



European ATM Service Description for the ExtendedFlightPlanSubmission Service

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Abstract

This document contains the updated version of the service description for the Extended Flight Plan Submission service produced for ISRM iteration 2.0.

The ExtendedFlightPlanSubmission service supports the service consumer (Airspace User) to:

- request the validation of an Extended Flight Plan (FPL) message before its submission;

- request the submission of Extended FPL/Extended Modification/Extended Delay message;
- request the cancellation of an Extended Flight Plan;
- request to the Network Manager the current processing outcomes of an Extended Flight Plan with a known Identifier .

The ExtendedFlightPlanSubmission service supports the service provider (Network Manager) to:

- send the reply of the validation request (ACK, REJ) to the service consumer (Airspace User);
- send the reply of the submission request (ACK, MAN, REJ) to the service consumer (Airspace User);
- send the status of a specific flight plan to the service consumers (Airspace User and ATC units). The status may be “Suspended” or “De-suspended”.
- send, on request, the latest outcome of the processing of a certain flight plan well identified.

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Executive summary

The Extended Flight Plan concept extends the ICAO Flight Plan with 4D Trajectory Data and Aircraft Performance Data.

The ExtendedFlightPlanSubmission service addresses both the following:

- the submission of an Extended Flight Plan from the Airspace User to the Network Manager;
- the provision of its status (suspended, de-suspended) from the Network Manager to the ATC units and Airspace Users.

In particular the ExtendedFlightPlanSubmission service enables subscribed Airspace Users to:

- verify an Extended Flight Plan (without submitting it to the Network Manager);
- submit an Extended Flight Plan to the Network Manager;
- send a request for the update or cancellation of an Extended Flight Plan to the Network Manager;
- send a request to receive the latest processing outcomes related to a certain flight plan.

The service enables also the Network Manager to provide the authorized consumers with replies about the outcomes of the verification and/or the submission.

Service consumers can optionally subscribe to a dedicated interface for the receipt of suspension/de-suspension messages related to an acknowledged Extended Flight Plan.

Consumers no more interested in the provided information can unsubscribe from the status service interface.

The service update, reported in this document, has been performed to align the model and SDD to the ISRM 00.07.00 Foundation.

1 Introduction

1.1 Purpose of the document

The purpose of this Service Description Document is to provide a holistic overview of the ExtendedFlightPlanSubmission service and its building blocks, as an evolution of the Service described in document DEL 08.03.10 D64 European ATM Service Description for ExtendedFlightPlanSubmission Service Edition 00.02.01 (See reference [17]). It serves as a complement to a model based description and supports the configuration management process by providing well-defined baselines.

1.2 Intended readership

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

1.3 Inputs from other projects

European ATM Service Description for the ExtendedFlightPlanSubmission Service (See reference [9]).

B4.3 EFPL Service Allocation FT14 (See reference [12]).

1.4 Glossary of terms

NA

1.5 Acronyms and Terminology

1.5.1 Acronyms

| Term | Definition |
|--------------------|--|
| ACK | Acknowledge |
| ADD | Architecture Description Document |
| AIRM | ATM Reference Information Model |
| AO | Aircraft Operator |
| ATC unit | Air Traffic Control unit |
| ATM | Air Traffic Management |
| AU | Airspace User |
| CC | Capability Configuration |
| CNL message | Cancellation message |
| EATMA | European Air Traffic Management Architecture |

| Term | Definition |
|------------------------|---|
| E-ATMS | European Air Traffic Management System |
| ECHG message | Extended modification message of the Extended Flight Plan |
| EDLA message | Extended delay message of the Extended Flight Plan |
| EFPL | Extended Flight Plan |
| FAA | Federal Aviation Administration |
| FOC | Flight Operation Center |
| FPL | Flight Plan |
| FIXM | Flight Information Exchange Model |
| IER | Information Exchange Requirement |
| IFPS | Integrated Initial Flight Plan Processing System |
| ISRM | Information Service Reference Model |
| MAN message | Manual message |
| MEP | Message Exchange Pattern |
| NAF | NATO Architecture Framework |
| NM | Network Manager |
| NSOV | NATO Service Oriented View |
| NOV | NATO Operational View |
| NSV | NATO System View |
| ORM | Operational Reply Message |
| OSED | Operational Service and Environment Definition |
| QoS | Quality of Service |
| PTR | Profile Tuning Restriction |
| REJ | Rejection |
| SDD | Service Description Document |
| SESAR | Single European Sky ATM Research Programme |
| SESAR Programme | The programme which defines the Research and Development activities and Projects for the SJU. |

| Term | Definition |
|---------------------------|---|
| SJU | SESAR Joint Undertaking (Agency of the European Commission) |
| SJU Work Programme | The programme which addresses all activities of the SESAR Joint Undertaking Agency. |
| SoaML | Service Oriented Architecture Modelling Language |
| SPR | Safety and Performance Requirements |
| SWIM | System Wide Information Management |
| UML | Unified Modelling Language |

1.5.2 Terminology

| Term | Definition | Source |
|---------------------------------|---|-----------------------------|
| Accepted Trajectory | Trajectory as calculated by NM to check the compliance of the flight plan with published constraints. It is based on the filed trajectory but integrates among other elements additional “soft” constraints like LOAs/ATC constraints published as PTRs. | See reference [9] |
| Capability | Capability is the ability of one or more of the enterprise’s resources to deliver a specified type of effect or a specified course of action to the enterprise stakeholders. | EATMA Guidance Material [8] |
| Capability Configuration | A Capability Configuration is a combination of Roles and Systems configured to provide a Capability derived from operational and/or business need(s) of a stakeholder type. | EATMA Guidance Material [8] |
| Node | A logical entity that performs Activities. Note: nodes are specified independently of any physical realisation. | EATMA Guidance Material [8] |
| Service | The contractual provision of something (a non-physical object), by one, for the use of one or more others. Services involve interactions between providers and consumers, which may be performed in a digital form (data exchanges) or through voice communication or written processes and procedures. | EATMA Guidance Material [8] |
| Service function | A type of activity describing the functionality of a Service. | EATMA Guidance Material [8] |
| Service interface | The mechanism by which a service communicates | EATMA Guidance Material [8] |
| Trajectory (4D) | The 4D trajectory is a set of consecutive segments linking published waypoints and/or pseudo waypoints computed by air or ground tools (FOC system, aircraft FMS, ground Trajectory Predictor) to build the lateral transitions and the vertical profiles. Each point is defined by a | See reference [9] |

| Term | Definition | Source |
|------|---|--------|
| | longitude, latitude, a level and a time | |

2 Service identification

| | |
|--------------|--|
| Name | ExtendedFlightPlanSubmission |
| ID | {677FD8AB-A276-4d00-B43B-89022926846A} |
| Version | Version: 2.0 |
| Keywords | EFPL, ECHG, EDLA, CNL, ORM, ACK, MAN, REJ, Extended Flight Plan, Extended Modification Message, Extended Delay Message, Cancellation Message, Operational Reply Message, Submission, Status, Suspension Message, De-Suspension Message, Processing Outcome |
| Architect(s) | Serena Rubbioli / Witold Wolski ENAV (IDS) |

| Lifecycle status | Date | References |
|------------------|--|--|
| Identified | 23/01/2013 | European ATM Service Identification for Extended Flight Plan Services (See reference [10]) |
| Allocated | 08/07/2013 | B4.3 EFPL Service Allocation FT14 (See reference [11]) |
| Designed | 01/06/2016 | This document |
| Validated | <i>Date when validated. Filled by WP3</i> | <i>Name of protocol documenting the decision</i> |
| IOC | <i>Date for Initial Operational Capability</i> | <i>Reference to technical enabler hosting the service in the ATM master plan</i> |
| FOC | <i>Date for Full Operational Capability</i> | <i>Reference to technical enabler hosting the service in the ATM master plan</i> |

3 Operational and Business context

The operational context for the ExtendedFlightPlanSubmission service derives from the P07.06.02 OSED (See reference [9]).

The Submission service enables the Airspace User to:

- request the validation of an EFPL message before its submission;
- request the submission of EFPL/ECHG/EDLA message;
- request the cancellation of an Extended Flight Plan;
- request the processing outcome of an Extended Flight Plan with a known identifier.

The Submission service enables the Network Manager to:

- send the reply of validation request (ACK, REJ) to the Airspace User;
- send the reply of submission request (ACK, MAN, REJ) to the Airspace User;
- send the processing outcome of an Extended Flight Plan with a known identifier in terms of an Operational Reply Message;
- send the status of a specific flight plan to the Airspace User and ATC units. The status may be "Suspended" or "De-suspended".

3.1 Information Exchange Requirements

The mapping from ExtendedFlightPlanSubmission Service to the Information Exchange Requirements is shown in Figure 1.

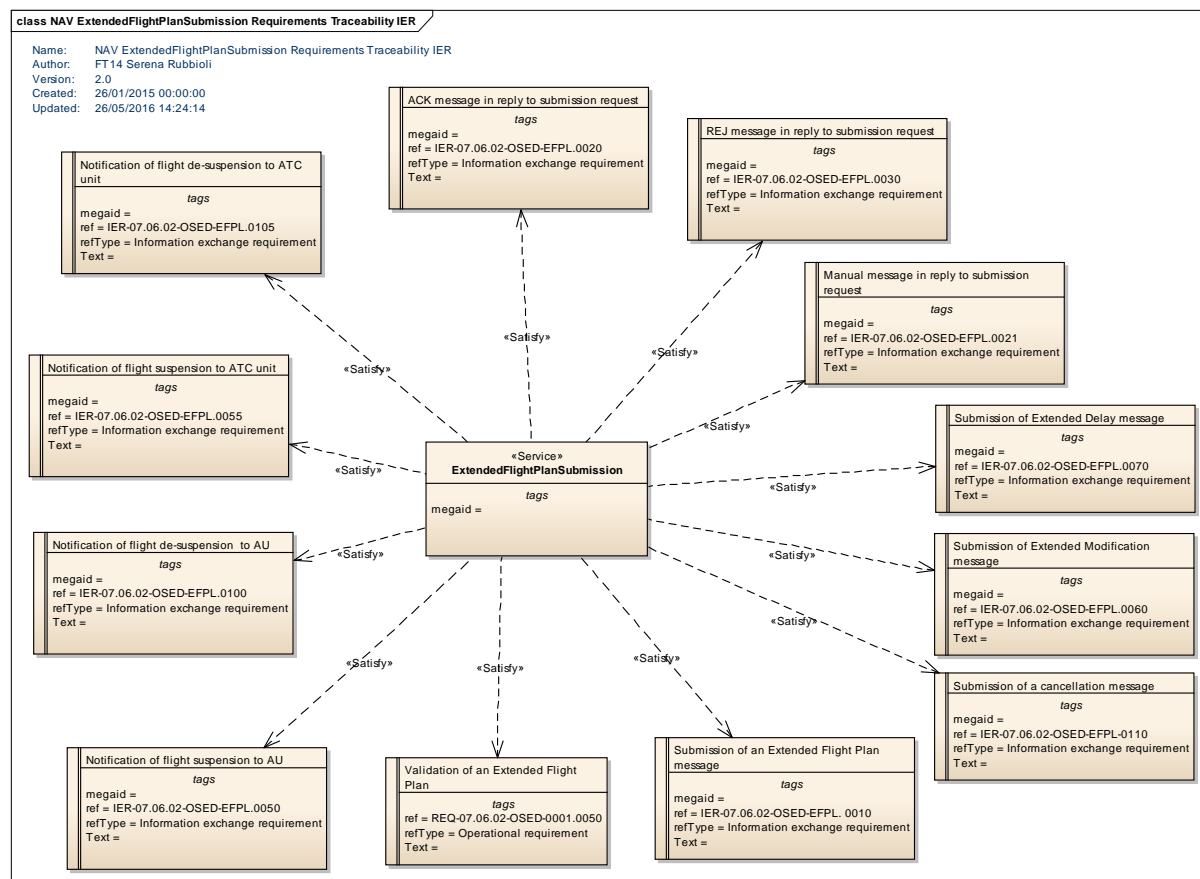


Figure 1: NAV ExtendedFlightPlanSubmission Requirements Traceability IER diagram

IERs TABLES:

| Element Name | Author | Notes |
|---|----------------------|---|
| ACK message in reply to submission request | FT14 Serena Rubbioli | The NM shall be able to reply to the AU submission request sending an ACK message. |
| Element Tagged Value Name | | Value |
| megaid | | |
| ref | | IER-07.06.02-OSED-EFPL.0020 |
| refType | | Information exchange requirement |
| Text | | |
| Element Name | Author | Notes |
| Manual message in reply to submission request | FT14 Serena Rubbioli | The NM shall be able to inform the AU that errors have been detected in the submitted EFPL/ECHG/EDLA message and that it has been referred for manual processing by the NM staff. |
| Element Tagged Value Name | | Value |
| megaid | | |
| ref | | IER-07.06.02-OSED-EFPL.0021 |
| refType | | Information exchange requirement |
| Text | | |
| Element Name | Author | Notes |
| Notification of flight de-suspension to | FT14 Serena Rubbioli | The NM shall be able to notify the AU of the |

