



PJ.15-01 TRL6

SubRegionalDCBCOSER

Service Description

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COSER

PJ15-01 SUB-REGIONAL DCB COMMON SERVICES

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Abstract

This document provides the description of the SubRegionalDCBCOSER Service that supports the provision of the Sub-Regional Demand Capacity Balancing (DCB) Common Service for TRL-6 maturity phase.



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1 Executive Summary

The Sub-Regional Demand Capacity Balancing (DCB) aims to contribute to a better usage of the airspace at sub-regional level, through enhanced planning and consequently more appropriate tactical intervention in support of AU and AO operations. In addition to the expected benefits in airspace capacity and fuel efficiency areas, an improvement in cost efficiency for the concerning stakeholders is also foreseen¹. The Sub-regional Demand Capacity Balancing (DCB) Common Service aims to enable Sub-Regional Demand Capacity Balancing (DCB) by reducing cost through the provision of a common service.

In TRL2 and TRL-4, PJ.15-01 described the scenarios where this Common Service could be provided, from a business perspective. The Business Model that captures these scenarios has been updated for the TRL-6 phase [2].

In line with this, this document has been updated as well to reflect the changes in SubRegionalDCBCOSER Service description from TRL-4 to TRL-6. The main changes can be observed in the System layer, where the architecture description provides an overview of the three services that have been identified and described in TRL-6. These three services have also been prototyped and used in two distinct technical validation exercises.

Please note that although two different scenarios were identified in PJ.15-01 TRL-6 Sub-Regional DCB Business Model [2], it was decided that only one architecture description would be sufficient for them. The rationale is that the main difference between the two scenarios is the business value proposed to the consumers of the Common Service, however this difference has no impact on the architectural changes introduced by the provision of Common Service, in terms of who the actors are and what information/data is being exchanged between them.

Following the Architecture steering principles provided by PJ19, existing architecture elements have been reused wherever possible. The identification and definition of new elements has been done only where deemed strictly necessary.

¹ Note that Demand Capacity Balancing concept is generated through Network Services solutions and the benefits associated with these solutions are Punctuality, Delay Reduction, Fuel Efficiency, etc. Sub-Regional DCB Common Service is focused on providing DCB services at a reduced cost, therefore cost efficiency is the benefit measured.

2 Introduction

2.1 Purpose of the document

This document describes the SubRegionalDCBCOSER Service for the Sub-Regional Demand and Capacity Balancing (DCB) Common Service. It follows the architecting approach defined in the Common Services Foundation Method [1] from SESAR 1 and uses the Business Model [2] previously produced in PJ.15-01 to provide the definition of operational, service and system architectures for the Sub-Regional DCB Common Service.

2.2 Intended readership

The intended audience for this document is the SESAR Joint Undertaking, the members in the SESAR 2020 Programme, the ATM stakeholders (e.g. Airspace Users, ANSPs, Airports, and manufacturing industry) with those third parties directly affected by its findings and the contributions having dependencies with the Solution such as PJ09.

Other transversal projects, such as PJ19, and tasks within the SESAR 2020 Programme may also have an interest.

The document also provides inputs for future work in PJ.15-01 regarding the service definition activities.

2.3 Inputs from other projects

The basic notions of the Sub-Regional DCB Common Service are described by PJ.15-01 in its TRL-6 Business Model document [2], including the potential customers of the service, the value propositions and the information flows needed between the stakeholders.

The concept of the DCB operations, although not always focused on the specificities of the Sub-Regional dimension, were widely developed in SESAR 1 Programme, mainly by WP07 and WP13.

In SESAR2020, the fundamentals of the Sub-Regional DCB are described in the SESAR2020 CONOPS [3], specifically based on the “Flow Manager” role. In addition, the DCB and NM concepts will further evolve in PJ09.

The reference architecture, including its individual elements, are from the EATMA Repository, which is maintained by using the MEGA modelling tool [4] and can be accessed via the European ATM Portal [5].

2.4 Structure of the document

The SDD is originally an annex of the TS/IRS document. However, given the specific nature of PJ.15 and after coordination with SJU, it was agreed that PJ15 Solutions would provide the SDD(s) as independent deliverable(s), by producing one SDD per service. Specifically, two SDD are expected to be delivered by PJ.15-01 for TRL-6 phase.



An initial skeleton of the document, including its structure and most of the diagrams and tables, was produced by using the automatic document generation capability of the MEGA tool. Later, the structure was tailored by PJ.15-01 to adapt it to its needs, and some of the sections were completed with textual descriptions and non-MEGA diagrams.

The structure of the document is as follows:

- Section 1 provides an executive summary.
- Section 2 introduces the document, by providing an explanation of the scope and purpose.
- Section 3 introduces the Service Description
- Section A.1 describes the Service Identification.
- Section A.2 describes the Information Exchange Requirements.
- Section A.3 gives an overview of the service functionality.
- Section A.4 describes the Service Interface Specifications.
- Sections A.5 and A.6 depict the payload exchanged through the service.
- Section A.7 describes the dynamic behavior of the service.

2.5 Glossary of basic concepts

Term	Definition	Source
Capability	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.	PJ19: EATMA Guidance Material and Report (2017) [12]
Capability Configuration	A Capability Configuration is a combination of Roles and Technical Systems configured to provide a Capability derived from operational and/or business need(s) of a stakeholder type.	PJ19: EATMA Guidance Material and Report (2017) [12]
Common Service	A service providing a capability in the same form to consumers that might otherwise have been undertaken by themselves.	SESAR B04.05 D02
Consumer	A user of a service	SESAR B04.05 D02
Customer	A consumer of a service under a specific contract.	SESAR B04.05 D02
Demand and Capacity Balancing	Assessment and balancing of demand and capacity at network and airport level to provide the NOP/AOP for the day of operation.	EATMA V12 – ATM Capability Model
Flow Manager	The Flow Manager is a role performed at sub-regional level which contributes to the Network Management Function.	SESAR2020 Concept of Operations Edition 2017

Node	A logical entity that performs activities. Note: nodes are specified independently of any physical realisation.	PJ19: EATMA Guidance Material and Report (2017) [12]
Operational Node Interaction Description (NOV-2)	Defines the nodes and describe information exchanges and (services between nodes). Mapping capability and nodes. In EATMA it is a high-level communication material	PJ19: EATMA Guidance Material and Report (2017) [12]
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.	PJ19: EATMA Guidance Material and Report (2017) [12]
Service contract (SLA)	A service contract represents an agreement between the stakeholders involved for how a service is to be provided and consumed. A service contract is specified through the service interface, the QoS and Service policies.	SESAR B.04.03 – Working method on service
Service instance	Service which has been implemented in accordance with its specification in the service catalogue (during the SESAR Development Phase, the service definitions are available in the ISRM) by a service provider (by itself or contracted to a third party).	SESAR B.04.03 – Working method on service
Service Provider	An organisation supplying services to one or more internal or external consumers.	SESAR B.04.05 – D02
Service taxonomy	The service taxonomy describes the categorisation of services provided between ATM stakeholders. It is used to organise the responsibilities of the service design as well as to provide a means of identifying services in the run-time environment.	SESAR B.04.03 – Working method on service
Stakeholder	A stakeholder is an individual, team, or organization (or classes thereof) with interest in, or concerns relative to, an enterprise (e.g. the European ATM). Concerns are those interests, which pertain to the enterprise's development, its operation or any other aspect that is critical or otherwise important to one or more stakeholders.	PJ19: EATMA Guidance Material and Report (2017) [12]
System Interface Description (NSV-1)	Links together the Operational View and the System View by depicting which systems and system connections realize which information exchanges. It is based on the definition of Capability Configurations and describes the assets, both technical and human which are required in order to provide capability.	PJ19: EATMA Guidance Material and Report (2017) [12]

Table 1: Glossary of basic concepts

2.6 Acronyms and Terminology

Term	Definition
ACC	Area Control Centre
AMAN	Arrival Manager (Controller Support Tool)
ANSP	Air Navigation Service Provider
AO	Airport Operator
AOP	Airport Operation Plan
ATFCM	Air Traffic Flow and Capacity Management
ATM	Air Traffic Management
ATS	Air Traffic Services
AU	Airspace Users
CC	Capability Configuration
CDM	Collaborative Decision Making
DCB	Demand and Capacity Balancing
DPI	Departure Planning Information
EATMA	European ATM Architecture
EOBT	Estimated Off-Block Time
ER	En-Route
FAB	Functional Airspace Block
FM	Flow Manager
KPI	Key Performance Indicator
MEP	Message Exchange Pattern
NAF	NATO Architecture Framework
NM	Network Manager
NOP	Network Operations Plan
NOV	NAF Operational View
NSV	NAF System View
PJ	Project
QoS	Quality of Service
SDD	Service Description Document
SESAR	Single European Sky ATM Research Programme
SID	Standard Instrument Departure
SJU	SESAR Joint Undertaking (Agency of the European Commission)
SLA	Service level Agreement



STAM	Short Term ATFCM Measures
STAR	Standard Terminal Arrival Route
SUA	Special Use Area
TRL	Technology Readiness Level
TTA	Target Time of Arrival
TWR	Tower (Capability Configuration in EATMA)

Table 2: Acronyms and Terminology

3 Scope of the Service Description

The main objective of the SubRegionalCOSER Service description is to describe the main architecture elements and their relationships across the different architecture layers of the Sub-Regional DCB Common Service. This description starts with the business and operational needs and goes down to the system resources that will need to collaborate with each other to meet these needs - supported by the services that enable the actual exchange of data.

The scope of this document is to provide the logical service definition that aims to support the provision of the Sub-Regional DCB Common Service, as defined by PJ.15-01. It includes artefacts such as service interfaces, service operations and service payload (data elements and entities), while maintaining a technology-agnostic nature, meaning that the definition of the service does not recommend or constrain any specific technology choices.

3.1 Sub-Regional DCB Common Service

Although the complete definition and the underlying principles of the Sub-Regional DCB Common Service can be found in the Business Model [2], some extracts are provided below to better understand the scope of this document.

Sub-regional activity takes management responsibility for the airspace for a number of geographically adjacent ACCs whilst presenting a single operational interface to the regional actor; representing the local actors, including Airports, within this airspace.

The objective of developing Sub-Regional DCB as a common service is to provide optimised operation of a highly integrated part of the network by working closely with the units to balance demand against the available capacity of the different stakeholders.

It is expected that Sub-regional DCB can be applied within a multi-ACC or multi-ANSP environment and facilitate an improved usage of the airspace at sub-regional level and facilitate tactical interventions when necessary, ensuring that any potential disruptions could be correctly managed.

3.1.1 Sub-Regional DCB Common Service Scenarios

In the Business Model, two potential scenarios have been identified as candidates for deployment:

- New Sub-Regional DCB Common Service. In this scenario an ANSP that does not provide or participate in any Sub-Region wish to do so in a multi-ACC environment.
- Refreshment of legacy Sub-Regional DCB Service. In this scenario an ANSP who was already part of a Sub-Region intends to migrate to a SESAR compliant service due to cost efficiency purposes.

4 Security Requirements

This section describes the Security Requirements. The security requirements are generated through analysis performed in the PJ15-01 Sub-Regional DCB TRL4 Security Assessment Reports [14][15][16].

Note that there are no Functional Security Requirements identified for the SubRegionalIDCBCOSER service.

Identifier	IER-15.01-SECR-101
Title	Background Verification Checks.
Requirement	Background verification checks on all staff shall be carried out in accordance with relevant laws, regulation, and ethics. The checks shall be proportional to the roles and responsibilities.
Status	<In Progress>
Rationale	ISO 27001 Control Set Requirement
Category	<Security>

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ.15.01

Identifier	IER-15.01-SECR-102
Title	Staff Awareness Training
Requirement	Staff shall receive appropriate awareness training and regular updates in organisational policies and procedures, as relevant for their job function.
Status	<Validated>
Rationale	ISO 27001 Control Set Requirement
Category	<Security>

[REQ Trace]



Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ.15.01

Identifier	IER-15.01-SECR-103
Title	Formal Exchange Policies
Requirement	Formal exchange policies, procedures, and controls shall be in place to protect the exchange of ATM services and information through the use of all types of communication facilities
Status	<In Progress>
Rationale	ISO 27001 Control Set Requirement
Category	<Security>

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ.15.01

Identifier	IER-15.01-SECR-104
Title	ATM Networks Management and control
Requirement	ATM Networks shall be adequately managed and controlled, in order to be protected from threats, and to maintain security for the ATM systems and applications using the network, including information in transit.
Status	<In Progress>
Rationale	ISO 27001 Control Set Requirement
Category	<Security>

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ.15.01

Identifier	IER-15.01-SECR-105
Title	Information Storage and Exchange Confidentiality and Criticality
Requirement	Information storage and exchange means shall be defined according to information confidentiality/criticality level.
Status	<In Progress>
Rationale	ISO 27001 Control Set Requirement
Category	<Security>

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ.15.01

Identifier	IER-15.01-SECR-106
Title	ATM Security Perimeters and Sensitive Areas
Requirement	Security perimeters shall be used to protect ATM sensitive areas and ATM processing facilities.
Status	<In Progress>
Rationale	ISO 27001 Control Set Requirement
Category	<Security>

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ.15.01

Identifier	IER-15.01-SECR-107
Title	ATM Secure Areas Access Controls
Requirement	ATM secure areas shall be protected by appropriate entry controls which allow access only to authorized personnel and which detect unauthorized access
Status	<In Progress>
Rationale	ISO 27001 Control Set Requirement
Category	<Security>

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ.15.01

Identifier	IER-15.01-SECR-108
Title	ATM Cabling Protection
Requirement	ATM cabling shall be protected from deliberate damage, eavesdropping or interference.
Status	<In Progress>
Rationale	ISO 27001 Control Set Requirement
Category	<Security>

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ.15.01

Identifier	IER-15.01-SECR-109
Title	ATM Equipment Maintenance
Requirement	ATM equipment shall be maintained and serviced to ensure their availability and integrity



Status	<In Progress>
Rationale	ISO 27001 Control Set Requirement
Category	<Security>

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ.15.01

Identifier	IER-15.01-SECR-110
Title	Detection, prevention, and recovery controls
Requirement	Detection, prevention, and recovery controls to protect ATM software against malicious code and appropriate user awareness procedures shall be implemented.
Status	<In Progress>
Rationale	ISO 27001 Control Set Requirement
Category	<Security>

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ.15.01

Identifier	IER-15.01-SECR-111
Title	Access Control Policies
Requirement	An access control policy shall be established, documented, and reviewed based on business and security requirements for access.
Status	<In Progress>
Rationale	ISO 27001 Control Set Requirement
Category	<Security>

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ.15.01

Identifier	IER-15.01-SECR-112
Title	Protection of authentication information or devices
Requirement	User shall be required to follow good security practices in the protection of authentication information or devices.
Status	<In Progress>
Rationale	ISO 27001 Control Set Requirement
Category	<Security>

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ.15.01

Identifier	IER-15.01-SECR-113
Title	Access Control Lists
Requirement	To have control about the ACCs that request information to a provider using an Access Control Lists.
Status	<In Progress>
Rationale	ISO 27001 Control Set Requirement
Category	<Security>

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ.15.01

5 References and Applicable documents

- [1] SESAR B.04.05 D15 Common Service Foundation Methodology, Edition 00.02.01
- [2] SESAR2020 PJ15 D2.1.060 Sub-Regional DCB TRL-6 Business Model, Edition 00.01.02
- [3] SESAR2020 PJ19 D2.1 Concept of Operations Edition 2017, Edition 01.00.00
- [4] MEGA Web Access:
https://www.srvs.nm.eurocontrol.int/mega_prod/hopex/megaauthentication.aspx
- [5] <https://www.eatmportal.eu/working/signin>
- [6] ICAO Doc 9854, Global Air Traffic Management Operational Concept, First Edition – 2005
- [7] SESAR2020 PJ15 D2.1.060 Sub-Regional DCB TRL-6 Business Model, Edition 00.01.0-
- [8] SESAR2020 PJ15 D2.1.110 Sub-Regional DCB TRL-6 High-Level Architecture Description, Edition 00.01.00
- [9] SESAR2020 PJ15 D2.1.040 Technical Validation Plan for the Sub-Regional DCB Common Service (TRL-6), Edition 00.00.06
- [10] SESAR 2020 PJ19 D3.2 Service Portfolio 2017 Edition 00.01.00
- [11] EATMA V12
- [12] PJ19: EATMA Guidance Material and Report (2017)
- [13] PJ09 OSED-SPR-Interop – Part 1 (2019)
- [14] PJ15-01 Sub-Regional DCB TRL4 Security Assessment Report PJ15-01 Part A, Edition 00.01.02
- [15] PJ15-01 Sub-Regional DCB TRL4 Security Assessment Report PJ15-01 Part B, Edition 00.01.02
- [16] PJ15-01 Sub-Regional DCB TRL4 Security Assessment Report PJ15-01 Part C, Edition 00.01.02

Appendix A

A.1 Service Identification

Name of the Service	SubRegionalDCBCOSER
Identifier	yfUuDLkUQnsF
Version	EATMA Draft
Architect(s)	WITHERINGTON Mark
Last Modification Date	10/9/2019

Table 3: Service identification (I)

IOC	
FOC	12/31/2029

Table 4: Service Identification (II)

A.2 Information Exchange Requirements

Information Exchange requirements have been incorporated within the 15-01 High Level Architecture Description [8]. The information requirements have been developed from the NOV-2 (Operational Node Context Diagram) Sub-regional DCB Common Service – New Service Scenario detailed in the 15-01 High Level Architecture Description [8].

A.3 Service Overview

A.3.1 Service Taxonomy

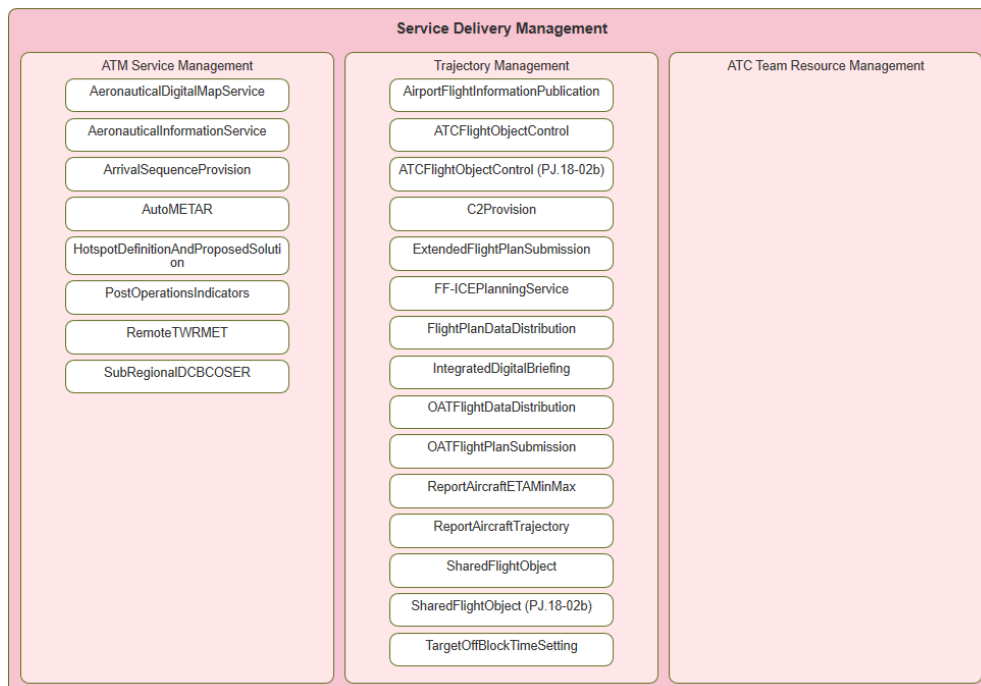


Table 5: Service Taxonomy

A.3.2 Service Levels (NFRs)

To ensure that the service is designed in such a way that is ready to support the exchange of information between the stakeholders, and thus effectively contribute to the achievement of the Sub-Regional DCB Common Service, a set of indicators have been defined in PJ.15-01 to measure the Quality of Service (QoS).

For each of the indicators, a success threshold (minimum value to be achieved) has been set by expert judgement, by considering the overall validation objectives for TRL-6 as well as the context where the technical validation exercises will be taking place. These indicators will be used as driver for the development and integration activities, and the technical validation results should capture the degree of compliance regarding these indicators and the success thresholds.

Table 6 provides the list of the indicators defined in PJ.15-01 for TRL-6 phase, along with their definition and their success threshold.

Indicator	Definition	Success threshold
Service availability	Percentage of time that the service is up and running	Greater than or equal to 95%
Message integrity	Percentage of messages transmitted by the service provider that correctly reaches the consumer system	Greater than or equal to 95%
Data integrity	For each message that correctly reaches the consumer system, the percentage of attributes that have been received with no error or corruption	Greater than or equal to 95%
Time of response	Time that it takes for the service provider to process the service request and generate the required output ready to be distributed to the consumer	Smaller than or equal to 2 seconds
Time of transmission	Time that it takes for a message to go from the provider system to the consumer system	Smaller than or equal to 5 seconds

Table 6: Quality of Service for SubRegionalDCBCOSER service in TRL-6

A.3.3 Service Functions and Capabilities

Table 7 shows that the “SubRegionalDCBCOSER” service is supporting the “Sub-Regional DCB Common Service Provision” Capability in the EATMA V12 Capability Model. It is a Level 3 capability which falls under the “Service Delivery Management” capability area. The complete Capability model can be found at <https://www.eatmportal.eu/working/rnd/atm-capability-model>

Supported Capability	Parent Capability	Level 1 Capability
Air Traffic Flow Management		
	Demand and Capacity Balancing (airspace)	
		Demand and Capacity Balancing
Sub-regional DCB Common Service Management		
	ATM Service Management	

		Service Delivery Management
--	--	-----------------------------

Table 7: EATMA Capability supported by Service

A.3.4 Service Interfaces

Table 8 provides the description of the SubRegionalDCBCOSER Service.

