System Wide Information Management (SWIM)

Instructional Example of
How to Write a
Web Service Description Document (WSDD)

Version 2
July 15, 2013
Replaces Version 1 dated August 16, 2010
Foreword

The Web Service Description Document (WSDD) contained herein is an instructional example of describing a Web service as prescribed by FAA-STD-065 rev. A [3]. The example WSDD describes a fictitious “Flight Plan Service (FPS)” used to file and modify a flight plan.

The FAA Pilot/Controller Glossary (P/CG) defines a flight plan as “specified information relating to the intended flight of an aircraft that is filed orally or in writing with an FSS or an ATC facility.” This example WSDD simulates a scenario in which a flight plan is created by a service consumer and sent to a service provider for filing.

This document does not attempt to model or suggest a new Web service. Therefore, while an effort was made to present a realistic picture of a Web service that could be developed for flight planning, a number of logical and technical components that a “real” Web service usually requires were purposely omitted to make it easier for a reader to perceive or understand the major notions presented in FAA-STD-065A. For example, this document does not describe a scenario in which the service consumer interacts with a service provider in an Enterprise Service Bus (ESB)-brokered environment, the technological solution for today’s SWIM NAS Enterprise Messaging Service (NEMS)-based implementations. In this environment, many service functionalities are delegated to an ESB or other infrastructure service and are appropriately described in documentation for these components (e.g., NEMS-specific documentation). For the same reason, and to avoid limiting this example to environment-specific implementations of a Web service, all technological standards or protocols employed in this example should not be taken as endorsing, recommending, or favoring any technology used in implementing Web services.

To make this example complete, the WSDD includes a fictitious “Flight Plan Exchange Model” (FPXM) designed to enable the management and distribution of flight plan data in digital format (see more in section 5.5 of the WSDD). FPXM, a very limited emulation of an information exchange model similar to FIXM, AIXM and other industry exchange models, was expressly made for this example; it does not represent any actual model or artifacts developed or being developed by FAA and should not be used for any purpose except as an instructional aide.

It should be mentioned that there is also an example of how to write an FPS Web Service Requirements Document (WSRD) that describes requirements for the fictitious FPS in accordance with FAA-STD-070, Preparation of Web Service Requirements Documents [4].

Questions about the example WSDD may be directed to:

Federal Aviation Administration
Communication, Information and Network Programs, Enterprise Engineering, AJM-31
800 Independence Avenue, SW
Washington, DC 20591
Typographical Conventions used in the Instructional Example

Page headers, page numbers, figure and table captions, etc. are in accordance with FAA-STD-065A Section 4, General Requirements [3].

FAA-STD-065A does not dictate other stylistic aspects of a WSDD (e.g., font face, font size, page borders, etc.).

Instances of shaded and bordered paragraphs (like this) that appear at various points in the example represent **explanatory notes** that would not appear in an actual WSDD.
Web Service Description Document

Flight Plan Service (FPS)
## Web Service Description Document

**Flight Plan Service (FPS)**

### Approval Signatures

<table>
<thead>
<tr>
<th>Name</th>
<th>Organization</th>
<th>Signature</th>
<th>Date Signed</th>
</tr>
</thead>
<tbody>
<tr>
<td>John Smith</td>
<td>FAA En Route Services Modernization Group, ANG-X</td>
<td></td>
<td>September 7, 2013</td>
</tr>
<tr>
<td>James Jones</td>
<td>FAA Traffic Modernization Program (TMP), AJR-N</td>
<td></td>
<td>September 8, 2013</td>
</tr>
<tr>
<td>Betty Brown</td>
<td>Alpha Airlines</td>
<td></td>
<td>October 9, 2013</td>
</tr>
</tbody>
</table>
# Revision Record

<table>
<thead>
<tr>
<th>Revision Letter</th>
<th>Description</th>
<th>Revision Date</th>
<th>Entered By</th>
</tr>
</thead>
</table>

## Notes

- **FAA-2-345**
- Revision A
- September 3, 2013
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1 Scope

This Web Service Description Document (WSDD) provides a description of the Flight Plan Service (FPS). This service gives a service consumer the capability to file, modify, and cancel a flight plan operating under Instrument Flight Rules (IFR).

