



# European ATM Service Description for the TAF Service

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## **Abstract**

The TAF service covers the dissemination of standard ICAO TAF bulletins over SWIM. This service aims therefore at bringing the benefits of increased interoperability via SWIM to the MET Community of Interest. Service design has been performed in the context of Service Activity SVA003 entailing Airport Meteorological and Surface Contamination services.

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Rational for rejection

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00.01.01	09/09/2014	Released		Updated to reflect SJU assessment
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00.02.01	17/12/2015	Final		Updated based on SJU comments
00.03.00	30/05/2016	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_08.03.10_response

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This deliverable consists of SJU foreground.

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## Executive summary

This document is the result of the “Service Design” step of the B.4.3 Working Method on Services for the TAF Service. The document provides a comprehensive logical specification for system engineers on how to realize the dissemination of MET data over SWIM.

The TAF service covers the dissemination of standard ICAO TAF bulletins over SWIM to a wide range of subscribing ATM users. This service aims therefore at bringing the benefits of increased interoperability via SWIM to the MET Community of Interest. Service design has been performed in the context of the SESAR Service Activity “SVA003” entailing Airport Meteorological and Surface Contamination services.

SVA003 has happened in the frame of the SESAR MET Coordination Group and has seen the participation of a good number of different partners, both Operational and System, from OFA5.1.1 (WP6 and WP12) and WP11.2.

Edition 1.1 of this SDD was firstly published in ISRM 1.3.. Edition 2.0 was produced for ISRM 1.4 and was used as reference for SESAR validation exercise EXE-06.03.01-VP-669 (SESAR R5). This edition wraps all quality improvements for delivery with the final SESAR ISRM 2.0.

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# 1 Introduction

## 1.1 Purpose of the document

The purpose of this SDD is to provide a complete logical description of the TAF 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 by the NAF Framework.

This SDD serves 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 TAF Service.

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

## 1.2 Intended readership

SESAR Deployment Manager, SCG, the OPS and SYS projects participating in the SVA003 Team, 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
FAA	Federal Aviation Administration
IER	Information Exchange Requirement

Term	Definition
<b>ISRM</b>	Information Service Reference Model
<b>IWXXM</b>	ICAO Weather Information Exchange Model
<b>MG</b>	ISRM Modelling Guidelines
<b>NAF</b>	NATO Architecture Framework
<b>NSOV</b>	NATO Service Oriented View
<b>NOV</b>	NATO Operational View
<b>NSV</b>	NATO System View
<b>OSED</b>	Operational Service and Environment Definition
<b>QoS</b>	Quality of Service
<b>SAR</b>	Service Allocation Report
<b>SCG</b>	Service Coordination Group
<b>SDD</b>	Service Description Document
<b>SESAR</b>	Single European Sky ATM Research Programme
<b>SESAR Programme</b>	The programme which defines the Research and Development activities and Projects for the SJU.
<b>SIR</b>	Service Identification Report
<b>SJU</b>	SESAR Joint Undertaking (Agency of the European Commission)
<b>SJU Work Programme</b>	The programme which addresses all activities of the SESAR Joint Undertaking Agency.
<b>SWIM</b>	System Wide Information Management
<b>TAF</b>	Terminal Aerodrome Forecast
<b>UML</b>	Unified Modelling Language
<b>V&amp;V</b>	Validation and Verification
<b>WSDL</b>	Web Services Definition Language
<b>XSD</b>	XML Schema Definition



## 1.5.2 Terminology

Term	Definition	Source
<b>Capability</b>	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 [13]
<b>Capability Configuration</b>	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 [13]
<b>Node</b>	A logical entity that performs Activities. Note: nodes are specified independently of any physical realisation.	EATMA Guidance Material [13]
<b>Service</b>	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 [13]
<b>Service function</b>	A type of activity describing the functionality of a Service.	EATMA Guidance Material [13]
<b>Service interface</b>	The mechanism by which a service communicates	EATMA Guidance Material [13]

## 2 Service identification

Name	TAF
ID	{ECA03906-8600-4281-9EAF-449741058E9D}
Version	3.0
Keywords	TAF, Airport Meteorological Forecast, MET ICAO Product
Architect(s)	██████████ FINMECCANICA