Service Name	Description
SubRegionalDCBCOSER	The SubRegionalDCBCOSER Service allows the consumer to get information related to the Hotspots, the imbalances and flights identified at a sector or group of sectors belonging to the same Sub-Region, via a Request/Reply pattern. The SubRegionalDCBCOSER service also the consumer to get information related to the Special Use Areas (SUAs) that are relevant to the area of interest. The identification of imbalances is generated by using the local capacity plans and the demand forecast provided by the NM, and the imbalances can be identified by using different KPI (short-term flight entries, controller workload, sector occupancy, etc.).

Table 8: Description of the Service

The SubRegionalDCBCOSER service has two service interfaces, as shown in Figure 1 below.

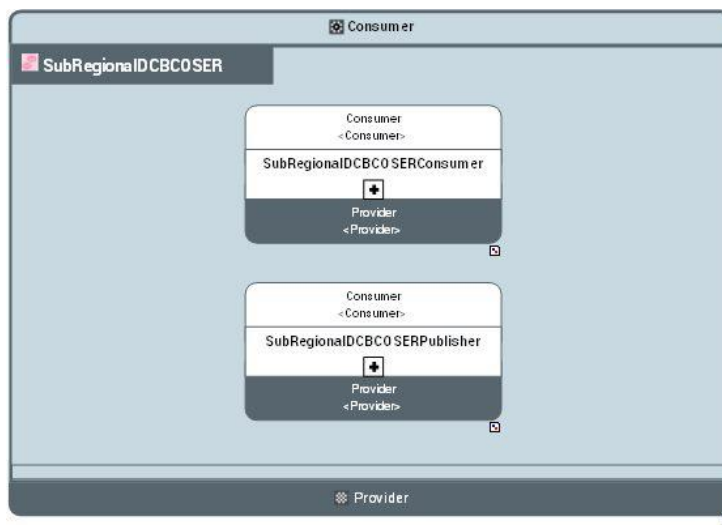


Figure 1: Service to Service Interface mapping

The Table 9 summarizes the interfaces of the SubRegionalDCBCOSER Service, along with their description. These are further specified in the next section.

Service Interface Definition	Description
SubRegionalDCBCOSERConsumer	<p>This interface is the consuming interface to receive the Area of Interest data including Control Centre and Default Sector Configuration data. This interface also responds to requests for the following data generated by the provider:</p> <ul style="list-style-type: none"> · Hotspot data,

	<ul style="list-style-type: none"> · SUA reservation data, · KPI data, · Overload data · Imbalance data · Flight Data · Reference Location data, · Sector Flights.
SubRegionalDCBCOSERPublisher	<p>This interface is the providing interface to receive a subscription or an unsubscription from the consumer, as well as the request for receiving the following data:</p> <ul style="list-style-type: none"> · Hotspot data, · SUA reservation data, · KPI data, · Overload data · Imbalance data · Flight Data · Reference Location data, · Sector Flights.

Table 9: Service Interface description

A.4 Service interface specifications

A.4.1 SubRegionalDCBCOSERConsumer

This interface is the consuming interface to receive the sub-regional imbalance data generated by the provider and the notifications about its availability, as illustrated in Figure 2Figure 5.

The interface design is using a standard Request/Reply Message Exchange Pattern (MEP).



Figure 2: “SubRegionalDCBCOSERConsumer” Interface Exchange diagram

This interface owns two Service Operations, as shown in Table 10 below. The next sub-sections will further specify the operations.

Service Operation	Invoker participant	Input parameter	Invoked participant	Return
publishAllControlCentres	<Provider>	AllControlCentreListRequest	<Consumer>	-
publishDefaultSectorConfiguration	<Provider>	SectorConfigurationListRequest	<Consumer>	-

Table 10: Operations of the “SubRegionalDCBCOSERConsumer” Interface

A.4.1.1 Operation publishAllControlCentres

Operation on the provider side to distribute all Flow Manager Centres and the list of Local Area Group Identities for each one.

The sequence of the exchanges needed to complete this operation is illustrated in Figure 3, while Table 11 captures the input and return payloads. For this operation, the service provider (<Provider> in Figure 2) is the invoker participant and the service consumer (<Consumer> in Figure 2) is the invoked participant.

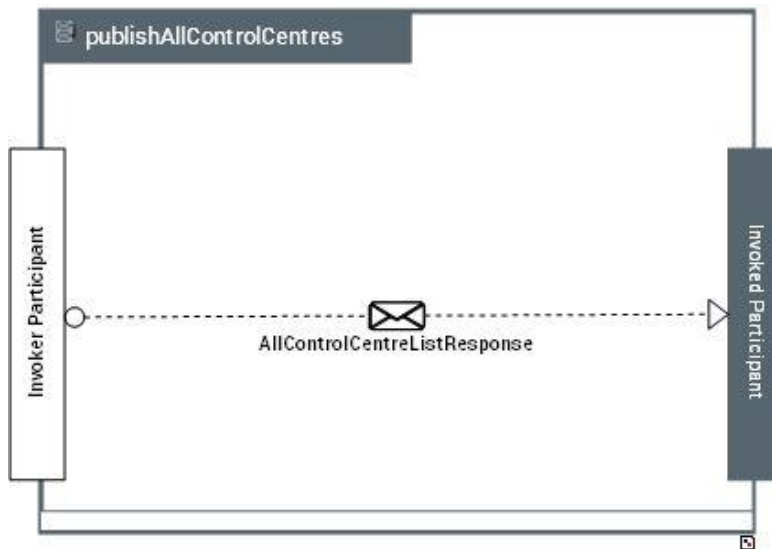


Figure 3: “publishAllControlCentres” Operation Exchange diagram

Input	Service Payload	CLDM Data Entity
	AllControlCentreListResponse	AllControlCentreList

Table 11: “publishAllControlCentres” operation parameters

A.4.1.2 Operation publishDefaultSectorConfiguration

This operation will provide all Flow Manager Centres and the list of Local Area Group Identities for each one.

The sequence of the exchanges needed to complete this operation is illustrated in Figure 4, while Table 12 captures the input and return payloads. For this operation, the service provider (<Provider> in Figure 2) is the invoker participant and the service consumer (<Consumer> in Figure 2) is the invoked participant.

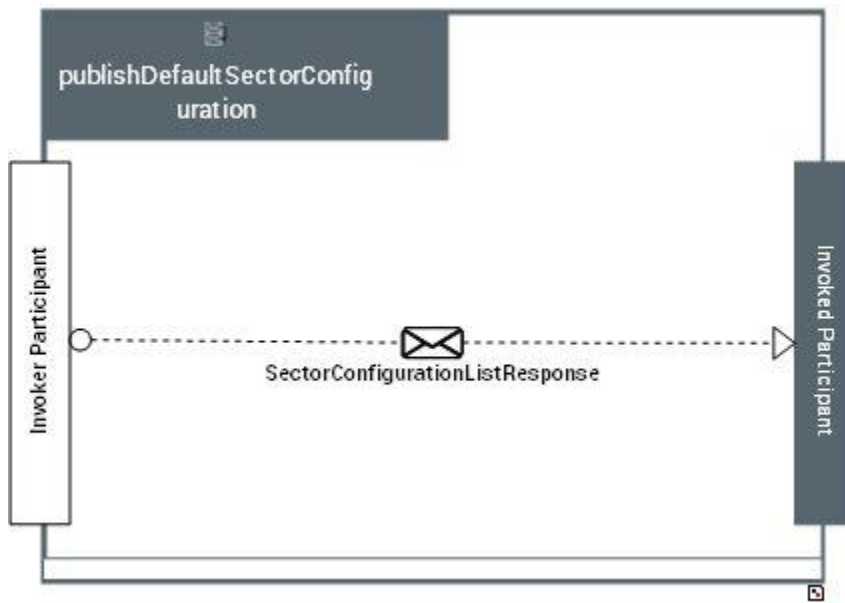


Figure 4: “publishDefaultSectorConfiguration” Operation Exchange diagram

Input	Service Payload	CLDM Data Entity
	SectorConfigurationListResponse	SectorConfigurationPlan

Table 12: “publishDefaultSectorConfiguration” operation parameters

A.4.2 SubRegionalDCBCOSERProvider

This interface is the providing interface to receive a subscription or an unsubscription request for sub-regional imbalance data from the consumer, as illustrated in Figure 5.

The interface design is using a standard Publish/Subscribe MEP.

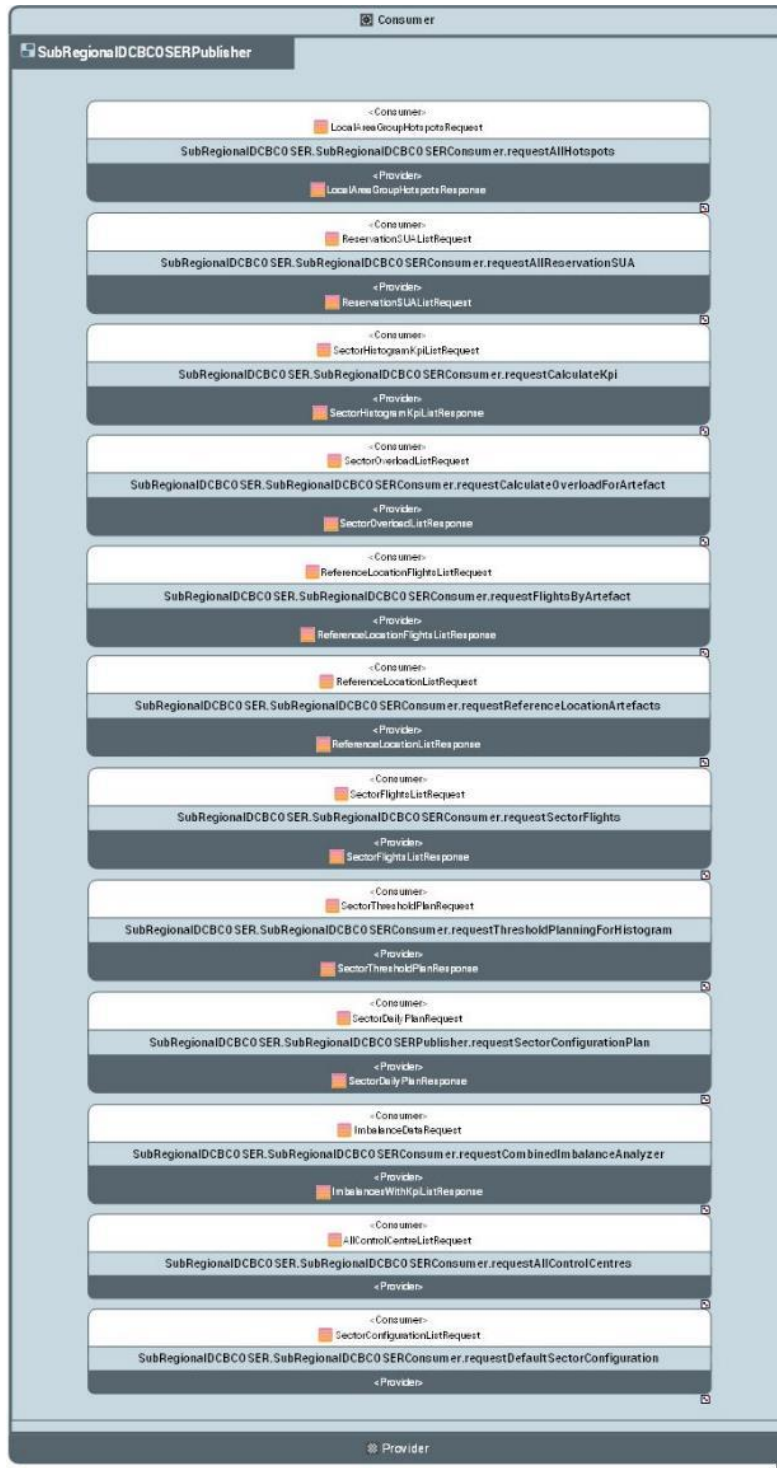


Figure 5: “SubRegionalDCBCOSERProvider” Interface Exchange diagram



This interface owns three Service Operations, as shown in Table 13 below. The next sub-section will further specify the operations.

Service Operation	Invoker participant	Input parameter	Invoked participant	Return
requestAllHotspots	<Consumer>		<Provider>	
requestAllReservationSUA	<Consumer>		<Provider>	
requestCalculateKpi	<Consumer>		<Provider>	
requestCalculateOverloadForArtefact	<Consumer>		<Provider>	
requestFlightsByArtefact	<Consumer>		<Provider>	
requestReferenceLocationArtefacts	<Consumer>		<Provider>	
requestSectorFlights	<Consumer>		<Provider>	
requestThresholdPlanningForHistogram	<Consumer>		<Provider>	
requestSectorConfigurationPlan	<Consumer>		<Provider>	
requestCombinedImbalanceAnalyser	<Consumer>		<Provider>	
requestAllControlCentres	<Consumer>		<Provider>	
requestDefaultSectorConfiguration	<Consumer>		<Provider>	

Table 13: Operations of the “SubRegionalDCBCOSERProvider” Interface

A.4.2.1 Operation requestAllHotspots

Operation on the consumer side to distribute a request for Hotspots for the selected Local Area Group. Operation on the provider side to distribute Hotspots for the selected Local Area Group.

The sequence of the exchanges needed to complete this operation is illustrated in Figure 6, while Table 14 captures the input and return payloads. For this operation, the service consumer (<Consumer> in Figure 5) is the invoker participant and the service provider (<Provider> in Figure 5) is the invoked participant.

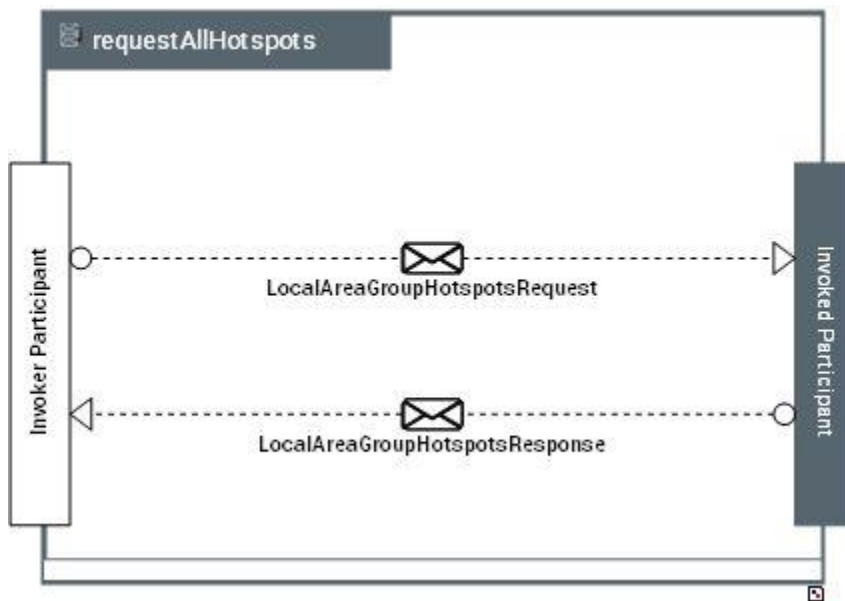


Figure 6: “requestAllHotspots” Operation Exchange diagram

Input	Service Payload	CLDM Data Entity
	LocalAreaGroupHotspotsRequest	LocalAreaGroupHotspotRequest
Return	Service Payload	CLDM Data Entity
	LocalAreaGroupHotspotsResponse	LocalAreaGroupHotspotList

Table 14: “requestAllHotspots” operation parameters

A.4.2.2 Operation requestAllReservationSUA

Operation on the consumer side to distribute a request all the available SUAs Reservations for the RSA Designators equal to EG*. Operation on the provider side to distribute the list of all the available SUAs Reservations for the RSA Designators equal to EG*.

The sequence of the exchanges needed to complete this operation is illustrated in Figure 7, while Table 15 captures the input and return payloads. For this operation, the service consumer (<Consumer> in Figure 5) is the invoker participant and the service provider (<Provider> in Figure 5) is the invoked participant.

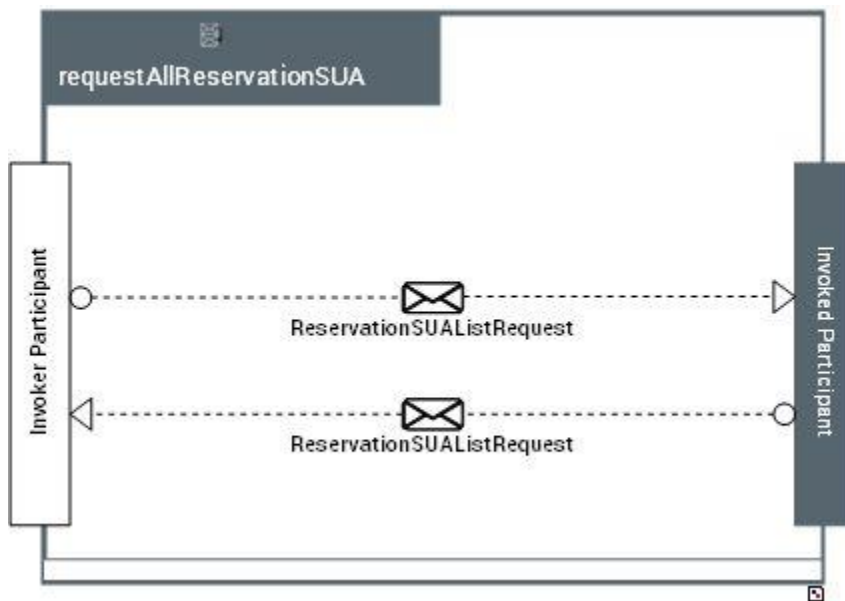


Figure 7: “requestAllReservationSUA” Operation Exchange diagram

Input	Service Payload	CLDM Data Entity
	ReservationSUAListRequest	ReservationSuaListRequest
Return	Service Payload	CLDM Data Entity
	ReservationSUAListRequest	ReservationSuaListRequest

Table 15: “requestAllReservationSUA” operation parameters

A.4.2.3 Operation requestCalculateKpi

Operation on the consumer side to distribute a request for a Histogram with its KPI values for a specified time interval. Operation on the provider side to distribute the Histogram with its KPI values and colour coding per each step for the selected Operational Sector and Time Interval.

The sequence of the exchanges needed to complete this operation is illustrated in Figure 8, while Table 16 captures the input and return payloads. For this operation, the service consumer (<Consumer> in Figure 5) is the invoker participant and the service provider (<Provider> in Figure 5) is the invoked participant.

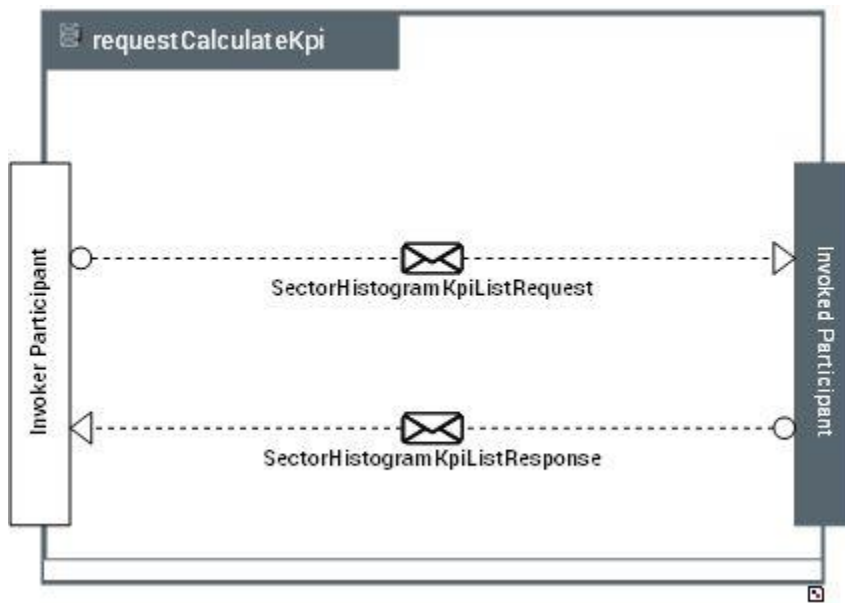


Figure 8: “requestCalculateKpi” Operation Exchange diagram

Input	Service Payload	CLDM Data Entity
	SectorHistogramKpiListRequest	SectorHistogramKpiListRequest
Return	Service Payload	CLDM Data Entity
	SectorHistogramKpiListResponse	SectorHistogramKpiList

Table 16: “requestCalculateKpi” operation parameters

A.4.2.4 Operation requestCalculateOverloadForArtefact

Operation on the consumer side to distribute a request for a Reference Location Histogram with KPI values and colour coding for the selected Reference Location and Time Interval. Operation on the provider side to distribute the Reference Location Histogram with KPI values and colour coding for the selected Reference Location and Time Interval.

The sequence of the exchanges needed to complete this operation is illustrated in, while Table 17 captures the input and return payloads. For this operation, the service consumer (<Consumer> in Figure 5) is the invoker participant and the service provider (<Provider> in Figure 5) is the invoked participant.

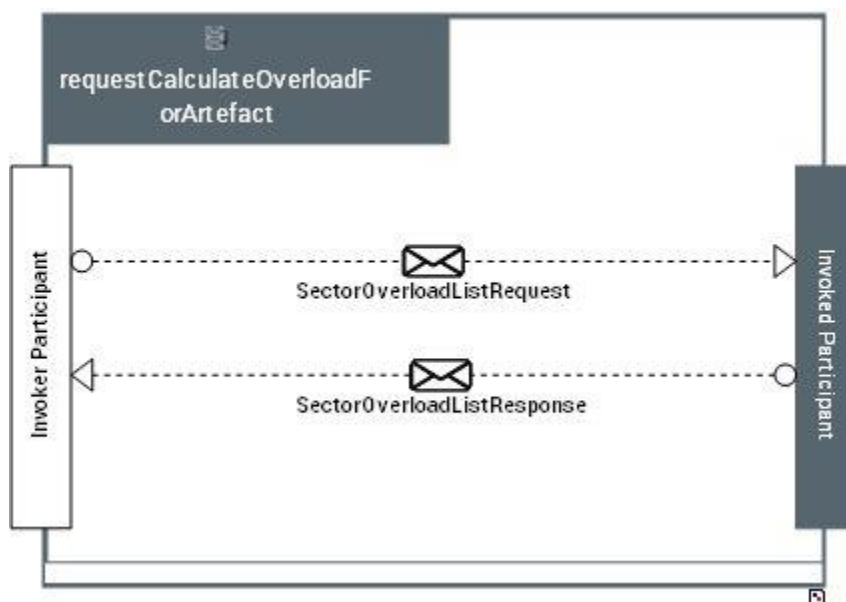


Figure 9: “requestCalculateOverloadForArtefact” Operation Exchange diagram

Input	Service Payload	CLDM Data Entity
	SectorOverloadListRequest	SectorOverloadListRequest
Return	Service Payload	CLDM Data Entity
	SectorOverloadListResponse	SectorOverloadList

Table 17: “requestCalculateOverloadForArtefact” operation parameters

A.4.2.5 Operation requestFlightsByArtefact

Operation on the consumer side to distribute a request for Flights for the selected Reference Location and Time Interval. Operation on the provider side to distribute the Flights for the selected Reference Location and Time Interval.