| | | | |
|--|----------------------------------|----------------------------------|---|
| AU | | de-suspension of a flight. | |
| | Element Tagged Value Name | Value | |
| | megaid | | |
| | ref | IER-07.06.02-OSD-EFPL.0100 | |
| | refType | Information exchange requirement | |
| | Text | | |
| Element Name | | Author | Notes |
| Notification of flight de-suspension to ATC unit | | FT14 serena Rubbioli | The NM shall be able to notify the ATC unit of the de-suspension of a flight. |
| | Element Tagged Value Name | Value | |
| | megaid | | |
| | ref | IER-07.06.02-OSD-EFPL.0105 | |
| | refType | Information exchange requirement | |
| | Text | | |
| Element Name | | Author | Notes |
| Notification of flight suspension to ATC unit | | FT14 Serena Rubbioli | The NM shall be able to notify the ATC unit of the suspension of a flight. |
| | Element Tagged Value Name | Value | |
| | megaid | | |
| | ref | IER-07.06.02-OSD-EFPL.0055 | |
| | refType | Information exchange requirement | |
| | Text | | |
| Element Name | | Author | Notes |
| Notification of flight suspension to AU | | FT14 Serena Rubbioli | The NM shall be able to notify the AU of the suspension of a flight. |
| | Element Tagged Value Name | Value | |
| | megaid | | |
| | ref | IER-07.06.02-OSD-EFPL.0050 | |
| | refType | Information exchange requirement | |
| | Text | | |
| Element Name | | Author | Notes |
| REJ message in reply to submission request | | FT14 Serena Rubbioli | The NM shall be able to inform the AU that errors have been detected in the submitted EFPL/ECHG/EDLA message and that it has been automatically rejected. |
| | Element Tagged Value Name | Value | |
| | megaid | | |
| | ref | IER-07.06.02-OSD-EFPL.0030 | |
| | refType | Information exchange requirement | |
| | Text | | |
| Element Name | | Author | Notes |
| Submission of Extended Delay message | | FT14 Serena Rubbioli | The AU shall be able to submit an extended delay message (EDLA) to the NM. |
| | Element Tagged Value Name | Value | |
| | megaid | | |
| | ref | IER-07.06.02-OSD-EFPL.0070 | |
| | refType | Information exchange requirement | |
| | Text | | |
| Element Name | | Author | Notes |
| Submission of Extended Modification message | | FT14 Serena Rubbioli | The AU shall be able to submit an extended modification message (ECHG) to the NM. |
| | Element Tagged Value Name | Value | |
| | megaid | | |
| | ref | IER-07.06.02-OSD-EFPL.0060 | |

| | refType | Information exchange requirement | |
|---|---------------------------|---|--|
| | Text | | |
| Element Name | Author | Notes | |
| Submission of a cancellation message | FT14 Serena Rubbioli | The AU shall be able to submit the cancellation request of an EFPL to the NM. | |
| | Element Tagged Value Name | Value | |
| | megaid | | |
| | ref | IER-07.06.02-OSED-EFPL-0110 | |
| | refType | Information exchange requirement | |
| | Text | | |
| Element Name | Author | Notes | |
| Submission of an Extended Flight Plan message | FT14 Serena Rubbioli | The AU shall be able to submit an EFPL message to the NM. | |
| | Element Tagged Value Name | Value | |
| | megaid | | |
| | ref | IER-07.06.02-OSED-EFPL. 0010 | |
| | refType | Information exchange requirement | |
| | Text | | |

Table 1: Requirements tracing

3.2 Other Requirements

3.2.1 Non-Functional Requirements

The diagram below shows the Non-Functional Requirements taken from the SPR document (Ref.[22]).

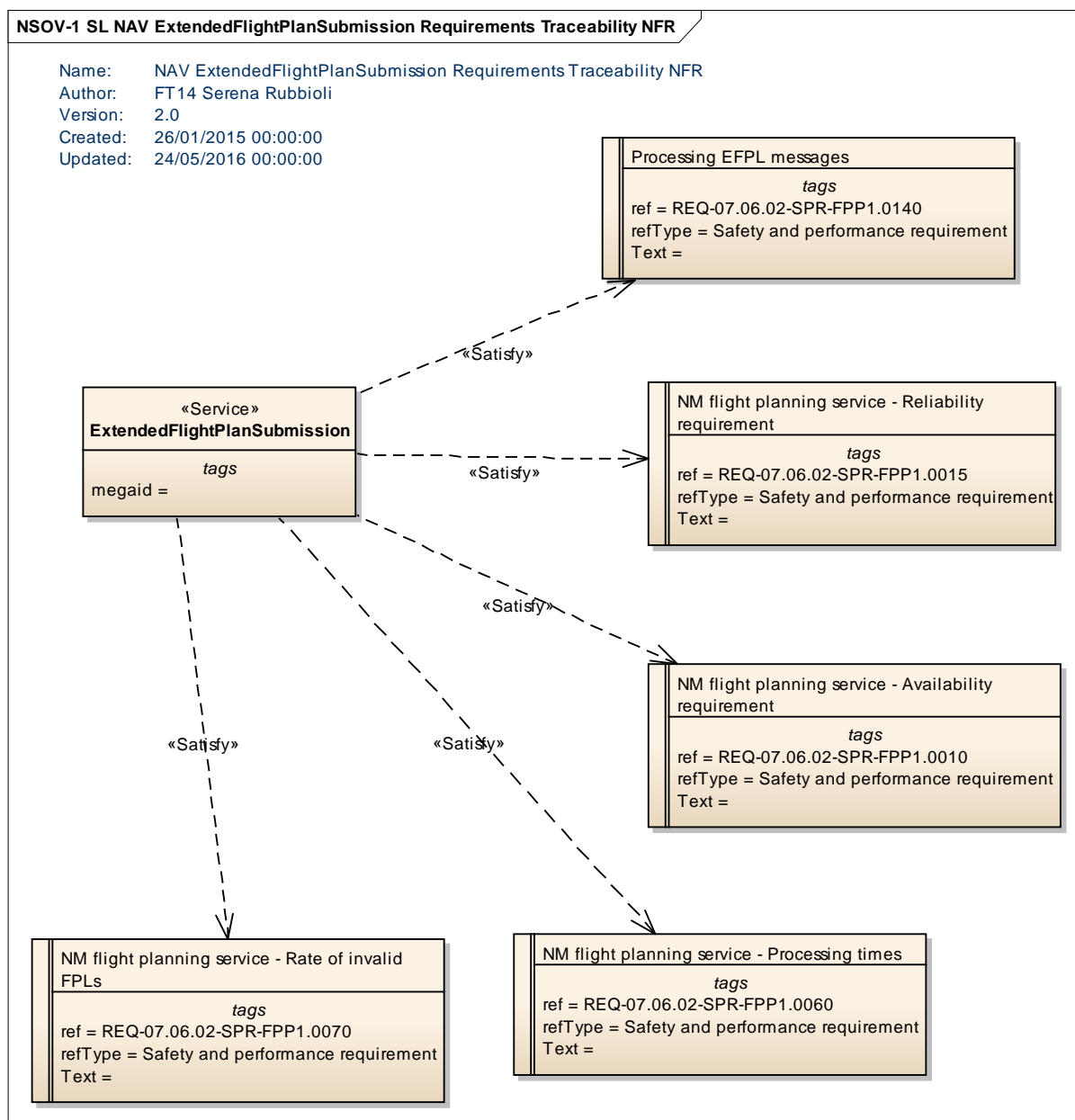


Figure 2: NAV ExtendedFlightPlanSubmission Requirements Traceability NfR diagram

3.2.2 Relevant Industrial Standards

The data described in the P07.06.02 OSED are based on the definitions given in the ICAO Doc 4444 for the 2012 Flight Plan (ICAO Doc 4444 ATM/501 PANS – Air Traffic Management – 15th Edition 2007 Amendment 2).

The reference information exchange model applicable to the payload is FIXM 3.0.1 with its EFPL extension version 1.0 beta released by Eurocontrol.

3.2.3 Nodes

The Service to EATMA Nodes Mapping diagram is shown in Figure 3.

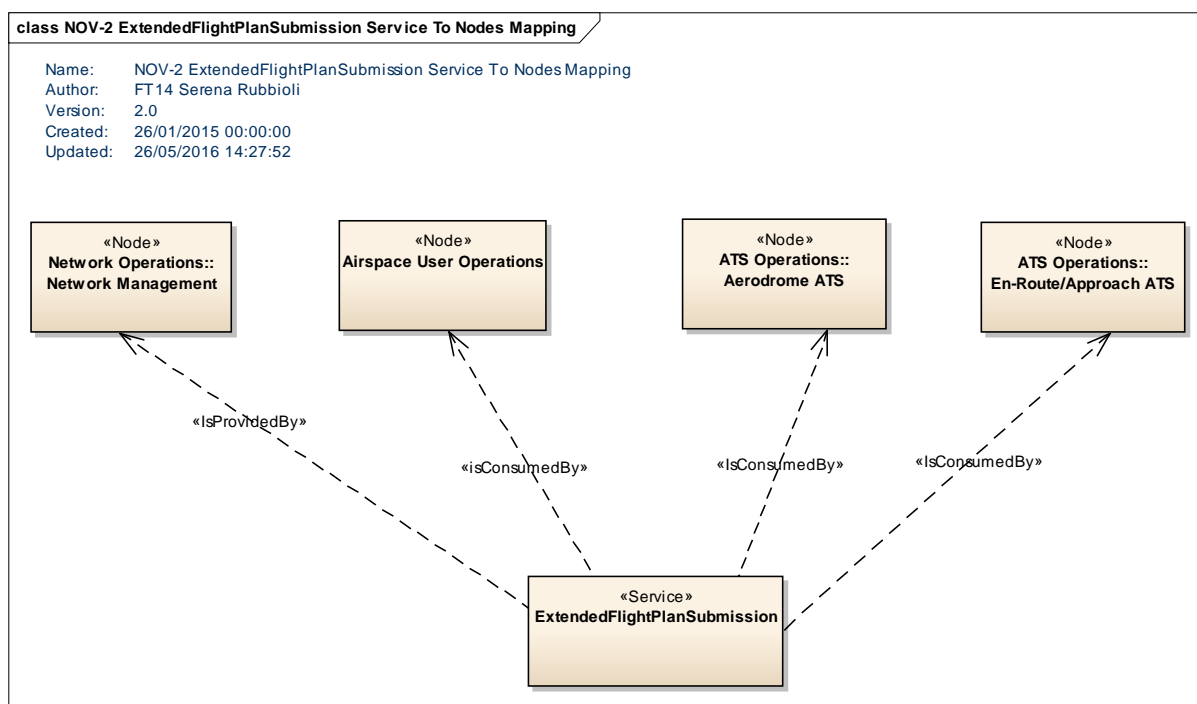


Figure 3: NOV-2 ExtendedFlightPlanSubmission Service to Nodes Mapping diagram

4 Service overview

The ExtendedFlightPlanSubmission service is used to support the following interactions between the service provider (Network Manager) and the service consumers (AU and ATC units):

- The service provider is able to receive a request of validation of an EFPL (without its submission) from the service consumer (AU);
- The service provider is able to receive a request of submission of an EFPL/ECHG/EDLA message from the service consumer (AU);
- The service provider is able to receive a request of cancellation of a flight plan from the service consumer (AU);
- The service provider is able to receive a request concerning the current processing outcome of a flight plan from the service consumer (AU);
- The service provider is able to send a Validation Operational Reply Message (ACK, REJ) to the service consumer (AU) as a reply of the validation request;
- The service provider is able to send an Operational Reply Message to the service consumer (AU) as a reply of the submission request;
- The service provider is able to send an Operational Reply Message (ACK, REJ, MAN) to the service consumer (AU) as a reply of the processing outcome request;
- The service provider is able to send the status of an Extended Flight Plan to the service consumers (AU and ATC units). The EFPL status may be “Suspended” or “De-suspended”.

4.1 Service Taxonomy

The service taxonomy is described in the ISRM Service Portfolio document [19].

4.2 Service Levels (NfRs)

Non Functional Requirements are described in section 3.2.1.

4.3 Service Functions and Capabilities

The mapping from Service to EATMA Operational Activities for the ExtendedFlightPlanSubmission Service is shown in the NSOV-4 Service to Operational Activity diagram, which is reported in Figure 4. The mapping from Service to EATMA Capabilities for the ExtendedFlightPlanSubmission Service is shown in Figure 5

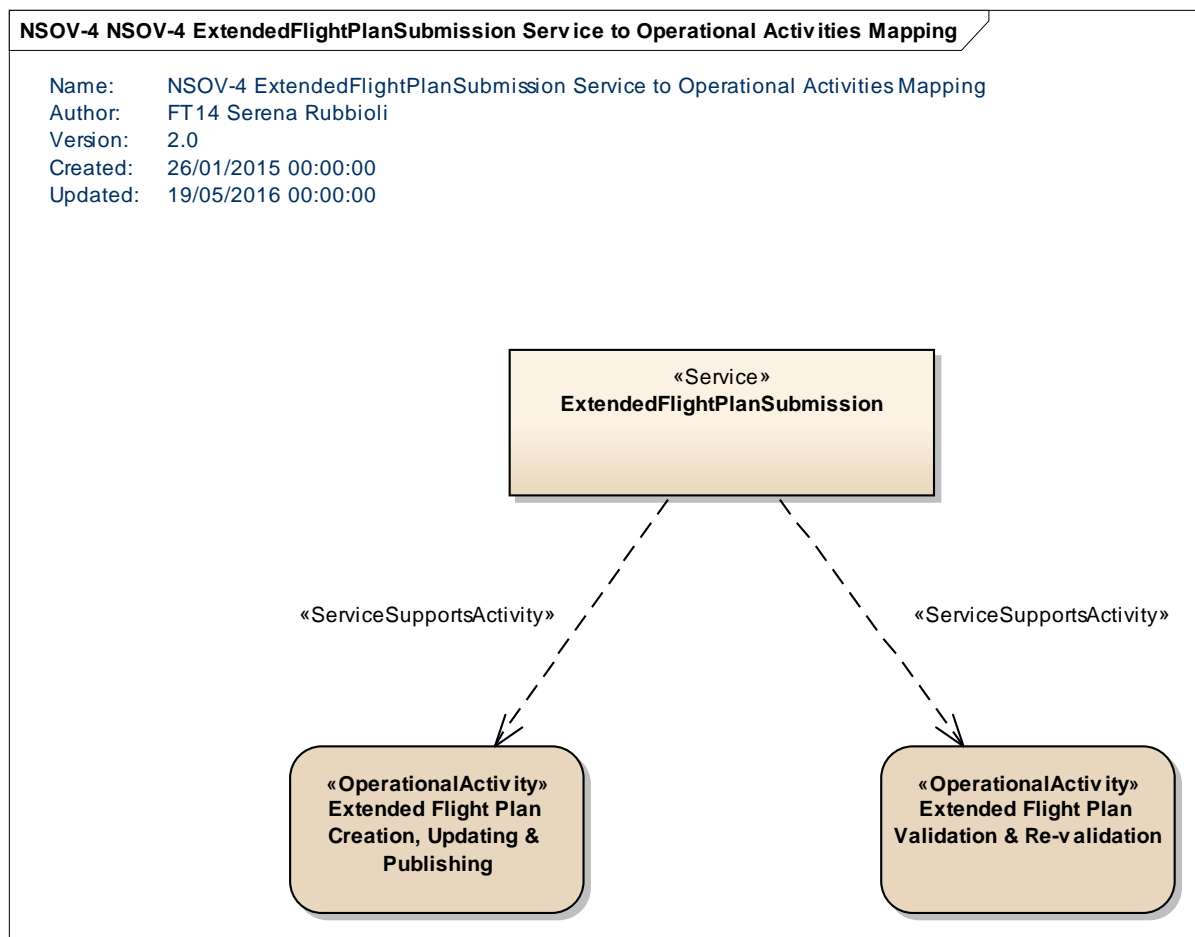


Figure 4: NSOV-4 ExtendedFlightPlanSubmission Service to Operational Activities Mapping diagram¹

For the service to capabilities mapping, please see the NSOV-2 ExtendedFlightPlanSubmission Interface Definition diagram, reported in Figure 5.

