



# European ATM Service Description for the AirportMETInducedCapacityReduction Service

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**Abstract**

The AirportMETInducedCapacityReduction Service provides an indication of the maximum airport capacity achievable considering only the current and near term weather conditions, and thus providing useful input to the overall capacity computation made by DCB at the airport.

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|                        |

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| 00.01.01 | 1/08/2012  | Revised | ██████████████████ | SDD update to reflect work done in Fast Track 2 |
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| 00.01.03 | 27/05/2014 | Draft   | ██████████████████ | Update based on foundation 1.1                  |
| 00.02.00 | 30/05/2014 | Final   | ██████████████████ | Minor revisions from verification.              |
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| 00.02.01 | 30/11/2015 | Final   | ██████████████████ | Changed delivery ID                             |

|          |            |              |  |  |
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This deliverable consists of SJU foreground.

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## Executive summary

The AirportMETInducedCapacityReduction Service provides an indication of the maximum airport capacity achievable considering only the current and near term weather conditions, and thus providing an essential input to the overall capacity computation made by DCB at the airport.

## 1 Introduction

The AirportMETInducedCapacityReduction Service supplies the short term maximum airport capacity as constrained by the predicted weather, to consumers at an airport. The publication consists of the departure and arrival capacity for the specified airport at the specified date and time.

### 1.1 Purpose of the document

The purpose of this Service Description Document (SDD) is to provide a complete logical description of the AirportMETInducedCapacityReduction 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 AirportMETInducedCapacityReduction 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                                   |
|---------------|--|
| <b>ADD</b>    | Architecture Description Document            |
| <b>ATM</b>    | Air Traffic Management                       |
| <b>CC</b>     | Capability Configuration                     |
| <b>EATMA</b>  | European Air Traffic Management Architecture |
| <b>E-ATMS</b> | European Air Traffic Management System       |



| Term                   | Definition  |
|------------------------|---|
| <b>IER</b>             | Information Exchange Requirement  |
| <b>ISRM</b>            | Information Service Reference Model   |
| <b>MEP</b>             | Messaging Exchange Pattern  |
| <b>MET</b>             | Meteorology or Meteorological   |
| <b>NAF</b>             | NATO Architecture Framework   |
| <b>NSOV</b>            | NATO Service Oriented View  |
| <b>NOV</b>             | NATO Operational View   |
| <b>OSED</b>            | Operational Service and Environment Definition  |
| <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>SJU</b>             | SESAR Joint Undertaking (Agency of the European Commission)                                   |
| <b>SWIM</b>            | System Wide Information Management  |
| <b>UML</b>             | Unified Modelling Language  |

## 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 [4] |
| <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 [4] |
| <b>Node</b>                     | A logical entity that performs Activities. Note: nodes are specified independently of any physical realisation.  | EATMA Guidance Material [4] |
| <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                                     | EATMA Guidance              |



| Term                     | Definition   | Source                      |
|--------------------------|--|-----------------------------|
|                          | between providers and consumers, which may be performed in a digital form (data exchanges) or through voice communication or written processes and procedures. | Material [4]                |
| <b>Service function</b>  | A type of activity describing the functionality of a Service.  | EATMA Guidance Material [4] |
| <b>Service interface</b> | The mechanism by which a service communicates  | EATMA Guidance Material [4] |

## 2 Service identification

|              |  |
|--------------|--|
| Name         | AirportMETInducedCapacityReduction           |
| ID           | {D8921042-EC05-42a4-A0DC-B1EC4422EA03}       |
| Version      | 3.0  |
| Keywords     | Airport Meteorology, Airport Capacity        |
| Architect(s) | ██████████ (DFS) / ██████████ (FINMECCANICA) |

| Lifecycle status | Date   | Link  |
|------------------|--|---|
| Identified       | 30/03/2012                                     | ISRM0.4 Delivery Report [8]   |
| Allocated        | 29/03/2012                                     | Service Allocation for WP8 Fast Track 1[9]                                  |
| Designed         | 30/03/2012                                     | ISRM0.4 Delivery Report [8]   |
| Validated        | <i>Date when validated. Filled by WP3</i>      | N/A   |
| IOC              | <i>Date for Initial Operational Capability</i> | <i>Link to technical enabler hosting the service in the ATM master plan</i> |
| FOC              | <i>Date for Full Operational Capability</i>    | <i>Link to technical enabler hosting the service in the ATM master plan</i> |