Lifecycle status	Date	Reference
Identified	12/12/2013	See reference [3]
Allocated	21/02/2014	See reference [4]
Designed	31/05/2016	This document
Validated	03/03/2016	See reference [17]
IOC	<i>Date for Initial Operational Capability</i>	<i>Reference to technical enabler hosting the service in the ATM master plan</i>
FOC	<i>Date for Full Operational Capability</i>	<i>Reference to technical enabler hosting the service in the ATM master plan</i>

### 3 Operational and Business context

The TAF (Terminal Aerodrome Forecast) is a pre-defined ICAO format for reporting weather forecast information with particular reference to aerodromes. TAFs are issued every six hours for major civil airfields and generally apply to a 24 or 30-hour period, and an area within approximately five miles from the centre of an airport runway complex. TAFs are issued every 3 hours for military airfields and some civil airfields and cover a period ranging from 3 hours to 24 hours. See ICAO Annex 3 [14].

The requirements for the provision of a service for dissemination of the TAF bulletin of interest for airport operations and the full business and operational context for this service is given by the P06.05.04 OSED[1][2]. It is also been described in the SVA003 Service Identification Report (SIR) [3] and has been elaborated further in the SVA003 Service Allocation Report (SAR) [4]. These documents in particular have already covered:

- a description of what ATM goals and problems the service addresses;
- business level capabilities the service will realise can be inserted;
- the positioning of the service into the SESAR technical Architecture (ADD and TADs);
- the link to Operational Improvements;
- the list of IERs, operational and non-functional requirements from source documents;
- the relevance to the SESAR MET Coordination Group, and the linkage to the “2013 MET Issue Resolution”;
- the prototyping and validation triggers from within the Programme.

## 3.1 Information Exchange Requirements

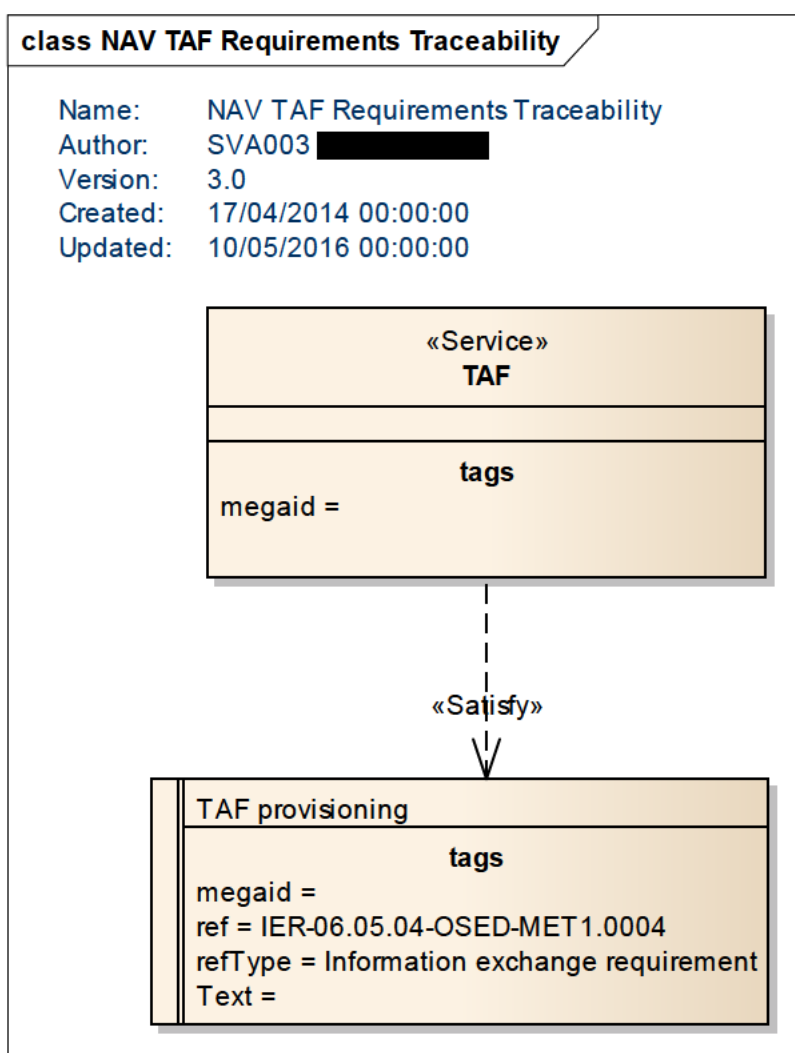


Figure 1: NAV TAF Service Requirements Traceability IER Diagram

## 3.2 Other Requirements

### 3.2.1 Non-Functional Requirements

N/A.