¹ This diagram has been updated to take into account the latest EATMA Operational Activities.

4.4 Service Interfaces

The ExtendedFlightPlanSubmission Service has two service interfaces (ports):

- **StatusProviderInterface²** which includes the definitions and operations enabling the service consumers to subscribe/unsubscribe to/from the Service (FlightStatusProvided definition) and to receive flight plan suspension / desuspension messages from the service provider;
- **FlightPlanCoordinatorInterface** which includes the definition and operations enabling the service consumers to send ExtendedFlightPlans and related updates to the service provider, and to request the processing outcomes for a specific flight plan processed by the service provider.

The Service interface specifications are reported in Chapter 5 and are thus here not detailed

The NSOV-2 ExtendedFlightPlanSubmission Service Interface Definition diagram is in Figure 5.

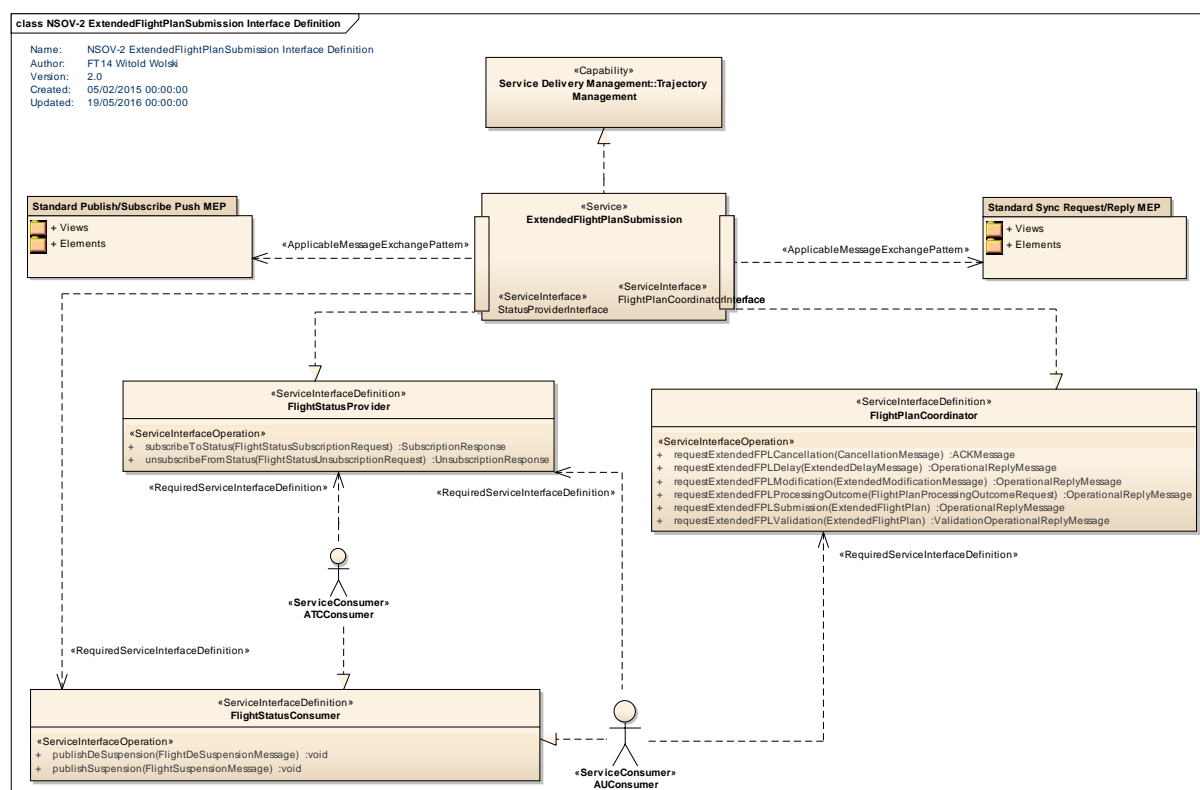


Figure 5: NSOV-2 ExtendedFlightPlanSubmission Interface Definition diagram

The related service interface definitions are listed in Table 2 which is reported below.

² Optional interface

| ServiceInterface | ServiceInterfaceDefinition | ServiceInterfaceOperation | Role |
|--------------------------------|----------------------------|-------------------------------------|----------|
| FlightPlanCoordinatorInterface | FlightPlanCoordinator | requestExtendedFPLSubmission | provided |
| FlightPlanCoordinatorInterface | FlightPlanCoordinator | requestExtendedFPLDelay | provided |
| FlightPlanCoordinatorInterface | FlightPlanCoordinator | requestExtendedFPLModification | provided |
| FlightPlanCoordinatorInterface | FlightPlanCoordinator | requestExtendedFPLCancellation | provided |
| FlightPlanCoordinatorInterface | FlightPlanCoordinator | requestExtendedFPLValidation | provided |
| FlightPlanCoordinatorInterface | FlightPlanCoordinator | requestExtendedFPLProcessingOutcome | provided |
| StatusProviderInterface | FlightStatusProvider | subscribeToStatus | provided |
| StatusProviderInterface | FlightStatusProvider | unsubscribeFromStatus | provided |
| StatusProviderInterface | FlightStatusConsumer | publishDeSuspension | required |
| StatusProviderInterface | FlightStatusConsumer | publishSuspension | required |

Table 2: Service Interfaces

5 Service interface specifications

The ExtendedFlightPlanSubmission Service has two service interfaces (ports):

- **StatusProviderInterface**³ which includes the definitions and operations enabling the service consumers to subscribe/unsubscribe to/from the Service (FlightStatusProvided definition) and to receive flight plan suspension / desuspension messages from the service provider;
- **FlightPlanCoordinatorInterface** which includes the definition and operations enabling the service consumers to send ExtendedFlightPlans and related updates to the service provider, and to request the processing outcomes for a specific flight plan processed by the service provider.

The interfaces of the ExtendedFlightPlanSubmission Service are shown in Figure 5 and are hereby described, including their service interface definitions and operations.

The payload diagrams linked to each operation, in all service interface definitions presented in this chapter, from the release of ISRM 1.4 are still based also on the FIXM 3.0.1 standard model plus its FIXM EFPL Extension v.1.0 Beta (as agreed within WP8 relevant representatives). Please note that the FIXM 3.0.1 with its EFPL Extension supports the following information:

- **ICAO FPL Data:** all data to be provided in a filed flight plan as specified in the ICAO Doc 4444 (See reference [15]) and the IFPS⁴ Users Manual (See reference [16] - for data items specific to the IFPS Zone), including the Field 15 route information;
- **4D Trajectory Data (UP4DT):** AO calculated flight 4D trajectory as included in the operational flight plan (OFP) of the flight;
- **Flight Performance Data:** the climbing and descending capabilities of the aircraft specific to the flight, taking into account the performance of the airframe that is used to operate the flight as well as any other parameters that may influence it such as engine settings and status, cost factor applied by the operator. The Flight Performance Data will be provided as climb and descent performance profiles and as total weight of aircraft as part of the 4D trajectory⁵ in order to allow for two approaches in the re-calculation of a flight trajectory within the recipient systems.

5.1 Service Interface StatusProviderInterface

The purpose of the Service Interface **StatusProviderInterface** is to foresee the service interface definitions with necessary operations to allow the service consumers to subscribe/unsubscribe to/from the Service and to receive flight plan suspension / desuspension messages from the service provider.

The message exchange pattern foreseen for the service interface **StatusProviderInterface** is the Standard Publish/Subscribe Push MEP.

The Service Interface **StatusProviderInterface** implements two Service Interface definitions:

- the **FlightStatusProvider** service interface definition.
- the **FlightStatusConsumer** service interface definition.

Such service interface definitions are described in the following subparagraphs.

³ Optional interface

⁴ Integrated Initial Flight Plan Processing System

⁵ the Total Weight or the Climb/Descent Performance Profiles shall be included in an extended flight plan message. When one of the two data items is included the other one is optional.

5.1.1 Service Interface Definition FlightStatusProvider

The purpose of the **FlightStatusProvider** service interface definition is to implement those service operations enabling the service consumers to subscribe/unsubscribe to/from the Service.

The architecture of the **FlightStatusProvider** interface definition includes the following operations:

- **subscribeToStatus**
- **unsubscribeFromStatus**

These operations are described in the next paragraphs, including their related payload diagrams and tables which have been defined in the release of ISRM (1.4) upon discussion within WP8.

5.1.1.1 Operation subscribeToStatus

The service operation **subscribeToStatus** allows the service consumer to send the request for subscription (including the timestamp of the request) to the service provider and foresees a reply (including the timestamp of the reply) from the service provider, for the successful subscription⁶.

5.1.1.1.1 Operation Functionality

The operation *functionality* foresees:

- to pass to the Service Interface the parameter named **FlightStatusSubscriptionRequest** to the service provider and
- to obtain a reply containing the parameter **SubscriptionResponse** as confirmation for a successful subscription.

5.1.1.1.2 Operation Parameters

The input parameter for the operation is **FlightStatusSubscriptionRequest** (which contains the timestamp of the request sent by the service consumer).

The output parameter for the operation is **SubscriptionResponse** (which contains the timestamp of the reply sent by the service provider concerning the successful subscription).

The payload diagrams and related tables are reported hereby, where each attribute and relationship is described. The tagged values show the linked AIRM (Ref. [23]) class where/if applicable.

⁶ The management of the subscription failure is done at the level of the technical interface. ISRM stands at a higher (logical) abstraction level, therefore it does not specify further the outcome of the subscription.

PAYLOAD DIAGRAMS:

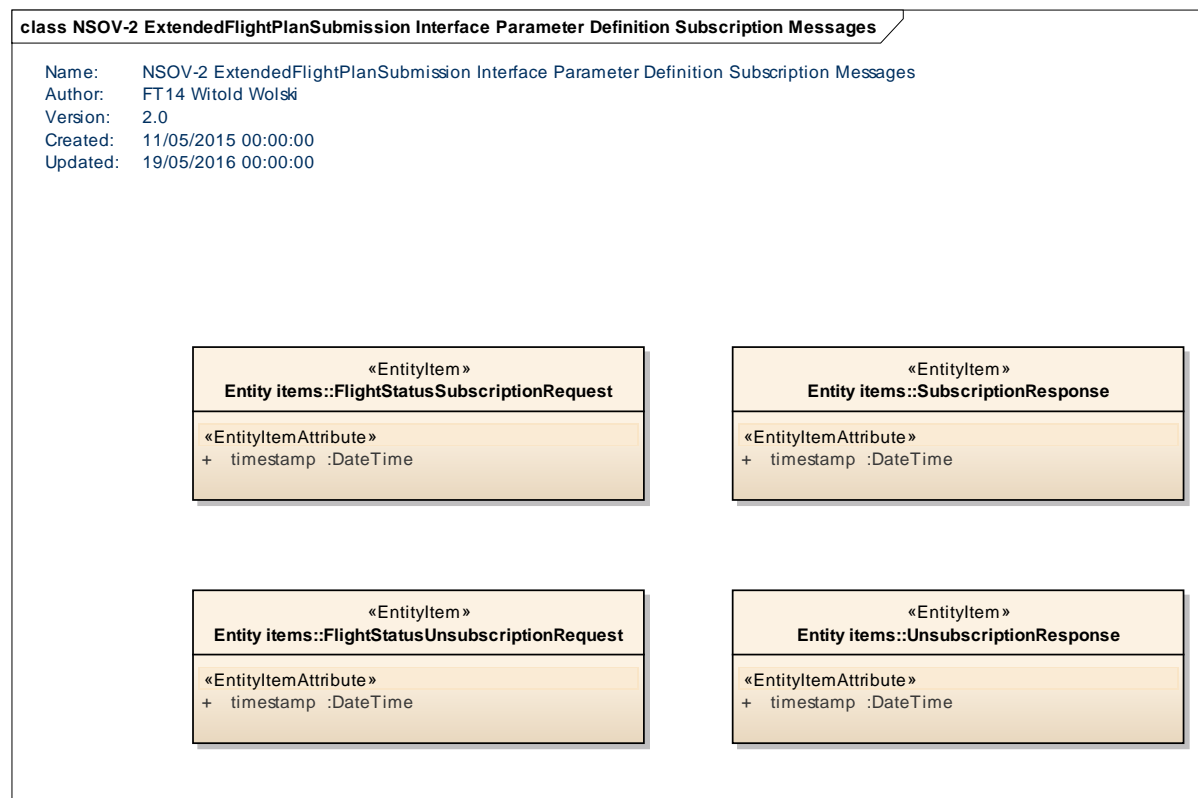


Figure 6: NSOV-2 ExtendedFlightPlanSubmission Interface Parameter Definition diagram – Subscription Messages

PAYLOAD TABLES:

| Element Name | | Author | Notes |
|---------------------------------|----------|---|---|
| FlightStatusSubscriptionRequest | | FT14 Serena Rubbioli | Message for subscription to notification of flight status (suspended/de-suspended). |
| Attribute Name | Type | Notes | |
| timestamp | DateTime | The time of submission of the subscription request. | |
| Tagged Value Name | | Value | |
| CLDMSemanticTrace | | CLDM_out_of_scope | |

| Element Name | | Author | Notes |
|----------------------|----------|--|-----------------------------------|
| SubscriptionResponse | | FT14 Serena Rubbioli | Response to subscription request. |
| Attribute Name | Type | Notes | |
| timestamp | DateTime | The timestamp from when the subscription is effective. | |
| Tagged Value Name | | Value | |
| CLDMSemanticTrace | | CLDM_out_of_scope | |

Table 3: Payload tracing to AIRM

5.1.1.2 Operation unsubscribeFromStatus

The service operation **unsubscribeFromStatus** allows the service consumer to send the request for unsubscription (including the timestamp of the request) to the service provider and foresees a reply (including the timestamp of the reply) from the service provider, for the successful unsubscription.

