European ATM Service Description for the AirportMETNowcast 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 AirportMETNowcast Service
Deliverable ID	D65
Edition	00.03.01
Template Version	02.00.02
Task contributors	
DFS, EUROCONTROL, NORACON, NATMIG, FINMECCANICA, FREQUENTIS, THALES, ENAIRE, DSNA, INDRA, SEAC and ENAV	

Abstract

The AirportMETNowcast Service provides a Meteorological prediction of the weather at the airport concerned, at a small interval in the future. This service is consumed by a number of different actors with the airport. The supplier of the service is currently the IWIS (Improved Weather Information System).

Authoring & Approval

Prepared By - *Authors of the document.*		
Name & Company	Position & Title	Date
██████ DFS	████████████	12/03/2012
████████████ FINMECCANICA	████████████	15/04/2016

Reviewed By - *Reviewers internal to the project.*		
Name & Company	Position & Title	Date
████████████ NORACON	████████████	14/03/2012
████████████ NORACON	████████████	14/03/2012
████████████ FINMECCANICA	████████████	25/04/2016
████████████ NORACON	████████████	30/05/2014
████████████ NORACON	████████████	12/05/2016

Reviewed By - *Other SESAR projects, Airspace Users, staff association, military, Industrial Support, other organisations.*		
Name & Company	Position & Title	Date
████████████ FINMECCANICA	████████████	14/03/2012

Approved for submission to the SJU By - *Representatives of the company involved in the project.*		
Name & Company	Position & Title	Date
████████████ NORACON	████████████	25/09/2012
████████████ NORACON	████████████	31/05/2016
████████████ NORACON	████████████	31/05/2016

Rejected By - *Representatives of the company involved in the project.*		
Name & Company	Position & Title	Date

Rational for rejection

Document History

Edition	Date	Status	Author	Justification
00.00.01	12/03/2012	Draft	████	First version. Distributed for initial review.
00.00.02	14/03/2012	Draft	████	Comments from 8.3
00.01.01	15/06/2012	Draft	████	Comments from SJU and FT2 work.
00.01.02	10/08/2012	Draft	████	FT2 work.
00.01.03	25/09/2012	Draft	████	FT2 work.
00.01.04	08/12/2013	Final	████	Migrating to new template edition
00.01.05	27/05/2014	Draft	████	Draft update according to foundation 1.1
00.02.00	29/05/2014	Final	████	Final corrections

00.02.01	05/09/2014	Revised		Minor update after SJU assessment.
00.02.01	30/11/2015	Final		Changed delivery ID
00.03.00	10/05/2016	Final		Updated to ISRM Foundation 00.07.00 and based on requirements for ISRM 2.0
00.03.01	20/07/2016	Final update		Updated according to 08.03.10-D65_SJU_Assessment_report_reponse

Intellectual Property Rights (foreground)

This deliverable consists of SJU foreground.

Table of Contents

List of tables

List of figures

Executive summary

This document is the result of the "Service Design" step of the B.4.3 Working Method on Services for the AirportMETNowcast Service. The AirportMetNowcast Service provides a Meteorological prediction of the weather at the airport concerned, at a small interval in the future. This service is essential in achieving situational awareness about dangers related to the current or upcoming degradation of meteorological conditions which could turn into the safe delivery of ATM services. This service is consumed by a number of different actors over SWIM.

1 Introduction

The AirportMETNowcast Service supplies a short term weather forecast to consumers at an airport. The nowcast consists of the wind speed and direction, the air temperature, the altimeter pressure setting and the RVR.

1.1 Purpose of the document

The purpose of this Service Description Document (SDD) is to provide a complete logical description of the AirportMETNowcast Service, its operational context, its basic architectural features, its dynamical aspects, its operations and the data provided. All these aspects are presented as model views according to the ISRM UML EATMA Profile, which organize knowledge about a service into views inspired to the NAF Framework.

This SDD services as a complement to a model based description and supports the configuration management process by providing well-defined baselines.

The logical service model presented in this SDD edition is part of the ISRM 2.0 release, and provides a blueprint which service developers must follow in order to create SWIM-Compliant implementations of the AirportMETNowcast Service.

The service presented will be a part of the Service Portfolio. The Service portfolio presents all services that are available or is planned to become available at a high level.

1.2 Intended readership

SESAR Deployment Manager, SCG, the OPS and SYS projects participating in the validation and development of this service, Service Architects, Information Architects, System Engineers and Developers in pursuing architecting, design and development activities.