### 3.2.2 Relevant Industrial Standards

The relevant industrial standard envisaged in the validation exercise EXE-06.03.01-VP-669 was IWXXM 1.1 [15] for the modelling of the service message.

### 3.2.3 Nodes

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

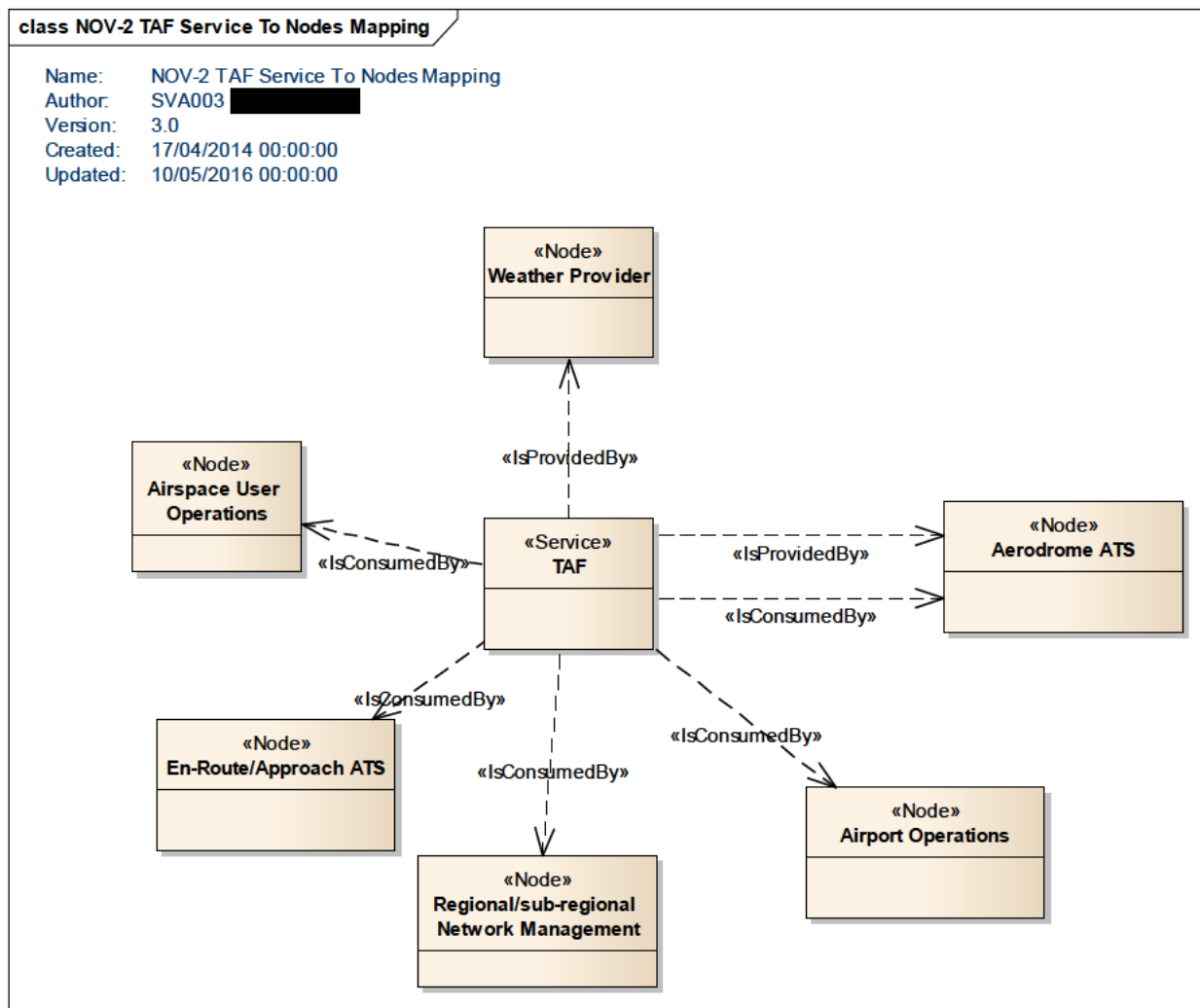


Figure 2: NOV-2 TAF Service to Nodes Mapping diagram

## 4 Service overview

### 4.1 Service Taxonomy

The service taxonomy is described in the ISRM Service Portfolio document [5].