### 3 Operational and Business context

The DOD [6] does supply some high level requirements which have been linked to the requirements from the OFA 5.1.1 OSED [7] and is shown in the diagram below. Newer OSEDs have been developed in the OFA more recently, however this service has not been updated.

#### 3.1 Information Exchange Requirements

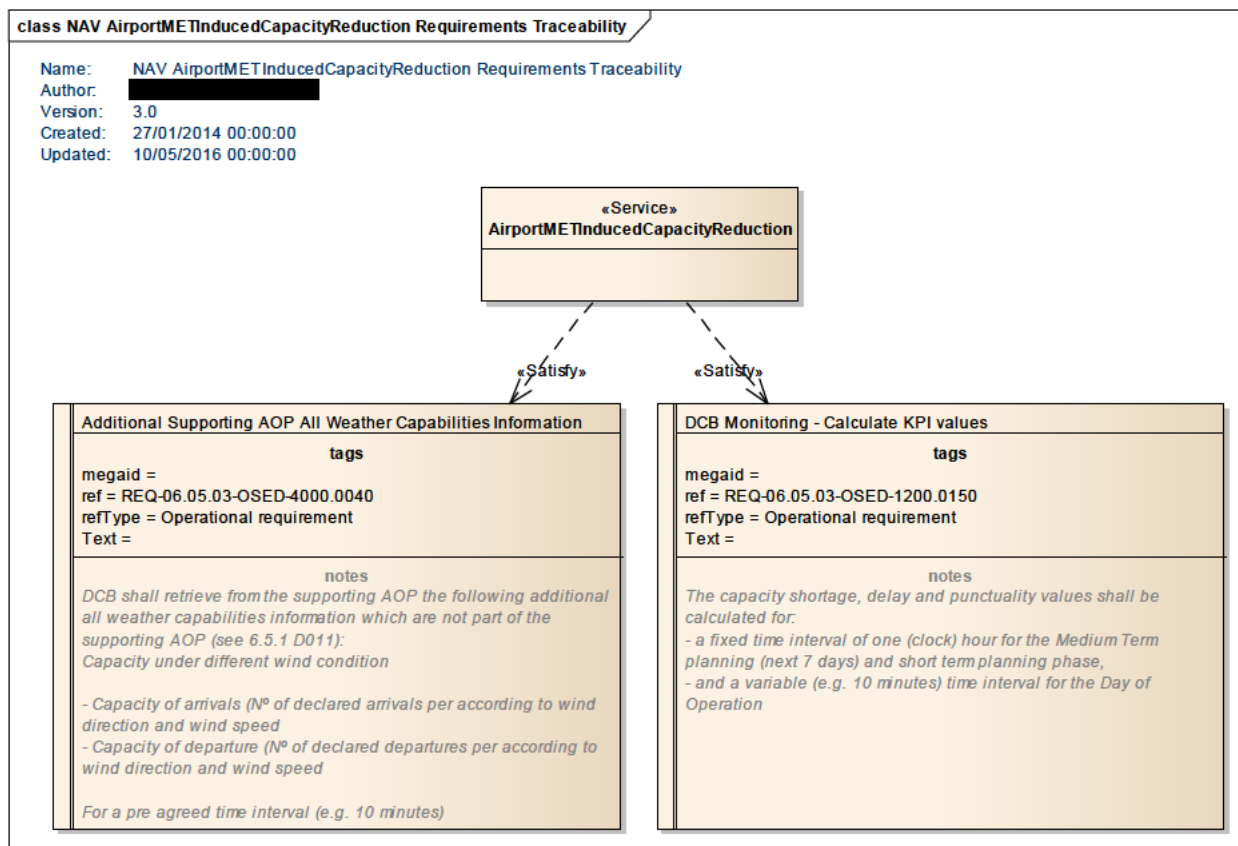


Figure 1: NAV AirportMETInducedCapacityReduction Service Requirements Traceability IER Diagram

### 3.2 Other Requirements

#### 3.2.1 Non-Functional Requirements

N/A.