5.1.1.2.1 Operation Functionality

The operation *functionality* foresees:

- to pass to the Service Interface the parameter named **FlightStatusUnsubscriptionRequest** to the service provider
- to obtain a reply containing the parameter **UnsubscriptionResponse** as confirmation for a successful unsubscription.

5.1.1.2.2 Operation Parameters

The operation has the input *parameter* **FlightStatusUnsubscriptionRequest** that contains the timestamp of the request sent by the service consumer.

The operation has the input *parameter* **UnsubscriptionResponse** that contains the timestamp of the reply sent by the service provider concerning the successful unsubscription.

PAYLOAD DIAGRAMS:

The payload diagram is available in Figure 6 thus is not reported here. Please see Figure 6

PAYLOAD TABLES:

| Element Name | | Author | Notes |
|-----------------------------------|----------|---|--|
| FlightStatusUnsubscriptionRequest | | FT14 Serena Rubbioli | Message for unsubscription from flight status (suspended/de-suspended) notification. |
| Attribute Name | Type | Notes | |
| timestamp | DateTime | The time from when the unsubscription is effective. | |
| Tagged Value Name | | Value | |
| CLDMSemanticTrace | | CLDM_out_of_scope | |

| Element Name | | Author | Notes |
|------------------------|----------|--|-------------------------------------|
| UnsubscriptionResponse | | FT14 Serena Rubbioli | Response to unsubscription request. |
| Attribute Name | Type | Notes | |
| timestamp | DateTime | The timestamp from when the unsubscription is effective. | |

Table 4: Payload tracing to AIRM

5.1.2 Service Interface Definition FlightStatusConsumer

The purpose of the **FlightStatusConsumer** service interface definition is to implement those service operations enabling the service consumers to receive suspension and desuspension messages for the flightplans already accepted by service provider (Network Manager).

The architecture of the **FlightStatusConsumer** interface definition includes the following operations:

- **publishSuspension**
- **publishDesuspension**

These operations are described in the next paragraphs, including their related payload diagrams and tables which have been defined in the release of ISRM (1.4) upon discussion within WP8.

5.1.2.1 Operation publishSuspension

The Operation *publishSuspension* allows the publishing of the information concerning the suspension of a flight plan.

5.1.2.1.1 Operation Functionality

The service operation provides the service consumer with the functionality to receive automatically all the notifications of concerning flights that are suspended.

5.1.2.1.2 Operation Parameters

The service operation has the input parameter *FlightSuspensionMessage*.
A return type is not foreseen.

The payload diagrams and related tables are reported hereby, where each attribute and relationship is described. The tagged values show the linked AIRM class where/if applicable.

PAYLOAD DIAGRAMS:

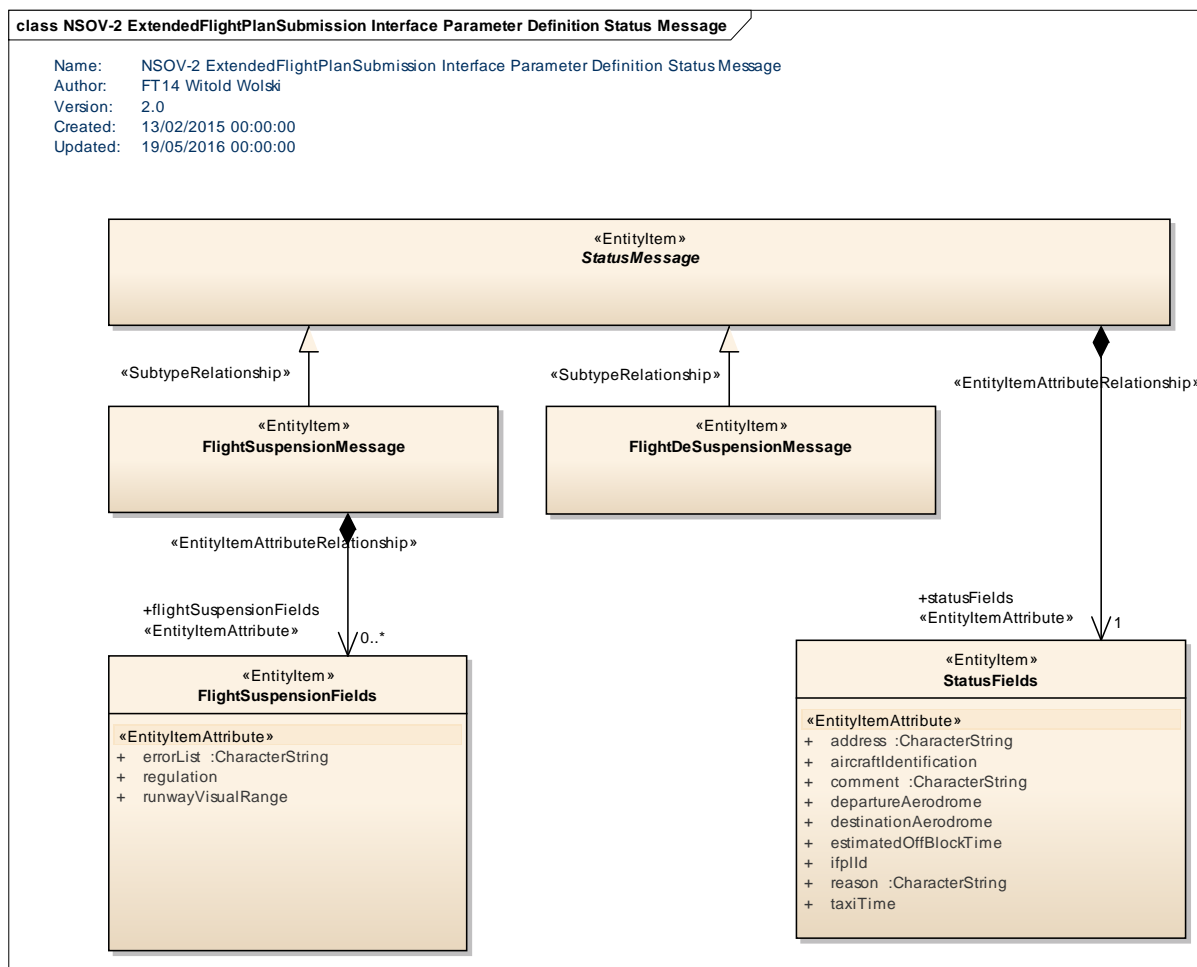


Figure 7: NSOV-2 ExtendedFlightPlanSubmission Interface Parameter Definition diagram – Status Message

PAYLOAD TABLES:

| Element Name | Author | Notes |
|---------------|----------------------|----------------|
| StatusMessage | FT14 Serena Rubbioli | Status message |

| Element Name | Author | Notes |
|---------------------------|----------------------|--|
| StatusFields | FT14 Serena Rubbioli | Status message |
| Element Tagged Value Name | | Value |
| CLDMSemanticTrace | | CLDM_out_of_scope |
| Attribute Name | Type | Notes |
| ifpId | | Unique flight plan identification which is issued by NM. |
| Tagged Value Name | | Value |
| CLDMSemanticTrace | | urn:x-ses:sesarju:airm:v410:ConsolidatedLogicalDataModel:Subje |

| | | ctFields:Flight:Flight@ifplIdentifier | |
|------------------------|--|---|--|
| Attribute Name | Type | Notes | |
| aircraftIdentification | | Aircraft identification. | |
| Tagged Value Name | Value | | |
| CLDMSemanticTrace | urn:x-ses:sesarju:airm:v410:ConsolidatedLogicalDataModel:SubjectFields:Flight:Flight@aircraftIdentification | | |
| Attribute Name | Type | Notes | |
| address | CharacterString | Address consist of a sequence of Addressee Indicators, one for each addressee to whom the message is to be delivered (optional field). | |
| Tagged Value Name | Value | | |
| CLDMSemanticTrace | CLDM_out_of_scope | | |
| Attribute Name | Type | Notes | |
| departureAerodrome | | Aerodrome of departure. | |
| Tagged Value Name | Value | | |
| CLDMSemanticTrace | urn:x-ses:sesarju:airm:v410:ConsolidatedLogicalDataModel:SubjectFields:BaseInfrastructure:AerodromeInfrastructure:Aerodrome@designator | | |
| Attribute Name | Type | Notes | |
| estimatedOffBlockTime | | New estimated off-block time and date. | |
| Tagged Value Name | Value | | |
| CLDMContextTrace | urn:x-ses:sesarju:airm:v410:ConsolidatedLogicalDataModel:SubjectFields:Common:Codelists:CodePlanningStatusType@ESTIMATED | | |
| CLDMSemanticTrace | urn:x-ses:sesarju:airm:v410:ConsolidatedLogicalDataModel:SubjectFields:Flight:FlightEvent:OffBlock@time | | |
| IMDefinitionTrace | urn:x-ses:sesarju:airm:v410:InformationModel:SubjectFields:Flight:FlightEvent:EstimatedOffBlockTime | | |
| Attribute Name | Type | Notes | |
| taxiTime | | The average taxiing time for the runway in use which was considered by NM to derive the take-off times from the off-block times when calculating the last flight profile. | |
| Tagged Value Name | Value | | |
| CLDMSemanticTrace | urn:x-ses:sesarju:airm:v410:ConsolidatedLogicalDataModel:SubjectFields:BaseInfrastructure:AerodromeInfrastructure:TaxiRoute@taxiTime | | |
| Attribute Name | Type | Notes | |
| destinationAerodrome | | Aerodrome of destination. | |
| Tagged Value Name | Value | | |
| CLDMSemanticTrace | urn:x-ses:sesarju:airm:v410:ConsolidatedLogicalDataModel:SubjectFields:Flight:Flight@destinationAerodrome | | |
| Attribute Name | Type | Notes | |
| reason | CharacterString | Reason to explain an action by NM | |
| Tagged Value Name | Value | | |
| CLDMSemanticTrace | CLDM_out_of_scope | | |
| Attribute Name | Type | Notes | |
| comment | CharacterString | This field provides additional information. Zero or more occurrences of this field can appear in | |

| | | | |
|--|--------------------------|-------------------|----------------|
| | | | a FLS message. |
| | Tagged Value Name | Value | |
| | CLDMSemanticTrace | CLDM out of scope | |

| Element Name | | Author | Notes |
|------------------------|---------------------------|----------------------|--|
| FlightSuspensionFields | | FT14 Serena Rubbioli | This data type contains some fields of a suspension message |
| | Element Tagged Value Name | | Value |
| | CLDMSemanticTrace | | urn:x-ses:sesarju:airm:v410:ConsolidatedLogicalDataModel:SubjectFields:AirTrafficOperations:DemandAndCapacityBalancing:ATFMRegulation |
| | Attribute Name | Type | Notes |
| | errorList | CharacterString | List of errors. |
| | Tagged Value Name | | Value |
| | CLDMSemanticTrace | | CLDM_out_of_scope |
| | Attribute Name | Type | Notes |
| | regulation | | Name of the regulation affecting the flight (zero or more occurrences) |
| | Tagged Value Name | | Value |
| | CLDMSemanticTrace | | urn:x-ses:sesarju:airm:v410:ConsolidatedLogicalDataModel:SubjectFields:AirTrafficOperations:DemandAndCapacityBalancing:ATFMRegulation@designator |
| | Attribute Name | Type | Notes |
| | runwayVisualRange | | Runway Visual Range (optional). |
| | Tagged Value Name | | Value |
| | CLDMSemanticTrace | | urn:x-ses:sesarju:airm:v410:ConsolidatedLogicalDataModel:SubjectFields:Meteorology:RunwayVisualRange@rvrValue |

| Element Name | Author | Notes |
|---------------------------|----------------------|--|
| FlightDeSuspensionMessage | FT14 Serena Rubbioli | Message for notification of a flight de-suspension |

Table 5: Payload tracing to AIRM

5.1.2.2 Operation publishDeSuspension

The Operation *publishDeSuspension* allows the publishing the information concerning the desuspension of a flight plan

5.1.2.2.1 Operation Functionality

The service operation provides the service consumer with the functionality to receive automatically the notification of information concerning the flight desuspension.

5.1.2.2.2 Operation Parameters

The service operation has the input parameter *FlightDeSuspensionMessage*. A return type is not foreseen because out of scope in practice.

Note: the descriptions of the relevant Entity Items are hereby not reported, being these already available in Figure 7 and Table 5 where each attribute and relationship is described.

PAYLOAD DIAGRAMS: see Figure 7

PAYLOAD TABLES: see Table 5

5.2 Service Interface: FlightPlanCoordinatorInterface

The purpose of the Service Interface **FlightPlanCoordinatorInterface** is to foresee the service interface definitions with operations to allow the service consumers the request the submission, modification, delay, cancellation of a flight plan, including a specific operation to request the “current processing outcome” for certain flight plan.

The message exchange pattern foreseen for the service interface FlightPlanCoordinatorInterface is the Standard Synchronous Request/Reply MEP.

The Service Interface FlightPlanCoordinatorInterface implements the **FlightPlanCoordinator** Service Interface definition, described in the following subparagraphs.

5.2.1 Service Interface Definition FlightPlanCoordinator

The purpose of the **FlightPlanCoordinator** service interface definition is to implement those service operations enabling the service consumer to submit requests for submission, modification, delay, cancellation of flight plan(s), and the specific operation to request the “current processing outcome” of a certain already submitted flight plan.

The architecture of the FlightPlanCoordinator interface definition exposes the following operations:

- **requestExtendedFPLValidation**
- **requestExtendedFPLSubmission**
- **requestExtendedFPLModification**
- **requestExtendedFPLDelay**
- **requestExtendedFPLCancellation**
- **requestExtendedFPLProcessingOutcome**

These operations are described in the next paragraphs, including their related payload diagrams and tables which have been defined in the release of ISRM (1.4) upon discussion within WP8.