### 4.2 Service Levels (NfRs)

N/A.

### 4.3 Service Functions and Capabilities

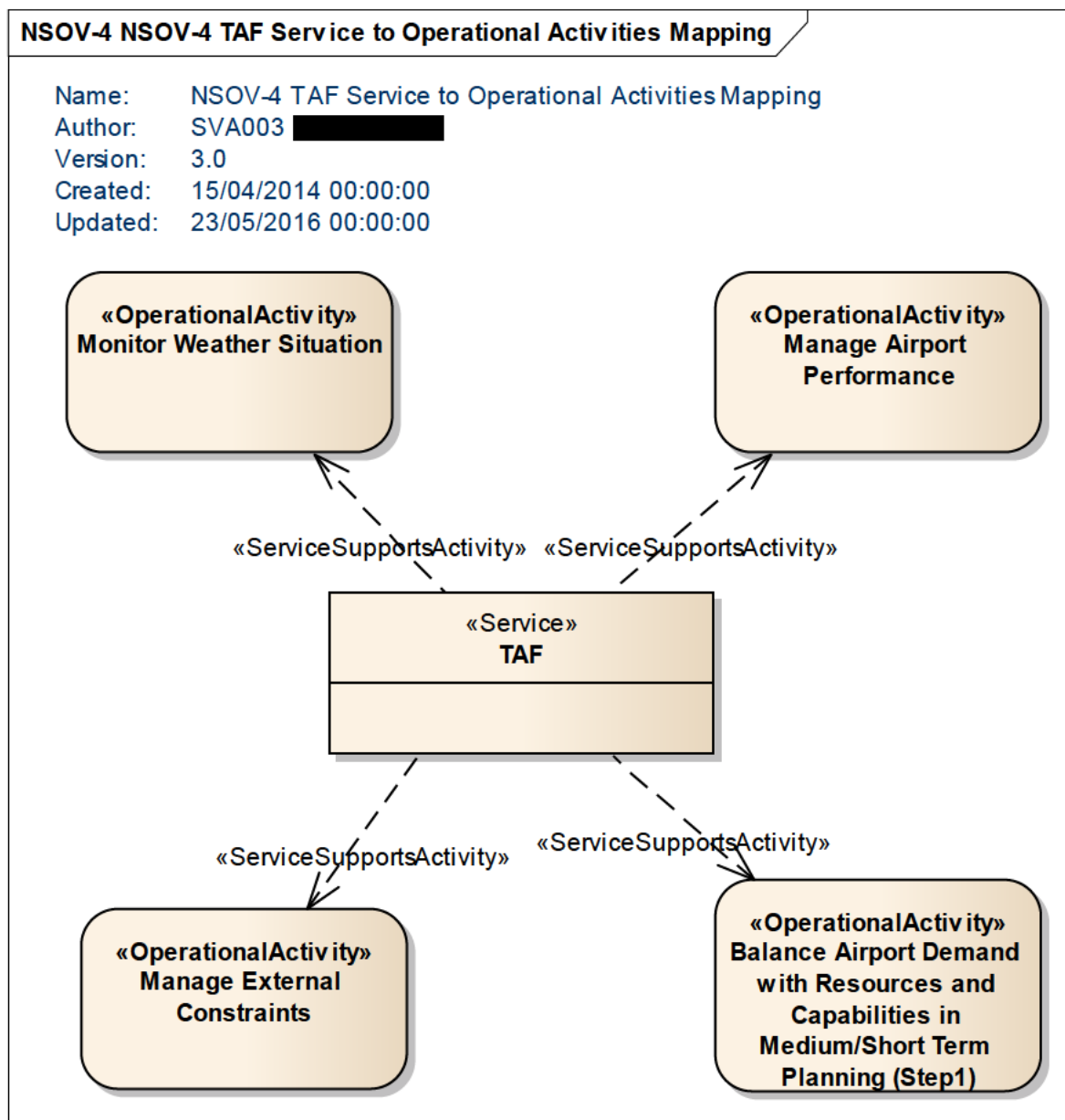


Figure 3: NSOV-4 TAF Service to Operational Activities Mapping diagram

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 TAFPublisher service interface definition allows the consumer to subscribe or unsubscribe to the data, while the TAFSubscriber service interface definition allows 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.