This WSDD has been prepared in accordance with FAA-STD-065A, Department of Transportation Federal Aviation Administration, Preparation of Web Service Description Documents [3].

1.1 Background

In today’s NAS environment, a flight plan specifies information that describes a desired route of flight between a well-defined departure and destination point within which separation services are required. Additional information provided in the flight plan shows that the flight meets the legal requirements of Instrument Flight Rules (IFR).

The intended outcome of filing an IFR flight plan is to receive air traffic control (ATC) separation services between the departure and destination airports through a subsequent flight plan clearance.

As a part of transitioning toward the Next Generation Air Transportation System (NextGen), the En Route Services Modernization Group (ESMG) has implemented this flight plan filing capability as a Web service. See the FPS Web Service Requirements Document [2] for more information.
2 Applicable Documents


2.1 Government Documents
[9] (Reserved)

2.2 Non-Government Standards and Other Publications


3 Definitions

3.1 Terms and Definitions

**Access Control**
Protection of system resources against unauthorized access; a process by which use of system resources is regulated according to a security policy and is permitted by only authorized entities. STD-070 [4]

**Audit**
A process that records information needed to establish accountability for system events and for the actions of system entities that cause them. STD-065A [3]

**Audit Trail**
A chronological record of system activities that is sufficient to enable the reconstruction and examination of the sequence of environments and activities. STD-070 [4]

**Authentication**
The process of verifying an identity claimed by or for a system entity. STD-065A [3]

**Authorization**
The granting of rights or permission to a system entity (mainly but not always a user or a group of users) to access a Web service. STD-065A [3]

**Binding**
An association between an interface, a concrete protocol, and a data format. A binding specifies the protocol and data format to be used in transmitting messages defined by the associated interface. STD-065A [3]

**Business Function**
A characteristic action or activity that needs to be performed to achieve a desired objective, or in the context of this WSDD, to achieve a real world effect. STD-065A [3]

**Credentials**
Data that is transferred to establish the claimed identity of an entity. STD-070 [4]

**Data Element**
A unit of data for which the definition, identification, representation, and permissible values are specified by means of a set of attributes. STD-065A [3]

**Datatype**
A set of distinct values, characterized by properties of those values, and by operations on those values. STD-065A [3]
**Effect**  
A state or condition that results from interaction with a service. Multiple states may result depending on the extent to which the interaction completes successfully or generates a fault. STD-065A [3]

**FAA Telecommunications Infrastructure (FTI)**  
A network that supports National Airspace System (NAS) operations by providing the connectivity required by systems including the Enhanced Traffic Management Systems (ETMS), the Standard Terminal Automated Replacement System (STARS), and the Wide Area Augmentation System (WAAS), and applications like e-mail, Internet, payroll, and other administrative services. (Adapted from [http://www.faa.gov/air_traffic/technology/fti/](http://www.faa.gov/air_traffic/technology/fti/))

**Fault**  
A message that is returned as a result of an error that prevents a service from implementing a required function. A fault usually contains information about the cause of the error. STD-065A [3]

**Format**  
The arrangement of bits or characters within a group, such as a data element, message, or language. STD-065A [3]

**Idempotent**  
A term used to describe an operation in which a given message will have the same effect whether it is received once or multiple times; i.e., receiving duplicates of a given message will not cause any undesirable effect. STD-065A [3]

**Input**  
Data entered into, or the process of entering data into, an information processing system or any of its parts for storage or processing. STD-065A [3]

**Integrity**  
Protective measures that assure that data has not been changed, destroyed, or lost in an unauthorized or accidental manner. STD-065A [3]

**Message**  
An identifiable collection of units of information (data elements), presented in a manner suitable for communication, interpretation, or processing within a context of interacting Service-Oriented Architecture components. STD-070 [4]
**Message Exchange Pattern (MEP)**  A template, devoid of application semantics, that describes a generic pattern for the exchange of messages between agents. It describes the relationships (e.g., temporal, causal, sequential, etc.) of multiple messages exchanged in conformance with the pattern, as well as the normal and abnormal termination of any message exchange conforming to the pattern.  STD-065A [3]