The sequence of the exchanges needed to complete this operation is illustrated in Figure 10, while Table 18 captures the input and return payloads. For this operation, the service consumer (<Consumer> in Figure 5) is the invoker participant and the service provider (<Provider> in Figure 5) is the invoked participant.

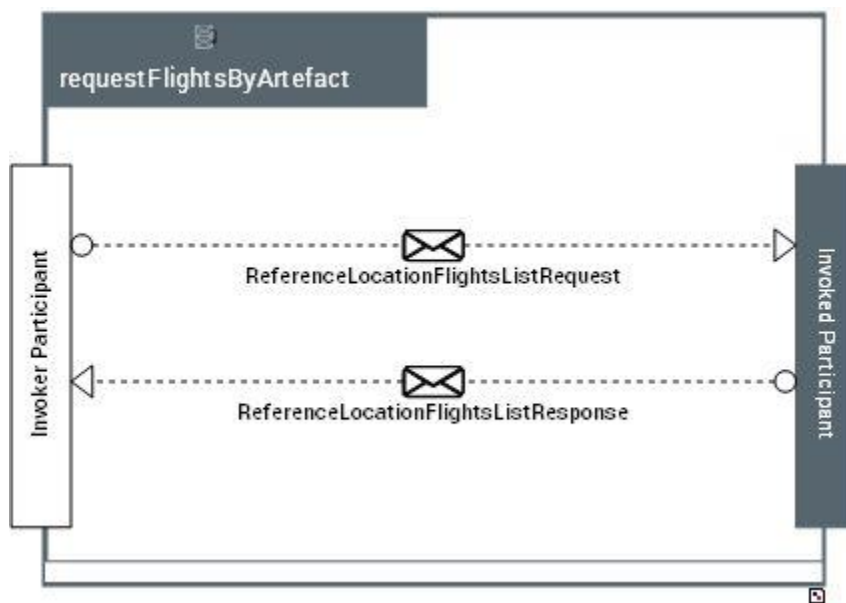


Figure 10: “requestFlightsByArtefact” Operation Exchange diagram

Input	Service Payload	CLDM Data Entity
	ReferenceLocationFlightsListRequest	ReferenceLocationFlightsListRequest
Return	Service Payload	CLDM Data Entity
	ReferenceLocationFlightsListResponse	ReferenceLocationFlightsList

Table 18: “requestFlightsByArtefact” operation parameters

A.4.2.6 Operation requestReferenceLocationArtefacts

Operation on the consumer side to distribute a request for the Reference Location for an input List of Local Area Groups. Operation on the provider side to distribute the Reference Location for an input List of Local Area Groups.

The sequence of the exchanges needed to complete this operation is illustrated in Figure 11, while Table 19 captures the input and return payloads. For this operation, the service consumer (<Consumer> in Figure 5) is the invoker participant and the service provider (<Provider> in Figure 5) is the invoked participant.

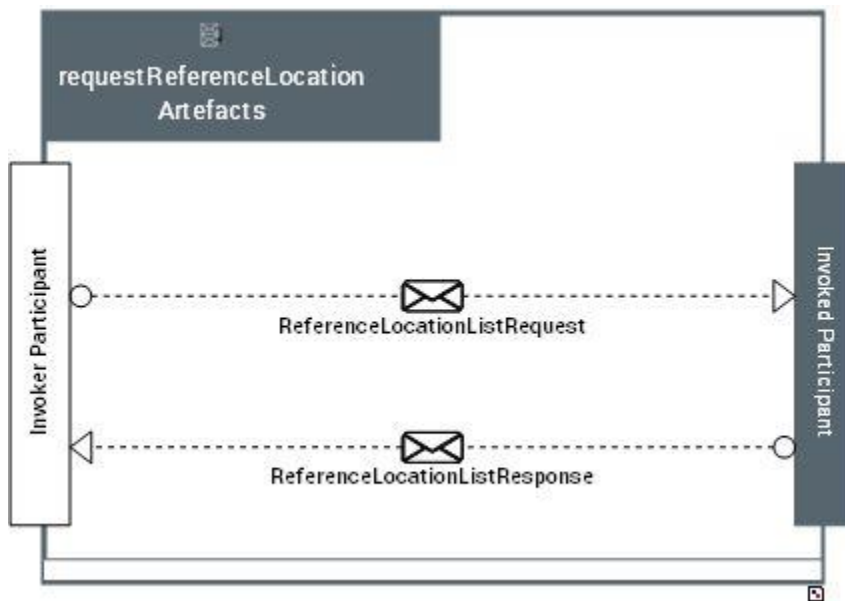


Figure 11: “requestReferenceLocationArtefacts” Operation Exchange diagram

Input	Service Payload	CLDM Data Entity
	ReferenceLocationListRequest	ReferenceLocationListRequest
Return	Service Payload	CLDM Data Entity
	ReferenceLocationListResponse	ReferenceLocationList

Table 19: “requestReferenceLocationArtefacts” operation parameters

A.4.2.7 Operation requestSectorFlights

Operation on the consumer side to distribute a request to obtain flights for the selected Operational Sector, Time Interval and KPI. Operation on the provider side to distribute the flights for the selected Operational Sector, Time Interval and KPI.

The sequence of the exchanges needed to complete this operation is illustrated in Figure 12, while Table 20 captures the input and return payloads. For this operation, the service consumer (<Consumer> in Figure 5) is the invoker participant and the service provider (<Provider> in Figure 5) is the invoked participant.

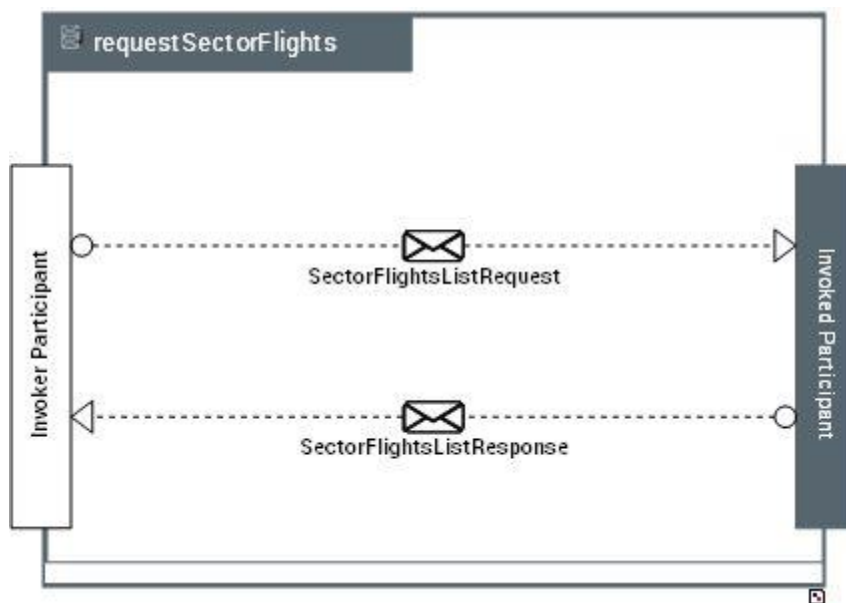


Figure 12: “requestSectorFlights” Operation Exchange diagram

Input	Service Payload	CLDM Data Entity
	SectorFlightsListRequest	SectorFlightListRequest
Return	Service Payload	CLDM Data Entity
	SectorFlightsListResponse	SectorFlightList

Table 20: “requestSectorFlights” operation parameters

A.4.2.8 Operation requestThresholdPlanningForHistogram

Operation on the consumer side to distribute a request to obtain flights for the selected Operational Sector, Time Interval and KPI. Operation on the provider side to distribute the flights for the selected Operational Sector, Time Interval and KPI

The sequence of the exchanges needed to complete this operation is illustrated in Figure 13, while Table 21 captures the input and return payloads. For this operation, the service consumer (<Consumer> in Figure 5) is the invoker participant and the service provider (<Provider> in Figure 5) is the invoked participant.

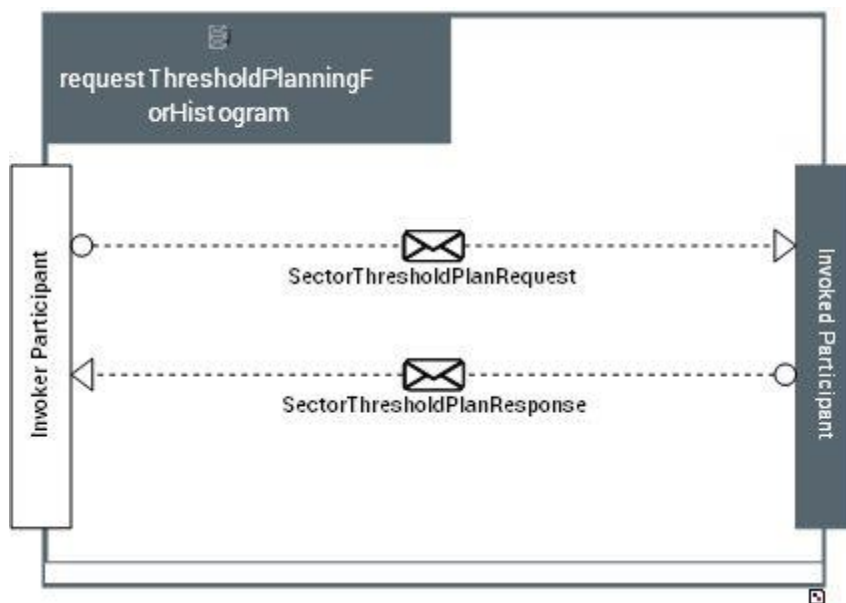


Figure 13: “requestThresholdPlanningForHistogram” Operation Exchange diagram

Input	Service Payload	CLDM Data Entity
	SectorThresholdPlanRequest	SectorThresholdPlanRequest
Return	Service Payload	CLDM Data Entity
	SectorThresholdPlanResponse	SectorThresholdPlan

Table 21: “requestThresholdPlanningForHistogram” operation parameters

A.4.2.9 Operation requestSectorConfigurationPlan

Operation on the consumer side to distribute a request for the current Sector Configuration Plan for the Agreed Plan within a Time Interval. Operation on the provider side to distribute the current Sector Configuration Plan for the Agreed Plan within a Time Interval.

The sequence of the exchanges needed to complete this operation is illustrated in Figure 14, while Table 22 captures the input and return payloads. For this operation, the service consumer (<Consumer> in Figure 5) is the invoker participant and the service provider (<Provider> in Figure 5) is the invoked participant.

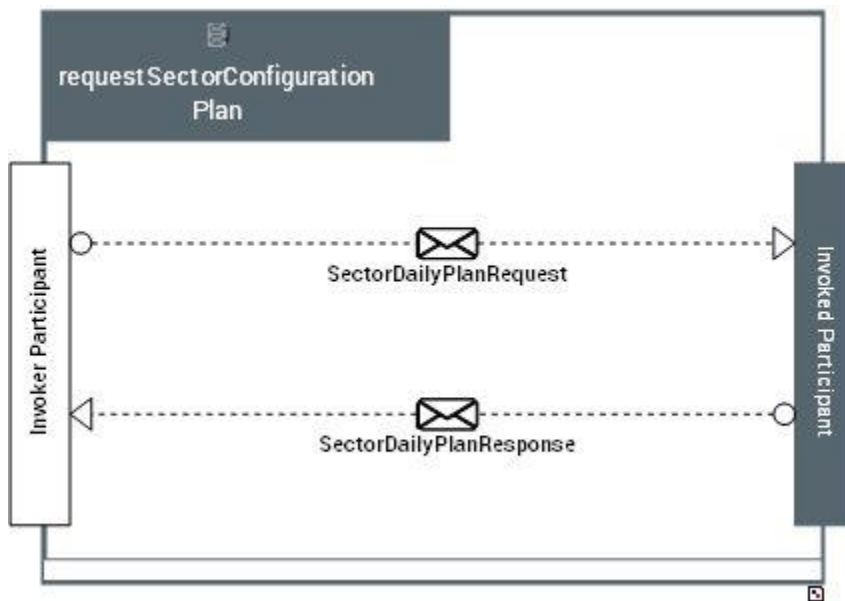


Figure 14: “requestSectorConfigurationPlan” Operation Exchange diagram

Input	Service Payload	CLDM Data Entity
	SectorDailyPlanRequest	SectorDailyPlanRequest
Return	Service Payload	CLDM Data Entity
	SectorDailyPlanResponse	SectorDailyPlan

Table 22: “requestSectorConfigurationPlan” operation parameters

A.4.2.10 Operation requestCombinedImbalanceAnalyser

Operation on the consumer side to distribute a request for all the Imbalances for one requested KPI with a requested Step and LAG within a given time interval. Operation on the provider side to distribute the Imbalances for one requested KPI with a requested Step and LAG within a given time interval.

The sequence of the exchanges needed to complete this operation is illustrated in Figure 15, while Table 23 captures the input and return payloads. For this operation, the service consumer (<Consumer> in Figure 5) is the invoker participant and the service provider (<Provider> in Figure 5) is the invoked participant.

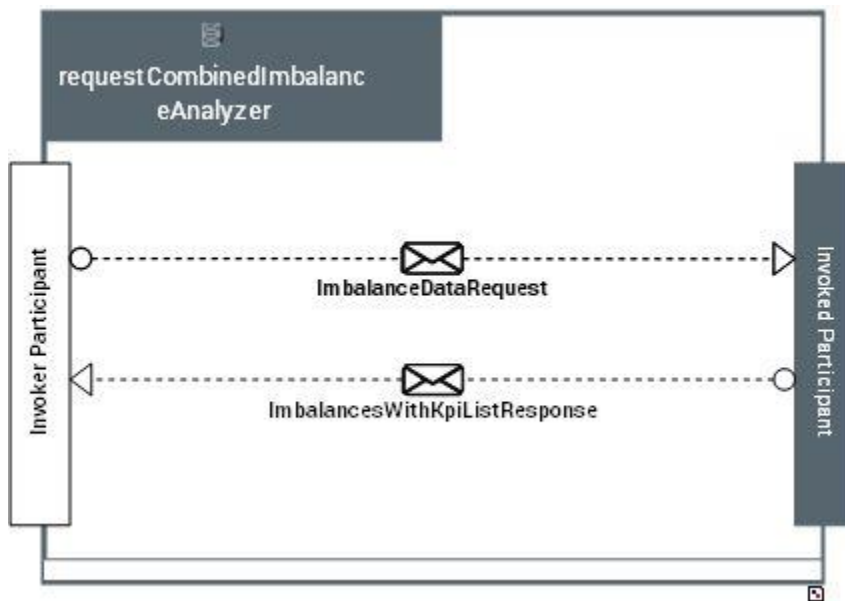


Figure 15: “requestCombinedImbalanceAnalyser” Operation Exchange diagram

Input	Service Payload	CLDM Data Entity
	ImbalanceDataRequest	ImbalanceDataRequest
Return	Service Payload	CLDM Data Entity
	ImbalancesWithKpiListResponse	ImbalanceDataResponse

Table 23: “requestCombinedImbalanceAnalyser” operation parameters

A.4.2.11 Operation requestAllControlCentres

Operation on the provider side to distribute all Flow Manager Centres and the list of Local Area Group Identities for each one.

The sequence of the exchanges needed to complete this operation is illustrated in Figure 16, while Table 24 captures the input and return payloads. For this operation, the service consumer (<Consumer> in Figure 5) is the invoker participant and the service provider (<Provider> in Figure 5) is the invoked participant.

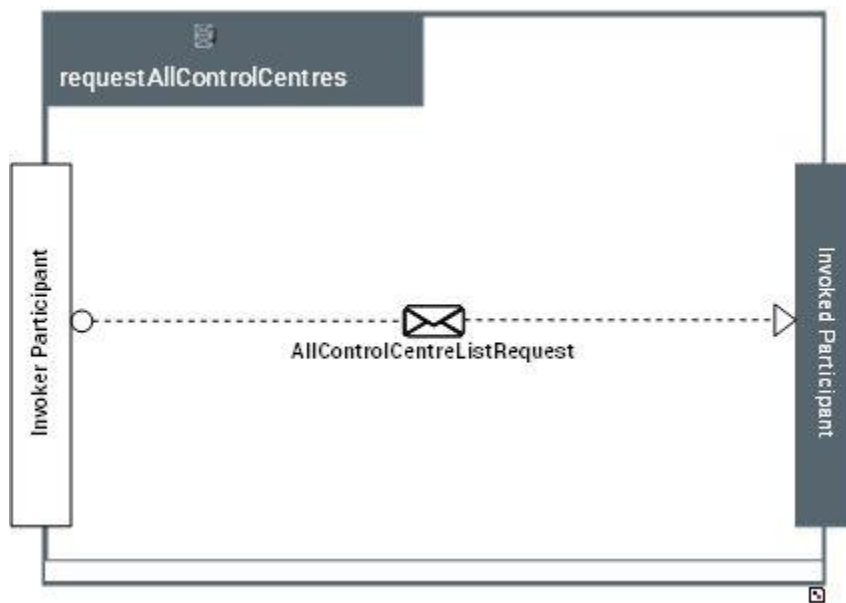


Figure 16: “requestAllControlCentres” Operation Exchange diagram

Input	Service Payload	CLDM Data Entity
	AllControlCentreListResponse	AllControlCentreList

Table 24: “requestAllControlCentres” operation parameters

A.4.2.12 Operation requestDefaultSectorConfiguration

This operation will provide all Flow Manager Centres and the list of Local Area Group Identities for each one.

The sequence of the exchanges needed to complete this operation is illustrated in Figure 17, while Table 25 captures the input and return payloads. For this operation, the service consumer (<Consumer> in Figure 5) is the invoker participant and the service provider (<Provider> in Figure 5) is the invoked participant.

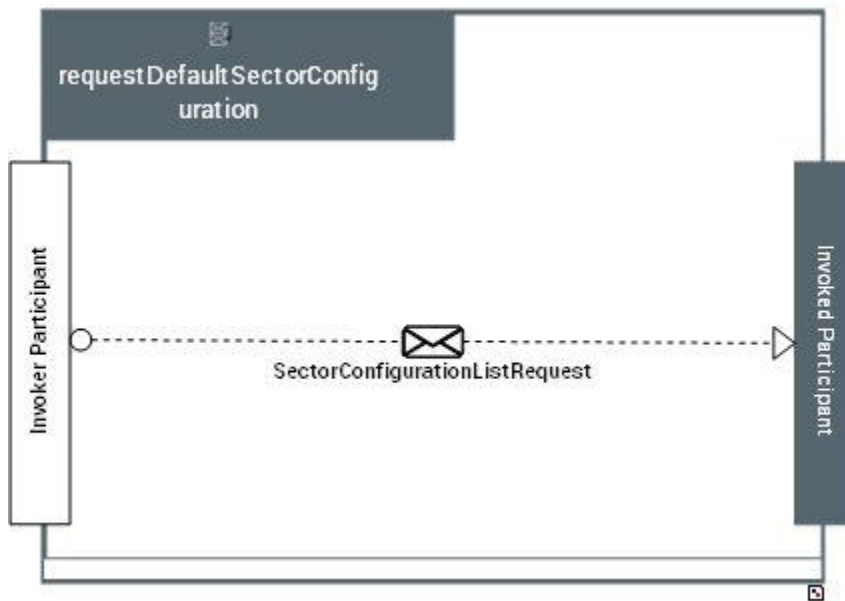


Figure 17: “requestDefaultSectorConfiguration” Operation Exchange diagram

Input	Service Payload	CLDM Data Entity
	SectorConfigurationListRequest	SectorConfigurationPlan

Table 25: “requestDefaultSectorConfiguration” operation parameters

A.5 Payload Data Diagrams

This section shows the data diagrams of the entities that are used as payload of the service. They constitute the actual content that is exchanged between the provider and the consumer of the service when invoking the operations.