Name: NSOV-2 TAF Interface Definition  
 Author: SVA003 [REDACTED]  
 Version: 3.0  
 Created: 15.04.2014 00:00:00  
 Updated: 26.05.2016 00:00:00

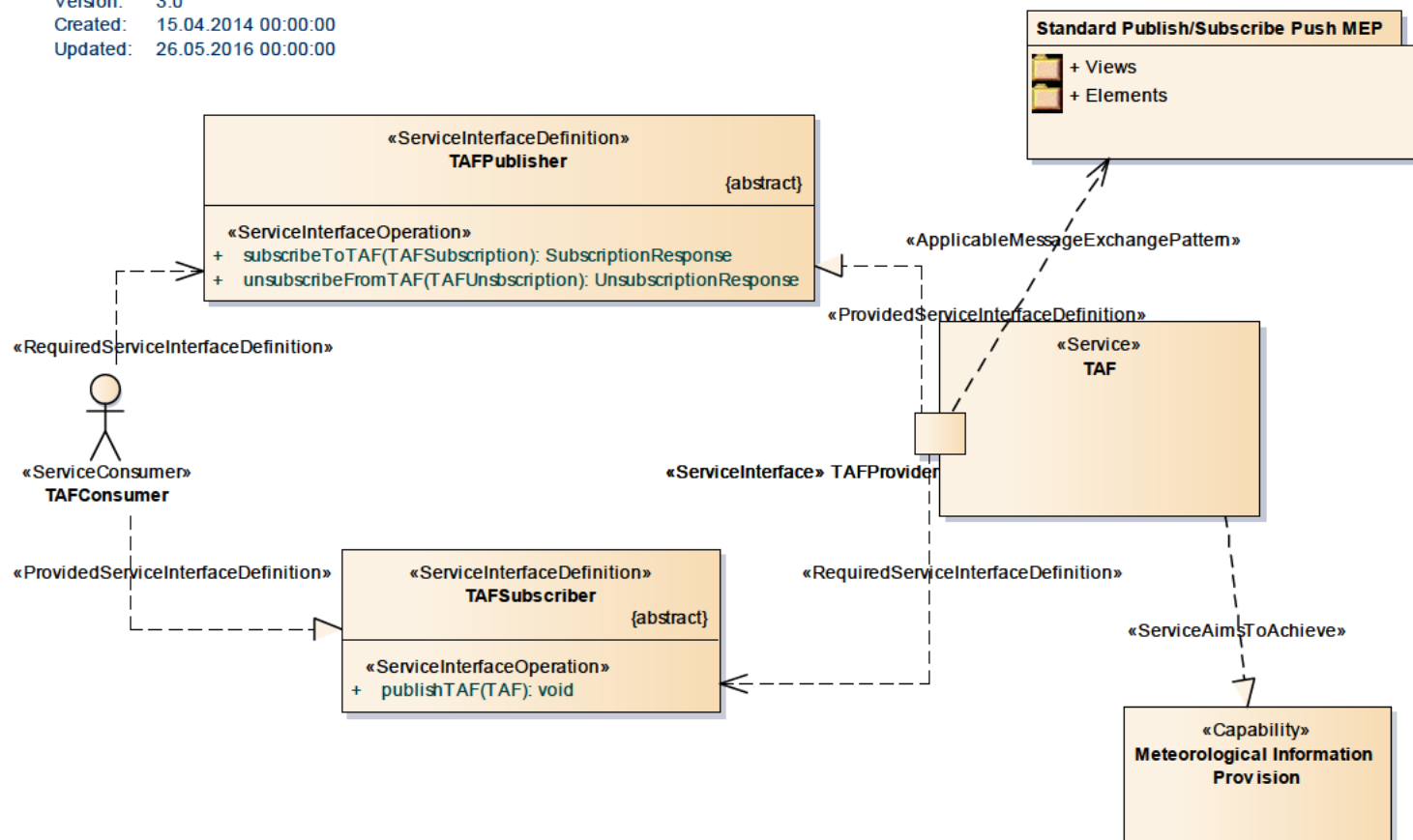


Figure 4: NSOV-2 TAF Service Interface Definition diagram

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ServiceInterface	ServiceInterfaceDefinition	ServiceInterfaceOperation	Role
TAFProvider	TAFPublisher	subscribeToTAF	provided
TAFProvider	TAFPublisher	unsubscribeFromTAF	provided
TAFProvider	TAFSubscriber	publishTAF	required

**Table 1: Service Interfaces**

## 5 Service interface specifications

### 5.1 Service Interface TAFProvider

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 TAFPublisher

This interface definition allows a consumer to subscribe or unsubscribe from the provision of the service message.