1.3 Inputs from other projects

N/A

1.4 Glossary of terms

N/A

1.5 Acronyms and Terminology

1.5.1 Acronyms

Term	Definition
ADD	Architecture Description Document
ATM	Air Traffic Management
CC	Capability Configuration
EATMA	European Air Traffic Management Architecture
E-ATMS	European Air Traffic Management System

Term	Definition
IER	Information Exchange Requirement
ISRM	Information Service Reference Model
MEP	Messaging Exchange Pattern
MET	Meteorology or Meteorological
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
SAR	Service Allocation Report
SCG	Service Coordination Group
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)
SWIM	System Wide Information Management
UML	Unified Modelling Language
V&V	Validation and Verification

1.5.2 Terminology

Term	Definition	Source
Capability	Capability is the ability of one or more of the enterprise's resources to deliver a specified type of effect or a specified course of action to the enterprise stakeholders.	EATMA Guidance Material [10]
Capability Configuration	A Capability Configuration is a combination of Roles and Systems configured to provide a Capability derived from operational and/or business need(s) of a stakeholder type.	EATMA Guidance Material [10]

Term	Definition	Source
Node	A logical entity that performs Activities. Note: nodes are specified independently of any physical realisation.	EATMA Guidance Material [10]
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.	EATMA Guidance Material [10]
Service function	A type of activity describing the functionality of a Service.	EATMA Guidance Material [10]
Service interface	The mechanism by which a service communicates	EATMA Guidance Material [10]

2 Service identification

Name	AirportMETNowcast
ID	{FC81A8A8-F208-4704-9727-907D3A6CC38E}
Version	3.0
Keywords	Airport Meteorology, Weather Forecast
Architect(s)	▓▓▓▓▓ (DFS) / ▓▓▓▓▓▓▓ (FINMECCANICA)

Lifecycle status	Date	References
Identified	30/03/2012	See reference [14]
Allocated	29/03/2012	See reference [15]
Designed	30/03/2012	See reference [14]
Validated	*Date when validated. Filled by WP3*	N/A
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

The DOD [12] does supply some high level requirements which have been linked to the requirements from the OFA 5.1.1 OSED [13] and is shown in the diagram below. Newer OSEDs have been developed in the OFA more recently, however this service has not been updated based on these.

3.1 Information Exchange Requirements
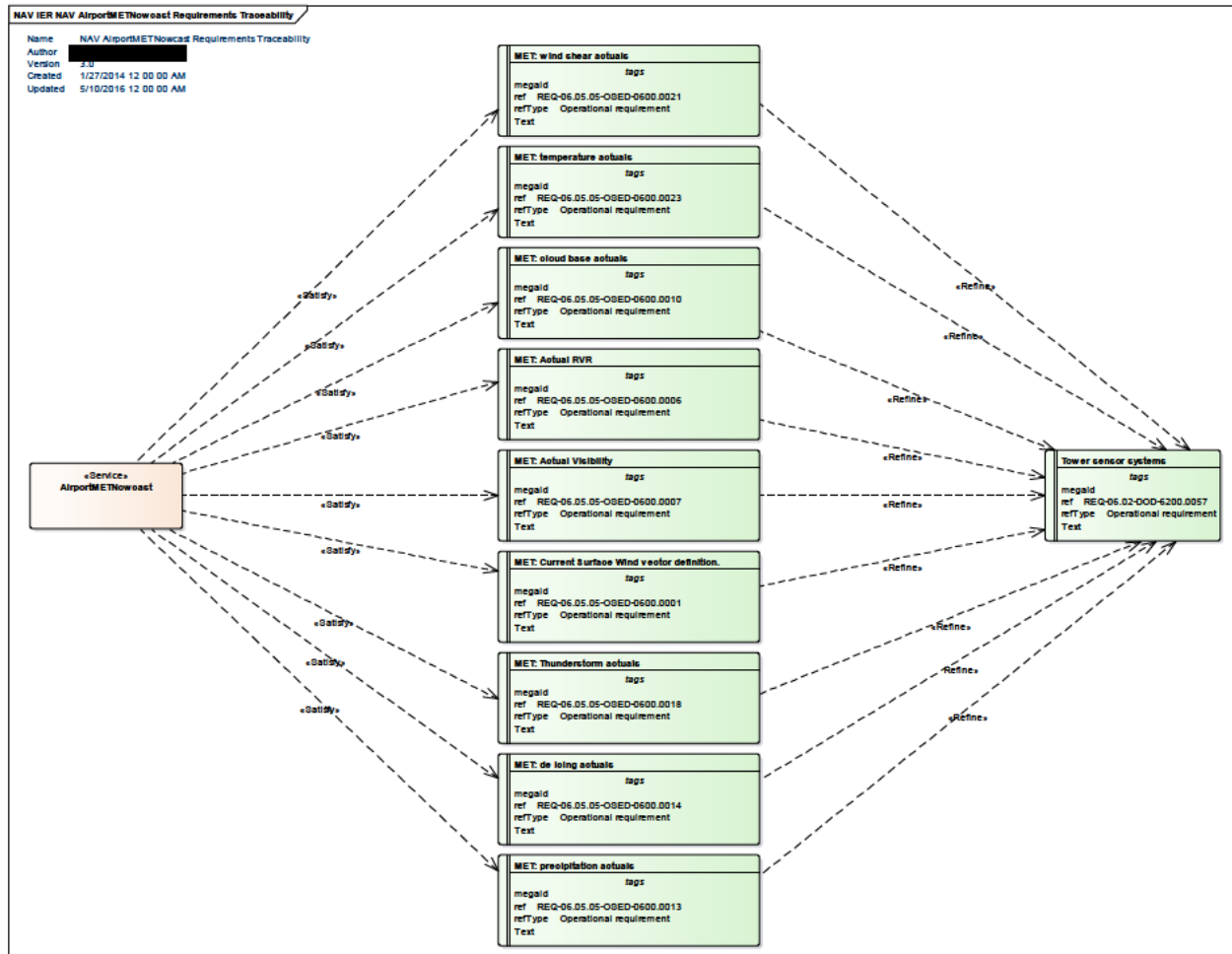
Figure 1: NAV AirportMETNowcast Service Requirements Traceability IER Diagram

