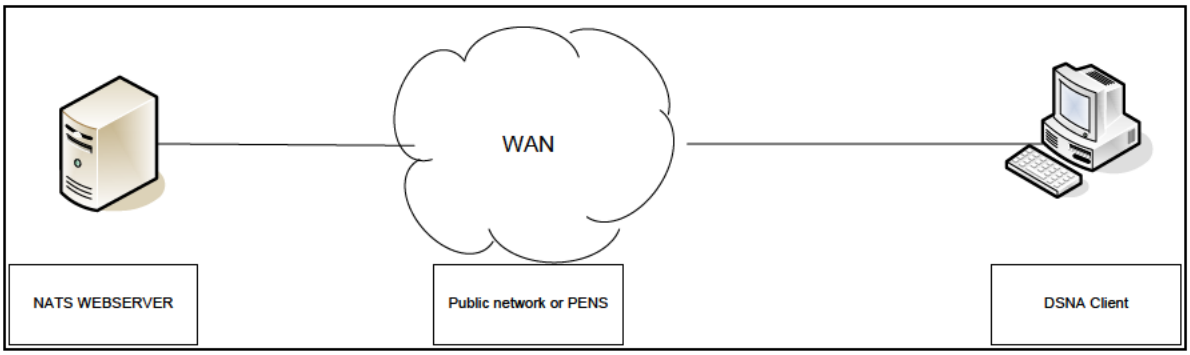

Figure 12: WAN architecture schema

DSNA VIEW

The flow entered the DSNA network through a secured gateway. It was transported to the En-Route centre via the internal DSNA WAN. There, a dedicated LAN or the test LAN if possible, was used in order to:

- not impact operational systems and network,
- allow an access to radar data.

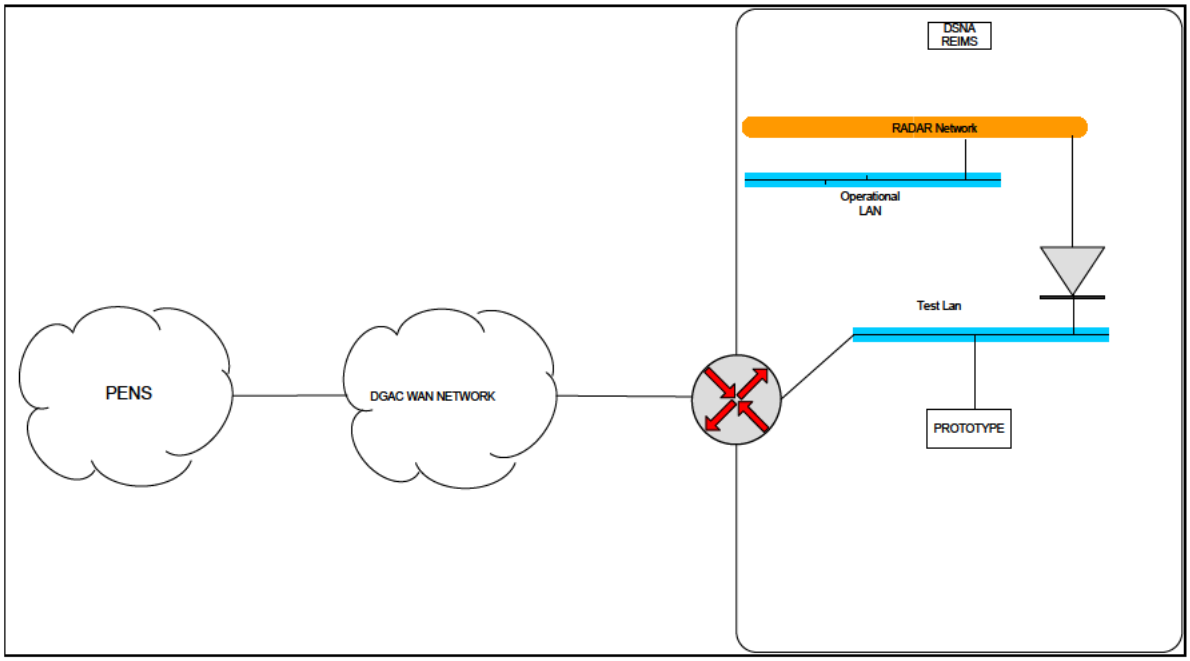

Figure 13: DSNA WAN/LAN view

Technology

The exercise used the following interoperability standard stack:.

[REQ]

Identifier	REQ-14.01.04-TS-00**01**.0001
Requirement	The SWIM Messaging capability shall be compliant with the following interoperability standards: ▪ SOAP 1.1 over HTTP 1.1. ▪ SOAP 1.2 over HTTP 1.1. ▪ XML over HTTP 1.1. ▪ DDS Real Time Publish Subscribe Protocol (DDS Interoperability Wire Protocol version 2.1). ▪ WS-Notification ▪ WS-Security ▪ UDDI 3.01
Title	Reims UAC D08 AMAN platform
Status	<In Progress>
Rationale	
Category	<V&V>
Validation Method	Live trial
Verification Method	

Table 7: Validation Protocoll Stack

9 References

Name	Version	Document ID / Location
[1] FAA Web Service Description Document	2008-16-10	http://www.faa.gov/about/office_org/headquarters_offices/ato/service_units/techops/atc_comms_services/swim/documentation/media/briefings/WSDD%20FPS%20EXAMPLE%2008-16-10.pdf
[2] NATO Architecture Framework	v3.0 & 3.1	http://www.nhqc3s.nato.int/
[3] SoaML	1.0 Beta 09-04-01	http://www.omg.org/spec/SoaML/
[4] Project deliverables template	03.00.00	SJU templates & guidelines package, Project deliverables template
[5] SESAR Operational Service and Environment Definition	03.00.00	SJU templates & guidelines package, OSED template
[6] SESAR Safety and Performance Requirements	03.00.00	SJU templates & guidelines package, SPR template
[7] European ATM SID for Arrival Management Information Service	00.01.00	08.03.10 SID Document SVA005
[8] Technical Note to 5.6.4 OSED/SPR/INTEROP - Step 1	00.01.01	05.06.07 D06
[9] Consolidated SPR-INTEROP	01.01.00	05.06.04 D34
[10] OFA 05.01.01 Consolidated OSED edition 3 document	00.03.01	06.05.04 D16
[11] OFA 05.01.01 Interoperability Requirements (INTEROP) document	00.01.01	06.05.04 D12
[12] Operational Service and Environment Definition (OSED) for Time Based Separation for Arrivals (TBS)	00.01.02	06.08.01 D05
[13] Final OSED	01.00.00	05.06.04 D35
[14] Update of 5.6.4 OSED - Step 1	00.01.01	05.06.07 D15
[15] Update of 5.6.4 SPR-INTEROP - Step 1	00.01.01	05.06.07 D16
[16] EXE-5.6.7-VP-695 (Extended AMAN) Validation Report	00.02.00	05.06.07 D49

Name	Version	Document ID / Location
[17] ISRM Tooling Guidelines	00.07.00	08.03.10 D44
[18] ISRM Modelling Guidelines	00.07.00	08.03.10 D44
[19] ISRM Foundation Rulebook	00.07.00	08.03.10 D44
[20] ISRM Verification Guidelines	00.07.00	08.03.10 D44
[21] ISRM Service Portfolio	00.08.01	08.03.10 D65
[22] Verification reports for the service	N/A	08.03.10 D65 Verification reports

-END OF DOCUMENT-