##### 5.1.1.1 Operation subscribeToTAF

The service operation allows the service consumer to subscribe to a particular TAF bulletin.

###### 5.1.1.1.1 Operation Functionality

The service operation allows the consumer to select the desired airport for which he desires a TAF bulletin.

###### 5.1.1.1.2 Operation Parameters

The operation has been modelled with a return type representing the generic outcome for a subscription.

Element Name	Author	Notes
TAFSubscription	SVA003 [REDACTED]	Message for the Subscription
SubscriptionResponse	SVA003 [REDACTED]	Reply to the subscription operation.

Table 2: Payload elements for the subscribeToTAF operation

##### 5.1.1.2 Operation unsubscribeFromTAF

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

###### 5.1.1.2.1 Operation Functionality

The service operation allows the consumer to select the desired airport for which he does not want TAF bulletins anymore.

###### 5.1.1.2.2 Operation Parameters

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

Element Name	Author	Notes
TAFUnsubscription	SVA003 [REDACTED]	Message for the Unsubscription
UnsubscriptionResponse	SVA003 [REDACTED]	Reply to the unsubscription operation.

Table 3: Payload elements for the unsubscribeFromTAF operation

## 5.1.2 Service Interface Definition TAFSubscriber

This interface definition allows the provider to publish the TAF.

### 5.1.2.1 Operation publishTAF

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

#### 5.1.2.1.1 Operation Functionality

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

#### 5.1.2.1.2 Operation Parameters

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

The relevant EntityItems are described in the table below, each attribute and relationship is described. The tagged values show the linked AIRM class.

It is to be noted that the service relies upon the logical structure of the IWXXM 1.1 data model. The payload can accommodate the TAF bulletin.