5.2.1.1 Operation requestExtendedFPLValidation

The service operation *requestExtendedFPLValidation* enables a Subscribed Consumer to send a request to validate an Extended Flight Plan included in the request itself, without submitting it to the Network Manager. It foresees also that a response from the service provider is sent to the service consumer, containing the validation results (acknowledgment if it is valid, or rejection with list of eventual errors, comment and possible route).

5.2.1.1.1 Operation Functionality

The operation *functionality* foresees:

- to pass to the Service Interface the input parameter *ExtendedFlightPlanMessage*
- to receive from the Service Interface a return type *validationOperationalReplyMessage* containing either a confirmation of successful ingestion of the flight plan (ACK) or a rejection message (REJ) with a list of the related errors.

Note: this functionality allows essentially to perform a pre-validation of the flight plan (structure and completeness, big errors) useful to detect major problems in the flight plan subject to validation.

The operation parameters are hereby described more in detail.

5.2.1.1.2 Operation Parameters

The service operation has the input parameter *ExtendedFlightPlan* (which contains the extended flight plan information to be validated).

The operation has been modelled with the return type *ValidationOperationalReplyMessage* (ACK or REJ) which is the response sent by the service provider to the request from the service consumer:

- ACK is foreseen in case the flight plan is validated successfully
- REJ is foreseen in case the flight plan could not pass the validation checks of the service provider.

Note: other return types are out of scope for a validation request.

The payload diagrams and related tables are reported hereby, where each attribute and relationship is described. The tagged values show the linked AIRM class where/if applicable.

PAYLOAD DIAGRAMS:

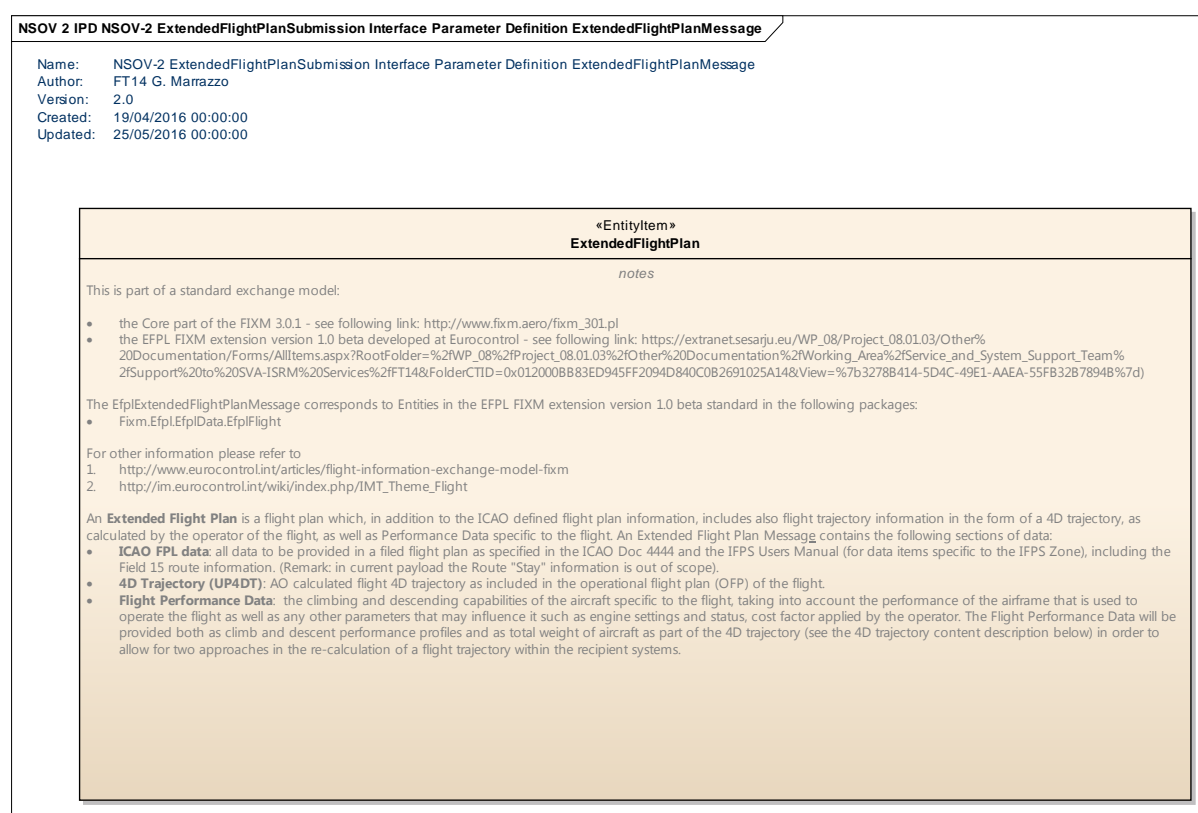


Figure 8: NSOV-2 ExtendedFlightPlanSubmission Interface Parameter Definition diagram – ExtendedFlightPlan

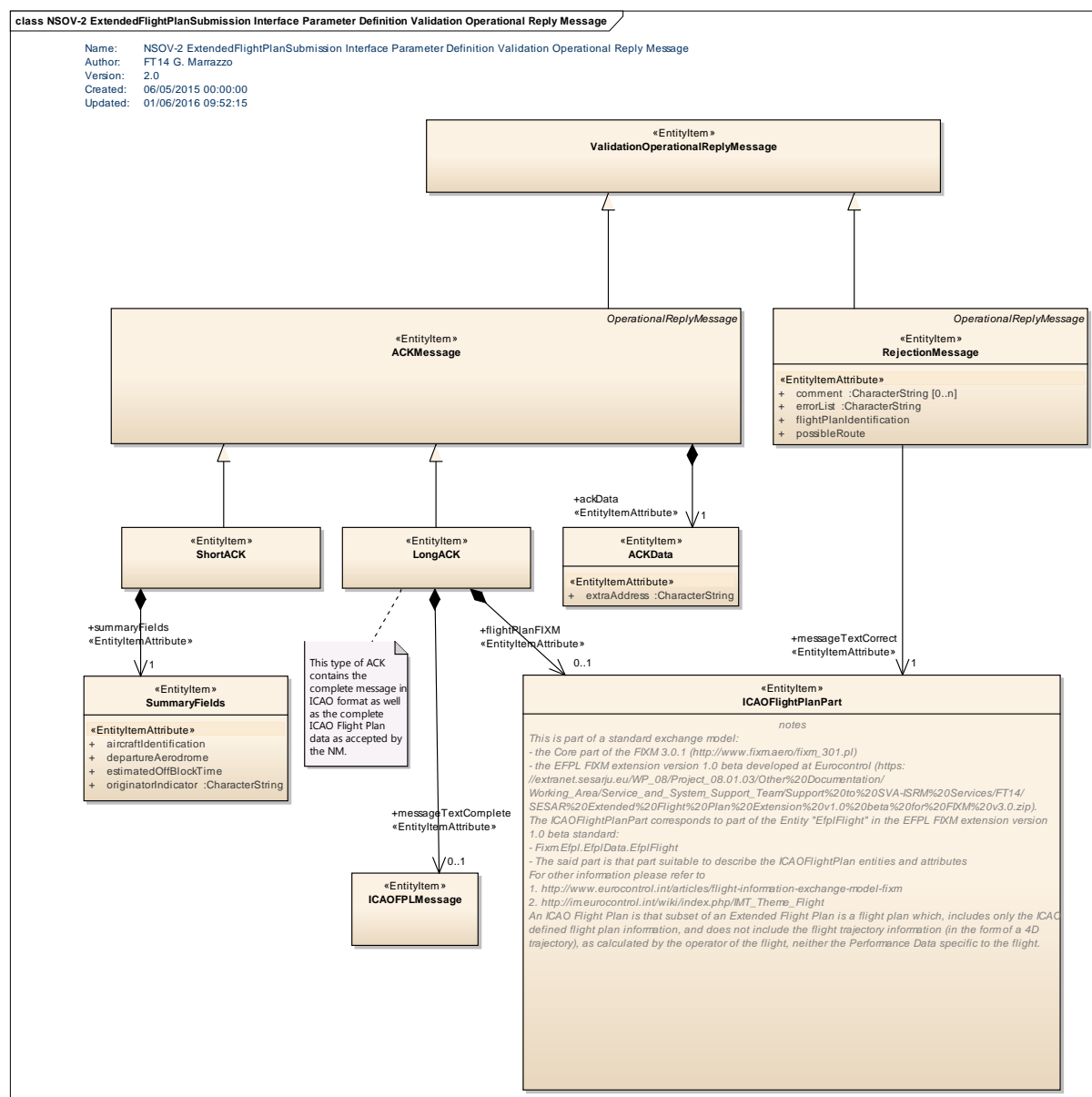


Figure 9: NSOV-2 ExtendedFlightPlanSubmission Interface Parameter Definition diagram – ValidationOperationalReplyMessage

PAYLOAD TABLES:

Input parameter:

| Element Name | Author | Notes |
|--------------------|----------------------|--|
| ExtendedFlightPlan | FT14 Serena Rubbioli | <p>This is part of a standard exchange model:</p> <ul style="list-style-type: none"> the Core part of the FIXM 3.0.1 - see following link: http://www.fixm.aero/fixm_301.pl the EFPL FIXM extension version 1.0 beta developed at Eurocontrol - see following link: |

| | | |
|--|--|---|
| | | <p>https://extranet.sesarju.eu/WP_08/Project_08.01.03/Other%20Documentation/Forms/AllItems.aspx?RootFolder=%2fWP_08%2fProject_08.01.03%2fOther%20Documentation%2fWorking_Area%2fService_and_System_Support_Team%2fSupport%20to%20SVA-ISM%20Services%2fFT14&FolderCTID=0x012000BB83ED945FF2094D840C0B2691025A14&View=%7b3278B414-5D4C-49E1-AAEA-55FB32B7894B%7d</p> <p>The EfplExtendedFlightPlanMessage corresponds to Entities in the EFPL FIXM extension version 1.0 beta standard in the following packages:</p> <ul style="list-style-type: none"> • Fixm.Efpl.EfplData.EfplFlight <p>For other information please refer to</p> <ol style="list-style-type: none"> 1. http://www.eurocontrol.int/articles/flight-information-exchange-model-fixm 2. http://im.eurocontrol.int/wiki/index.php/IMT_Theme_Flight <p>An Extended Flight Plan is a flight plan which, in addition to the ICAO defined flight plan information, includes also flight trajectory information in the form of a 4D trajectory, as calculated by the operator of the flight, as well as Performance Data specific to the flight. An Extended Flight Plan Message contains the following sections of data:</p> <ul style="list-style-type: none"> • ICAO FPL data: all data to be provided in a filed flight plan as specified in the ICAO Doc 4444 and the IFPS Users Manual (for data items specific to the IFPS Zone), including the Field 15 route information. (Remark: in current payload the Route "Stay" information is out of scope). • 4D Trajectory (UP4DT): AO calculated flight 4D trajectory as included in the operational flight plan (OFP) of the flight. • Flight Performance Data: the climbing and descending capabilities of the aircraft specific to the flight, taking into account the performance of the airframe that is used to operate the flight as well as any other parameters that may influence it such as engine settings and status, cost factor applied by the operator. The Flight Performance Data will be provided both as climb and descent performance profiles and as total |
|--|--|---|

| | | weight of aircraft as part of the 4D trajectory (see the 4D trajectory content description below) in order to allow for two approaches in the re-calculation of a flight trajectory within the recipient systems. |
|---------------------------|---|---|
| Element Tagged Value Name | Value | |
| CLDMSemanticTrace | CLDM_out_of_scope | |
| IMDefinitionTrace | urn:x-ses:sesarju:airm:v410:InformationModel:SubjectFields:AirTrafficOperations:InformationServicesProducts:FlightInformationProduct:ExtendedFlightPlan | |

Table 6: Payload tracing to AIRM

Output Parameter:

| Element Name | Author | Notes |
|-----------------------------------|----------------------|--|
| ValidationOperationalReplyMessage | FT14 Serena Rubbioli | Validation Operational Reply Message (ACK or REJ). |

| Element Name | Author | Notes |
|---------------------------|----------------------|--|
| ACKMessage ⁷ | FT14 Serena Rubbioli | Acknowledge message. Two different types of ACK messages are available: <ul style="list-style-type: none"> Short ACK: when the message is automatically processed without amendment. Long ACK: when the message includes amendments. This type of ACK contains the complete message in ICAO format as accepted by the IFPS. Where a Long ACK is received, the message originator shall check for any amendments made by the IFPS, especially when the submitted message contains the IFPS Re-route Accepted authorisation |
| Element Tagged Value Name | Value | |
| CLDMSemanticTrace | CLDM_out_of_scope | |

| Element Name | Author | Notes |
|---------------------------|----------------------|--|
| ACKData | FT14 Serena Rubbioli | Acknowledgement data. |
| Element Tagged Value Name | Value | |
| CLDMSemanticTrace | CLDM_out_of_scope | |
| Attribute Name | Type | Notes |
| extraAddress | CharacterString | Extra address(es) for message re-addressing. |
| Tagged Value Name | Value | |
| CLDMSemanticTrace | CLDM_out_of_scope | |

| Element Name | Author | Notes |
|--------------|----------------------|---|
| ShortACK | FT14 Serena Rubbioli | Short acknowledged message. The message |

⁷ As work for future activities in SESAR 2020, PTRs and the accepted trajectory should be included in the response of validation and submission functionalities.