#### 3.2.2 Relevant Industrial Standards

N/A.

### 3.2.3 Nodes

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

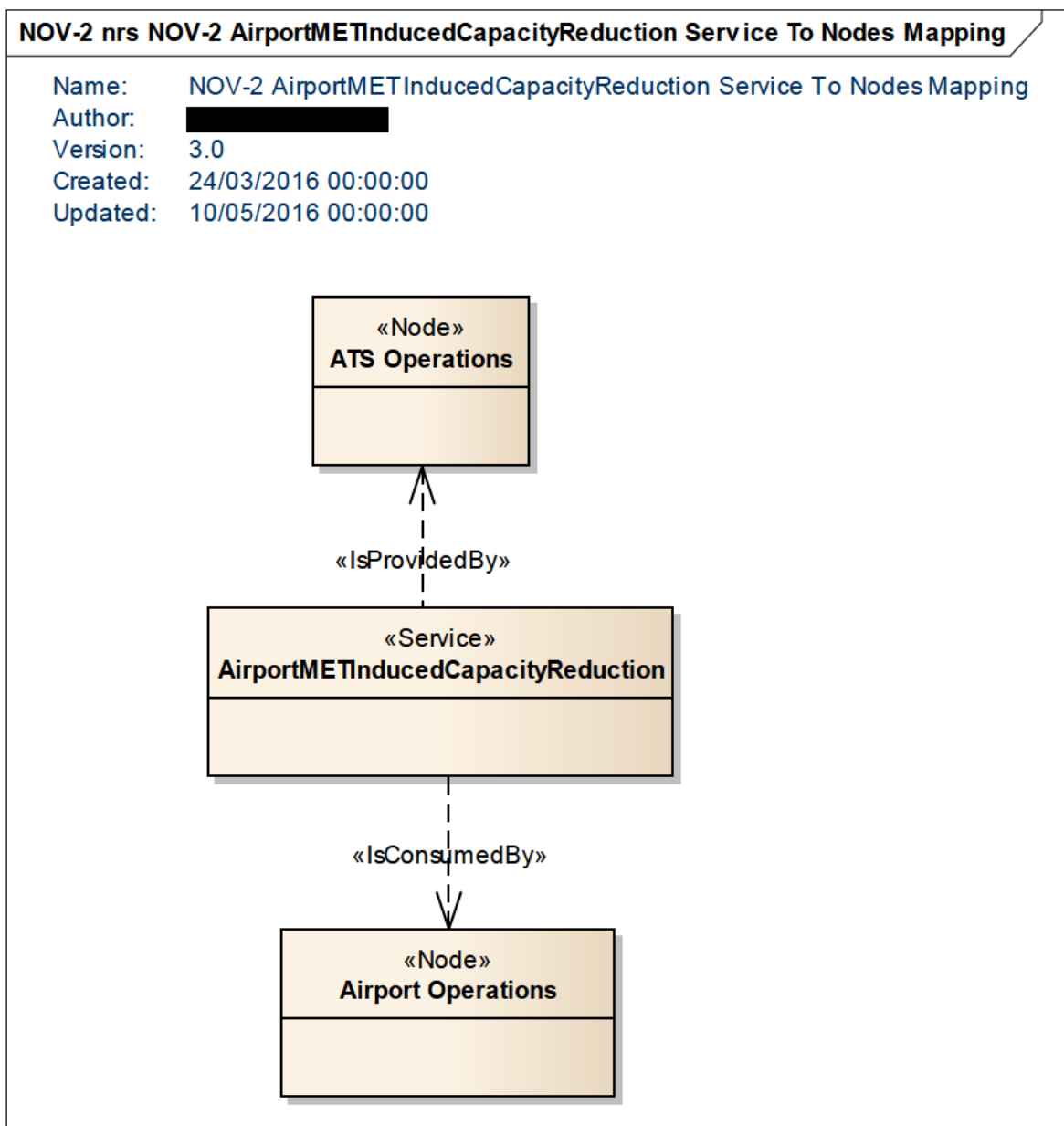


Figure 2: NOV-2 AirportMETInducedCapacityReduction