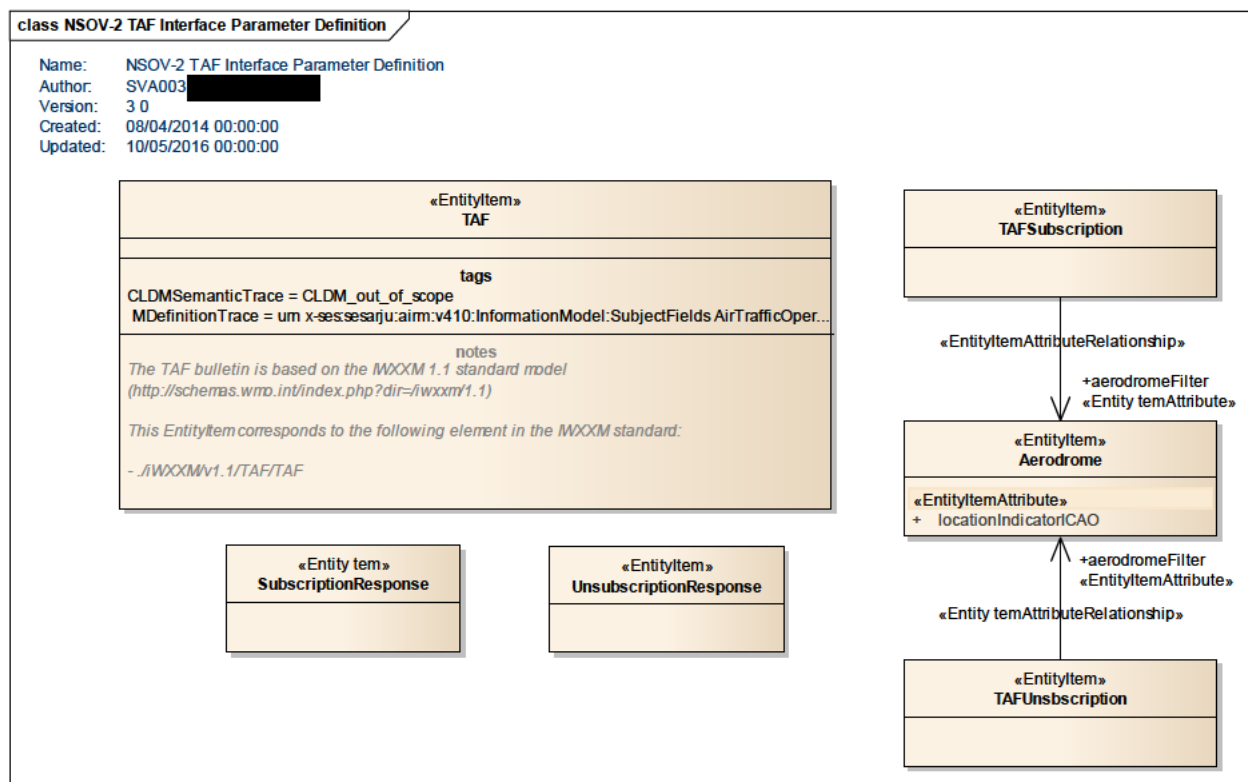


Figure 5: NSOV-2 TAF Service Interface Parameter Definition diagram

Element Name	Author	Notes
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TAF	SVA003	The TAF bulletin is based on the IWXXM 1.1 standard model ( <a href="http://schemas.wmo.int/index.php?dir=/iwxm/1.1">http://schemas.wmo.int/index.php?dir=/iwxm/1.1</a> )  This EntityItem corresponds to the following element in the IWXXM standard:  - ./IWXXM/v1.1/TAF/TAF
	<b>Element Tagged Value Name</b>	<b>Value</b>
	CLDMSemanticTrace	CLDM_out_of_scope
	IMDefinitionTrace	urn:x- ses:sesarju:airm:v410:InformationModel:SubjectFields: AirTrafficOperations:InformationServicesProducts:Met eorologicalInformationProduct:TAF

Element Name	Author	Notes
Aerodrome	SVA003	A defined area on land or water (including any buildings, installations and equipment) intended to be used either wholly or in part for the arrival, departure and surface movement of aircraft.
	<b>Element Tagged Value Name</b>	<b>Value</b>
	CLDMSemanticTrace	urn:x- ses:sesarju:airm:v410:ConsolidatedLogicalDataModel:S ubjectFields:BaseInfrastructure:AerodromeInfrastructur e:Aerodrome
	<b>Attribute Name</b>	<b>Type</b>
	locationIndicatorICAO	The four letter ICAO location indicator of the aerodrome/heliport, as listed in ICAO DOC 7910.
	<b>Tagged Value Name</b>	<b>Value</b>
	CLDMSemanticTrace	urn:x- ses:sesarju:airm:v410:ConsolidatedLogicalDataModel:Subje ctFields:BaseInfrastructure:AerodromeInfrastructure:Aerodr ome@designator

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 can be shown using the NSOV-5c Service-Event diagram created for the purpose. The following diagram shows that the interaction envisaged between provider and consumer is an asynchronous publish/subscribe “push” type MEP.