A.5.1 NSOV-2 SubRegionalDCBCOSER Interface Parameter Definition ControlCentre

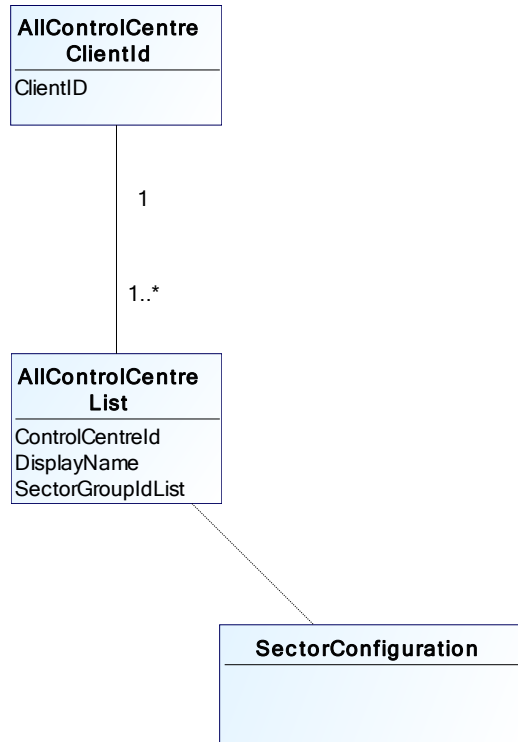


Figure 18: “SubRegionalDCBCOSER” Interface Parameter Definition ControlCentre

A.5.2 NSOV-2 SubRegionalDCBCOSER Interface Parameter Definition ReferenceLocation

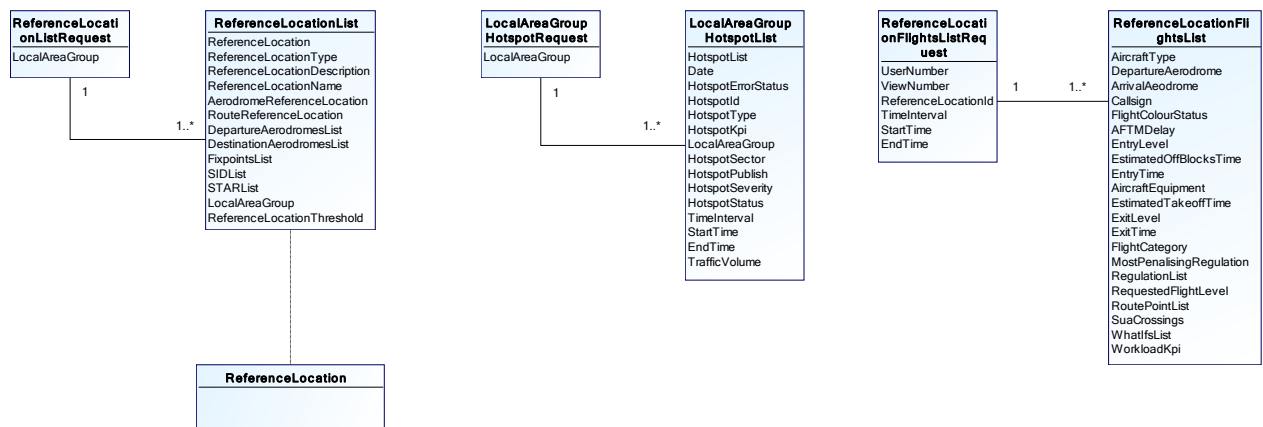


Figure 19: “SubRegionalDCBCOSER” Interface Parameter Definition ReferenceLocation

A.5.3 NSOV-2 SubRegionalDCBCOSER Interface Parameter Definition ReservationSua

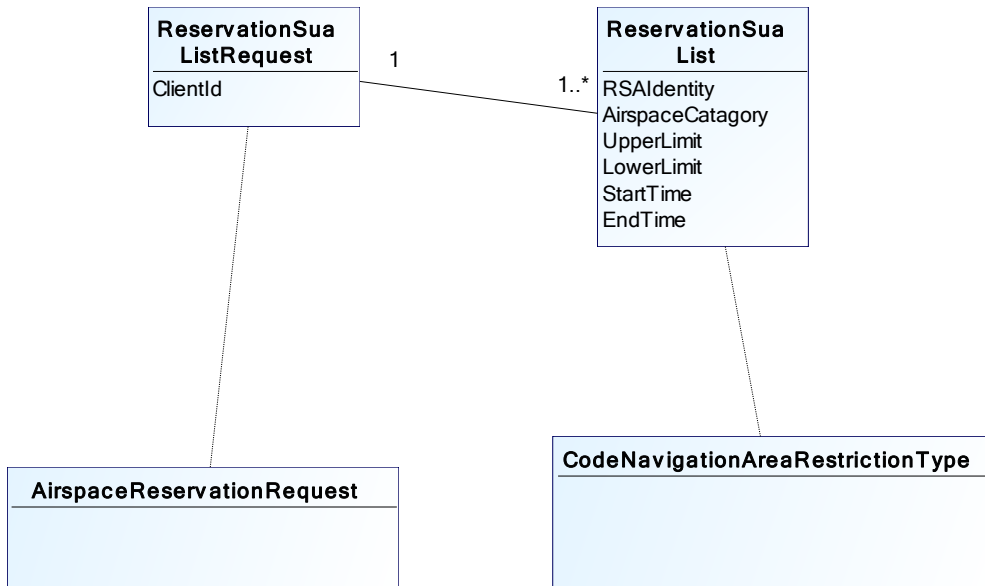


Figure 20: "SubRegionalDCBCOSER" Interface Parameter Definition ReservationSua

A.5.4 NSOV-2 SubRegionalDCBCOSER Interface Parameter Definition Sector

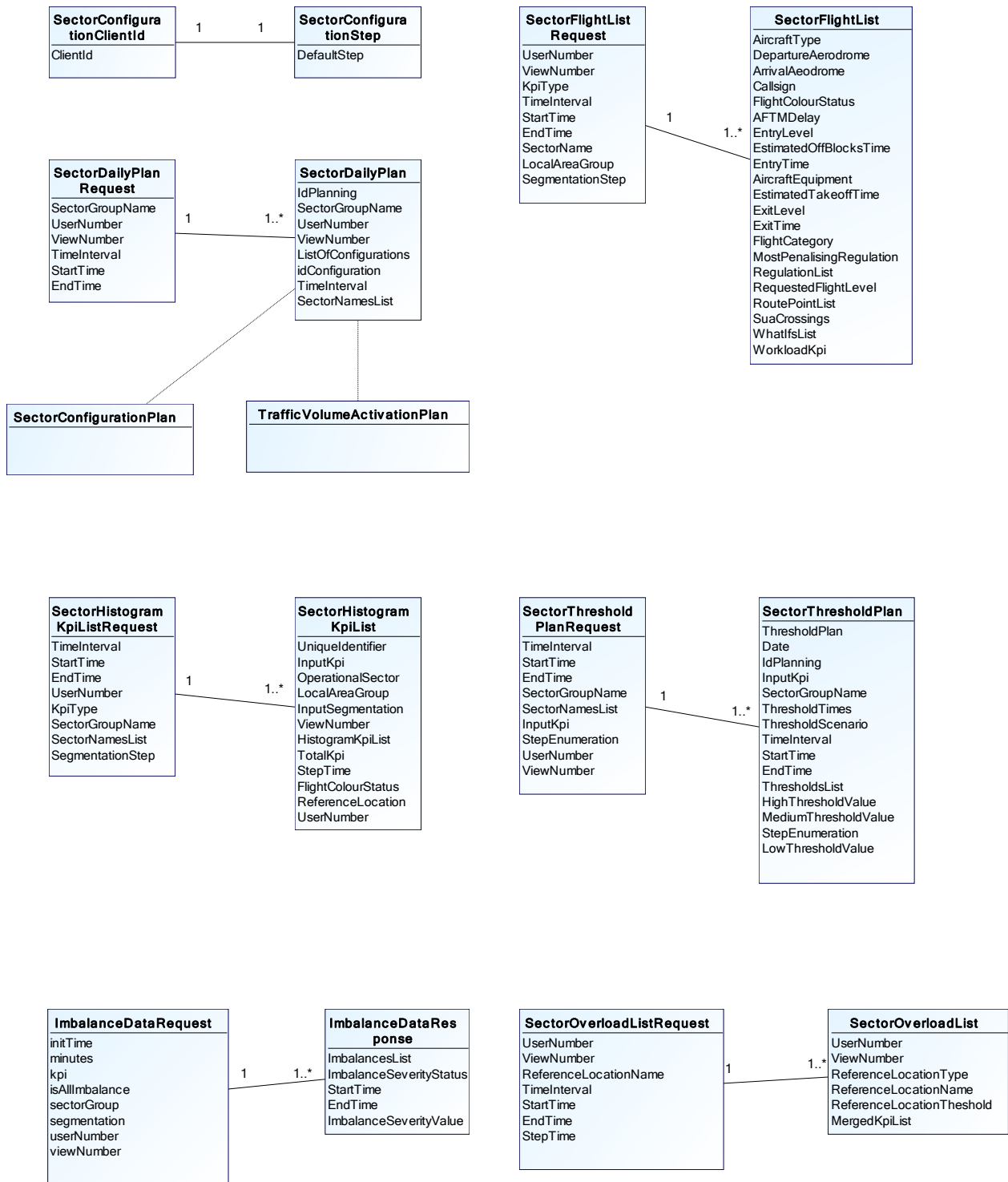


Figure 21: SubRegionalDCBCOSER Interface Parameter Definition Sector

A.5.5 NSOV-2 NSOV-2 SubRegionalImbalanceData Interface Parameter Definition Core

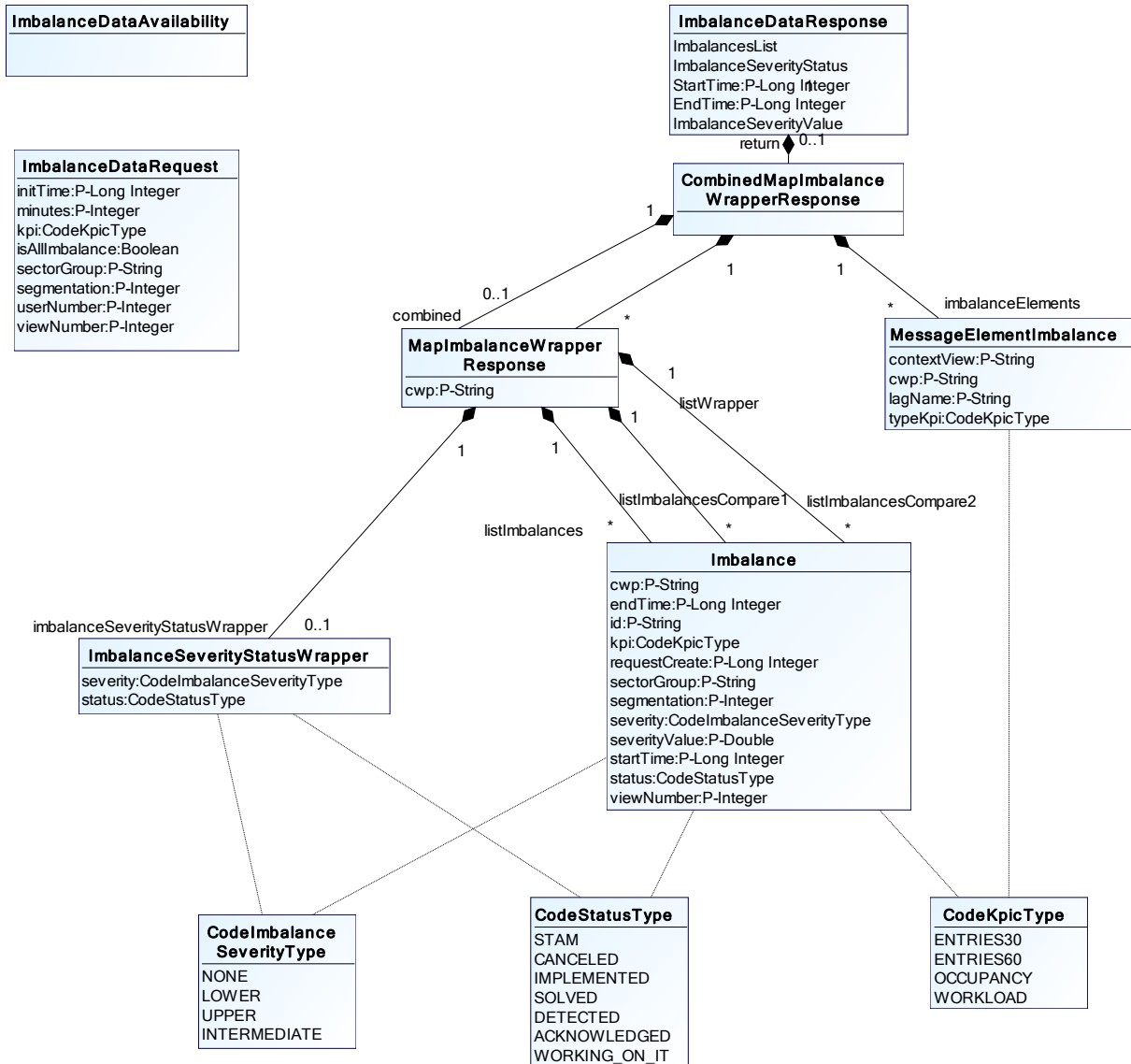


Figure 22: SubRegionalDCBCOSER Interface Parameter Definition Core

A.6 Payload Elements

This section provides the description of each data entity and their attributes, in line with the diagrams shown in section A.5.

The payload description provided in Table 26 has the following structure:

Class			
ActiveRunwayConfiguration		The Runway Configuration that is currently used for flight operations in and out of the airport.	
	AssociationEnd (DM)	RunwayConfiguration	
	AssociationEnd (DM)	LandingRate	
	AssociationEnd (DM)	FinalArrivalSeparationAdvice	
	AssociationEnd (DM)	FinalArrivalSafetyMitigationAdvice	
	AssociationEnd (DM)	DepartureManagementTool	
	AssociationEnd (DM)	RunwayConfigurationPlan	
	AssociationEnd (DM)	LandingSequence	
	AssociationEnd (DM)	DepartureSequence	
	AssociationEnd (DM)	TimeToInsertInSequence	
	AssociationEnd (DM)	TimeToRemoveFromSequence	
	AssociationEnd (DM)	ArrivalManagementTool	
Class			
ActiveSectorConfiguration		The sector configuration that is currently used for enabling air traffic control operations within a control area.	
	AssociationEnd (DM)	SectorConfiguration	
	AssociationEnd (DM)	SectorConfigurationPlan	
Class			
ActualDemand		Demand evaluated from Airspace Users' requests such as filed flight plans and shared/reference business trajectories.	
	AssociationEnd (DM)	TacticalATFMPhase	
	AssociationEnd (DM)	OperationalDataset	
	Specialisation of	Type	Notes
	Demand		The number of aircraft requesting to use the ATM system in a given time period.
Class			

AdvisoryAirspace		An airspace of defined dimensions, or designated route, within which air traffic advisory service is available.	
	AssociationEnd (DM)	AdvisoryArea	
	AssociationEnd (DM)	AirTrafficAdvisoryService	
	AssociationEnd (DM)	ATSRoute	
	Specialisation of	Type	Notes
	UncontrolledAirspace		Airspace type of Class G and specified Class F airspace within which ATC service is not provided.
Class			
AdvisoryArea		A designated area within a flight information region where air traffic advisory service is available.	
	AssociationEnd (DM)	AdvisoryAirspace	
	Specialisation of	Type	Notes
	Airspace		A defined three dimensional region of space relevant to air traffic.
Class			
AerialWork		An aircraft operation in which an aircraft is used for specialized services such as agriculture, construction, photography, surveying, observation and patrol, search and rescue, aerial advertisement, etc.	
	Specialisation of	Type	Notes
	Flight		The operation of an aircraft which, in the case of a manned aircraft, takes place between the time any person boards the aircraft with the intention of flight until such time as all such persons have disembarked, or in the case of an unmanned aircraft, takes place between the time the aircraft is ready to move with the purpose of flight until such time as it comes to rest at the end of the flight and the primary propulsion system is shut down.
Class			
Aerodrome		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.	
	AssociationEnd (DM)	AerodromeSet	
	AssociationEnd (DM)	CriticalEvent	
	AssociationEnd (DM)	DeclaredCapacity	
	AssociationEnd (DM)	FlightConditionElement	
	AssociationEnd (DM)	AirportCapacity	
	AssociationEnd (DM)	MeteringFix	
	AssociationEnd (DM)	AirportOperationsParameter	
	AssociationEnd (DM)	AirportResourceStatus	
	AssociationEnd (DM)	ArrivalOperations	

	AssociationEnd (DM)	InitialMeteringFix		
	AssociationEnd (DM)	DepartureOperations		
	AssociationEnd (DM)	ReferenceLocation		
	AssociationEnd (DM)	ATCBlindSpot		
	AssociationEnd (DM)	SurfaceContamination		
	AssociationEnd (DM)	ATMProcedureImplementation		
	AssociationEnd (DM)	ParkingConfiguration		
	AssociationEnd (DM)	AerodromeSystem		
	AssociationEnd (DM)	City		
	AssociationEnd (DM)	RunwayConfiguration		
	AssociationEnd (DM)	AerodromeLocationIndicator		
	AssociationEnd (DM)	AerodromeRegulation		
	AssociationEnd (DM)	AltimeterSource		
	AssociationEnd (DM)	AircraftStandConfiguration		
	AssociationEnd (DM)	TaxiwayConfiguration		
	AssociationEnd (DM)	OperationalFlightInformationService		
	AssociationEnd (DM)	IATALocationIdentifier		
	AssociationEnd (DM)	AircraftStand		
	AssociationEnd (DM)	AerodromeReferencePoint		
	AssociationEnd (DM)	Apron		
	AssociationEnd (DM)	Heliport		
	AssociationEnd (DM)	AutomaticTerminalInformationService		
	AssociationEnd (DM)	WorkArea		
	AssociationEnd (DM)	AirportArrivalSlot		



	AssociationEnd (DM)	NonMovementArea		
	AssociationEnd (DM)	ManoeuvringArea		
	AssociationEnd (DM)	Runway		
	AssociationEnd (DM)	AerodromeSurfaceRoutingNetwork		
	AssociationEnd (DM)	Flight		
	AssociationEnd (DM)	Terminal		
	AssociationEnd (DM)	EstimatedTimeOfArrival		
	AssociationEnd (DM)	AirportDepartureSlot		
	AssociationEnd (DM)	TotalEstimatedElapsedTime		
	AssociationEnd (DM)	StayAerodome		
	AssociationEnd (DM)	Taxiway		
	AssociationEnd (DM)	AerodromeHotSpot		
	AssociationEnd (DM)	VisualNavigationAid		
	AssociationEnd (DM)	MovementArea		
	AssociationEnd (DM)	RadioNavigationAid		
	AssociationEnd (DM)	CoordinatedAirport		
	AssociationEnd (DM)	AerodromeControlService		
	AssociationEnd (DM)	SchedulesFacilitatedAirport		
	AssociationEnd (DM)	AirportTransitView		
	AssociationEnd (DM)	ACDMIrregularity		
	AssociationEnd (DM)	NOTAM		
	AssociationEnd (DM)	RulesProcedures		
	AssociationEnd (DM)	AerodromeTrafficZone		
	AssociationEnd (DM)	Turnaround		
	AssociationEnd (DM)	ReclearanceInFlight		
	AssociationEnd (DM)	TerminalControlArea		



	AssociationEnd (DM)	FinalArrivalSafetyMitigationAdvice		
	AssociationEnd (DM)	FinalArrivalSeparationAdvice		
	AssociationEnd (DM)	MinimumSectorAltitude		
Class				
AerodromeTrafficZone		An airspace of defined dimensions established around an aerodrome for the protection of aerodrome traffic.		
	AssociationEnd (DM)	Aerodrome		
	Specialisation of	Type	Notes	
	Airspace		A defined three dimensional region of space relevant to air traffic.	
Class				
AirborneHolding		A tactical ATFM measure requiring aircraft to hold at a waypoint in a predefined standard holding pattern.		
	Specialisation of	Type	Notes	
	ATFMMeasure		The actions taken to perform air traffic flow management and capacity management.	
Class				
AirDefenceIdentificationZone		Special designated airspace of defined dimensions within which aircraft are required to comply with special identification and/or reporting procedures additional to those related to the provision of air traffic services (ATS).		
	Specialisation of	Type	Notes	
	Airspace		A defined three dimensional region of space relevant to air traffic.	
Class				
AirportCapacity		The number of arrivals, departures and total aircraft movements, taking into account the composite effect of airside taxiway and landside constraints.		
	AssociationEnd (DM)	RunwayCapacity		
	AssociationEnd (DM)	FFICEInformation		
	AssociationEnd (DM)	TerminalCapacity		
	AssociationEnd (DM)	AirportResourceStatus		
	AssociationEnd (DM)	Aerodrome		
	Specialisation of	Type	Notes	
	Capacity		The maximum number of aircraft that can be accommodated in a given time period by the system or one of its components (throughput).	
Class				
Airspace		A defined three dimensional region of space relevant to air traffic.		
	AssociationEnd (DM)	FormalOrganisation		
	AssociationEnd (DM)	AerialRefuelling		
	AssociationEnd (DM)	AirspaceClassification		



	AssociationEnd (DM)	AirspaceLocationIndicator		
	AssociationEnd (DM)	ATSRoute		
	AssociationEnd (DM)	DeclaredCapacity		
	AssociationEnd (DM)	RequiredNavigationPerformance		
	AssociationEnd (DM)	NOTAM		
	AssociationEnd (DM)	AssessmentArea		
	AssociationEnd (DM)	Flight		
	AssociationEnd (DM)	ReferenceLocation		
	AssociationEnd (DM)	AirTrafficService		
	AssociationEnd (DM)	RulesProcedures		
	AssociationEnd (DM)	FlightConditionElement		
	AssociationEnd (DM)	Capacity		
	AssociationEnd (DM)	State		
	AssociationEnd (DM)	CriticalEvent		
	AssociationEnd (DM)	AirspaceEntry		
	AssociationEnd (DM)	VHF8.33kHzChannelSpacing		
	AssociationEnd (DM)	ReducedVerticalSeparationMinimum		
	AssociationEnd (DM)	State		
	AssociationEnd (DM)	StandardLevelSector		
	AssociationEnd (DM)	FlightPriority		
	AssociationEnd (DM)	AirspaceExit		
	AssociationEnd (DM)	State		
	AssociationEnd (DM)	Obstruction		
	AssociationEnd (DM)	ConvectionCell		
	AssociationEnd (DM)	Geometry		
Class				
AirspaceReservation		The result of the procedure through which a volume is temporary reserved for an activity.		