3.2 Other Requirements

3.2.1 Non-Functional Requirements

NA.

3.2.2 Relevant Industrial Standards

NA.

3.2.3 Nodes

The EATMA nodes specified in the service are shown in the NOV-2 AirportMETNowcast Service To Nodes Mapping diagram below:

NOV-2 nrs NOV-2 AirportMETNowcast Service To Nodes Mapping

Name: NOV-2 AirportMETNowcast Service To Nodes Mapping
Author: FT1
Version: 3.0
Created: 3/25/2016 12:00:00 AM
Updated: 5/10/2016 12:00:00 AM

Figure 2: NOV-2 AirportMETNowcast Service to Nodes Mapping diagram

4 Service overview

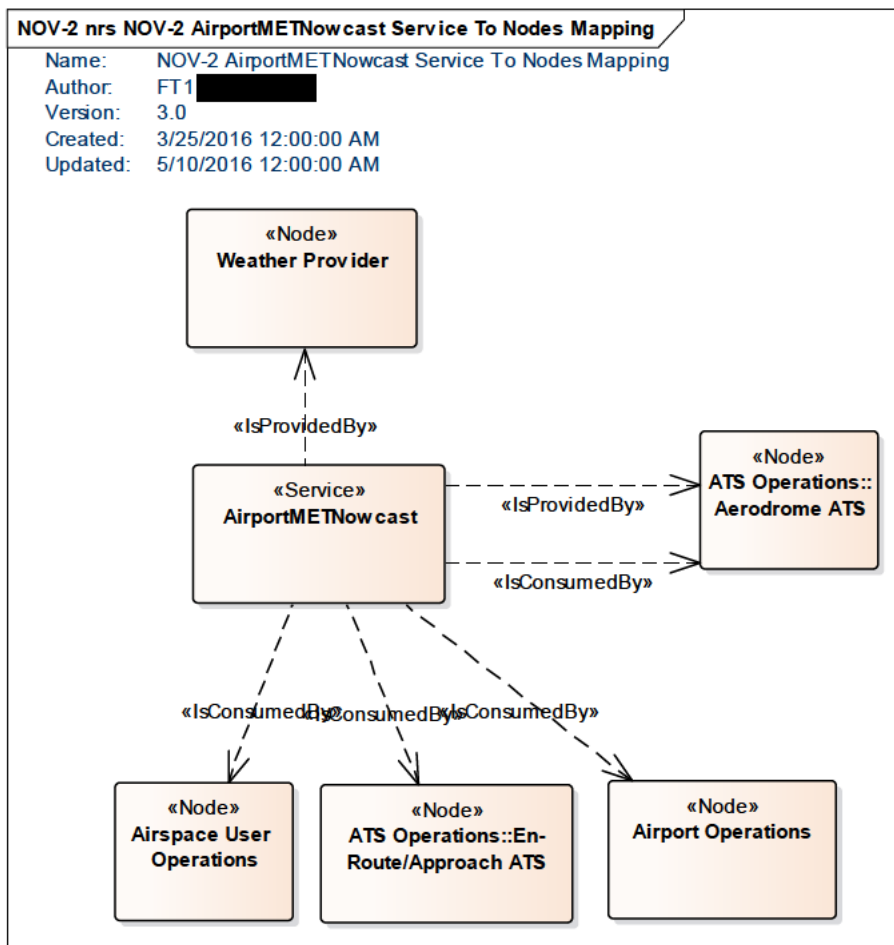### 4.1 Service Taxonomy

The service taxonomy is described in the ISRM Service Portfolio document [3].