Service to Nodes Mapping diagram

## 4 Service overview

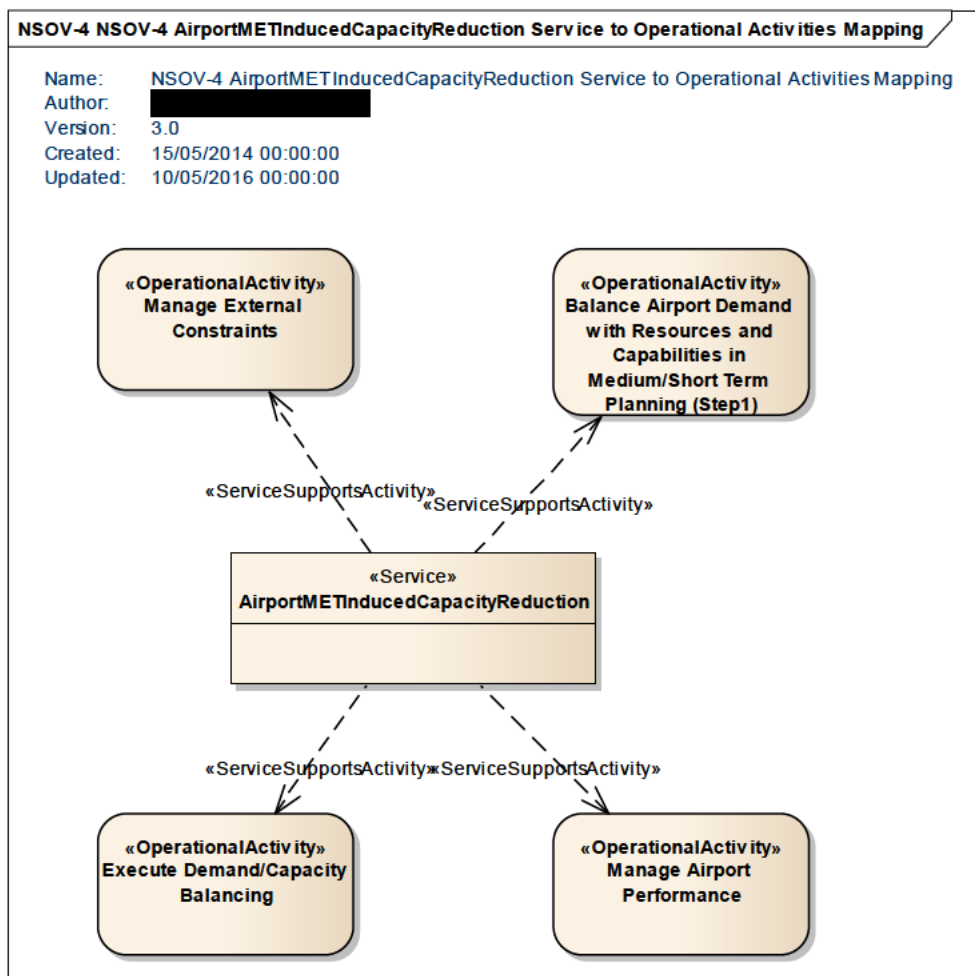
### 4.1 Service Taxonomy

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

### 4.2 Service Levels (NfRs)

N/A.