	AssociationEnd (DM)	AirspaceManagementCell		
	AssociationEnd (DM)	Mission		
	AssociationEnd (DM)	AirspaceUsePlan		
	AssociationEnd (DM)	AMCManageableArea		
Class				
	AirspaceRestriction	A defined volume of airspace within which, variously, activities dangerous to the flight of aircraft may be conducted at specified times (a 'danger area'); or such airspace situated above the land areas or territorial waters of a State, within which the flight of aircraft is restricted in accordance with certain specified conditions (a 'restricted area'); or airspace situated above the land areas or territorial waters of a State, within which the flight of aircraft is prohibited (a 'prohibited area').		
	AssociationEnd (DM)	RestrictedArea		
	AssociationEnd (DM)	ProhibitedArea		
	AssociationEnd (DM)	DangerArea		
	Specialisation of	Type	Notes	
	Airspace		A defined three dimensional region of space relevant to air traffic.	
Class				
	AirTrafficControlService	A service provided for the purpose of: a) preventing collisions: 1. between aircraft, and 2. on the manoeuvring area between aircraft and obstructions; and b) expediting and maintaining an orderly flow of air traffic.		
	AssociationEnd (DM)	RoutePortion		
	AssociationEnd (DM)	TerminalProcedure		
	AssociationEnd (DM)	ControlledAirspace		
	AssociationEnd (DM)	RatedAirTrafficController		
	AssociationEnd (DM)	AirTrafficControlUnit		
	AssociationEnd (DM)	Operator		
	AssociationEnd (DM)	HoldingProcedure		
	Specialisation of	Type	Notes	
	AirTrafficService		A generic term meaning variously, flight information service, alerting service, air traffic advisory service, air traffic control service (area control service, approach control service or aerodrome control service).	
Class				
	AirTrafficFlowManagementUnit	A unit in charge of providing Air Traffic Flow Management.		

	AssociationEnd (DM)	FlowManagementPosition		
	AssociationEnd (DM)	AppropriateATSAuthority		
	AssociationEnd (DM)	ATFMMeasure		
	AssociationEnd (DM)	Capacity		
	AssociationEnd (DM)	Demand		
	AssociationEnd (DM)	Imbalance		
	AssociationEnd (DM)	AirTrafficFlowManagement		
	AssociationEnd (DM)	AirTrafficControlUnit		
	Specialisation of Organisation	Type	Notes	
			A collection of people organized together into a community or other social, commercial or political structure. The group has some common purpose or reason for existence which goes beyond the set of people belonging to it, and can act as an agent.	
Class				
AirTrafficManagementSystem		A system that provides ATM through the collaborative integration of humans, information, technology, facilities and services, supported by air and ground- and/or space-based communications, navigation and surveillance.		
	AssociationEnd (DM)	Capacity		
	AssociationEnd (DM)	TrafficFlow		
	AssociationEnd (DM)	TrafficVolume		
	AssociationEnd (DM)	ATMCommunity		
Class				
Airway		A control area or portion thereof established in the form of a corridor.		
	AssociationEnd (DM)	ATSRoute		
	Specialisation of ControlArea	Type	Notes	
			A controlled airspace extending upwards from a specified limit above the earth.	
Class				
AlertArea		An airspace which may contain a high volume of pilot training activities or unusual type of aerial activity, neither of which is hazardous to aircraft.		
	Specialisation of Airspace	Type	Notes	
			A defined three dimensional region of space relevant to air traffic.	
Class				
AlertingService		A service provided to notify appropriate organizations regarding aircraft in need of search and rescue aid, and assist such organizations as required.		
	AssociationEnd (DM)	FlightInformationCentre		

	AssociationEnd (DM)	AirTrafficControlUnit		
	AssociationEnd (DM)	RescueCoordinationCentre		
	AssociationEnd (DM)	Operator		
	AssociationEnd (DM)	FlightInformationRegion		
	Specialisation of	Type	Notes	
	AirTrafficService		A generic term meaning variously, flight information service, alerting service, air traffic advisory service, air traffic control service (area control service, approach control service or aerodrome control service).	
Class				
AllControlCentreClientID				
	ClientID	P-String		Yes
Class				
AllControlCentreList				
	ControlCentreId	P-String		Yes
	DisplayName	P-String		Yes
	SectorGroupIDList	P-String		Yes
Class				
AltimeterSettingRegion		An airspace of defined dimensions within which standardized altimeter setting procedures apply.		
	Specialisation of	Type	Notes	
	Airspace		A defined three dimensional region of space relevant to air traffic.	
Class				
AMCManageableArea		An area subject to management and allocation by an AMC at ASM Level 2 and level 3.		
	AssociationEnd (DM)	CrossBorderArea		
	AssociationEnd (DM)	DangerArea		
	AssociationEnd (DM)	RestrictedArea		
	AssociationEnd (DM)	TemporaryReservedArea		
	AssociationEnd (DM)	SharedMissionTrajectory		
	AssociationEnd (DM)	AirspaceReservation		
	AssociationEnd (DM)	Flight		
	AssociationEnd (DM)	StayARES		
	AssociationEnd (DM)	TemporarySegregatedArea		

	Specialisation of	Type	Notes
	Airspace		A defined three dimensional region of space relevant to air traffic.
Class			
	AreaOfCommonInterest	A route or portion of a route that is in close proximity to flight information boundaries. The extent is usually determined by the required separation minima.	
	AssociationEnd (DM)	FlightInformationRegion	
	AssociationEnd (DM)	CurrentFlightPlan	
	AssociationEnd (DM)	SeparationMinima	
	AssociationEnd (DM)	ControlAreaBoundaryPoint	
Class			
	ArrivalManagementTool	Software based system used to improve arrival flows at one or more aerodromes by calculating an optimised landing sequence and flight specific time information at other significant points, taking into account all applicable constraints.	
	AssociationEnd (DM)	ActiveAdvisoryHorizon	
	AssociationEnd (DM)	ArrivalManagementAdvisory	
	AssociationEnd (DM)	ArrivalManagementStrategy	
	AssociationEnd (DM)	MeteringHorizon	
	AssociationEnd (DM)	InitialMeteringFixSequence	
	AssociationEnd (DM)	EligibilityHorizon	
	AssociationEnd (DM)	InitialLandingSequence	
	AssociationEnd (DM)	InitialMeteringHorizon	
	AssociationEnd (DM)	FrozenHorizon	
	AssociationEnd (DM)	MeteringFixSequence	
	AssociationEnd (DM)	LandingSequence	
	AssociationEnd (DM)	RunwayLandingRate	
	AssociationEnd (DM)	ActiveRunwayConfiguration	
Class			
	ATFCMNotificationMessage	The official medium for the notification of Air Traffic Flow and Capacity Management (ATFCM) measures, published by the Network Manager	

		Operations Centre (NMOC) during the day before the day of operation (D-1), in order to provide a summary of planned ATFCM measures, and to promulgate any specific instructions or communication requirements associated with those measures.		
	AssociationEnd (DM)	TacticalATFMPhase		
	AssociationEnd (DM)	AirTrafficServicesUnit		
	AssociationEnd (DM)	NetworkManager		
	AssociationEnd (DM)	AirportOperator		
	AssociationEnd (DM)	PretacticalATFMPhase		
Class				
ATFMDailyPlan		The set of tactical air traffic flow management measures prepared during the Pre-Tactical phase.		
	AssociationEnd (DM)	PretacticalATFMPhase		
	AssociationEnd (DM)	NetworkOperationsPlan		
	AssociationEnd (DM)	ATFMMeasure		
	Specialisation of	Type	Notes	
	ATFCMNotificationMessage		The official medium for the notification of Air Traffic Flow and Capacity Management (ATFCM) measures, published by the Network Manager Operations Centre (NMOC) during the day before the day of operation (D-1), in order to provide a summary of planned ATFCM measures, and to promulgate any specific instructions or communication requirements associated with those measures.	
Class				
ATFMEvent		A situation involving a loss of EATMN capacity, or an imbalance between EATMN capacity and demand, or a failure in the information flow in one or several parts of EATMN.		
	AssociationEnd (DM)	Capacity		
Class				
ATFMMeasure		The actions taken to perform air traffic flow management and capacity management.		
	AssociationEnd (DM)	TrafficVolume		
	AssociationEnd (DM)	Flight		
	AssociationEnd (DM)	PretacticalATFMPhase		
	AssociationEnd (DM)	ATFMDailyPlan		
	AssociationEnd (DM)	Flight		
	AssociationEnd (DM)	CriticalEvent		

	AssociationEnd (DM)	StrategicATFMPhase		
	AssociationEnd (DM)	TacticalATFMPhase		
	AssociationEnd (DM)	AirTrafficFlowManagementUnit		
	AssociationEnd (DM)	Flight		
	AssociationEnd (DM)	StrategicATFMPhase		
	AssociationEnd (DM)	Imbalance		
Class				
ATFMPhase		A phase in which ATFM is carried out.		
	AssociationEnd (DM)	AirTrafficFlowManagement		
	AssociationEnd (DM)	ATFCMInformationMessage		
Class				
ATFMRegulation		An ATFCM measure implemented by means of a departure slot in order to balance traffic demand against available ATC capacity.		
	AssociationEnd (DM)	RegulationRate		
	AssociationEnd (DM)	SlotAllocationList		
	AssociationEnd (DM)	ExceptionalCondition		
	AssociationEnd (DM)	TrafficVolume		
	AssociationEnd (DM)	PretacticalATFMPhase		
	AssociationEnd (DM)	TacticalATFMPhase		
	AssociationEnd (DM)	Flight		
	AssociationEnd (DM)	RegulationCause		
	AssociationEnd (DM)	MostPenalisingRegulation		
	Specialisation of	Type	Notes	
	ATFMMeasure		The actions taken to perform air traffic flow management and capacity management.	
Class				
BuildingBlock		Elementary sections of modularised airspace (as defined by the appropriate airspace provider) that are too small individually for controlling purposes, but instead form the basic constituent parts of a controlling block as part of an optimising process.		
	AssociationEnd (DM)	ControlledAirspace		
	Specialisation of	Type	Notes	
	Airspace		A defined three dimensional region of space relevant to air traffic.	

Class			
Capacity		The maximum number of aircraft that can be accommodated in a given time period by the system or one of its components (throughput).	
	AssociationEnd (DM)	Heliport	
	AssociationEnd (DM)	AirTrafficManagementSystem	
	AssociationEnd (DM)	TrafficVolume	
	AssociationEnd (DM)	Demand	
	AssociationEnd (DM)	LowVisibilityConditions	
	AssociationEnd (DM)	AirTrafficFlowManagementUnit	
	AssociationEnd (DM)	Airspace	
	AssociationEnd (DM)	SectorConfiguration	
	AssociationEnd (DM)	ATFMEvent	
Class			
CapacityPlan		The capacity of a Traffic Volume over a given period of time.	
	AssociationEnd (DM)	NetworkOperationsPlan	
Class			
CirclingApproach		An extension of an instrument approach procedure which provides for visual circling of the aerodrome prior to landing.	
	AssociationEnd (DM)	VisualManoeuvringCirclingArea	
	AssociationEnd (DM)	InstrumentApproachProcedure	
Class			
CivilRPASOperation		Aircraft operation performed by a civil unmanned aerial vehicle.	
	Specialisation of	Type	Notes
	Flight		The operation of an aircraft which, in the case of a manned aircraft, takes place between the time any person boards the aircraft with the intention of flight until such time as all such persons have disembarked, or in the case of an unmanned aircraft, takes place between the time the aircraft is ready to move with the purpose of flight until such time as it comes to rest at the end of the flight and the primary propulsion system is shut down.
Class			
CombinedMapImbalanceWrapperResponse			
	combined	MapImbalanceWrapperResponse	0..1
	imbalanceElements	MessageElementImbalance	*

	listWrapper	MapImbalanceWrapperResponse		*
Class				
CommercialAirTransportOperation		An aircraft operation involving the transport of passengers, cargo or mail for remuneration or hire.		
	Specialisation of	Type	Notes	
	Flight		The operation of an aircraft which, in the case of a manned aircraft, takes place between the time any person boards the aircraft with the intention of flight until such time as all such persons have disembarked, or in the case of an unmanned aircraft, takes place between the time the aircraft is ready to move with the purpose of flight until such time as it comes to rest at the end of the flight and the primary propulsion system is shut down.	
Class				
ControlArea		A controlled airspace extending upwards from a specified limit above the earth.		
	AssociationEnd (DM)	SectorConfiguration		
	AssociationEnd (DM)	ControlAreaBoundaryPoint		
	AssociationEnd (DM)	CoordinationAndTransfer		
	AssociationEnd (DM)	ControlSector		
	Specialisation of	Type	Notes	
	ControlledAirspace		An airspace of defined dimensions within which air traffic control service is provided in accordance with the airspace classification.	
Class				
ControlAreaBoundaryPoint		A defined point on the control area boundary common to adjacent Air Traffic Service Units.		
	AssociationEnd (DM)	ControlArea		
	AssociationEnd (DM)	CDNMessage		
	AssociationEnd (DM)	EstimateMessage		
	AssociationEnd (DM)	AreaOfCommonInterest		
	Specialisation of	Type	Notes	
	OperationalPointUsage		The usage of a point when describing the Air Traffic Operations.	
Class				
ControlledAirspace		An airspace of defined dimensions within which air traffic control service is provided in accordance with the airspace classification.		
	AssociationEnd (DM)	AirTrafficControlService		
	AssociationEnd (DM)	FlightInformationRegion		
	AssociationEnd (DM)	BuildingBlock		

	Specialisation of	Type	Notes
	Airspace		A defined three dimensional region of space relevant to air traffic.
Class			
ControlSector		A subdivision of a designated control area within which responsibility is assigned to one controller or to a small group of controllers.	
	AssociationEnd (DM)	RatedAirTrafficController	
	AssociationEnd (DM)	SectorConfiguration	
	AssociationEnd (DM)	ControlArea	
	Specialisation of	Type	Notes
	ControlledAirspace		An airspace of defined dimensions within which air traffic control service is provided in accordance with the airspace classification.
Class			
CoordinationAndTransfer		A dialogue procedure between ATC Units successively in control of a flight, comprising <ul style="list-style-type: none"> - notification of the flight - coordination of conditions of transfer by the transferring ATC unit - coordination, if necessary, and acceptance of conditions of transfer by the accepting ATC unit - transfer of control to the accepting ATC unit. 	
	AssociationEnd (DM)	TransferOfControlPoint	
	AssociationEnd (DM)	AirTrafficControlUnit	
	AssociationEnd (DM)	AcceptingUnitOrController	
	AssociationEnd (DM)	Flight	
	AssociationEnd (DM)	LetterOfAgreement	
	AssociationEnd (DM)	TransferringUnitOrController	
	AssociationEnd (DM)	AcceptanceMessage	
	AssociationEnd (DM)	ControlArea	
	AssociationEnd (DM)	CDNMessage	
	AssociationEnd (DM)	CoordinationMessage	
	AssociationEnd (DM)	CurrentFlightPlan	
	AssociationEnd (DM)	EstimateMessage	
	AssociationEnd (DM)	FlightObjectDataset	
	AssociationEnd (DM)	CivilMilitaryCrossing	
Class			

CriticalEvent		An unusual situation or crisis involving a major loss of EATMN capacity, or a major imbalance between EATMN capacity and demand, or a major failure in the information flow in one or several parts of EATMN.		
	AssociationEnd (DM)	ZeroRateRegulation		
	AssociationEnd (DM)	LowVisibilityCondi tions		
	AssociationEnd (DM)	Aerodrome		
	AssociationEnd (DM)	ExceptionalConditio n		
	AssociationEnd (DM)	Airspace		
	AssociationEnd (DM)	ATFMMeasure		
	Specialisation of	Type	Notes	
	ATFMEvent		A situation involving a loss of EATMN capacity, or an imbalance between EATMN capacity and demand, or a failure in the information flow in one or several parts of EATMN.	
Class				
CrossBorderArea		Airspace of defined dimensions, above the land areas or territorial waters of more than one state.		
	AssociationEnd (DM)	State		
	AssociationEnd (DM)	AMCManageableAr ea		
	Specialisation of	Type	Notes	
	Airspace		A defined three dimensional region of space relevant to air traffic.	
Class				
DangerArea		An airspace of defined dimensions within which activities dangerous to the flight of aircraft may exist at specified times.		
	AssociationEnd (DM)	AirspaceRestriction		
	AssociationEnd (DM)	AMCManageableAr ea		
	Specialisation of	Type	Notes	
	Airspace		A defined three dimensional region of space relevant to air traffic.	
Class				
DeclaredCapacity		A measure of the ability of the ATC system or any of its subsystems or operating positions to provide service to aircraft during normal activities. It is expressed as the number of aircraft entering a specified portion of the ATM infrastructure in a given period of time, taking due account of weather, ATC unit configuration, staff and equipment available, and any other factors that may affect the workload of the controller responsible for the infrastructure.		
	AssociationEnd (DM)	TrafficVolume		
	AssociationEnd (DM)	Aerodrome		

	AssociationEnd (DM)	AppropriateATSAuthority		
	AssociationEnd (DM)	Airspace		
	AssociationEnd (DM)	SignificantPoint		
	AssociationEnd (DM)	AerodromeSet		
	Specialisation of	Type	Notes	
	Capacity		The maximum number of aircraft that can be accommodated in a given time period by the system or one of its components (throughput).	
Class				
Demand		The number of aircraft requesting to use the ATM system in a given time period.		
	AssociationEnd (DM)	TrafficFlow		
	AssociationEnd (DM)	AirTrafficFlowManagementUnit		
	AssociationEnd (DM)	SectorConfiguration		
	AssociationEnd (DM)	Capacity		
Class				
DepartureManagementTool		A tool for managing departure operations.		
	AssociationEnd (DM)	DepartureSequence		
	AssociationEnd (DM)	TaxiwayConfiguration		
	AssociationEnd (DM)	StartupSequence		
	AssociationEnd (DM)	ActiveRunwayConfiguration		
Class				
DepartureSequence		An ordered set of departures.		
	AssociationEnd (DM)	DepartureManagementTool		
	AssociationEnd (DM)	TakeOff		
	AssociationEnd (DM)	TimeToInsertInSequence		
	AssociationEnd (DM)	TimeToRemoveFromSequence		
	AssociationEnd (DM)	ActiveRunwayConfiguration		
Class				
DynamicMobileArea		A temporary mobile airspace exclusion area which aims to minimise the impact on the network while satisfying the needs of military airspace users.		
	AssociationEnd (DM)	FlightObjectDataset		
	Specialisation of	Type	Notes	

	Airspace		A defined three dimensional region of space relevant to air traffic.	
Class				
ElevatedHeliport		A heliport located on a raised structure on land.		
	Specialisation of	Type	Notes	
	Heliport		An aerodrome or a defined area on a structure intended to be used wholly or in part for the arrival, departure and surface movement of helicopters.	
Class				
EntryCount		The number of aircraft requesting to enter in a Reference Location in a given time period.		
	AssociationEnd (DM)	PretacticalATFMPhase		
	AssociationEnd (DM)	TacticalATFMPhase		
	AssociationEnd (DM)	MonotoringValue		
	Specialisation of	Type	Notes	
	TrafficCount		The number of aircraft on a location during a time period.	
Class				
ExceptionalCondition		A mechanism whereby the regulation also applies to traffic that is usually exempted.		
	AssociationEnd (DM)	CriticalEvent		
	AssociationEnd (DM)	ATFMRegulation		
Class				
FinalArrivalSafetyMitigationAdvice		In the context of final arrival sequence, the advice for safety mitigation.		
	AssociationEnd (DM)	ArrivalPair		
	AssociationEnd (DM)	Aerodrome		
	AssociationEnd (DM)	SeparationMinima		
	AssociationEnd (DM)	ActiveRunwayConfiguration		
	Specialisation of	Type	Notes	
	Alert		Indication of an actual or potential hazardous situation that requires particular attention or action.	
Class				
FinalArrivalSeparationAdvice		In the context of final arrival sequence, the advice to ensure additional spacing required between each arrival pair taking into account their respective landing stabilisation speed profile intentions or characteristics.		
	AssociationEnd (DM)	ArrivalPair		
	AssociationEnd (DM)	SeparationMinima		
	AssociationEnd (DM)	Aerodrome		
	AssociationEnd (DM)	ActiveRunwayConfiguration		
	Specialisation of	Type	Notes	

	Alert		Indication of an actual or potential hazardous situation that requires particular attention or action.
Class			
	FixBalancing	A tactical ATFM measure aiming at distributing demand and avoiding delays whereby the aircraft is assigned a different arrival or departure fix than the one indicated in the flight plan.	
	Specialisation of	Type	Notes
	ATFMMeasure		The actions taken to perform air traffic flow management and capacity management.
Class			
	Flight	The operation of an aircraft which, in the case of a manned aircraft, takes place between the time any person boards the aircraft with the intention of flight until such time as all such persons have disembarked, or in the case of an unmanned aircraft, takes place between the time the aircraft is ready to move with the purpose of flight until such time as it comes to rest at the end of the flight and the primary propulsion system is shut down.	
	AssociationEnd (DM)	FlightPlan	
	AssociationEnd (DM)	ATFMHotspot	
	AssociationEnd (DM)	FlightScript	
	AssociationEnd (DM)	DepartureClearance	
	AssociationEnd (DM)	MissionDevelopmentTrajectory	
	AssociationEnd (DM)	ATFMMeasure	
	AssociationEnd (DM)	ATFMMeasure	
	AssociationEnd (DM)	PositionReport	
	AssociationEnd (DM)	ATFMMeasure	
	AssociationEnd (DM)	ATFMRegulation	
	AssociationEnd (DM)	ReferenceBusinessTrajectory	
	AssociationEnd (DM)	OceanicClearance	
	AssociationEnd (DM)	SharedBusinessTrajectory	
	AssociationEnd (DM)	SharedMissionTrajectory	
	AssociationEnd (DM)	SharedMissionTrajectory	
	AssociationEnd (DM)	SpecialHandling	
	AssociationEnd (DM)	DeltaEmission	
	AssociationEnd (DM)	DepartureReferenceTimeReordering	



	AssociationEnd (DM)	DepartureReferenceTimeReordering		
	AssociationEnd (DM)	HorizontalFlightEfficiencySubjectOfAssessment		
	AssociationEnd (DM)	FlightSuspension		
	AssociationEnd (DM)	Mission		
	AssociationEnd (DM)	FlightSequence		
	AssociationEnd (DM)	AircraftMovement		
	AssociationEnd (DM)	ArrivalManagementAdvisory		
	AssociationEnd (DM)	FlightPhase		
	AssociationEnd (DM)	IATAUniqueFlightIdentifier		
	AssociationEnd (DM)	FormationFlight		
	AssociationEnd (DM)	FormationFlight		
	AssociationEnd (DM)	ArrivalOperations		
	AssociationEnd (DM)	MostPenalisingRegulation		
	AssociationEnd (DM)	Aircraft		
	AssociationEnd (DM)	MultiSwap		
	AssociationEnd (DM)	FlightDesignator		
	AssociationEnd (DM)	FlightCapability		
	AssociationEnd (DM)	Operator		
	AssociationEnd (DM)	CrewMember		
	AssociationEnd (DM)	FlightRules		
	AssociationEnd (DM)	ICAOFlightID		
	AssociationEnd (DM)	FlightDesignator		
	AssociationEnd (DM)	Trajectory		
	AssociationEnd (DM)	SSRCode		
	AssociationEnd (DM)	GloballyUniqueFlightIdentifier		
	AssociationEnd (DM)	DepartureOperations		