| | | is automatically processed without amendment. |
|---------------------------|--|---|
| Element Name | Author | Notes |
| SummaryFields | FT14 Serena Rubbioli | Summary fields of the message |
| Element Tagged Value Name | Value | |
| CLDMSemanticTrace | CLDM_out_of_scope | |
| Attribute Name | Type | Notes |
| aircraftIdentification | | Aircraft Identification |
| Tagged Value Name | Value | |
| CLDMSemanticTrace | urn:x-ses:sesarju:airm:v410:ConsolidatedLogicalDataModel:SubjectFields:Flight:FlightIdentifier:FlightDesignator@flightNumber | |
| IMDefinitionTrace | urn:x-ses:sesarju:airm:v410:InformationModel:SubjectFields:Flight:FlightIdentifier:FlightDesignator | |
| Attribute Name | Type | Notes |
| departureAerodrome | | Aerodrome of Departure |
| Tagged Value Name | Value | |
| CLDMSemanticTrace | urn:x-ses:sesarju:airm:v410:ConsolidatedLogicalDataModel:SubjectFields:Flight:Flight@departureAerodrome | |
| IMDefinitionTrace | urn:x-ses:sesarju:airm:v410:InformationModel:SubjectFields:BaseInfrastructure:AerodromeInfrastructure:Aerodrome | |
| Attribute Name | Type | Notes |
| estimatedOffBlockTime | | Estimated Off Block Time |
| Tagged Value Name | Value | |
| CLDMSemanticTrace | urn:x-ses:sesarju:airm:v410:ConsolidatedLogicalDataModel:SubjectFields:Flight:FlightEvent:OffBlock@time | |
| IMDefinitionTrace | urn:x-ses:sesarju:airm:v410:InformationModel:SubjectFields:Flight:FlightEvent:EstimatedOffBlockTime | |
| Attribute Name | Type | Notes |
| originatorIndicator | CharacterString | Originator address (AFTN or SITA address). NOTE: IFPS sends a copy of the Operational Reply message to the FOC address when the originator address is not the one of the FOC. The presence of the originator address is to inform the FOC that IFPS has received a message for one of its flight plans from a different address. This is how it is done with the textual operational replies, the Webservice reply that corresponds to the operational reply does not have this attribute because there is no way today in the NM Webservice to push a reply to a system that did not previously send a request (query/reply services) so NM cannot send via Webservice a copy of an operational reply to the FOC. |
| Tagged Value Name | Value | |
| CLDMSemanticTrace | CLDM_out_of_scope | |

| Element Name | Author | Notes |
|--------------|--------|-------|
|--------------|--------|-------|

| | | |
|---------|----------------------|---|
| LongACK | FT14 Serena Rubbioli | Long Acknowledgement message when the message includes amendments. This type of ACK contains the complete message in ICAO format as accepted by the NM. |
|---------|----------------------|---|

| Element Name | Author | Notes |
|------------------|--------------------------|---|
| RejectionMessage | FT14 Serena Rubbioli | A Reject (REJ) message is sent to notify the message originator that the submitted message could not be processed successfully, either automatically or manually, and that the submitted message has not been accepted by IFPS. The REJ message also contains an error list (to a maximum of 10) to help the Airspace Users to rectify the error(s). The Airspace User can react by amending the original message appropriately and re-submitting the corrected message to the IFPS. (7.6.2 OSED) |
| | Attribute Name | Type |
| | comment | CharacterString |
| | | Notes |
| | | This field provides additional information. Zero or more occurrences. |
| | Tagged Value Name | Value |
| | CLDMSemanticTrace | CLDM_out_of_scope |
| | Attribute Name | Type |
| | flightPlanIdentification | CharacterString |
| | | Notes |
| | | The unique identifier of a flight plan submitted to the NM |
| | Tagged Value Name | Value |
| | CLDMSemanticTrace | urn:x-ses:sesarju:airm:v410:ConsolidatedLogicalDataModel:SubjectFields:Flight:Flight@ifplIdentifier |
| | Attribute Name | Type |
| | errorList | CharacterString |
| | | Notes |
| | | List of errors. |
| | Tagged Value Name | Value |
| | CLDMSemanticTrace | CLDM_out_of_scope |
| | Attribute Name | Type |
| | possibleRoute | |
| | | Notes |
| | | Possible route (optional). The field is only present when the following conditions are met: -The message is a flight plan or a modification for a change of route. -The error for which the message is rejected is related to the route. -The NM is able to find an acceptable route. |
| | Tagged Value Name | Value |
| | CLDMSemanticTrace | urn:x-ses:sesarju:airm:v410:ConsolidatedLogicalDataModel:SubjectFields:Flight:CodeLists:CodeTrajectoryType@EXPANDED_ROUTE |

| Element Name | Author | Notes |
|--------------------|---------------|--|
| ICAOFlightPlanPart | FT14 w.wolski | This is part of a standard exchange model: - the Core part of the FIXM 3.0.1 (http://www.fixm.aero/fixm_301.pl) - the EFPL FIXM extension version 1.0 beta developed at Eurocontrol |

| | | <p>(https://extranet.sesarju.eu/WP_08/Project_08.01.03/Other%20Documentation/Working_Area/Service_and_System_Support_Team/Support%20to%20SVA-ISRM%20Services/FT14/SESAR%20Extended%20Flight%20Plan%20Extension%20v1.0%20beta%20for%20FIXM%20v3.0.zip).</p> <p>The ICAOFlightPlanPart corresponds to part of the Entity "EfplFlight" in the EFPL FIXM extension version 1.0 beta standard:</p> <ul style="list-style-type: none"> - Fixm.Efpl.EfplData.EfplFlight - The said part is that part suitable to describe the ICAOFlightPlan entities and attributes <p>For other information please refer to</p> <ol style="list-style-type: none"> 1. http://www.eurocontrol.int/articles/flight-information-exchange-model-fixm 2. http://im.eurocontrol.int/wiki/index.php/IMT_Theme_Flight <p>An ICAO Flight Plan is that subset of an Extended Flight Plan is a flight plan which, includes only the ICAO defined flight plan information, and does not include the flight trajectory information (in the form of a 4D trajectory), as calculated by the operator of the flight, neither the Performance Data specific to the flight.</p> |
|--|---------------------------|--|
| | Element Tagged Value Name | Value |
| | CLDM | CLDM_out_of_scope |
| | IMDefinitionTrace | urn:x-ses:sesarju:airm:v410:InformationModel:SubjectFields:AirTrafficOperations:InformationServicesProducts:FlightInformationProduct:FlightPlan |

Table 7: Payload tracing to AIRM

5.2.1.2 Operation requestExtendedFPLSubmission

The service operation *requestExtendedFPLSubmission* allows the authorized service consumer to send to the service provider the submission request of the extended flight plan information included in the request itself. It foresees also that a response from the service provider is sent to the service consumer, in relation to the submission results such as acknowledgment, rejection or manual editing of the flight plan being performed by the service provider.

5.2.1.2.1 Operation Functionality

The operation *functionality* foresees:

- to pass to the operation an *ExtendedFlightPlan*
- to receive in reply an *OperationalReplyMessage*

Note: the OperationalReplyMessage contains either a confirmation of successful ingestion of the flight plan or a rejection message (with a list of the related errors) or a message reporting that the submitted flight plan is subject to manual editing by the service provider.

The operation parameters are described in the following paragraph.

5.2.1.2.2 Operation Parameters

The input parameter is the *ExtendedFlightPlan* (which contains the extended flight plan information being submitted).

The output parameter is the *OperationalReplyMessage* (which can be ACK, REJ or MAN)

The payload diagrams and related tables are reported hereby, where each attribute and relationship is described. The tagged values show the linked AIRM class where/if applicable.

PAYLOAD DIAGRAMS:

For the Service Interface Parameter Definition diagram related to the Extended Flight Plan, see Figure 8.

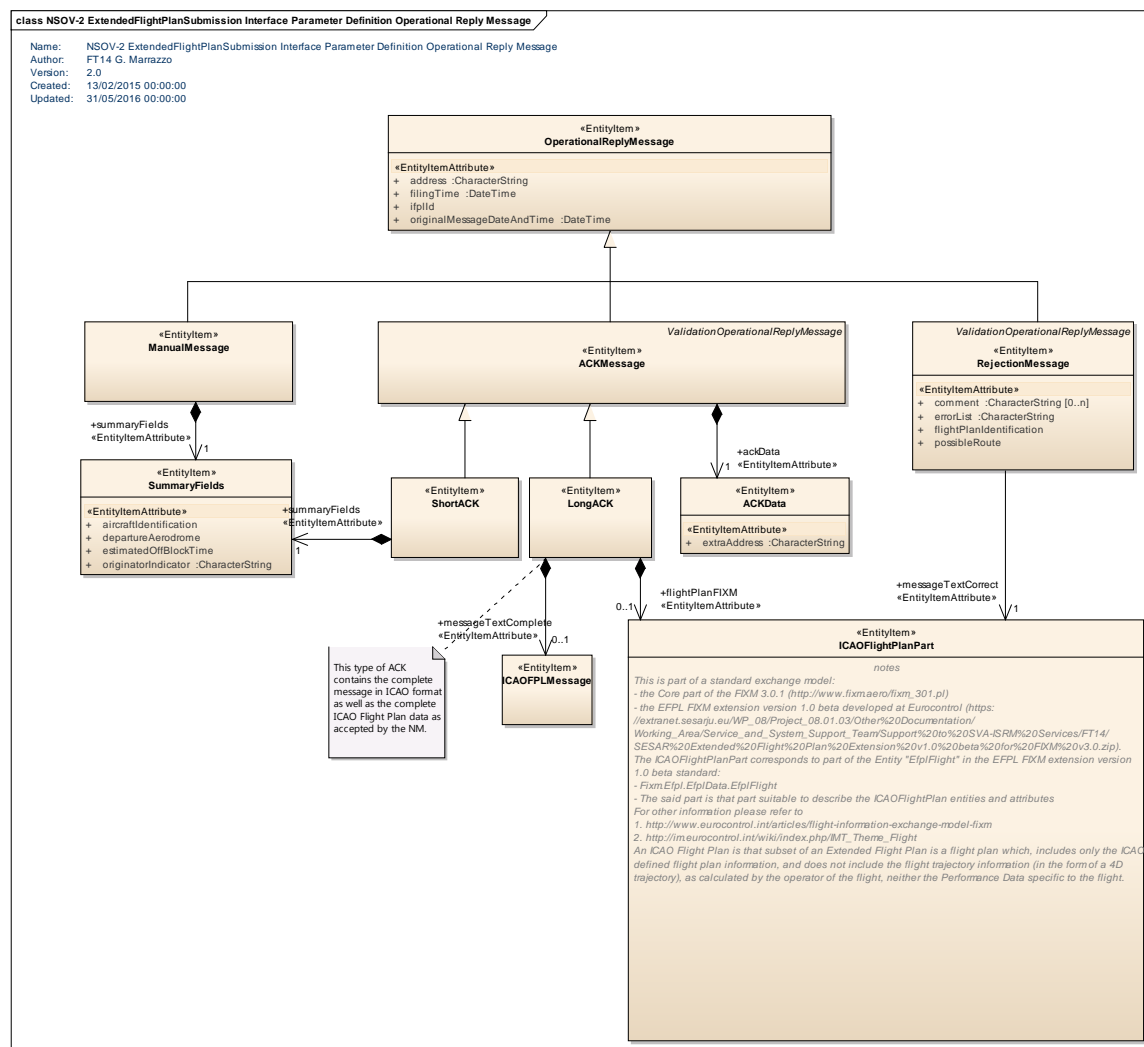


Figure 10: NSOV-2 ExtendedFlightPlanSubmission Interface Parameter Definition diagram – OperationalReplyMessage

PAYLOAD TABLES:**Input parameter:**

ExtendedFlightPlan: see Table 6.

Output Parameter:

| Element Name | Author | Notes |
|----------------------------|---|---|
| OperationalReplyMessage | FT14 G. Marrazzo | In order to indicate to the message originator the status of the processing of a submitted message, the IFPS uses operational reply messages (ORM). ORM are implemented using three possible message types: - ACK - MAN - REJ where ACK, MAN and REJ are complex data type. |
| Attribute Name | Type | Notes |
| ifplId | | |
| Tagged Value Name | Value | |
| CLDMSemanticTrace | urn:x-ses:sesarju:airm:v410:ConsolidatedLogicalDataModel:SubjectFields:Flight:Flight@ifplIdentifier | |
| IMDefinitionTrace | urn:x-ses:sesarju:airm:v410:InformationModel:SubjectFields:Flight:FlightIdentifier:IFPLIdentifier | |
| Attribute Name | Type | Notes |
| filingTime | DateTime | Filing time of the submitted message |
| Tagged Value Name | Value | |
| CLDMSemanticTrace | CLDM_out_of_scope | |
| Attribute Name | Type | Notes |
| originalMessageDateAndTime | DateTime | Date and time of receipt of original message by the NM. |
| Tagged Value Name | Value | |
| CLDMSemanticTrace | CLDM_out_of_scope | |
| Attribute Name | Type | Notes |
| address | CharacterString | List of addresses to which that message is to be distributed. |
| Tagged Value Name | Value | |
| CLDMSemanticTrace | CLDM_out_of_scope | |

| Element Name | Author | Notes |
|---------------|----------------------|--|
| ManualMessage | FT14 Serena Rubbioli | Manual message. A Manual (MAN) message is used to indicate to the message originator that errors have been detected in the submitted message and that it has been referred for manual processing by the IFPS staff. N.B.: The OSED doesn't contain information about the MAN message structure. |

| | | |
|--|--|---|
| | | In the "IFPS users manual" you can find some examples about ORM messages structure. |
|--|--|---|

Table 8: Payload tracing to AIRM

ACKMessage – RejectionMessage – ShortACK – LongACK – ACKData – ICAOFlightPlanPart – SummaryFields: see Table 7.

5.2.1.3 Operation requestExtendedFPLModification

The service operation *requestExtendedFPLSubmission* allows the authorized service consumer to send to the service provider a request of submission of a modification of an extended flight plan already available in the service provider systems; it foresees also that a response from the service provider is sent to the service consumer, in relation to the results of the modification request (such as acknowledgment, rejection of the request or flight plan subject to manual editing by the service provider).

5.2.1.3.1 Operation Functionality

The operation *functionality* foresees:

- to pass to the operation an *ExtendedModificationMessage*
- to receive in reply an *OperationalReplyMessage*

Note: the OperationalReplyMessage contains either a confirmation of successful ingestion or a rejection message (with a list of the related errors) or a message reporting that the submitted modification is subject to manual editing by the service provider.

The operation parameters are described in the following paragraph.

5.2.1.3.2 Operation Parameters

The input parameter is the *ExtendedModificationMessage* (which contains the extended flight plan information modified).

The output parameter is the *OperationalReplyMessage* (which can be ACK, REJ or MAN)

The payload diagrams and related tables are reported hereby, where each attribute and relationship is described. The tagged values show the linked AIRM class where/if applicable.