4.2 Service Levels (NfRs)

NA.

4.3 Service Functions and Capabilities
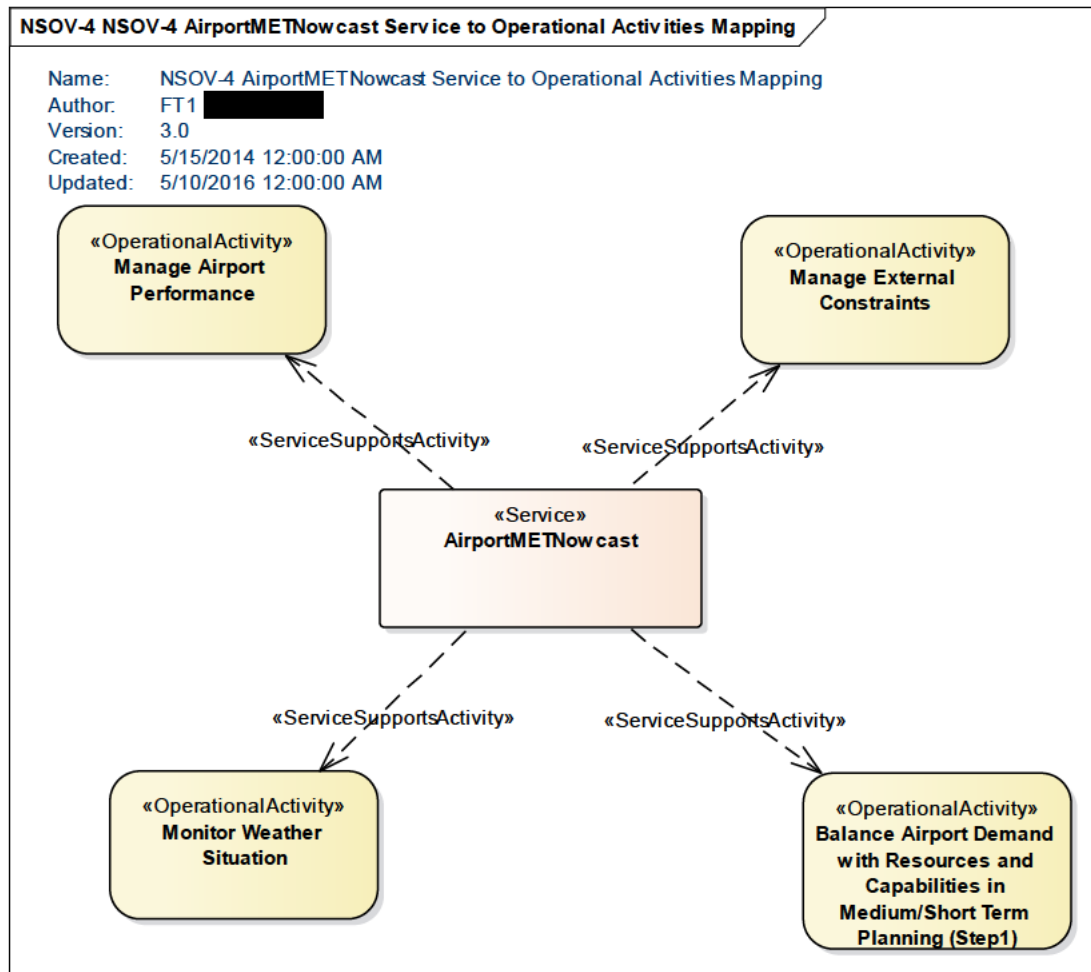
Figure 3: NSOV-4 AirportMETNowcast Service to Operational Activities Mapping diagram

For the service to capabilities mapping, see the NSOV-2 Service Interface Definition diagram in Section 4.4.