### 4.3 Service Functions and Capabilities



**Figure 3: NSOV-4 AirportMETInducedCapacityReduction 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 AirportMETInducedCapacityReduction Publisher service interface definition enables the consumer to subscribe or unsubscribe to the data, while the AirportMETInducedCapacityReduction 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.

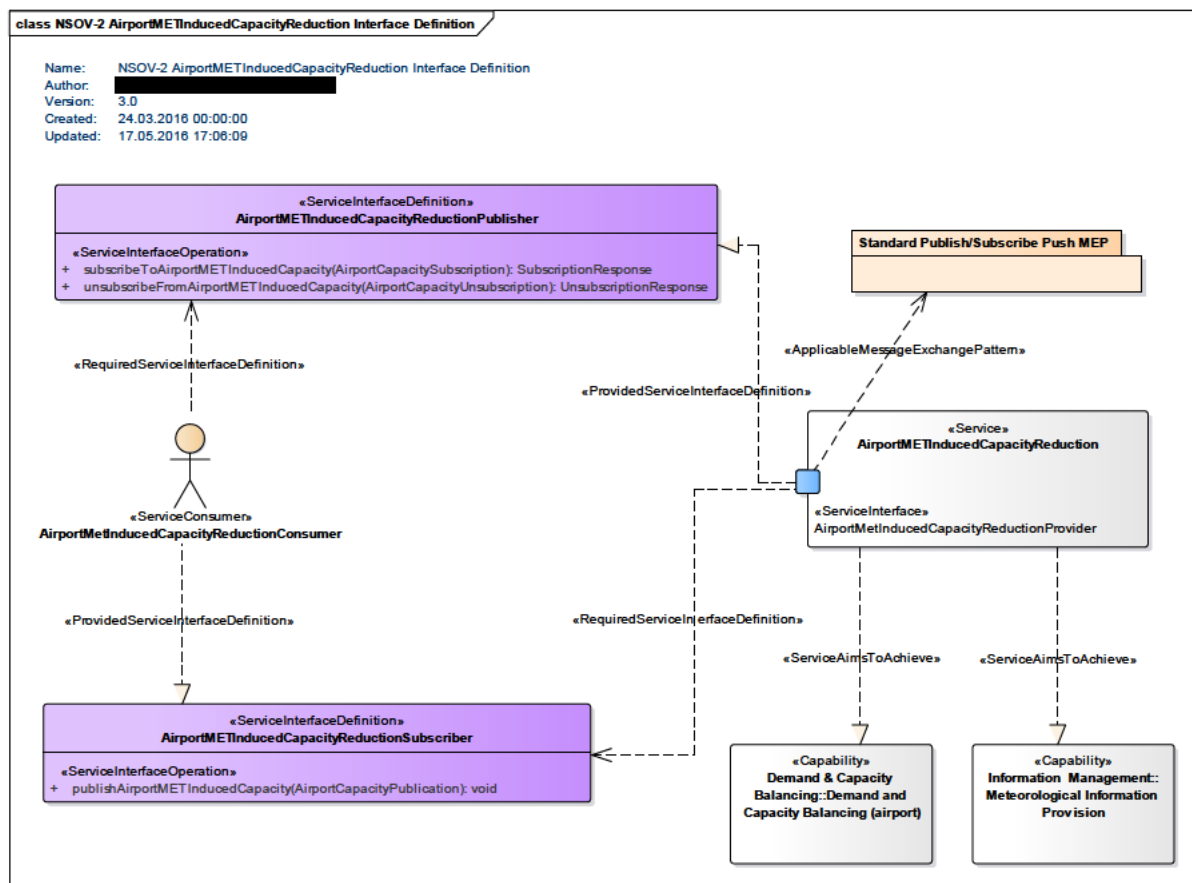


Figure 4: NSOV-2 AirportMETInducedCapacityReduction Service Interface Definition diagram

| ServiceInterface                           | ServiceInterfaceDefinition                    | ServiceInterfaceOperation                | Role     |
|--|---|--|----------|
| AirportMETInducedCapacityReductionProvider | AirportMETInducedCapacityReduction Publisher  | subscribeToAirportMETInducedCapacity     | provided |
| AirportMETInducedCapacityReductionProvider | AirportMETInducedCapacityReduction Publisher  | unsubscribeFromAirportMETInducedCapacity | provided |
| AirportMETInducedCapacityReductionProvider | AirportMETInducedCapacityReduction Subscriber | publishAirportMETInducedCapacity         | required |