PAYLOAD DIAGRAMS:

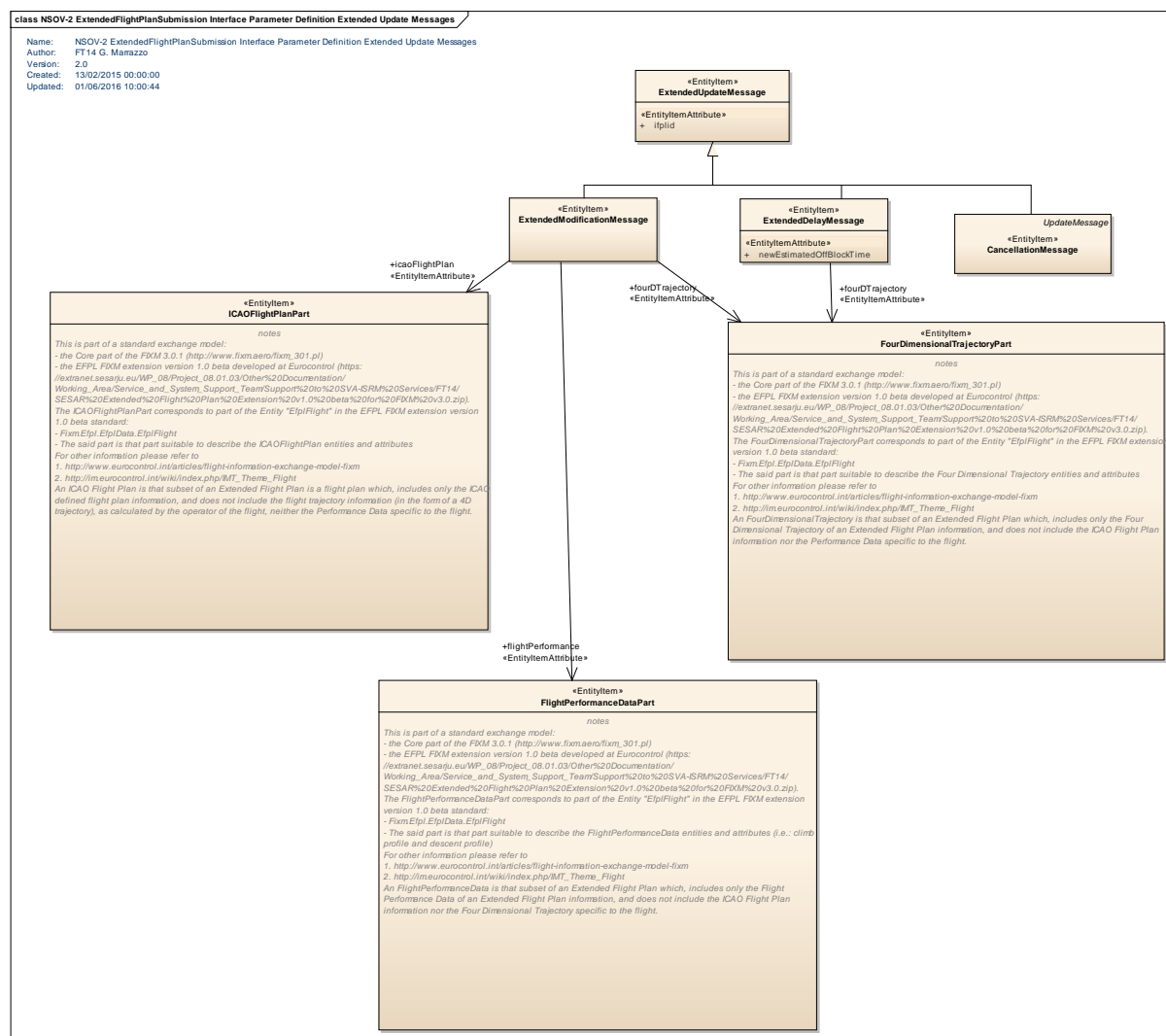


Figure 11: NSOV-2 ExtendedFlightPlanSubmission Interface Parameter Definition diagram – ExtendedUpdateMessages

For the Service Interface Parameter Definition diagram related to the Operational Reply Message, see Figure 10.

PAYLOAD TABLES:

Input parameter:

| Element Name | Author | Notes |
|---------------------------|---|--|
| ExtendedUpdateMessage | FT14 Serena Rubbioli | ExtendedUpdateMessage is the super class of ExtendedModificationMessage, ExtendedDelayMessage and CancellationMessage. |
| Element Tagged Value Name | Value | |
| encoding | | |
| Attribute Name | Type | Notes |
| ifplid | | Flight plan association data to allow the association of the message to the original flight plan. The association data will depend on the message format. For example, in case of an exchange of flight plan data with IFPS using a web based technology (such as the existing NM B2B services), the association data would be the unique flight plan identification code allocated by IFPS to the flight upon reception of the original Extended Flight Plan message. |
| Tagged Value Name | Value | |
| CLDMSemanticTrace | urn:x-ses:sesarju:airm:v410:ConsolidatedLogicalDataModel:SubjectFields:Flight:Flight:ifplIdentifier | |
| IMDefinitionTrace | urn:x-ses:sesarju:airm:v410:InformationModel:SubjectFields:Flight:FlightIdentifier:IFPLIdentifier | |

Table 9: Payload tracing to AIRM

| Element Name | Author | Notes |
|-----------------------------|----------------------|--|
| ExtendedModificationMessage | FT14 Serena Rubbioli | <p>An extended modification message shall contain, as a minimum:</p> <ul style="list-style-type: none"> • Flight plan association data to allow the association of the message to the original flight plan. The association data will depend on the message format and protocol used for the data exchange. For example, in case of an exchange of flight plan data with IFPS using a web based technology (such as the existing NM B2B services), the association data would be the unique flight plan identification code allocated by IFPS to the flight upon reception of the original Extended Flight Plan message. • The data elements that are modified. In case they are modified, the 4D Trajectory and/or Flight Performance Data, as defined in 4.1.2.1, shall be included as well. In case, the Flight |

| | | <p>Performance Data is modified then the corresponding updated 4D Trajectory shall be included. The 4D Trajectory may be modified without the Flight Performance Data being modified as well.</p> <p>Note: an extended modification message may optionally repeat all data elements included in the original extended flight plan message even if they are not updated. This will depend on the data format and protocol used for the exchange of data.</p> |
|--|---------------------------|---|
| | Element Tagged Value Name | Value |
| | encoding | |

Table 10: Payload tracing to AIRM

Output parameter:

OperationalReplyMessage: see Table 8.

5.2.1.4 Operation requestExtendedFPLDelay

The service operation *requestExtendedFPLDelay* allows the authorized service consumer to send to the service provider the request of submission of a request for delay of an extended flight plan already available in the service provider systems (EDLA).

It foresees also that a response from the service provider is sent to the service consumer, in relation to the results of the delay request, such as acknowledgment, rejection of the request or manual editing by the service provider.

5.2.1.4.1 Operation Functionality

The operation *functionality* foresees:

- to pass to the operation an *ExtendedDelayMessage*
- to receive in reply an *OperationalReplyMessage*

Note: the OperationalReplyMessage contains either a confirmation of successful ingestion or a rejection message (with a list of the related errors) or a message reporting that the submitted modification is subject to manual editing by the service provider.

The operation parameters are described in the following paragraph.

5.2.1.4.2 Operation Parameters

The input parameter is a subtype of the *ExtendedUpdateMessage* (which contains the extended flight plan information modified).

The output parameter is the *OperationalReplyMessage* (which can be ACK, REJ or MAN)

The payload diagrams and related tables are reported hereby, where each attribute and relationship is described. The tagged values show the linked AIRM class where/if applicable.

PAYLOAD DIAGRAMS:

For the service interface parameter diagram related to the ExtendedDelayMessage, see Figure 11.

For the service interface parameter diagram related to the OperationalReplyMessage, see Figure 10.

PAYLOAD TABLES:**Input parameter:**

ExtendedUpdateMessage: see Table 9.

| Element Name | Author | Notes |
|---------------------------|----------------------|--|
| ExtendedDelayMessage | FT14 Serena Rubbioli | <p>An extended delay message shall contain, as a minimum:</p> <ul style="list-style-type: none"> Flight plan association data to allow the association of the message to the original flight plan. The association data will depend on the message format. For example, in case of an exchange of flight plan data with IFPS using a web based technology (such as the existing NM B2B services), the association data would be the unique flight plan identification code allocated by IFPS to the flight upon reception of the original Extended Flight Plan message. The new estimated off-block time The new estimated off-block date, in case it is modified The updated 4D Trajectory, in case it is modified due to the delay |
| Element Tagged Value Name | | Value |
| encoding | | |
| Attribute Name | Type | Notes |
| newEstimatedOffBlockTime | | New estimated off-block time and date. |
| Tagged Value Name | | Value |
| CLDMContextTrace | | urn:x-ses:sesarju:airm:v410:ConsolidatedLogicalDataModel:SubjectFields:Common:Codelists:CodePlanningStatusType@ESTIMATED |
| CLDMSemanticTrace | | urn:x-ses:sesarju:airm:v410:ConsolidatedLogicalDataModel:SubjectFields:Flight:FlightEvent:OffBlock@time |
| IMDefinitionTrace | | urn:x-ses:sesarju:airm:v410:InformationModel:SubjectFields:Flight:FlightEvent:EstimatedOffBlockTime |

Table 11: Payload tracing to AIRM

Output parameter:

OperationalReplyMessage: see Table 8

5.2.1.5 Operation requestExtendedFPLCancellation

The service operation *requestExtendedFPLCancellation* allows the authorized service consumer to send to the service provider the request of cancellation of an extended flight plan already available in the service provider systems (CNL). It foresees also that a response from the service provider is sent to the service consumer, in relation to the result of the cancellation request.

5.2.1.5.1 Operation Functionality

The operation *functionality* foresees:

- to pass to the operation a *CancellationMessage*
- to receive in reply an *ACKMessage*

The operation parameters are described in the following paragraph.

5.2.1.5.2 Operation Parameters

The input parameter is the *CancellationMessage*.

The output parameter is the *OperationalReplyMessage* with its only practically applicable *ACKMessage* specialization (other values in reply are out of the scope for a cancellation request).

The payload diagrams and related tables are reported hereby, where each attribute and relationship is described. The tagged values show the linked AIRM class where/if applicable.

PAYLOAD DIAGRAMS:

For the service interface parameter diagram related to the *CancellationMessage*, see Figure 11.

PAYLOAD TABLES:**Input parameter:**

ExtendedUpdateMessage: see Table 9.

| Element Name | Author | Notes |
|---------------------|---------------------------|---|
| CancellationMessage | FT14 Serena Rubbioli | Message for the cancellation of a flight plan (CNL) |
| | Element Tagged Value Name | Value |
| | encoding | |

Table 12: Payload tracing to AIRM

Output parameter:

ACKMessage: see Table 7

5.2.1.6 Operation requestExtendedFPLProcessingOutcome

The service operation *requestExtendedFPLProcessingOutcome* provides the authorized service consumer with the functionality to send to the service provider a request to obtain the current flight plan processing outcome (i.e.: at the time of request).

Note: the most important reason for this operation is the fact that it is the only way to find out when the manual processing of a flight by the service provider is finished and how is the result.

5.2.1.6.1 Operation Functionality

The operation *functionality* foresees:

- to pass to the operation an *ExtendedFPLProcessingOutcomeRequest*
- to receive in reply an *OperationalReplyMessage*

The operation parameters are described in the following paragraph.

5.2.1.6.2 Operation Parameters

The input parameter is the *ExtendedFPLProcessingOutcomeRequest* (a simple request containing the flightplan identifier whose processing outcome /current result is being requested).

The output parameter is the *OperationalReplyMessage*.

The payload diagrams and related tables are reported hereby, where each attribute and relationship is described. The tagged values show the linked AIRM class where/if applicable.

PAYLOAD DIAGRAMS:

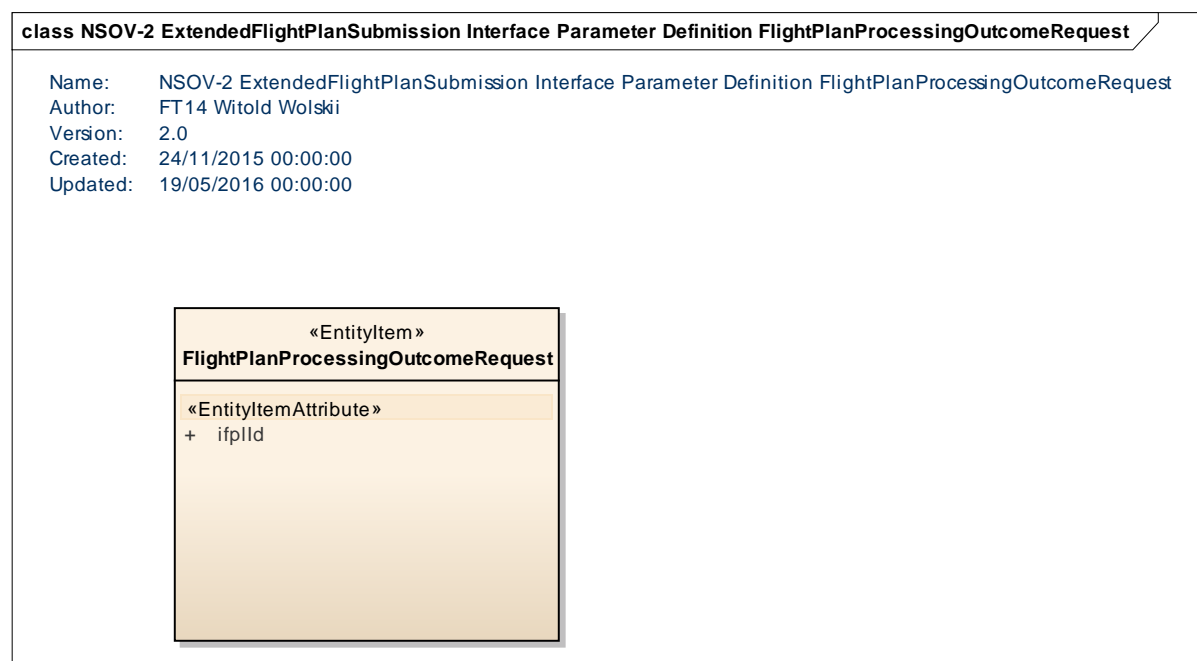


Figure 12: NSOV-2 ExtendedFlightPlanSubmission Interface Parameter Definition diagram – FlightPlanProcessingOutcome

For the service interface parameter definition diagram related to the OperationalReplyMessage, see Figure 10.