4.4 Service Interfaces

The service is based on a single pub/sub interface. The AirportMETNowcast Publisher service interface definition enables the consumer to subscribe or unsubscribe to the data, while the AirportMETNowcast Subscriber service interface definition enables the service provider to publish the

message containing the data. The messages for subscription and unsubscription are only logical abstract wrappers, since the actual management of the publication mechanism is done at the level of the SWIM Technical Infrastructure.
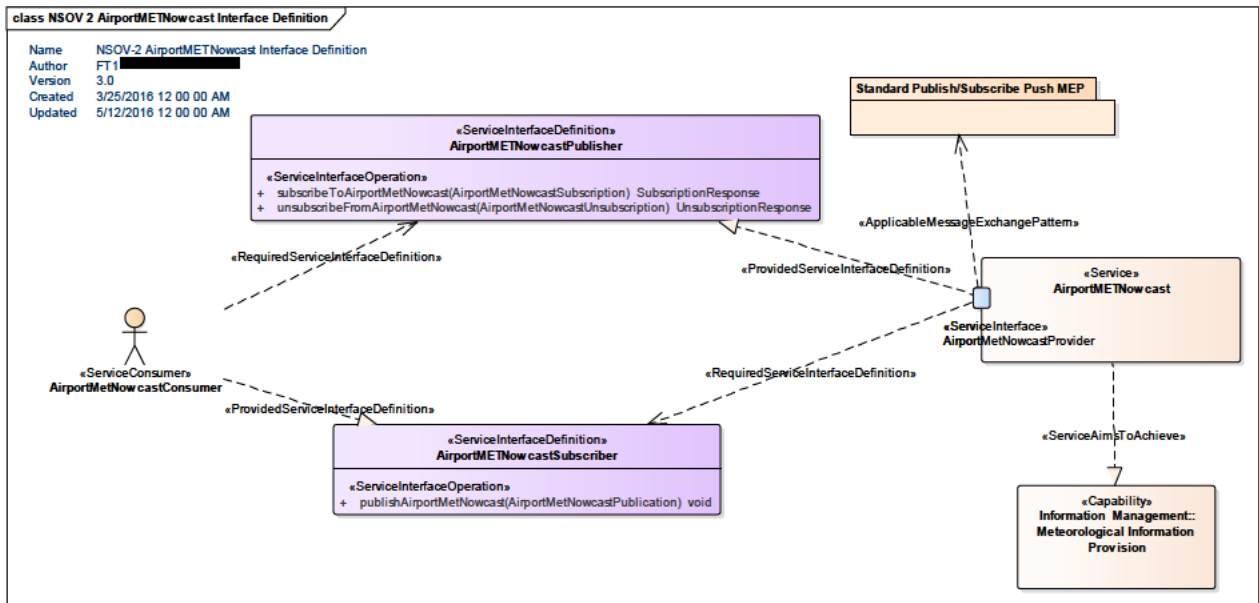
Figure 4: NSOV-2 AirportMETNowcast Service Interface Definition diagram

ServiceInterface	ServiceInterfaceDefinition	ServiceInterfaceOperation	Role
AirportMETNowcast Provider	AirportMETNowcast Publisher	subscribeToAirportMETNowcast	provided
AirportMETNowcast Provider	AirportMETNowcast Publisher	unsubscribeFromAirportMETNowcast	provided
AirportMETNowcast Consumer	AirportMETNowcast Subscriber	publishAirportMETNowcast	required

Table 1: Service Interfaces

5 Service interface specifications

5.1 Service Interface AirportMETNowcastProvider

This is the only interface for this service. It implements the Standard Publish/Subscribe Push message exchange pattern, and exposes two service interface definitions, one for the provider and one for the consumer side.

5.1.1 Service Interface Definition AirportMETNowcastPublisher

This interface definition enables a consumer to subscribe or unsubscribe from the provisioning of the service message.

5.1.1.1 Operation subscribeToAirportMETNowcast

The service operation enables the service consumer to subscribe to a particular airport meteorological nowcast.

5.1.1.1.1 Operation Functionality

The service operation enables the consumer to select the desired airport for which he wants an airport meteorological nowcast.

5.1.1.1.2 Operation Parameters

The operation is modelled with a return type representing the generic outcome for a subscription

Element Name	Author	Notes
AirportMETNowcastSubscription	███████	Message for the Subscription
SubscriptionResponse	███████	Reply to the subscription operation.

Table 2: Payload elements for the subscribeToAirportMETNowcast operation

5.1.1.2 Operation unsubscribeFromAirportMETNowcast

The service operation enables the service consumer to unsubscribe from the service.

5.1.1.2.1 Operation Functionality

The service operation enables the consumer to select the desired airport for which he does not want airport meteorological nowcast anymore.

5.1.1.2.2 Operation Parameters

The operation is modelled with a return type representing the generic outcome for an unsubscription.