Table 1: Service Interfaces



## 5 Service interface specifications

### 5.1 Service Interface

#### AirportMETInducedCapacityReductionProvider

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

##### AirportMETInducedCapacityReduction Publisher

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

##### 5.1.1.1 Operation subscribeToAirportMETInducedCapacity

The service operation enables the service consumer to subscribe to the capacity figures.

###### 5.1.1.1.1 Operation Functionality

The service operation enables the consumer to select the desired airport for which he wants capacity figures.

###### 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                                |
|--|--------|--------------------------------------|
| AirportMETInducedCapacityReductionSubscription |        | Message for the Subscription         |
| SubscriptionResponse                           |        | Reply to the subscription operation. |

**Table 2: Payload elements for the subscribeToAirportMETInducedCapacityReduction operation**

##### 5.1.1.2 Operation unsubscribeFromAirportMETInducedCapacity

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 capacity figures anymore.

###### 5.1.1.3 Operation Parameters

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

| Element Name                                     | Author | Notes                                  |
|--|--------|--|
| AirportMETInducedCapacityReductionUnsubscription |        | Message for the Unsubscription         |
| UnsubscriptionResponse                           |        | Reply to the unsubscription operation. |

**Table 3: Payload elements for the unsubscribeFromAirportMETInducedCapacityReduction operation**



## 5.1.2 Service Interface Definition

### AirportMETInducedCapacityReduction Subscriber

This interface definition enables the provider to publish the AirportMETInducedCapacityReduction .

#### 5.1.2.1 Operation publishAirportMETInducedCapacity

The service operation enables the service consumer to receive a notification for a new AirportMETInducedCapacityReduction 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 AirportMETInducedCapacityReduction 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.