	AssociationEnd (DM)	AircraftIdentification		
	AssociationEnd (DM)	PilotInCommand		
	AssociationEnd (DM)	CoordinationAndTransfer		
	AssociationEnd (DM)	WhatIfFlight		
	AssociationEnd (DM)	FormationFlight		
	AssociationEnd (DM)	SlotSwapping		
	AssociationEnd (DM)	WhatIfContext		
	AssociationEnd (DM)	SlotSwapping		
	AssociationEnd (DM)	FlightTypeChange		
	AssociationEnd (DM)	TrafficFlow		
	AssociationEnd (DM)	TrafficVolume		
	AssociationEnd (DM)	EmergencyPhase		
	AssociationEnd (DM)	TimeToInsertInSequence		
	AssociationEnd (DM)	TimeToRemoveFromSequence		
	AssociationEnd (DM)	Aerodrome		
	AssociationEnd (DM)	FlightConfiguration		
	AssociationEnd (DM)	AirportTransitView		
	AssociationEnd (DM)	NOTAM		
	AssociationEnd (DM)	TakeOffConfiguration		
	AssociationEnd (DM)	ACDMIrregularity		
	AssociationEnd (DM)	AMCManageableArea		
	AssociationEnd (DM)	Airspace		
	AssociationEnd (DM)	ATFCMSlotMessage		
	AssociationEnd (DM)	OperationalFlightPlan		
	AssociationEnd (DM)	OperatorFlightPriority		
	AssociationEnd (DM)	FlightExecution		

	AssociationEnd (DM)	BusinessDevelopmentTrajectory		
	AssociationEnd (DM)	FlightPlanning		
	AssociationEnd (DM)	PostFlight		
	AssociationEnd (DM)	FFICEInformation		
	AssociationEnd (DM)	FFICEInformation		
	AssociationEnd (DM)	FFICEInformation		
	AssociationEnd (DM)	FlightObjectDataset		
	AssociationEnd (DM)	ATFMDepartureSlot		
Class				
FlightInformationRegion		An airspace of defined dimensions within which flight information service and alerting service are provided.		
	AssociationEnd (DM)	UncontrolledAirspace		
	AssociationEnd (DM)	AlertingService		
	AssociationEnd (DM)	AreaOfCommonInterest		
	AssociationEnd (DM)	NOTAM		
	AssociationEnd (DM)	FlightInformationService		
	AssociationEnd (DM)	ControlledAirspace		
	Specialisation of	Type	Notes	
	Airspace		A defined three dimensional region of space relevant to air traffic.	
Class				
FlightInformationService		A service provided for the purpose of giving advice and information useful for the safe and efficient conduct of flights.		
	AssociationEnd (DM)	Operator		
	AssociationEnd (DM)	FlightInformationCentre		
	AssociationEnd (DM)	AirTrafficControlUnit		
	AssociationEnd (DM)	FlightInformationRegion		
	Specialisation of	Type	Notes	
	AirTrafficService		A generic term meaning variously, flight information service, alerting service, air traffic advisory service, air traffic control service (area control service, approach control service or aerodrome control service).	
Class				

FlightObjectDataset	The system instance view of a flight, shared between the IOP stakeholders. Conceptually the Flight Object is intended to hold all ATM related flight data pertaining to individual flights that needs to be shared between any interested stakeholders.		
AssociationEnd (DM)	FlightExecution		
AssociationEnd (DM)	TrajectorySynchronisation		
AssociationEnd (DM)	FormationFlight		
AssociationEnd (DM)	UserPreferredTrajectory		
AssociationEnd (DM)	WhatIfTrajectory		
AssociationEnd (DM)	TakeOffTime		
AssociationEnd (DM)	ReferenceBusinessTrajectory		
AssociationEnd (DM)	ExtendedProjectedProfileReport		
AssociationEnd (DM)	AirspaceEntry		
AssociationEnd (DM)	Flight		
AssociationEnd (DM)	FlightScript		
AssociationEnd (DM)	GroundAgreedTrajectory		
AssociationEnd (DM)	CoordinationAndTransfer		
AssociationEnd (DM)	PlannedTrajectory		
AssociationEnd (DM)	ReferenceMissionTrajectory		
AssociationEnd (DM)	ATMCommunity		
AssociationEnd (DM)	AcceptingUnitOrController		
AssociationEnd (DM)	FlightDataManagerPublisher		
AssociationEnd (DM)	TransferringUnitOrController		
AssociationEnd (DM)	OLDIMessage		
AssociationEnd (DM)	DynamicMobileArea		
Class			
FlightPlanning	The ATM phase capturing the collaborative ATM activities that typically occurring prior to the day of operations. From a Trajectory perspective, this		

		phase is marked by the use of the Shared Business Trajectory to communicated intended flight operations.	
	AssociationEnd (DM)	Flight	
	AssociationEnd (DM)	MediumTermPlanning	
	AssociationEnd (DM)	ShortTermPlanning	
	AssociationEnd (DM)	LongTermPlanning	
	AssociationEnd (DM)	GroundSystemTrajectory	
	AssociationEnd (DM)	BusinessDevelopmentTrajectory	
	AssociationEnd (DM)	PretacticalATFMPhase	
	AssociationEnd (DM)	StrategicATFMPhase	
	AssociationEnd (DM)	Desired4DTrajectory	
	AssociationEnd (DM)	FFICEInformation	
	AssociationEnd (DM)	UserPreferredTrajectory	
	AssociationEnd (DM)	SharedMissionTrajectory	
	AssociationEnd (DM)	MissionDevelopmentTrajectory	
	AssociationEnd (DM)	FlightPlannedRoute	
	AssociationEnd (DM)	SharedBusinessTrajectory	
	AssociationEnd (DM)	TacticalATFMPhase	
	AssociationEnd (DM)	FlightExecution	
	Specialisation of	Type	Notes
	ATMPhase		A period in time grouping related collaborative ATM activities relative to a flight or a group of flights.
Class			
	FlightSuspension	An action performed on a flight as a result of an ATFM Measure	
	AssociationEnd (DM)	FlightConfirmationMessage	
	AssociationEnd (DM)	DeSuspensionMessage	
	AssociationEnd (DM)	Flight	



	AssociationEnd (DM)	ZeroRateRegulation		
	AssociationEnd (DM)	LowVisibilityRegulation		
	AssociationEnd (DM)	FlightSuspensionMessage		
Class				
ForecastDataset		A system instance view of the predicted traffic, including repetitive flights, taking into account wind predictions, North Atlantic Track traffic predictions, airport slots, airline schedules and the traffic from a similar day in the past.		
	AssociationEnd (DM)	ForecastDemand		
	AssociationEnd (DM)	PretacticalATFMPhase		
	AssociationEnd (DM)	OperationalDataset		
Class				
ForecastDemand		Demand estimated from initial information, such as schedules, and/or historical data.		
	AssociationEnd (DM)	PretacticalATFMPhase		
	AssociationEnd (DM)	StrategicATFMPhase		
	AssociationEnd (DM)	ForecastDataset		
	Specialisation of	Type	Notes	
	Demand		The number of aircraft requesting to use the ATM system in a given time period.	
Class				
GeneralAirTraffic		A flight conducted in accordance with the rules and procedures of ICAO.		
	Specialisation of	Type	Notes	
	Flight		The operation of an aircraft which, in the case of a manned aircraft, takes place between the time any person boards the aircraft with the intention of flight until such time as all such persons have disembarked, or in the case of an unmanned aircraft, takes place between the time the aircraft is ready to move with the purpose of flight until such time as it comes to rest at the end of the flight and the primary propulsion system is shut down.	
Class				
GeneralAviationOperation		An aircraft operation other than a commercial air transport operation or an aerial work operation.		
	Specialisation of	Type	Notes	
	Flight		The operation of an aircraft which, in the case of a manned aircraft, takes place between the time any person boards the aircraft with the intention of flight until such time as all such persons have disembarked, or in the case of an unmanned aircraft, takes place between the time the aircraft is ready to move with the purpose of flight until such time as it comes to rest at the end of the flight and the primary propulsion system is shut down.	

Class			
GroundDelayProgramme		A strategic, pre-tactical, or tactical ATFM measure where aircraft are held on the ground in order to manage capacity and demand in a specific volume of airspace or at a specific airport.	
	Specialisation of	Type	Notes
	ATFMMeasure		The actions taken to perform air traffic flow management and capacity management.
Class			
GroundStop		A tactical ATFM measure where some selected aircraft remain on the ground.	
	Specialisation of	Type	Notes
	ATFMMeasure		The actions taken to perform air traffic flow management and capacity management.
Class			
Helideck		A heliport located on an offshore structure such as an exploration or production platform used for the exploitation of oil or gas.	
	Specialisation of	Type	Notes
	Heliport		An aerodrome or a defined area on a structure intended to be used wholly or in part for the arrival, departure and surface movement of helicopters.
Class			
Heliport		An aerodrome or a defined area on a structure intended to be used wholly or in part for the arrival, departure and surface movement of helicopters.	
	AssociationEnd (DM)	MinimumSectorAlti tude	
	AssociationEnd (DM)	ATMProcedureImpl ementation	
	AssociationEnd (DM)	Aerodrome	
	AssociationEnd (DM)	AerodromeReferen cePoint	
	AssociationEnd (DM)	AircraftStandConfig uration	
	AssociationEnd (DM)	RulesProcedures	
	AssociationEnd (DM)	Apron	
	AssociationEnd (DM)	FinalApproachAndT akeOffArea	
	AssociationEnd (DM)	HelicopterAirTaxiwa yAndTaxiRoute	
	AssociationEnd (DM)	HelicopterClearway	
	AssociationEnd (DM)	HelicopterGroundT axiwayAndTaxiRout e	

	AssociationEnd (DM)	TaxiwayConfigurati on		
	AssociationEnd (DM)	VerticalStructure		
	AssociationEnd (DM)	AerodromeControls ervice		
	AssociationEnd (DM)	SafetyArea		
	AssociationEnd (DM)	TouchDownLiftOff		
	AssociationEnd (DM)	Taxiway		
	AssociationEnd (DM)	RunwayConfigurati on		
	AssociationEnd (DM)	VisualNavigationAid		
	AssociationEnd (DM)	Terminal		
	AssociationEnd (DM)	RadioNavigationAid		
	AssociationEnd (DM)	TerminalControlAre a		
	AssociationEnd (DM)	Capacity		
Class				
HoldingArea		A defined area within which aircraft performs an en-route or approach holding.		
	AssociationEnd (DM)	HoldingProcedure		
	AssociationEnd (DM)	StayHolding		
	Specialisation of	Type	Notes	
	Airspace		A defined three dimensional region of space relevant to air traffic.	
Class				
HoldingProcedure		A predetermined manoeuvre which keeps an aircraft within a specified airspace while awaiting further clearance.		
	AssociationEnd (DM)	SegmentLeg		
	AssociationEnd (DM)	RouteOrProcedureC hange		
	AssociationEnd (DM)	AMANProcedureAd visory		
	AssociationEnd (DM)	AirTrafficControlSer vice		
	AssociationEnd (DM)	HoldingAssessment		
	AssociationEnd (DM)	TerminalProcedure		
	AssociationEnd (DM)	HoldingArea		
	AssociationEnd (DM)	HoldingFix		

	AssociationEnd (DM)	Geometry		
Class				
Imbalance		An occurrence when the traffic demand exceeds the available capacity.		
	AssociationEnd (DM)	ATFMMeasure		
	AssociationEnd (DM)	AirTrafficFlowManagementUnit		
	AssociationEnd (DM)	TrafficBunching		
	AssociationEnd (DM)	ATFMHotspot		
Class				
Imbalance		An occurrence when the traffic demand exceeds the available capacity.		
	cwp	P-String	Identifier of the operator work station that is controlling the airspace where the imbalance has been identified.	No
	endTime	P-Long Integer	Start of the time interval (given in milliseconds) which the imbalance has been identified.	Yes
	id	P-String	A sequence of alphanumeric characters that uniquely identifies the imbalance, as generated by the system.	No
	kpi	CodeKpicType	Key Performance Indicator used by the service to identify the imbalance.	No
	requestCreate	P-Long Integer		Yes
	sectorGroup	P-String	Portion of the airspace that is the result of aggregating a group of operational sectors and for which the imbalance has been identified.	No
	segmentation	P-Integer	Time interval (given in minutes) used as the unit of measure for the identification of the imbalance.	Yes
	severity	CodeImbalanceSeverityType	Severity of the imbalance	No
	severityValue	P-Double	Numeric value assigned by the system to the imbalance, in order to specify its severity.	Yes
	startTime	P-Long Integer	Start of the time interval (given in milliseconds) which the imbalance has been identified.	Yes
	status	CodeStatusType	Status of the imbalance.	No
	viewNumber	P-Integer	Attribute that indicates whether the imbalance data provided is raw data (value = 0) or it is an agreed plan with	Yes

			changes made and What-If applied (value = 1).	
Class				
ImbalanceDataRequest		This message requests the provision of imbalance data by specifying a time interval, duration or the indicator to be used.		
	initTime	P-Long Integer	Specifies the start of the time interval (given in milliseconds) which imbalances should be identified and provided by the service.	Yes
	minutes	P-Integer	Specifies the length of the time interval (given in minutes) during which imbalances should be identified and provided by the service.	Yes
	kpi	CodeKpicType	Specifies what Key Performance Indicator should be used by the service to identify imbalances.	Yes
	isAllImbalance	Boolean	This attribute indicates if the return message should contain only the imbalances identified by using the requested KPI (value=FALSE) or all the KPIs (value=TRUE).	Yes
	sectorGroup	P-String	Portion of the airspace that is the result of aggregating a group of operational sectors.	Yes
	segmentation	P-Integer	Time interval (given in minutes) that should be used as the unit of measure for the identification of imbalances.	Yes
	userNumber	P-Integer	Attribute that indicates whether the imbalance data provided are in a draft status or not. Value = 0 indicates it is not in draft status.	Yes
	viewNumber	P-Integer	Attribute that indicates whether the imbalance data provided is raw data (value = 0) or it is an agreed plan with changes made and What-If applied (value = 1).	Yes
Class				
ImbalanceDataResponse		This message contains the information related with the imbalances returned by a request.		
	ImbalancesList			
	ImbalanceSeverityStatus			
	StartTime	P-Long Integer		Yes
	EndTime	P-Long Integer		Yes
	ImbalanceSeverityValue			

	return	CombinedMapImbalanceWrapperResponse		0..1
Class				
ImbalanceSeverityStatusWrapper		Indicates the severity and the status of an imbalance.		
	severity	CodeImbalanceSeverityType	The severity of an imbalance.	No
	status	CodeStatusType	The status of an imbalance.	No
Class				
InstrumentLandingSystem		A combination of radio navigation services intended to facilitate aircraft in landing by providing lateral and vertical guidance including indications of distance from the optimum point of landing.		
	AssociationEnd (DM)	NormalOperatingZone		
	Specialisation of	Type	Notes	
	RadioNavigationAid		Any electronic system which provides information to be used by the pilot or aircraft navigation systems for position determination or flight path guidance.	
Class				
LandingRate		The number of aircraft allowed to approach the Active Runway Configuration per hour, taking all operational constraints into account.		
	AssociationEnd (DM)	FFICEInformation		
	AssociationEnd (DM)	RunwayLandingRate		
	AssociationEnd (DM)	ActiveRunwayConfiguration		
Class				
LandingSequence		The order in which two or more aircraft are planned to land taking into account ATM constraints.		
	AssociationEnd (DM)	ArrivalManagementTool		
	AssociationEnd (DM)	Landing		
	AssociationEnd (DM)	ActiveRunwayConfiguration		
	Specialisation of	Type	Notes	
	FlightSequence		A set of flights ordered by the planned actual time of an event.	
Class				
LocalAreaGroupHotspotList				
	HotspotList	P-String		Yes
	Date	DateTime		Yes
	HotspotErrorStatus	P-String		No
	HotspotId	P-String		Yes
	HotspotType	P-String		Yes

	HotspotKpi	P-String		Yes
	LocalAreaGroup	P-String		Yes
	HotspotSector	P-String		Yes
	HotspotPublish	Boolean		Yes
	HotspotSeverity	P-String		Yes
	HotspotStatus	P-String		Yes
	TimeInterval	P-Long Integer		Yes
	StartTime	P-Long Integer		Yes
	EndTime	P-Long Integer		
	TrafficVolume	P-String		Yes
Class				
LocalAreaGroupHotspotRequest				
	LocalAreaGroup	P-String		Yes
Class				
LowVisibilityConditions		An occurrence at an aerodrome when the visibility is below a given threshold.		
	AssociationEnd (DM)	CriticalEvent		
	AssociationEnd (DM)	LowVisibilityRegulation		
	AssociationEnd (DM)	LowVisibilityProcedure		
	AssociationEnd (DM)	Capacity		
Class				
LowVisibilityRegulation		An ATFCM measure implemented in case Low Visibility Operations require a minimum runway visual range.		
	AssociationEnd (DM)	LowVisibilityConditions		
	AssociationEnd (DM)	RunwayVisualRange		
	AssociationEnd (DM)	FlightSuspension		
	Specialisation of	Type	Notes	
	ATFCMRegulation		An ATFCM measure implemented by means of a departure slot in order to balance traffic demand against available ATC capacity.	
Class				
ManagedAirspace		Airspace in which all traffic and its intent is known to the Air Traffic System.		
	Specialisation of	Type	Notes	
	Airspace		A defined three dimensional region of space relevant to air traffic.	
Class				
MapImbalanceWrapperResponse		Provides a list of imbalances to be displayed in a specific operator work station.		

	cwp	P-String	Identifier of the operator work station where the information is to be displayed.	No
	imbalanceSeverityStatusWrapper	ImbalanceSeverityStatusWrapper		0..1
	listImbalances	Imbalance		*
	listImbalancesCompare1	Imbalance		*
	listImbalancesCompare2	Imbalance		*
Class				
MessageElementImbalance				
	contextView	P-String		No
	cwp	P-String	Identifier of the operator work station where the information is to be displayed.	No
	lagName	P-String	Name of the Local Area Group for which the imbalances have been identified.	No
	typeKpi	CodeKpicType	Key Performance Indicator used by the service to identify the imbalance.	No
Class				
MicrowaveLandingSystem		A precision approach and landing guidance system operating in the microwave spectrum, which provides position information and various ground-to-air data.		
	AssociationEnd (DM)	NormalOperatingZone		
	Specialisation of	Type	Notes	
	RadioNavigationAid		Any electronic system which provides information to be used by the pilot or aircraft navigation systems for position determination or flight path guidance.	
Class				
MilesInTrail		A tactical ATFM measure expressed as the number of miles required between aircraft (in addition to the minimum longitudinal requirements) to meet a specific criterion which may be separation, airport, fix, altitude, sector or route specific.		
	Specialisation of	Type	Notes	
	ATFMMeasure		The actions taken to perform air traffic flow management and capacity management.	
Class				
MilitaryRPASOperation		Operation of the armed forces performed by an unmanned aerial vehicle.		
	Specialisation of	Type	Notes	
	Flight		The operation of an aircraft which, in the case of a manned aircraft, takes place between the time any person boards the aircraft with the intention of flight until such time as all such persons have disembarked, or in the case of an unmanned aircraft, takes place between the time the aircraft is ready to move with the purpose of flight until such time as it comes to rest at the end of the flight and the primary propulsion system is shut down.	