Element Name	Author	Notes
AirportMETNowcastUnsubscription	███████	Message for the Unsubscription
UnsubscriptionResponse	███████	Reply to the unsubscription operation.

Table 3: Payload elements for the unsubscribeFromAirportMETNowcast operation

5.1.2 Service Interface Definition AirportMETNowcast Subscriber

This interface definition enables the provider to publish the AirportMETNowcast .

5.1.2.1 Operation unsubscribeFromAirportMETNowcast

The service operation enables the service consumer to receive a notification for a new AirportMETNowcast which he has subscribed to.

5.1.2.1.1 Operation Functionality

The service operation simply enables the consumer to access a pre-subscribed new AirportMETNowcast available from the MET provider.

5.1.2.1.2 Operation Parameters

The operation is modelled without a return type. The operation has a single input parameter which represents the full service payload as represented above.

The relevant entity items are described in the table below, each attribute and relationship is described. The tagged values show the linked AIRM class.
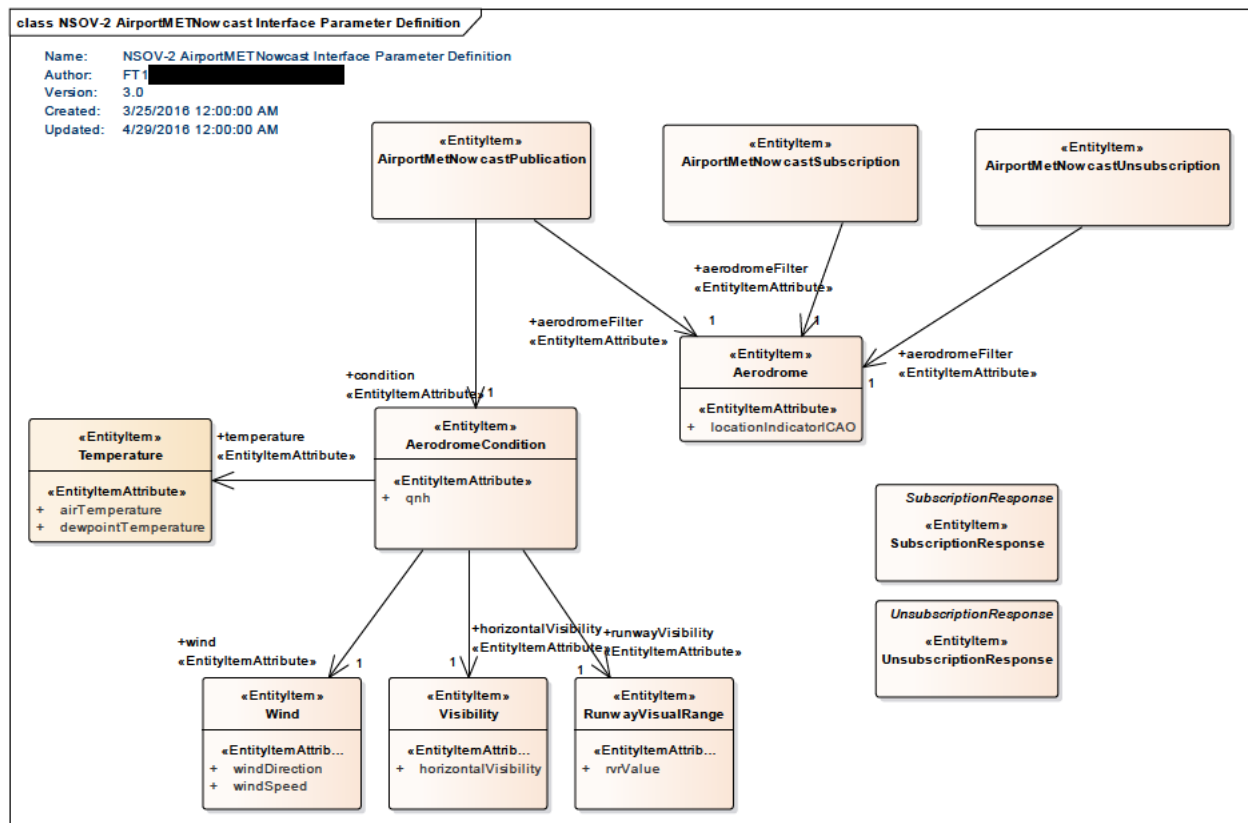
Figure 5: NSOV-2 AirportMETNowcast Service Interface Parameter Definition diagram

Element Name	Author	Notes
SubscriptionResponse		Reply to the subscription operation.
	Element Tagged Value Name	**Value**
	CLDMSemanticTrace	CLDM_out_of_scope