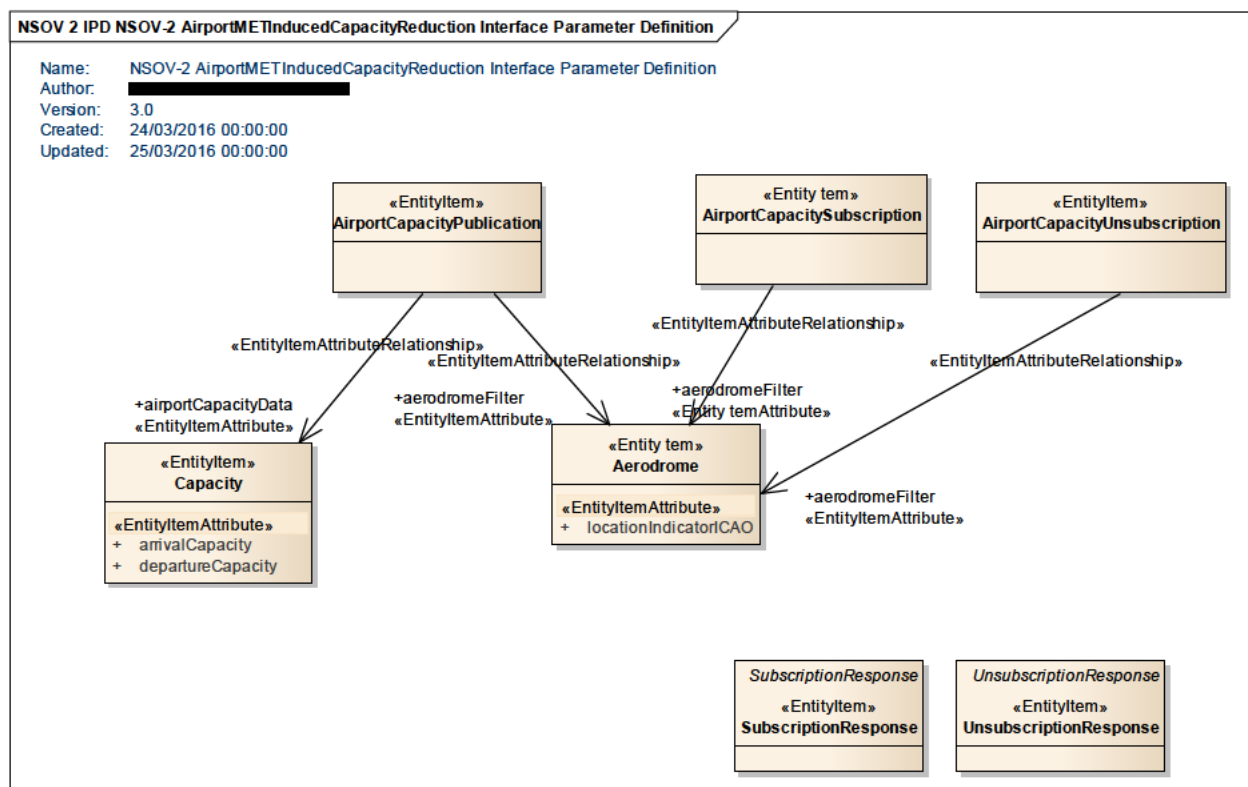


Figure 5: NSOV-2 AirportMETInducedCapacityReduction Service Interface Parameter Definition diagram

| Element Name                  | Author   | Notes  |
|-------------------------------|--|--|
| Capacity                      |  | Airport capacity figures.  |
| Attribute Name                | Type   | Notes  |
| arrivalCapacity               |  | Number of arrivals per hour which can be accommodated by the runway.               |
| Tagged Value Name             | Value  |  |
| CLDMContextTrace              | urn:x-<br>ses:sesarju:airm:v410:ConsolidatedLogicalDataModel:SubjectFields:AirTrafficOperations:CodeLists:CodeCapacityType@RUNWAY_DIRECTION_ARRIVAL_CAPACITY   |  |
| CLDMSemanticTrace             | urn:x-<br>ses:sesarju:airm:v410:ConsolidatedLogicalDataModel:SubjectFields:AirTrafficOperations:DemandAndCapacityBalancing:Capacity@value                      |  |
| Attribute Name                | Type   | Notes  |
| departureCapacity             |  | Number of departures per hour which can be accommodated by the runway.             |
| Tagged Value Name             | Value  |  |
| CLDMContextTrace              | urn:x-<br>ses:sesarju:airm:v410:ConsolidatedLogicalDataModel:SubjectFields:AirTrafficOperations:CodeLists:CodeCapacityType@RUNWAY_DIRECTION_DEPARTURE_CAPACITY |  |
| CLDMSemanticTrace             | urn:x-<br>ses:sesarju:airm:v410:ConsolidatedLogicalDataModel:SubjectFields:AirTrafficOperations:DemandAndCapacityBalancing:Capacity@value                      |  |
| Element Name                  | Author   | Notes  |
| SubscriptionResponse          |  | Reply to the subscription operation.   |
| Element Name                  | Author   | Notes  |
| UnsubscriptionResponse        |  | Reply to the unsubscription operation.   |
| Element Name                  | Author   | Notes  |
| AirportCapacityPublication    |  | Message type to supply the publication of an airport's Meteo Constrained capacity. |
| Element Tagged Value Name     | Value  |  |
| encoding                      |  |  |
| Element Name                  | Author   | Notes  |
| AirportCapacitySubscription   |  | Message type to supply the basic filter used in requesting an airport's capacity.  |
| Element Tagged Value Name     | Value  |  |
| encoding                      |  |  |
| Element Name                  | Author   | Notes  |
| AirportCapacityUnsubscription |  | Message type to supply the basic filter used in requesting an airport's capacity.  |
| Element Tagged Value Name     | Value  |  |
| encoding                      |  |  |