PAYLOAD TABLES:

Input Parameters:

| Element Name | Author | Notes |
|------------------------------------|---|--|
| FlightPlanProcessingOutcomeRequest | FT14 w.wolski | The request for obtaining the current outcomes of the processing of an Extended Flight Plan at NM systems. |
| Attribute Name | Type | Notes |
| ifplId | | |
| Tagged Value Name | Value | |
| CLDMSemanticTrace | urn:x-ses:sesarju:airm:v410:ConsolidatedLogicalDataModel:SubjectFields:Flight:Flight:ifplIdentifier | |
| IMDefinitionTrace | urn:x-ses:sesarju:airm:v410:InformationModel:SubjectFields:Flight:FlightIdentifier:IFPLIdentifier | |

Table 13: Payload tracing to AIRM

Output Parameter:

OperationalReplyMessage: see Table 8

6 Service dynamic behaviour

The ExtendedFlightPlanSubmission Service implements the following Service Interfaces (with their respective interface definitions):

- FlightPlanCoordinatorInterface
 - FlightPlanCoordinator
- StatusProviderInterface
 - FlightStatusProvider
 - FlightStatusConsumer

The dynamic behaviour of such service interface is described in the following paragraphs of the present chapter.

6.1 Service Interface FlightPlanCoordinatorInterface

The dynamic behaviour of FlightPlanCoordinatorInterface is described in Figure 13.

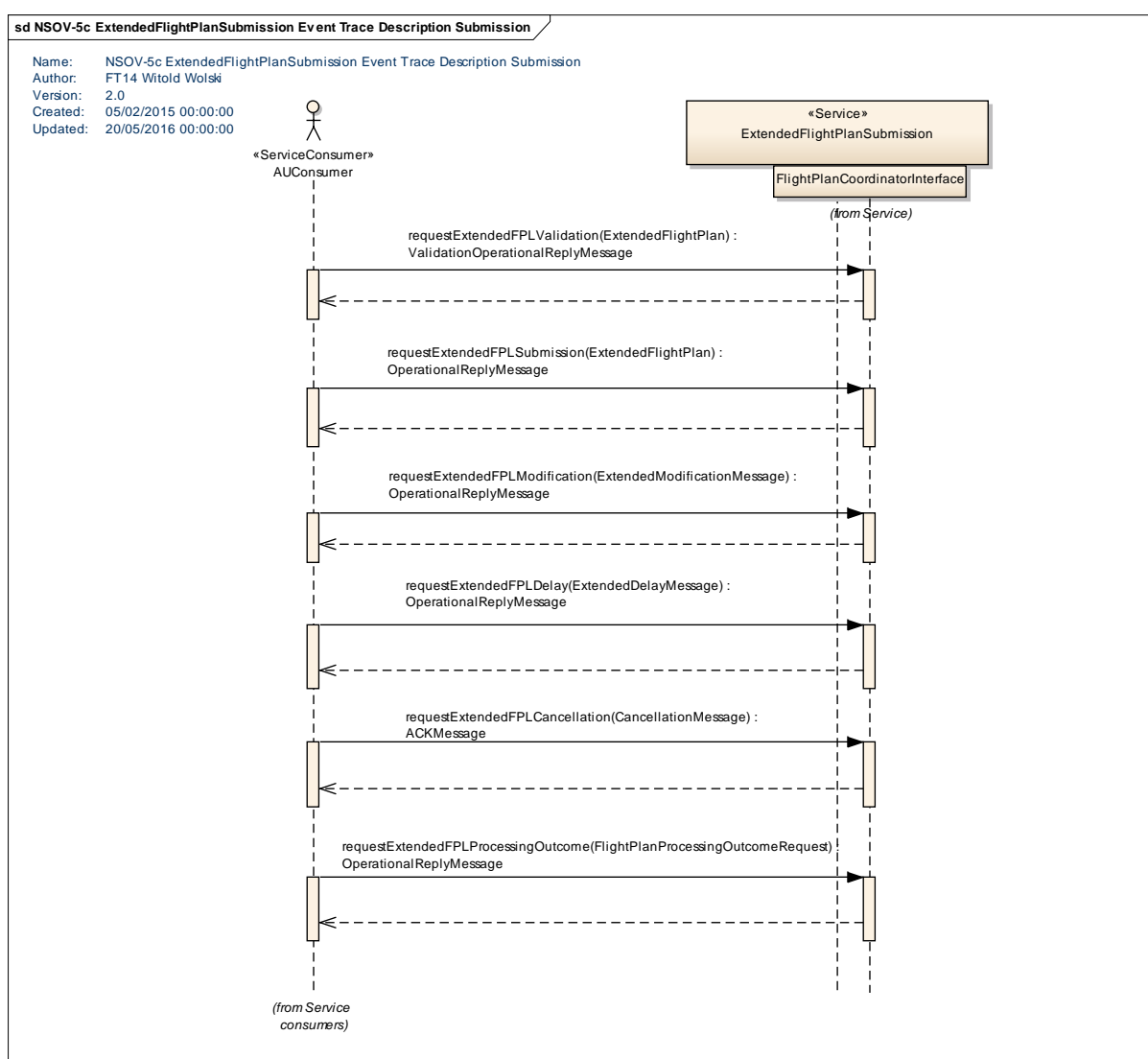


Figure 13: NSOV-5c ExtendedFlightPlanSubmission Event Trace Description for the FlightPlanCoordinatorInterface

6.2 Service Interface StatusProviderInterface

The dynamic behaviour of StatusProviderInterface is described in Figure 14.

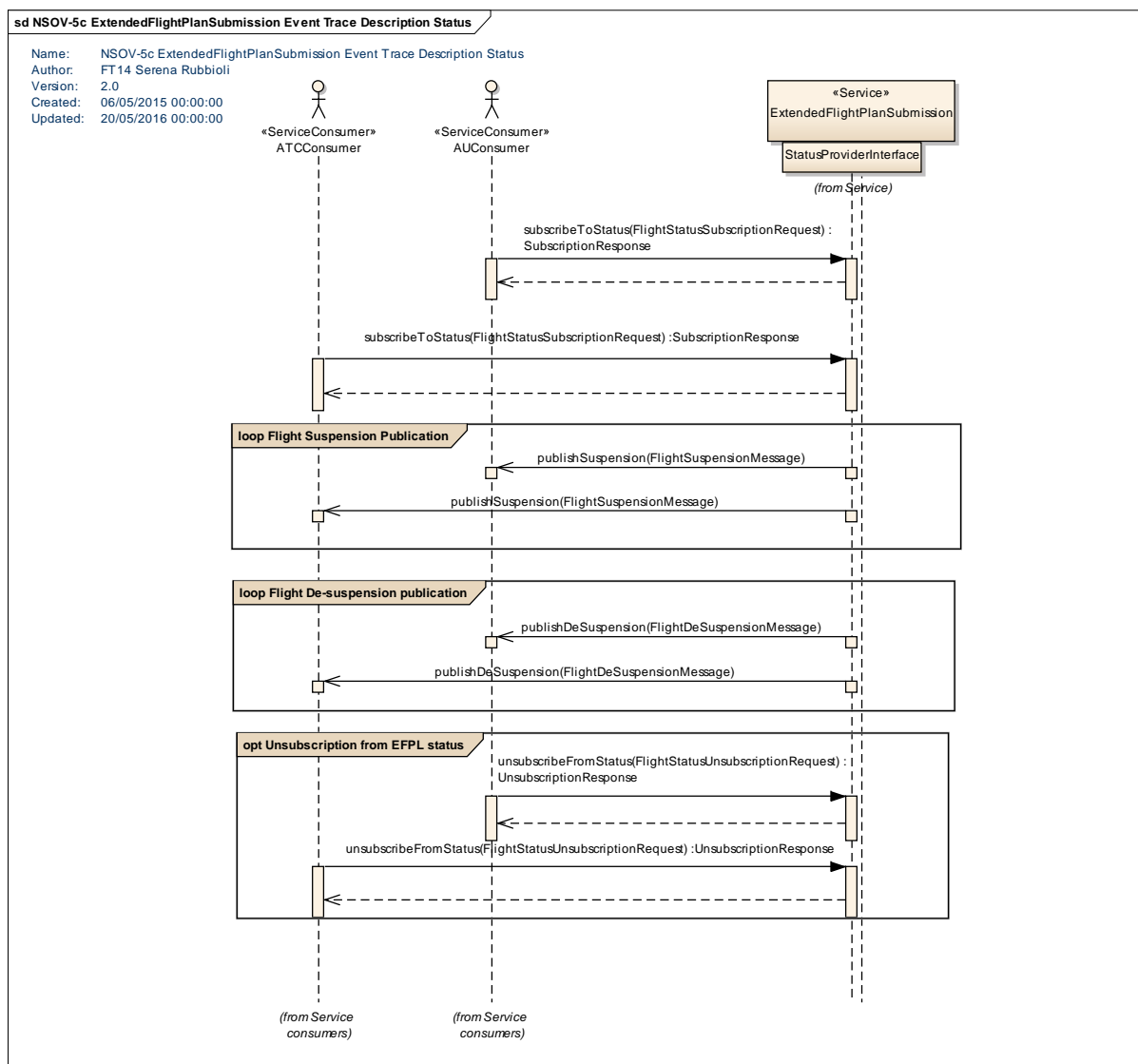


Figure 14: NSOV-5c ExtendedFlightPlanSubmission Event Trace Description for the StatusProviderInterface

7 Service provisioning (optional)

NA

8 Validation and Verification

8.1 Verification

The verification of the service model is compliant to ISRM Foundation Rulebook (Ref. [6]).

Verification was performed using the WP 8.3.10 verification tools integrated on Sparx Enterprise Architect framework:

- Autoverify script version 28927 (Tortoise SVN review 28927).
- MDG Technologies ISRM Verification Rules version 29993 (Tortoise SVN review 29325)
- MDG Technologies ISRM Library Functions version 29915 (Tortoise SVN review 29325)

8.1.1 Verification Results

The detailed findings, coming from execution of the verification script, are recorded in Verification_report_ExtendedFlightPlanSubmission_Service file, located in the D65 delivery package.

Verification reports are in the following files:

Designed_Services_-_ExtendedFlightPlanSubmissionService.xls

Designed_Services_-_ExtendedFlightPlanSubmissionService_Common.xls

A summary of those results is reported below:

| | | | |
|--------------------------------|---|--------------------------------|-------------------|
| Service name: | Designed Services - ExtendedFlightPlanSubmissionService | Date of Service Creation: | 20140212-09:37:57 |
| Service version: | 2.0 | Version of Verification Rules: | 00.07.00 |
| Phase: | 2.0 | Date of Verification: | 20160601-04:09:17 |
| Owner of service: | SVA002 Serena Rubbioli | Passes: | 180 |
| Name of verifier: | Witold Wolski | Failures: | |
| Overall comments: | NA | Manual: | 50 |
| MDG Library Functions version: | 29915 | MDG ISRM Verification version: | 29993 |

8.2 Validation

The submission functionalities related to this service has been validated in EXE-07.06.02-VP-713 (V3 exercise in R5). For the SWIM Compliance Report (See reference [20]).

9 References

| Name | Version | Document ID / Location |
|--|--------------------------------------|---|
| [1] Project deliverables template | 03.00.00 | SJU templates & guidelines package, Project deliverables template |
| [2] SESAR Operational Service and Environment Definition | 03.00.00 | SJU templates & guidelines package, OSED template |
| [3] SESAR Safety and Performance Requirements | 03.00.00 | SJU templates & guidelines package, SPR template |
| [4] ISRM Tooling Guidelines | 00.07.00 | 08.03.10 D44 |
| [5] ISRM Modelling Guidelines | 00.07.00 | 08.03.10 D44 |
| [6] ISRM Foundation Rulebook | 00.07.00 | 08.03.10 D44 |
| [7] ISRM Verification Guidelines | 00.07.00 | 08.03.10 D44 |
| [8] European ATM Architecture (EATMA) Guidance Material v4 | 00.04.02 | B.04.01 D66 |
| [9] Step 1 Business trajectory OSED 2015 update | 00.04.00 | 07.06.02 D45 |
| [10] Deliverable D22-003 to ISRM v1.0 | 00.00.04 | 08.03.05 D22-003 |
| [11] European ATM Service Identification for Extended Flight Plan Services | 00.01.00 | 08.03.05 D22-002 |
| [12] B4.3 EFPL Service Allocation FT14 | 00.00.04 | B.4.3 |
| [13] TM Perfo Initial System Requirements V1.0 | 01.00.01 | 13.02.01 D10 |
| [14] TM Perfo Final System Requirements V1.0 | 00.01.01 | 13.02.01 D145 |
| [15] ICAO Doc 4444 ATM/501 PANS – Air Traffic Management | Fifteenth Edition — 2007 Amendment 2 | http://code7700.com/pdfs/icao_doc_4444_15th_edition.pdf |
| [16] IFPS Users Manual | 19.0.1 Edition – - March 2015 | https://www.eurocontrol.int/sites/default/files/content/documents/nm/network-operations/HANDBOOK/ifps-users-manual-current.pdf |
| [17] European ATM Service Description for the ExtendedFlightPlanSubmission service | 00.02.01 | 08.03.10 D64 |

| Name | Version | Document ID / Location |
|--|----------|---|
| [18] European ATM Service Description for the FlightPlanDataDistribution service | 00.03.01 | 08.03.10 D65 |
| [19] ISRM Service Portfolio | 00.08.01 | 08.03.10 D65 |
| [20] SWIM Compliance Report for R5 V&V Exercise 713 | 00.00.03 | 08.01.01 D48 |
| [21] ATFCM Users Manual | 20.0 | http://www.eurocontrol.int/sites/default/files/content/documents/nm/network-operations/HANDBOOK/atfcm-users-manual-current.pdf |
| [22] Interim Step 1 SPR for Business Trajectory Management | 00.02.00 | 07.06.02 D87 |
| [23] ATM Information Reference Model | 4.1.0 | 08.01.03 D47 |
| [24] Verification reports for the service | N/A | 08.03.10 D65 Verification reports |

-END OF DOCUMENT-

founding members



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