### 6.1 Service Interface TAFProvider

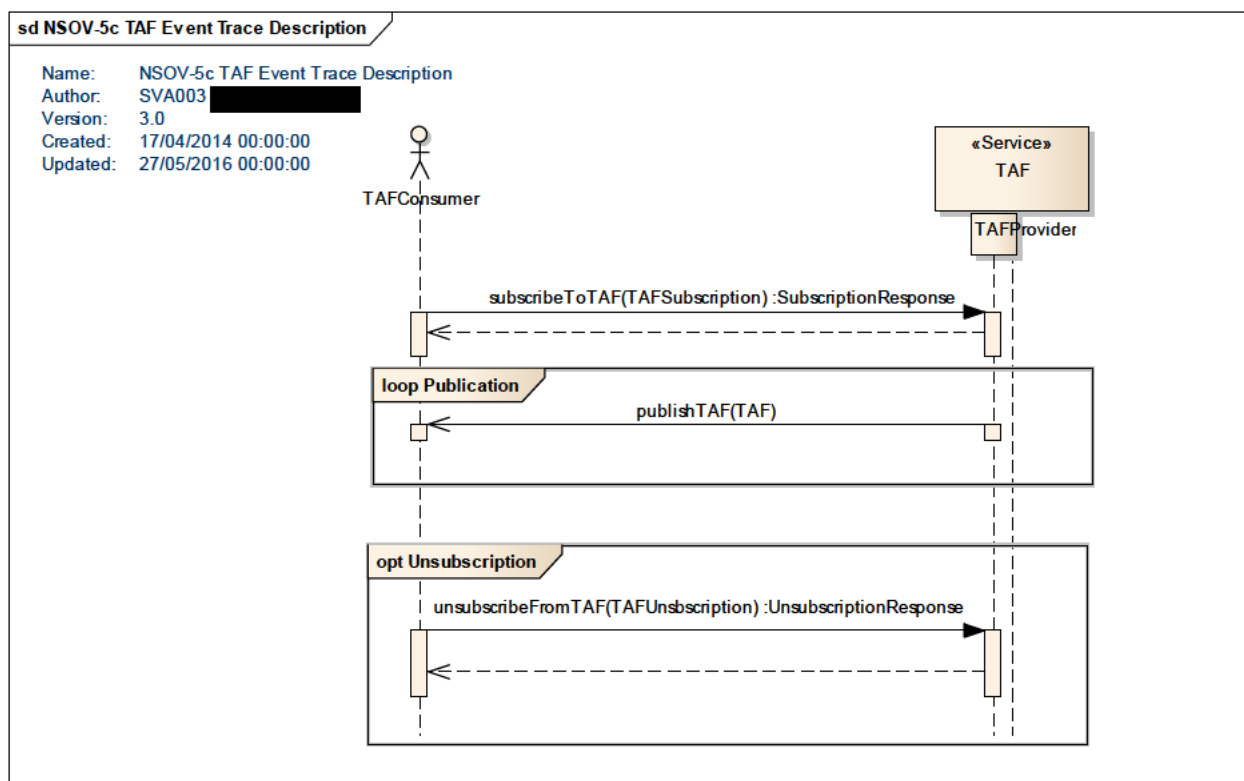


Figure 6: NSOV-5c TAF Service Event Trace Description

## 7 Service provisioning (optional)

Service prototyping has been performed in the context of MET-related validation exercise EXE-06.03.01-VP-669 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 this exercise 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 [11] and the ISRM Verification Guidance [12].

#### 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\_-\_TAFService.xls” and “Designed\_Services\_-\_TAFService\_Common.xls” available in [16].

### 8.2 Validation

Validation for this service was performed as part of the SESAR validation exercise EXE-06.03.01-VP-669 in Q1 2016. The outcome is recorded in the Validation report VALR [17].

## 9 References

Name	Version	Document ID / Location
[1] OFA 05.01.01 Consolidated OSED edition 3 document (Part1)	03.00.00	06.05.04 D16
[2] OFA 05.01.01 Consolidated OSED edition 3 document (Part2)	03.00.00	06.05.04 D16
[3] Service Identification Report - SVA003	00.01.00	08.03.06
[4] B.4.3 Service Allocation - SVA003	00.00.03	B.04.03
[5] ISRM Service Portfolio	00.08.01	08.03.10 D65
[6] Project deliverables template	03.00.00	SJU templates & guidelines package, Project deliverables template
[7] SESAR Operational Service and Environment Definition	03.00.00	SJU templates & guidelines package, OSED template
[8] SESAR Safety and Performance Requirements	03.00.00	SJU templates & guidelines package, SPR template
[9] ISRM Tooling Guidelines	00.07.00	08.03.10 D44
[10] ISRM Modelling Guidelines	00.07.00	08.03.10 D44
[11] ISRM Foundation Rulebook	00.07.00	08.03.10 D44
[12] ISRM Verification Guidelines	00.07.00	08.03.10 D44
[13] European ATM Architecture (EATMA) Guidance Material v4	00.04.02	B04.01 D66
[14] ICAO Annex 3, Meteorological Service for International Air Navigation	17 <sup>th</sup> Edition, July 2010	<a href="http://www.icao.int">www.icao.int</a>
[15] IWXXM	1.1	<a href="http://www.wmo.int/pages/prog/www/WIS/wiswiki/tiki-index.php?page=AvXML-1.1-Release">http://www.wmo.int/pages/prog/www/WIS/wiswiki/tiki-index.php?page=AvXML-1.1-Release</a>
[16] Verification reports for the service	N/A	08.03.10 D65 Verification reports
[17] SESAR P06.03.01 Delivery of VALR EXE669 ENAV proposition	00.01.00	06.03.01 D140



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