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

#### AirportMETInducedCapacityReductionProvider

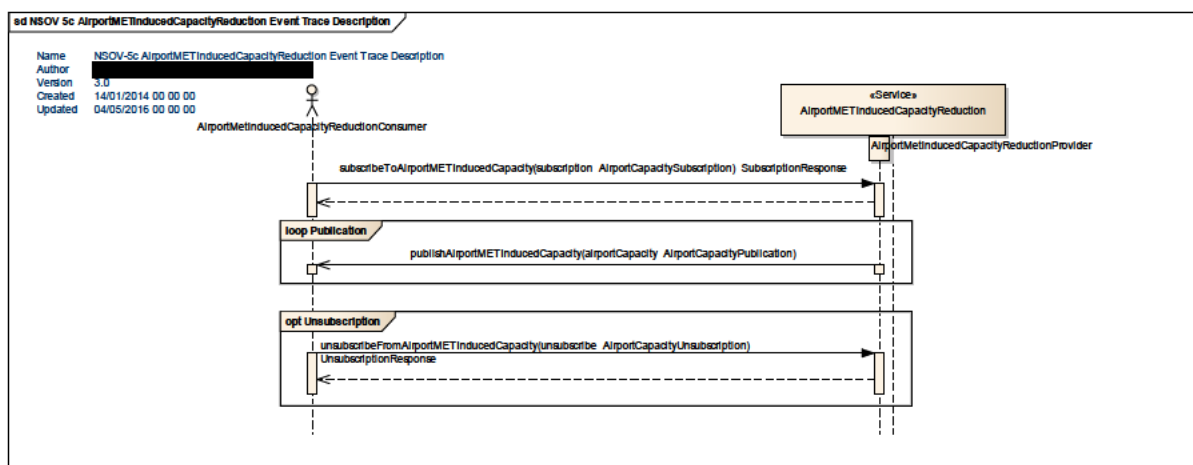


Figure 6: NSOV-5c AirportMETInducedCapacityReduction Service Event Trace Description

## 7 Service provisioning (optional)

The technology so far identified for the technical interface is the OASIS standard Web Service Notification and belongs to the SWIM Yellow Profile.

## 8 Validation and Verification

### 8.1 Verification

Verification was performed according to the ISRM Rulebook [2] and the ISRM Verification Guidance [3].

#### 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\_-\_AirportMETInducedCapacityReduction Service.xls” and “Designed\_Services\_-\_AirportMETInducedCapacityReduction Service\_Common.xls” available in [5].

### 8.2 Validation

Validation for this service was performed as part of the SESAR validation exercises EXE-06.05.05-VP-668 and EXE-06.09.02-VP-678 in SESAR.

## 9 References

| Name   | Version  | Document ID / Location   |
|--|----------|--|
| [1] ISRM 2.0 Service Portfolio   | 00.08.00 | DEL_08.03.10_D65_ISRM_Service_Portfolio                          |
| [2] ISRM Rule Book   | 00.07.00 | 08.03.10 D44   |
| [3] ISRM Verification Guidelines   | 00.07.00 | 08.03.10 D44   |
| [4] EATMA Guidance Material  | 00.04.02 | B.04.01 EATMA Guidance Material.docx                             |
| [5] Verification reports for the service                                     |          | 08.03.10 D65 Verification reports                                |
| [6] Step 1 Airport DOD, 20/2/2012  | 01.00.01 | 06.02.D07  |
| [7] 06.05.04 D07 OFA 05.01.01 Operational Service and Environment Definition | 00.01.00 | 06.05.04 D07   |
| [8] ISRM0.4 Delivery Report  | 00.01.00 | 08.03.10 D06   |
| [9] Service Allocation for WP8 Fast Track 1                                  | 00.00.09 | Internal B04.03 document Service Allocation for WP8 Fast Track 1 |

**-END OF DOCUMENT-**

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