Element Name		Author	Notes
UnsubscriptionResponse		▮▮▮▮▮▮▮▮▮▮▮	Reply to the unsubscription operation.
	Element Tagged Value Name		**Value**
	CLDMSemanticTrace		CLDM_out_of_scope

Element Name		Author	Notes
Wind		▮▮▮▮▮▮▮▮▮	The wind information.
	Element Tagged Value Name		**Value**
	CLDMSemanticTrace		urn:x-ses:sesarju:airm:v410:ConsolidatedLogicalDataModel:SubjectFields:Meteorology:Wind

	Attribute Name	Type	Notes
	windDirection		The angle representing the direction of the wind source.
	Tagged Value Name		**Value**
	CLDMSemanticTrace		urn:x-ses:sesarju:airm:v410:ConsolidatedLogicalDataModel:SubjectFields:Meteorology:Wind@windDirection
	Attribute Name	Type	Notes
	windSpeed		The speed of the wind at the current time at the airport.
	Tagged Value Name		**Value**
	CLDMSemanticTrace		urn:x-ses:sesarju:airm:v410:ConsolidatedLogicalDataModel:SubjectFields:Meteorology:Wind@windSpeed

Element Name		Author	Notes
AirportMetNowcastPublication		▮▮▮▮▮▮▮▮▮	Message type to supply the publication of an airport's meteorological nowcast.
	Element Tagged Value Name		**Value**
	CLDMSemanticTrace		CLDM_out_of_scope
	encoding		

Element Name		Author	Notes
AirportMetNowcastSubscription		▮▮▮▮▮▮▮▮▮	Message type to supply the basic filter used in requesting an airport's meteorological nowcast.
	Element Tagged Value Name		**Value**
	CLDMSemanticTrace		CLDM_out_of_scope
	encoding		

Element Name		Author	Notes
AirportMetNowcastUnsubscription		▮▮▮▮▮▮▮▮▮	Message type to supply the basic filter used in requesting an airport's meteorological nowcast.
	Element Tagged Value Name		**Value**
	CLDMSemanticTrace		CLDM_out_of_scope
	encoding		

Element Name		Author	Notes
AerodromeCondition		▮▮▮▮▮▮▮▮▮	Clustering of Q codes data for the MetNowcastPublication service message
	Element Tagged Value Name		**Value**
	CLDMSemanticTrace		urn:x-ses:sesarju:airm:v410:ConsolidatedLogicalDataModel:SubjectFields:Meteorology:AerodromeCondition

	Attribute Name	Type	Notes
	qnh		The QNH pressure setting for altimeters to read zero at the airport.
	Tagged Value Name		**Value**

Element Name		Author	Notes	
SubscriptionResponse		████████	Reply to the subscription operation.	
	Element Tagged Value Name		**Value**	
	CLDMSemanticTrace		CLDM_out_of_scope	

Element Name		Author	Notes	
UnsubscriptionResponse		████████	Reply to the unsubscription operation.	
	Element Tagged Value Name		**Value**	
	CLDMSemanticTrace		CLDM_out_of_scope	

Element Name		Author	Notes	
Wind		████████	The wind information.	
	Element Tagged Value Name		**Value**	
	CLDMSemanticTrace		urn:x-ses:sesarju:airm:v410:ConsolidatedLogicalDataModel:SubjectFields:Meteorology:Wind	
	Attribute Name	**Type**	**Notes**	
	CLDMSemanticTrace		urn:x-ses:sesarju:airm:v410:ConsolidatedLogicalDataModel:SubjectFields:Meteorology:AerodromeCondition@qnh	

Table 4: Payload tracing to AIRM

6 Service dynamic behaviour

The interface offers three operations, namely to subscribe/unsubscribe from the publication of the data, and to notify the consumer on the data being available. The service dynamic behaviour is shown using the NSOV-5c Service-Event diagram created for the purpose. The diagram shows that the interaction envisaged between provider and consumer is an asynchronous publish/subscribe "push" type MEP.