Class			
MilitaryTrainingRouteBuffer		A control area or portion thereof, established in the form of a corridor around a military training route in order to protect it from other traffic.	
	Specialisation of	Type	Notes
	ControlArea		A controlled airspace extending upwards from a specified limit above the earth.
Class			
MilitaryVariableProfileArea		A modular temporary airspace structure and reserved area introduced in order to enable sub-divisions, new areas or revised airspace requirements closer to air bases (60NM radius) and to define airspace scenarios to all geographical levels.	
	Specialisation of	Type	Notes
	Airspace		A defined three dimensional region of space relevant to air traffic.
Class			
MinimumDepartureIntervals		A tactical ATFM measure carried out when ATC sets a departure flow rate of, for example, 3 minutes between successive departures.	
	Specialisation of	Type	Notes
	ATFMMeasure		The actions taken to perform air traffic flow management and capacity management.
Class			
MinutesInTrail		A tactical ATFM measure expressed as the number of minutes required between successive aircraft.	
	Specialisation of	Type	Notes
	ATFMMeasure		The actions taken to perform air traffic flow management and capacity management.
Class			
MonotoringValue		The agreed number of flights accepted to enter into a reference location per rolling hour beyond which coordinated actions may be considered between the concerned parties in order to better balance the traffic load.	
	AssociationEnd (DM)	EntryCount	
	Specialisation of	Type	Notes
	Capacity		The maximum number of aircraft that can be accommodated in a given time period by the system or one of its components (throughput).
Class			
NavigationArea		An area specified by sectors with altitude or procedure descent gradient limitations for omnidirectional departures or Pilot navigation area.	
	AssociationEnd (DM)	TerminalProcedure	
	AssociationEnd (DM)	NavigationAreaSector or	
	Specialisation of	Type	Notes
	Airspace		A defined three dimensional region of space relevant to air traffic.
Class			
NavigationAreaSector		Subdivision of a sector to allow for different altitudes or gradients.	
	AssociationEnd (DM)	NavigationArea	
	Specialisation of	Type	Notes
	Airspace		A defined three dimensional region of space relevant to air traffic.
Class			
NetworkOperationsPlan		A set of information and actions derived and reached collaboratively both relevant to, and serving as a reference for, the management of the Pan-European network in different timeframes for all ATM stakeholders, which	

		includes, but is not limited to, targets, objectives, how to achieve them, anticipated impact. The NOP has a dynamic and rolling lifecycle starting in the planning phases and is progressively updated up to and including the execution and post-operations phases.		
	AssociationEnd (DM)	ATFMDailyPlan		
	AssociationEnd (DM)	CapacityPlan		
	AssociationEnd (DM)	SectorConfigurationPlan		
	AssociationEnd (DM)	OTMVPlan		
	AssociationEnd (DM)	TrafficVolumeActivationPlan		
	AssociationEnd (DM)	RunwayConfigurationPlan		
Class				
NormalOperatingZone		Airspace of defined dimensions extending to either side of an ILS localizer course and/or MLS final approach track. Only the inner half of the normal operating zone is taken into account in independent parallel approaches.		
	AssociationEnd (DM)	MicrowaveLandingSystem		
	AssociationEnd (DM)	InstrumentLandingSystem		
	Specialisation of	Type	Notes	
	Airspace		A defined three dimensional region of space relevant to air traffic.	
Class				
NOTAM		A notice distributed by means of telecommunication containing information concerning the establishment, condition or change in any aeronautical facility, service, procedure or hazard, the timely knowledge of which is essential to personnel concerned with flight operations.		
	AssociationEnd (DM)	IntegratedAeronauticalInformationPackage		
	AssociationEnd (DM)	NOTAMSeriesIdentifier		
	AssociationEnd (DM)	Timesheet		
	AssociationEnd (DM)	Flight		
	AssociationEnd (DM)	Position		
	AssociationEnd (DM)	InternationalNOTAMOffice		
	AssociationEnd (DM)	PreFlightInformationBulletin		
	AssociationEnd (DM)	NOTAMCode		
	AssociationEnd (DM)	FlightCrewMember		

	AssociationEnd (DM)	Aerodrome		
	AssociationEnd (DM)	PreFlightInformationBulletin		
	AssociationEnd (DM)	NOTAMService		
	AssociationEnd (DM)	Airspace		
	AssociationEnd (DM)	FlightInformationRegion		
	AssociationEnd (DM)	OFISMessage		
Class				
NoTransgressionZone		In the context of independent parallel approaches, a corridor of airspace of defined dimensions located centrally between the two extended runway centre lines, where a penetration by an aircraft requires a controller intervention to manoeuvre any threatened aircraft on the adjacent approach.		
	AssociationEnd (DM)	RunwayCentreLine		
	Specialisation of	Type	Notes	
	Airspace		A defined three dimensional region of space relevant to air traffic.	
Class				
Obstacle		All fixed (whether temporary or permanent) and mobile objects, or parts thereof, that: a) are located on an area intended for the surface movement of aircraft; or b) extend above a defined surface intended to protect aircraft in flight; or c) stand outside those defined surfaces and that have been assessed as being a hazard to air navigation.		
	AssociationEnd (DM)	MinimumObstacleClearanceAltitude		
	AssociationEnd (DM)	TerminalProcedure		
	AssociationEnd (DM)	ObstacleData		
	AssociationEnd (DM)	ObstacleFreeZone		
	AssociationEnd (DM)	ObstacleArea		
	AssociationEnd (DM)	VerticalStructure		
	AssociationEnd (DM)	ObstacleAssessmentArea		
	AssociationEnd (DM)	Obstruction		
	AssociationEnd (DM)	MinimumEnRouteAltitude		
Class				
ObstacleFreeZone		The airspace above the inner approach surface, inner transitional surfaces, and balked landing surface and that portion of the strip bounded by these surfaces, which is not penetrated by any fixed obstacle other than a low-mass and frangibly mounted one required for air navigation purposes.		
	AssociationEnd (DM)	Obstacle		

	Specialisation of	Type	Notes
	Airspace		A defined three dimensional region of space relevant to air traffic.
Class			
OccupancyTrafficMonitoringValue		A set of values (peak, sustain, overload duration, duration of counting) dedicated to monitor the instantaneous density of aircraft in a sector, as represented in occupancy counts.	
	Specialisation of	Type	Notes
	Capacity		The maximum number of aircraft that can be accommodated in a given time period by the system or one of its components (throughput).
Class			
OperationalAirTraffic		A flight which do not comply with the provisions stated for general air traffic and for which rules and procedures have been specified by appropriate national authorities.	
	Specialisation of	Type	Notes
	Flight		The operation of an aircraft which, in the case of a manned aircraft, takes place between the time any person boards the aircraft with the intention of flight until such time as all such persons have disembarked, or in the case of an unmanned aircraft, takes place between the time the aircraft is ready to move with the purpose of flight until such time as it comes to rest at the end of the flight and the primary propulsion system is shut down.
Class			
OTMVPlan		The Occupancy Traffic Monitoring Values (OTMV) to be attributed to a Traffic Volume over a given period of time.	
	AssociationEnd (DM)	NetworkOperations Plan	
Class			
OverDelivery		An occurrence when the declared rate is exceeded by the actual number of aircraft that enter a regulated sector during a particular period.	
	Specialisation of	Type	Notes
	Imbalance		An occurrence when the traffic demand exceeds the available capacity.
Class			
Overload		An occurrence when an air traffic controller reports that he/she has had to handle more traffic than they consider it was safe to do so.	
	Specialisation of	Type	Notes
	Imbalance		An occurrence when the traffic demand exceeds the available capacity.
Class			
PretacticalATFMPhase		An ATFM phase which takes place during six days prior to the day of operation and consists of planning and coordination activities.	
	AssociationEnd (DM)	ATFMRegulation	
	AssociationEnd (DM)	PreTacticalOperationalPlanning	
	AssociationEnd (DM)	EntryCount	
	AssociationEnd (DM)	ForecastDataset	
	AssociationEnd (DM)	ForecastDemand	
	AssociationEnd (DM)	ATFMDailyPlan	

	AssociationEnd (DM)	ATFCMNotification Message		
	AssociationEnd (DM)	TacticalATFMPhase		
	AssociationEnd (DM)	StrategicATFMPhase		
	AssociationEnd (DM)	FlightPlanning		
	AssociationEnd (DM)	ATFMMeasure		
	Specialisation of	Type	Notes	
	ATFMPhase		A phase in which ATFM is carried out.	
Class				
PreTacticalOperationalPlanning		ATM activities aiming to accommodate demand, once initial schedules have been provided and permissions have been obtained.		
	AssociationEnd (DM)	TacticalOperational Planning		
	AssociationEnd (DM)	FFICEInformation		
	AssociationEnd (DM)	SchedulingAndStrategicActivities		
	AssociationEnd (DM)	MediumTermPlanning		
	AssociationEnd (DM)	PretacticalATFMPhase		
Class				
ProhibitedArea		An airspace of defined dimensions, above the land areas or territorial waters of a State, within which the flight of aircraft is prohibited.		
	AssociationEnd (DM)	AirspaceRestriction		
	Specialisation of	Type	Notes	
	Airspace		A defined three dimensional region of space relevant to air traffic.	
Class				
ProtectedAirspace		Airspace protected from specific air traffic.		
	Specialisation of	Type	Notes	
	Airspace		A defined three dimensional region of space relevant to air traffic.	
Class				
RatedAirTrafficController		An air traffic controller holding a licence and valid ratings appropriate to the privileges to be exercised.		
	AssociationEnd (DM)	ControlSector		
	AssociationEnd (DM)	ControllerRoleAuthorization		
	AssociationEnd (DM)	CurrentFlightPlan		
	AssociationEnd (DM)	AirTrafficControlService		
	AssociationEnd (DM)	Separator		

	AssociationEnd (DM)	AirTrafficControlUnit		
	AssociationEnd (DM)	PlannedRoute		
	Specialisation of	Type	Notes	
	SafetySensitivePersonnel		Persons who might endanger aviation safety if they perform their duties and functions improperly including, but not limited to, crew members, aircraft maintenance personnel and air traffic controllers.	
Class				
	ReducedCoordinationArea	Portion of airspace of defined dimensions within which general aviation traffic is permitted "off-route" without requiring general aviation traffic controllers to initiate co-ordination with OAT controllers.		
	Specialisation of	Type	Notes	
	Airspace		A defined three dimensional region of space relevant to air traffic.	
Class				
	ReferenceLocationFlightsList			
	AircraftType	P-String		Yes
	DepartureAerodrome	P-String		Yes
	ArrivalAerodrome	P-String		Yes
	Callsign	P-String		Yes
	FlightColourStatus	P-String		Yes
	AFTMDelay	P-String		Yes
	EntryLevel	P-String		Yes
	EstimatedOffBlocksTime	P-String		Yes
	EntryTime	P-String		Yes
	AircraftEquipment	P-String		Yes
	EstimatedTakeoffTime	P-String		Yes
	ExitLevel	P-String		Yes
	ExitTime	P-String		Yes
	FlightCategory	P-String		Yes
	MostPenalisingRegulation	P-String		Yes
	RegulationList	P-String		Yes
	RequestedFlightLevel	P-String		Yes
	RoutePointList	P-String		Yes
	SuaCrossings	P-String		Yes
	WhatIfsList	P-String		Yes

	WorkloadKpi	P-String		Yes
Class				
ReferenceLocationFlightsListRequest				
	UserNumber	P-Integer		Yes
	ViewNumber	P-Integer		Yes
	ReferenceLocationId	P-String		Yes
	TimeInterval	P-Long Integer		Yes
	StartTime	P-Long Integer		Yes
	EndTime	P-Long Integer		Yes
Class				
ReferenceLocationList				
	ReferenceLocation	P-String		Yes
	ReferenceLocationType	P-String		Yes
	ReferenceLocationDescription	P-String		Yes
	ReferenceLocationName	P-String		Yes
	AerodromeReferenceLocation	P-String		Yes
	RouteReferenceLocation	P-String		Yes
	DepartureAerodromesList	P-String		Yes
	DestinationAerodromesList	P-String		Yes
	FixpointsList	P-String		Yes
	SIDList	P-String		Yes
	STARList	P-String		Yes
	LocalAreaGroup	P-String		Yes
	ReferenceLocationThreshold	P-Double		Yes
Class				
ReferenceLocationListRequest				
	LocalAreaGroup	P-String		Yes
Class				
RegulatedDemand		The air traffic taking according to any regulations that have been implemented.		
	AssociationEnd (DM)	RegulatedTacticalFlightModel		
	AssociationEnd (DM)	FiledTacticalFlightModel		
	Specialisation of	Type	Notes	
	Demand		The number of aircraft requesting to use the ATM system in a given time period.	

Class			
RegulationRate		The coordinated number of flights that can be accommodated in a certain time period.	
	AssociationEnd (DM)	ATFMRRegulation	
	Specialisation of	Type	Notes
	Capacity		The maximum number of aircraft that can be accommodated in a given time period by the system or one of its components (throughput).
Class			
ReservationSuaListRequest			
	ClientId		
Class			
RestrictedArea		An airspace of defined dimensions, above the land areas or territorial waters of a State, within which the flight of aircraft is restricted in accordance with certain specified conditions.	
	AssociationEnd (DM)	AirspaceRestriction	
	AssociationEnd (DM)	AMCManageableArea	
	Specialisation of	Type	Notes
	Airspace		A defined three dimensional region of space relevant to air traffic.
Class			
RunwayCapacity		The number of aircraft movements which aeronautical authorities determine can safely be operated, usually stated as the total number of landings and take-offs per hour, taking into account such factors as the physical characteristics of the runways and the surrounding area, altitude, the types of aircraft involved (larger aircraft may mandate greater separation) and air traffic control (approach and aerodrome control) capabilities.	
	AssociationEnd (DM)	RunwayDirection	
	AssociationEnd (DM)	Runway	
	AssociationEnd (DM)	AirportCapacity	
	Specialisation of	Type	Notes
	Capacity		The maximum number of aircraft that can be accommodated in a given time period by the system or one of its components (throughput).
Class			
RunwayCentreLine		A theoretical line parallel to the direction of the runway partitioning into two equal parts. This line is materialised by marking and a runway centreline light system which can be extended beyond the runway threshold in order to guide landing aircraft to the runway.	
	AssociationEnd (DM)	Runway	
	AssociationEnd (DM)	NoTransgressionZone	
	AssociationEnd (DM)	RunwayCentrelinePoint	
	AssociationEnd (DM)	FinalApproachTrack	

Class			
RunwayConfiguration		Configuration of runway directions available for use in a given airport operational mode.	
	AssociationEnd (DM)	Aerodrome	
	AssociationEnd (DM)	Heliport	
	AssociationEnd (DM)	RunwayDirection	
	AssociationEnd (DM)	ActiveRunwayConfiguration	
Class			
RunwayConfigurationPlan		The runway configurations to be activated over a given period.	
	AssociationEnd (DM)	NetworkOperationsPlan	
	AssociationEnd (DM)	ActiveRunwayConfiguration	
Class			
RunwayVisualRange		The range over which the pilot of an aircraft on the centre line of a runway can see the runway surface markings or the lights delineating the runway or identifying its centre line.	
	AssociationEnd (DM)	FlightConfirmationMessage	
	AssociationEnd (DM)	LowVisibilityRegulation	
Class			
SectorConfiguration		The four dimensional description of an ATS unit airspace sector, or group of sectors, which may be operated on a permanent or temporary basis.	
	AssociationEnd (DM)	ControlSector	
	AssociationEnd (DM)	Capacity	
	AssociationEnd (DM)	Demand	
	AssociationEnd (DM)	ActiveSectorConfiguration	
	AssociationEnd (DM)	ControlArea	
Class			
SectorConfigurationPlan		The sector configurations to be activated over a given period, minimally for a season.	
	AssociationEnd (DM)	NetworkOperationsPlan	
	AssociationEnd (DM)	ActiveSectorConfiguration	
Class			
SectorDailyPlan			
	IdPlanning	P-String	Yes
	SectorGroupName	P-String	Yes

	UserNumber	P-Integer		Yes
	ViewNumber			
	ListOfConfigurations			
	idConfiguration			
	TimeInterval	P-Long Integer		Yes
	SectorNamesList			
Class				
SectorDailyPlanRequest				
	SectorGroupName			
	UserNumber	P-Integer		Yes
	ViewNumber	P-Integer		Yes
	TimeInterval	P-Long Integer		
	StartTime	P-Long Integer		Yes
	EndTime	P-Long Integer		Yes
Class				
SectorFlightList				
	AircraftType	P-String		Yes
	DepartureAerodrome	P-String		Yes
	ArrivalAerodrome	P-String		Yes
	Callsign	P-String		Yes
	FlightColourStatus	P-String		Yes
	AFTMDelay	P-String		Yes
	EntryLevel	P-String		Yes
	EstimatedOffBlocksTime	P-String		Yes
	EntryTime	P-String		Yes
	AircraftEquipment	P-String		Yes
	EstimatedTakeoffTime	P-String		Yes
	ExitLevel	P-String		Yes
	ExitTime	P-String		Yes
	FlightCategory	P-String		Yes
	MostPenalisingRegulation	P-String		Yes
	RegulationList	P-String		Yes



	RequestedFlightLevel	P-String		Yes
	RoutePointList	P-String		Yes
	SuaCrossings	P-String		Yes
	WhatIfsList	P-String		Yes
	WorkloadKpi	P-String		Yes
Class				
SectorFlightListRequest				
	UserNumber	P-Integer		Yes
	ViewNumber	P-Integer		Yes
	KpiType	P-String		Yes
	TimeInterval	P-Long Integer		Yes
	StartTime	P-Long Integer		Yes
	EndTime	P-Long Integer		Yes
	SectorName	P-String		Yes
	LocalAreaGroup	P-String		Yes
	SegmentationStep	P-Integer		Yes
Class				
SectorHistogramKpiList				
	UniquelIdentifier	P-String		Yes
	InputKpi	P-String		Yes
	OperationalSector	P-String		Yes
	LocalAreaGroup	P-String		Yes
	InputSegmentation	P-Integer		Yes
	ViewNumber	P-Integer		Yes
	HistogramKpiList	P-String		Yes
	TotalKpi	P-String		Yes
	StepTime	P-Long Integer		Yes
	FlightColourStatus	P-String		
	ReferenceLocation	P-String		Yes
	UserNumber	P-Integer		Yes
Class				
SectorHistogramKpiListRequest				
	TimeInterval	P-Long Integer		Yes

	StartTime	P-Long Integer		Yes
	EndTime	P-Long Integer		Yes
	UserNumber	P-Integer		Yes
	KpiType	P-String		Yes
	SectorGroupName	P-String		Yes
	SectorNamesList	P-String		Yes
	SegmentationStep	P-Integer		Yes
Class				
SectorOverloadList				
	UserNumber	P-Integer		Yes
	ViewNumber	P-Integer		Yes
	ReferenceLocationType	P-String		Yes
	ReferenceLocationName	P-String		Yes
	ReferenceLocationTheshold	P-Double		Yes
	MergedKpiList	P-String		Yes
Class				
SectorOverloadListRequest				
	UserNumber	P-Integer		Yes
	ViewNumber	P-Integer		Yes
	ReferenceLocationName	P-String		Yes
	TimeInterval	P-Long Integer		Yes
	StartTime	P-Long Integer		Yes
	EndTime	P-Long Integer		Yes
	StepTime	P-String		Yes
Class				
SectorThresholdPlan				
	ThresholdPlan	P-String		Yes
	Date	P-Long Integer		Yes
	IdPlanning	P-String		Yes
	InputKpi	P-String		Yes
	SectorGroupName	P-String		Yes
	ThresholdTimes	P-String		Yes
	ThresholdScenario	P-String		Yes



	TimeInterval	P-Long Integer		Yes
	StartTime	P-Long Integer		Yes
	EndTime	P-Long Integer		Yes
	ThresholdsList	P-String		Yes
	HighThresholdValue	P-String		Yes
	MediumThresholdValue	P-String		Yes
	StepEnumeration	P-String		Yes
	LowThresholdValue	P-String		Yes
Class				
SectorThresholdPlanRequest				
	TimeInterval	P-Long Integer		Yes
	StartTime	P-Long Integer		Yes
	EndTime	P-Long Integer		Yes
	SectorGroupName	P-String		Yes
	SectorNamesList	P-String		Yes
	InputKpi	P-String		Yes
	StepEnumeration	P-String		Yes
	UserNumber	P-Integer		Yes
	ViewNumber	P-Integer		Yes
Class				
SharedMissionTrajectory		The trajectory published by the military airspace user that is available for collaborative ATM planning purposes.		
	AssociationEnd (DM)	MissionDevelopmentTrajectory		
	AssociationEnd (DM)	ReferenceMissionTrajectory		
	AssociationEnd (DM)	StayPhase		
	AssociationEnd (DM)	ATMCommunity		
	AssociationEnd (DM)	FlightTypeChange		
	AssociationEnd (DM)	Flight		
	AssociationEnd (DM)	Flight		
	AssociationEnd (DM)	AircraftIdentification		
	AssociationEnd (DM)	PilotInCommand		

	AssociationEnd (DM)	TakeOffConfiguration		
	AssociationEnd (DM)	AMCManageableArea		
	AssociationEnd (DM)	FlightPlanning		
	AssociationEnd (DM)	ExtendedFlightPlan		
	AssociationEnd (DM)	MediumTermPlanning		
	AssociationEnd (DM)	FlightPlan		
	Specialisation of	Type	Notes	
	MissionTrajectory		A trajectory enriched with other information that expresses the mission intentions of military and other airspace users. Mission Trajectory may additionally include specific airspace reservations when such airspace structure is needed.	
Class				
	ShipboardHeliport	A heliport located on a ship that may be purpose or non-purpose-built. A purpose-built shipboard heliport is one designed specifically for helicopter operations. A non-purpose-built shipboard heliport is one that utilizes an area of the ship that is capable of supporting a helicopter but not designed specifically for that task.		
	Specialisation of	Type	Notes	
	Heliport		An aerodrome or a defined area on a structure intended to be used wholly or in part for the arrival, departure and surface movement of helicopters.	
Class				
	ShortTermATFCMMMeasure	An approach to smooth sector workloads by reducing traffic peaks through short-term application of minor ground delays, appropriate flight level capping and exiguous rerouting to a limited number of flights.		
	AssociationEnd (DM)	MCDMCoordination		
	AssociationEnd (DM)	ATFMHotspot		
	Specialisation of	Type	Notes	
	ATFMMeasure		The actions taken to perform air traffic flow management and capacity management.	
Class				
	SlotSwapping	A tactical ATFM measure aiming at swapping departure slots that can be applied either manually or via automated means.		
	AssociationEnd (DM)	MostPenalisingRegulation		
	AssociationEnd (DM)	MultiSwap		
	AssociationEnd (DM)	Flight		
	AssociationEnd (DM)	CalculatedTimeOver		
	AssociationEnd (DM)	Flight		

	AssociationEnd (DM)	ATFMRegulationSlot		
	Specialisation of	Type	Notes	
	ATFMMeasure		The actions taken to perform air traffic flow management and capacity management.	
Class				
	SpecialEvent	Planned event like new ATC system implementation, big sport event, big military exercise that need to be communicated to Network Management because of their impact on ATM operations.		
	Specialisation of	Type	Notes	
	ATFMEvent		A situation involving a loss of EATMN capacity, or an imbalance between EATMN capacity and demand, or a failure in the information flow in one or several parts of EATMN.	
Class				
	SpecialRequirementsFlight	A flight that is expected to be operating in accordance with regulations issued by the relevant State for aircraft operating as State aircraft, as per Article 3 of the Convention on International Civil Aviation (Doc 7300), and for aircraft operating in accordance with State regulations for non-standard flying activities, normally through the use of reserved airspace.		
	Specialisation of	Type	Notes	
	Flight		The operation of an aircraft which, in the case of a manned aircraft, takes place between the time any person boards the aircraft with the intention of flight until such time as all such persons have disembarked, or in the case of an unmanned aircraft, takes place between the time the aircraft is ready to move with the purpose of flight until such time as it comes to rest at the end of the flight and the primary propulsion system is shut down.	
Class				
	State	An internationally recognized geographic entity that provides air traffic service.		
	AssociationEnd (DM)	MilitaryAuthority		
	AssociationEnd (DM)	Operator		
	AssociationEnd (DM)	PublicAuthority		
	AssociationEnd (DM)	DiplomaticClearance		
	AssociationEnd (DM)	ICAOAircraftAddresses		
	AssociationEnd (DM)	Airspace		
	AssociationEnd (DM)	Airspace		
	AssociationEnd (DM)	Airspace		
	AssociationEnd (DM)	CrossBorderArea		
	AssociationEnd (DM)	AppropriateATSAuthority		
	AssociationEnd (DM)	LicensingAuthority		