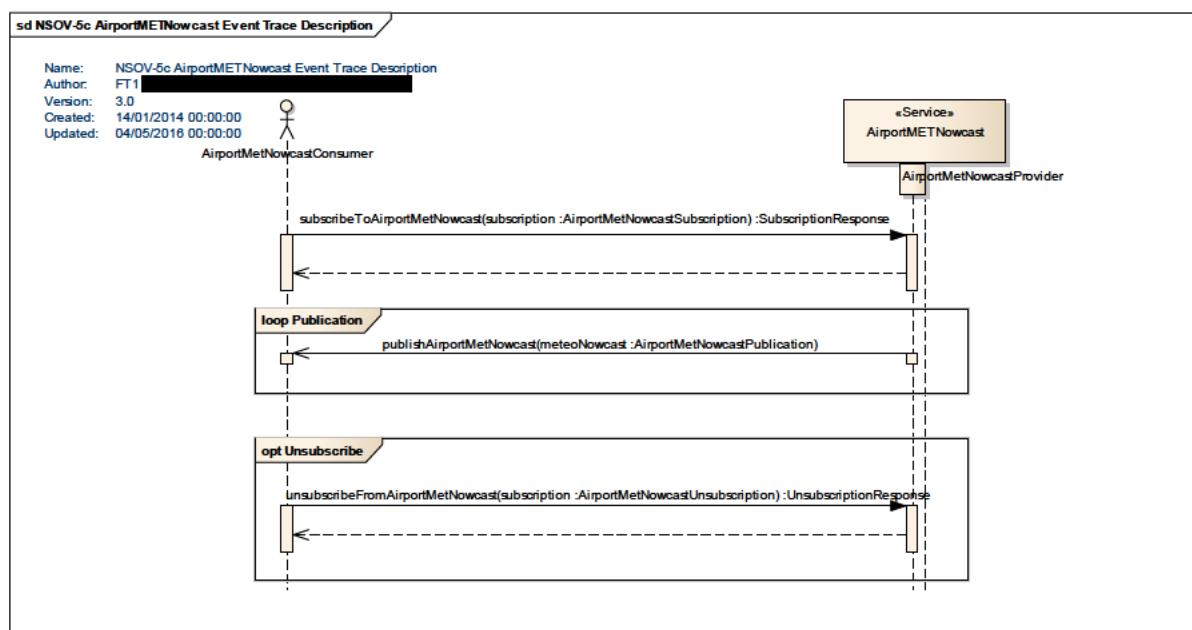## 6.1 Service Interface AirportMETNowcastProvider

Figure 6: NSOV-5c AirportMETNowcast Service Event Trace Description

7 Service provisioning (optional)

Service prototyping has been performed in the context of MET-related validation exercise EXE-06.09.02-VP-678 in SESAR. The technology so far identified for the technical interface is the OASIS standard Web Service Notification and belongs to the SWIM Yellow Profile. The detailed description of the technical service contract and service implementation for these exercises is part of technical deliverables by project 12.7.5.

8 Validation and Verification

8.1 Verification

Verification was performed according to the ISRM Rulebook [8] and the ISRM Verification Guidance [9].

8.1.1 Verification Results

Verification was performed via manual inspection and assisted by a script developed in 8.3.10. The verification outcome is completely free of errors.

Verification reports are in these files "Designed_Services_-_AirportMETNowcast Service.xls" and "Designed_Services_-_AirportMETNowcast Service_Common.xls" available in [11].

8.2 Validation

Validation for this service was performed as part of the SESAR validation exercise EXE-06.09.02-VP-678 in SESAR.

9 References

Name	Version	Document ID / Location
[1] 06.05.04-D16-OFA 05.01.01 Consolidated OSED (Part1)	03.00.00	06.05.04 D16
[2] 06.05.04-D16-OFA 05.01.01 Consolidated OSED (Part2)	03.00.00	06.05.04 D16
[3] ISRM Service Portfolio	00.08.01	08.03.10 D65
[4] SESAR Operational Service and Environment Definition	03.00.00	SJU templates & guidelines package, OSED template
[5] SESAR Safety and Performance Requirements	03.00.00	SJU templates & guidelines package, SPR template
[6] ISRM Tooling Guidelines	00.07.00	08.03.10 D44
[7] ISRM Modelling Guidelines	00.07.00	08.03.10 D44
[8] ISRM Foundation Rulebook	00.07.00	08.03.10 D44
[9] ISRM Verification Guidelines	00.07.00	08.03.10 D44
[10] EATMA Guidance Material	00.04.02	B04.01 D66
[11] Verification reports for the service	N/A	08.03.10 D65 Verification reports
[12] Airport DOD Step 1 (v01.00.01)-final-corrected-v2	01.00.01	06.02 D07
[13] DEL-06.05.04 D07_OFA050101_OSED 00.01.00	00.01.00	06.05.04 D07
[14] ISRM 0.4 Delivery Report	00.01.02	08.03.10 D06
[15] B4.3 Service Allocation for WP8 Fast Track 1	00.00.08	B4.3

-END OF DOCUMENT-