	AssociationEnd (DM)	MeteorologicalAuth ority		
	Specialisation of	Type	Notes	
	FormalOrganisation		An organisation which is recognized in the world at large, in particular in legal jurisdiction, with associated rights and responsibilities	
Class				
StateFlight		Operation of an aircraft used in military, customs or police service.		
	Specialisation of	Type	Notes	
	Flight		The operation of an aircraft which, in the case of a manned aircraft, takes place between the time any person boards the aircraft with the intention of flight until such time as all such persons have disembarked, or in the case of an unmanned aircraft, takes place between the time the aircraft is ready to move with the purpose of flight until such time as it comes to rest at the end of the flight and the primary propulsion system is shut down.	
Class				
StayARES		A period a special activity within a reserved airspace volume.		
	AssociationEnd (DM)	AMCManageableAr ea		
	Specialisation of	Type	Notes	
	StayPhase		A period of 'special activity' when the aircraft will 'stay' in the area defined for a given length of time.	
Class				
StayHolding		A period of special activity corresponding to an RPAS en-route holding.		
	AssociationEnd (DM)	HoldingArea		
	Specialisation of	Type	Notes	
	StayPhase		A period of 'special activity' when the aircraft will 'stay' in the area defined for a given length of time.	
Class				
StrategicATFMPhase		An ATFM phase which takes place seven days or more prior to the day of operation and includes research, planning and coordination activities.		
	AssociationEnd (DM)	ATFMMeasure		
	AssociationEnd (DM)	ATMPlanning		
	AssociationEnd (DM)	SchedulingAndStrat egicActivities		
	AssociationEnd (DM)	ForecastDemand		
	AssociationEnd (DM)	PretacticalATFMPha se		
	AssociationEnd (DM)	SimulationDataset		
	AssociationEnd (DM)	RouteAvailabilityDo cument		
	AssociationEnd (DM)	FlightPlanning		
	AssociationEnd (DM)	ATFMMeasure		
	Specialisation of	Type	Notes	

	ATFMPhase		A phase in which ATFM is carried out.
Class			
SurfaceLevelHeliport		A heliport located on the ground or on the water.	
	Specialisation of	Type	Notes
	Heliport		An aerodrome or a defined area on a structure intended to be used wholly or in part for the arrival, departure and surface movement of helicopters.
Class			
TacticalATFMPhase		An ATFM phase, which takes place on the day of operation.	
	AssociationEnd (DM)	ATFMRegulation	
	AssociationEnd (DM)	ActualDemand	
	AssociationEnd (DM)	TacticalOperational Planning	
	AssociationEnd (DM)	EntryCount	
	AssociationEnd (DM)	OperationalDataset	
	AssociationEnd (DM)	PostOperationalAna lysis	
	AssociationEnd (DM)	PretacticalATFMPha se	
	AssociationEnd (DM)	ATFCMSlotMessage	
	AssociationEnd (DM)	ATFCMNotification Message	
	AssociationEnd (DM)	FlightExecution	
	AssociationEnd (DM)	FlightPlanning	
	AssociationEnd (DM)	ATFMMeasure	
	Specialisation of	Type	Notes
	ATFMPhase		A phase in which ATFM is carried out.
Class			
TacticalRerouting		An ATFM measure which requires an aircraft operator to file an alternate route/flight level in order to resolve ATC capacity problems and minimise delays.	
	AssociationEnd (DM)	ReroutingMessage	
	AssociationEnd (DM)	TacticalReroutingPr oposal	
	Specialisation of	Type	Notes
	ATFMMeasure		The actions taken to perform air traffic flow management and capacity management.
Class			
TemporaryReservedArea		A defined volume of airspace normally under the jurisdiction of one aviation authority and temporarily reserved, by common agreement, for the specific use by another aviation authority and through which other traffic may be allowed to transit, under ATC clearance.	

	AssociationEnd (DM)	AMCManageableArea		
	Specialisation of	Type	Notes	
	Airspace		A defined three dimensional region of space relevant to air traffic.	
Class				
	TemporarySegregatedArea	A defined volume of airspace normally under the jurisdiction of one aviation authority and temporarily segregated, by common agreement, for the exclusive use by another aviation authority and through which other traffic will not be allowed to transit.		
	AssociationEnd (DM)	AMCManageableArea		
	Specialisation of	Type	Notes	
	Airspace		A defined three dimensional region of space relevant to air traffic.	
Class				
	TerminalCapacity	The number of passengers and tonnes of cargo per hour which can be processed in a terminal building (sometimes referred to as passenger throughput or cargo throughput).		
	AssociationEnd (DM)	Terminal		
	AssociationEnd (DM)	AirportCapacity		
	Specialisation of	Type	Notes	
	Capacity		The maximum number of aircraft that can be accommodated in a given time period by the system or one of its components (throughput).	
Class				
	TerminalControlArea	A control area normally established at the confluence of ATS routes in the vicinity of one or more major aerodromes.		
	AssociationEnd (DM)	Aerodrome		
	AssociationEnd (DM)	Heliport		
	AssociationEnd (DM)	TerminalProcedure		
	AssociationEnd (DM)	ATSRoute		
	Specialisation of	Type	Notes	
	ControlArea		A controlled airspace extending upwards from a specified limit above the earth.	
Class				
	TerminalProcedure	A series of predetermined manoeuvres with specified protection from obstacles.		
	AssociationEnd (DM)	MinimumSectorAltitude		
	AssociationEnd (DM)	ProcedureTransition		
	AssociationEnd (DM)	TouchDownLiftOff		
	AssociationEnd (DM)	RunwayDirection		
	AssociationEnd (DM)	Obstacle		

	AssociationEnd (DM)	NavigationAidInfras tructure		
	AssociationEnd (DM)	FlightCrewApplicati onAndApproval		
	AssociationEnd (DM)	Trajectory		
	AssociationEnd (DM)	AirTrafficControlSer vice		
	AssociationEnd (DM)	FlightIntent		
	AssociationEnd (DM)	RouteOrProcedureC hange		
	AssociationEnd (DM)	AircraftCapability		
	AssociationEnd (DM)	AircraftCategory		
	AssociationEnd (DM)	NavigationArea		
	AssociationEnd (DM)	TerminalControlAre a		
	AssociationEnd (DM)	ATSRoute		
	AssociationEnd (DM)	HoldingProcedure		
Class				
	TimeToInsertInSequence	<p>A parameter that prevents an improvement into an already organised departure sequence. It may be adjusted at any time depending on the local aerodrome traffic situation and may vary during the day. The TIS parameter is not relevant when ATC has sent an REA message for a flight.</p> <p>The TIS makes sure that a CTOT improvement cannot be sent at short notice as the aerodrome requires some time to introduce an aircraft in the departure sequence (the new CTOT cannot be earlier than clock time + TIS + taxi time).</p>		
	AssociationEnd (DM)	ATFMDepartureSlot		
	AssociationEnd (DM)	Flight		
	AssociationEnd (DM)	DepartureSequence		
	AssociationEnd (DM)	ActiveRunwayConf iguration		
Class				
	TimeToRemoveFromSequence	<p>A parameter that prevents a change to a later CTOT when the flight is already in the departure sequence. It may be adjusted at any time depending on the local aerodrome traffic situation and may vary during the day</p> <p>The CTOT will no longer be modified after CTOT - taxi time - TRS.</p>		
	AssociationEnd (DM)	Flight		
	AssociationEnd (DM)	ATFMDepartureSlot		

	AssociationEnd (DM)	DepartureSequence		
	AssociationEnd (DM)	ActiveRunwayConfiguration		
Class				
TrafficDemand		The air traffic according to the flight plans filed by the aircraft operator. It takes in account any flight plan modifications (CHG, DLA, etc.).		
	AssociationEnd (DM)	FiledTacticalFlightModel		
	Specialisation of	Type	Notes	
	Demand		The number of aircraft requesting to use the ATM system in a given time period.	
Class				
TrafficFlow		Flights with common entry locations upstream, downstream or both with respect to a reference location.		
	AssociationEnd (DM)	Demand		
	AssociationEnd (DM)	AirTrafficManagementSystem		
	AssociationEnd (DM)	TrafficVolume		
	AssociationEnd (DM)	Flight		
	AssociationEnd (DM)	TrafficOrientationScheme		
	AssociationEnd (DM)	AirTraffic		
Class				
TrafficLoad		The air traffic according to the best information available.		
	AssociationEnd (DM)	FiledTacticalFlightModel		
	AssociationEnd (DM)	RegulatedTacticalFlightModel		
	AssociationEnd (DM)	CurrentTacticalFlightModel		
	Specialisation of	Type	Notes	
	Demand		The number of aircraft requesting to use the ATM system in a given time period.	
Class				
TrafficOrientationScheme		A strategic ATFM measure that (re-) route traffic flows.		
	AssociationEnd (DM)	TrafficFlow		
	AssociationEnd (DM)	FlightRestriction		
	Specialisation of	Type	Notes	
	ATFMMeasure		The actions taken to perform air traffic flow management and capacity management.	
Class				
TrafficVolume		A set of conditions used to identify the flights over an airspace, point, aerodrome or set of aerodromes so that they can be monitored or		

		regulated within the tactical/pre-tactical Air Traffic Flow and Capacity Management (ATFCM) system.	
	AssociationEnd (DM)	ATFMMeasure	
	AssociationEnd (DM)	ATFMRegulation	
	AssociationEnd (DM)	Capacity	
	AssociationEnd (DM)	DeclaredCapacity	
	AssociationEnd (DM)	Flow	
	AssociationEnd (DM)	ReferenceLocation	
	AssociationEnd (DM)	TrafficFlow	
	AssociationEnd (DM)	AirTrafficManagementSystem	
	AssociationEnd (DM)	TrafficVolumeSet	
	AssociationEnd (DM)	Flight	
	AssociationEnd (DM)	ATFMHotspot	
Class			
TrafficVolumeActivationPlan		The activation status of a Traffic Volume over a given period of time.	
	AssociationEnd (DM)	NetworkOperationsPlan	
Class			
TransitionAltitude		The altitude at or below which the vertical position of an aircraft is controlled by reference to altitudes.	
	AssociationEnd (DM)	TransitionLayer	
	Specialisation of	Type	Notes
	Altitude		The vertical distance of a level, a point or an object considered as a point, measured from mean sea level (MSL).
Class			
TransitionLayer		The airspace between the transition altitude and the transition level.	
	AssociationEnd (DM)	TransitionLevel	
	AssociationEnd (DM)	TransitionAltitude	
	Specialisation of	Type	Notes
	Airspace		A defined three dimensional region of space relevant to air traffic.
Class			
TransitionLevel		The lowest flight level available for use above the transition altitude.	
	AssociationEnd (DM)	TransitionLayer	
	Specialisation of	Type	Notes
	Altitude		The vertical distance of a level, a point or an object considered as a point, measured from mean sea level (MSL).
Class			
UncontrolledAirspace		Airspace type of Class G and specified Class F airspace within which ATC service is not provided.	

	AssociationEnd (DM)	FlightInformationRegion		
	Specialisation of	Type	Notes	
	Airspace		A defined three dimensional region of space relevant to air traffic.	
Class				
	VariableGeometryArea	A reserved airspace composed of one core area and one or several extension areas. Anytime the Variable Geometry Area is activated, the core is activated and a sub-part of extension areas is activated, based on the mission profile.		
	Specialisation of	Type	Notes	
	Airspace		A defined three dimensional region of space relevant to air traffic.	
Class				
	VisualManoeuvringCirclingArea	The area in which obstacle clearance should be taken into consideration for aircraft carrying out a circling approach.		
	AssociationEnd (DM)	CirclingApproach		
	Specialisation of	Type	Notes	
	Airspace		A defined three dimensional region of space relevant to air traffic.	
Class				
	WarningArea	A non-regulatory airspace of defined dimensions designated over international waters that contains activity which may be hazardous to aircraft not participating in the activity. The purpose of such warning areas is to warn non participating pilots of the potential danger.		
	Specialisation of	Type	Notes	
	Airspace		A defined three dimensional region of space relevant to air traffic.	
Class				
	ZeroRateRegulation	An ATFCM measure with a rate set to zero, which means that no flight can be accommodated during the time of applicability		
	AssociationEnd (DM)	FlightSuspension		
	AssociationEnd (DM)	CriticalEvent		
	Specialisation of	Type	Notes	
	ATFMRegulation		An ATFCM measure implemented by means of a departure slot in order to balance traffic demand against available ATC capacity.	

Table 26: Service Payload description

A.6.1 Payload Data Types

Payload data types are described in Table 27.

Name	Description	Len	Dec	Type	Value
Boolean					
CodeImbalanceSeverityType	A code indicating the severity of an imbalance.				INTERMEDIATE LOWER NONE UPPER
CodeKpicType	A code indicating the type Key Performance Indicator used to identify imbalances.				ENTRIES30 ENTRIES60 OCCUPANCY WORKLOAD
CodeStatusType	A code indicating the status of an imbalance.				ACKNOWLEDGED CANCELED DETECTED IMPLEMENTED SOLVED STAM WORKING_ON_IT
DateTime				P-Datetime	
P-Double					
P-Integer					
P-Long Integer					
P-String					

Table 27: Payload Data Types description

A.7 Service dynamic behaviour

This section describes the dynamic aspects of the interactions around the SubRegionalDCBCOSER service, by depicting the nominal sequence of the service operations that occur between the provider and the consumer. An overview of this is shown in Figure 23 below, in the form of a sequence diagram.

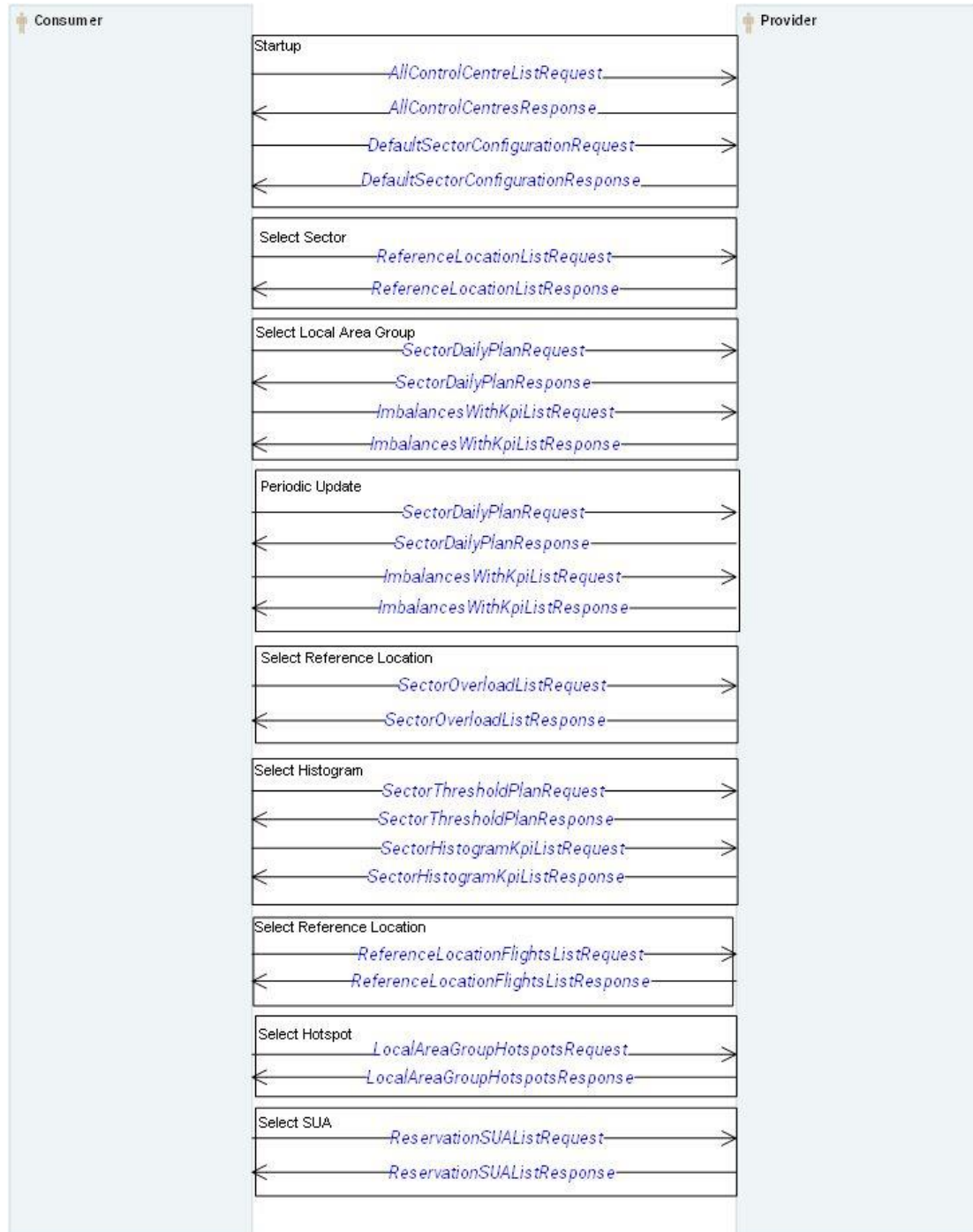


Figure 23: Service Dynamic Behavior diagram

A brief description of the sequence is provided below:

Startup:

- 1.1 The service consumer sends a “AllControlCentreListRequest” message to the provider in order to be able to receive the control centre list identified by the service.
- 1.2 The service provider responds to the consumers with a list of control centres. The “AllControlCentreListResponse” message is distributed to the consumer.
- 1.3 The service consumer sends a “DefaultSectorConfigurationRequest” message to the provider in order to be able to receive the Default Sector Configurations list identified by the service.
- 1.4 The service provider responds to the consumers with a list of Default Sector Configurations. The “DefaultSectorConfigurationResponse” message is distributed to the consumer.

Select Sector:

- 1.5 The service consumer sends a “ReferenceLocationListRequest” message to the provider in order to be able to receive the list of Local Area Groups (to ask for the Reference Locations for groups of sectors) identified by the service. In response the provider sends a “ReferenceLocationListResponse” containing a list reference locations and list of Local Area Groups as requested by the consumer.

Select Local Area Group:

- 1.6 The service consumer sends a “SectorDailyPlanRequest” message to the provider in order to be able to receive the current Sector Configuration Plan for the Agreed Plan within a Time Interval as identified by the service. In response the provider sends a “SectorDailyPlanResponse” containing the Sector Configuration Plan as requested by the consumer.
- 1.7 The service consumer sends a “ImbalancesWithKpiListRequest” message to the provider in order to be able to receive all the Imbalances for one requested KPI with a requested Step and LAG within a given time interval as identified by the service. In response the provider sends a “ImbalancesWithKpiListResponse” containing the Imbalances for the requested KPI and time interval as requested by the consumer.

Periodic Update:

- 1.8 The service consumer sends a “SectorDailyPlanRequest” message to the provider in order to be able to receive the current Sector Configuration Plan for the Agreed Plan within a Time Interval as identified by the service. In response the provider sends a “SectorDailyPlanResponse” containing the Sector Configuration Plan as requested by the consumer.
- 1.9 The service consumer sends a “ImbalancesWithKpiListRequest” message to the provider in order to be able to receive all the Imbalances for one requested KPI with a requested Step and LAG within a given time interval as identified by the service. In response the provider sends a “ImbalancesWithKpiListResponse” containing the Imbalances for the requested KPI and time interval as requested by the consumer.

Select Reference Location:

- 1.10 The service consumer sends a “SectorOverloadListRequest” message to the provider in order to be able to receive the information to show the Reference Location Histograms, KPI values and colour coding for the selected Reference Location and Time Interval as identified by the service. In response the provider sends a “SectorOverloadListResponse” containing the the information to show the Reference Location Histograms, KPI values and colour coding for the selected Reference Location and Time Interval as requested by the consumer.

Select Histogram:

- 1.11 The service consumer sends a “SectorThresholdPlanRequest” message to the provider in order to be able to receive the current Thresholds Plan for the Agreed Plan for the selected Operational Sector Histogram as identified by the service. In response the provider sends a “SectorThresholdPlanResponse” containing the information to show the Reference Location Histograms, KPI values and colour coding for the current Thresholds Plan for the Agreed Plan for the selected Operational Sector Histogram as requested by the consumer.
- 1.12 The service consumer sends a “SectorHistogramKpiListRequest” message to the provider in order to be able to receive the information to show a Histogram with its KPI values and colour coding per each step for the selected Operational Sector and Time Interval as identified by the service. In response the provider sends a “SectorHistogramKpiListResponse” containing the information to show the Reference Location Histograms, KPI values and colour coding for the information to show a Histogram with its KPI values and colour coding per each step for the selected Operational Sector and Time Interval as requested by the consumer.

Select Reference Location:

- 1.13 The service consumer sends a “ReferenceLocationFlightsListRequest” message to the provider in order to be able to receive the Flights for the selected Reference Location and Time Interval as identified by the service. In response the provider sends a “ReferenceLocationFlightsListResponse” containing the information to show the Flights for the selected Reference Location and Time Interval as requested by the consumer.

Select Hotspot:

- 1.14 The service consumer sends a “LocalAreaGroupHotspotsRequest” message to the provider in order to be able to receive the Hotspots for the selected Local Area Group as identified by the service. In response the provider sends a “LocalAreaGroupHotspotsResponse” containing the information to show the Hotspots for the selected Local Area Group as requested by the consumer.

Select SUA:

- 1.15 The service consumer sends a “ReservationSUAListRequest” message to the provider in order to be able to receive the available SUAs Reservations for the RSA Designators equal to EG*. In response the provider sends a “ReservationSUAListResponse” containing the information to show the available SUAs Reservations for the RSA Designators equal to EG* as requested by the consumer.