**Metadata**  Data that defines or describes other data.  STD-065A [3]

**Namespace**  A collection of names, identified by a [URI] reference, that are used in XML documents as element types and attribute names. The use of XML namespaces to uniquely identify metadata terms allows those terms to be unambiguously used across applications, promoting the possibility of shared semantics.  STD-065A [3]

**Non-Repudiation**  Protective measures against false denial of involvement in a communication.  STD-065A [3]

**Operation**  A set of messages related to a single Web service action.  STD-065A [3]

**Output**  Data transferred out of, or the process by which an information processing system or any of its parts transfers data out of, that system or part.  STD-065A [3]

**Permissible Values**  The set of allowable instances of a data element.  STD-065A [3]

**Precondition**  A state or condition that is required to be true before an action can be successfully invoked.  STD-065A [3]

**Processing**  A set of algorithms, calculations, or business rules that operate on input data in order to produce the required output or to produce a change of internal state.  STD-065A [3]

**Role**  A collection of permissions to use resources made available by a Web service.  STD-070 [4]

**Role-Based Access Control (RBAC)**  A form of identity-based access control where the system entities that are identified and controlled are functional positions in an organization or process.  STD-070 [4]
Security
The protection of information and data so that unauthorized persons or systems cannot read or modify them and authorized persons or systems are not denied access to them. STD-065A [3]

Synchronous Operation
A type of operation whose message exchange pattern describes temporally coupled or "lock-step" interactions, e.g., remote procedure call (RPC)-style request-response interactions. STD-065A [3]

Token
A data object or a portable, user-controlled, physical device used to verify an identity in an authentication process. STD-070 [4]

User
A human, his/her agent, a surrogate, or an entity that interacts with information processing systems. A person, organization entity, or automated process that accesses a system, whether authorized to do so or not. STD-065A [3]

3.2 Acronyms and Abbreviations

AIXM Aeronautical Information Exchange Model
ANSI American National Standards Institute
ATC Air Traffic Control
ATS Air Traffic Services
ESB Enterprise Service Bus
ESMG FAA En Route Services Modernization Group
FAA Federal Aviation Administration
FIXM Flight Information Exchange Model
FIPS Federal Information Processing Standards
FPS Flight Plan Service
FPXM Flight Plan Exchange Model
FSS Flight Service Station
FTI FAA Telecommunications Infrastructure
hPa hectopascal
<table>
<thead>
<tr>
<th>Acronym</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>HTTP</td>
<td>Hypertext Transport Protocol</td>
</tr>
<tr>
<td>ICAO</td>
<td>International Civil Aviation Organization</td>
</tr>
<tr>
<td>ID</td>
<td>Identifier</td>
</tr>
<tr>
<td>IFR</td>
<td>Instrument Flight Rules</td>
</tr>
<tr>
<td>INCITS</td>
<td>InterNational Committee for Information Technology Standards</td>
</tr>
<tr>
<td>MEP</td>
<td>Message Exchange Pattern</td>
</tr>
<tr>
<td>MSL</td>
<td>Mean Sea Level</td>
</tr>
<tr>
<td>NAS</td>
<td>National Airspace System</td>
</tr>
<tr>
<td>NEMS</td>
<td>NAS Enterprise Messaging Service</td>
</tr>
<tr>
<td>NextGen</td>
<td>Next Generation Air Transportation System</td>
</tr>
<tr>
<td>NIST</td>
<td>National Institute of Standards and Technology</td>
</tr>
<tr>
<td>OASIS</td>
<td>Organization for the Advancement of Structured Information Standards</td>
</tr>
<tr>
<td>P/CG</td>
<td>Pilot/Controller Glossary</td>
</tr>
<tr>
<td>PIN</td>
<td>Personal Identification Number</td>
</tr>
<tr>
<td>QoS</td>
<td>Quality of Service</td>
</tr>
<tr>
<td>RBAC</td>
<td>Role-Based Access Control</td>
</tr>
<tr>
<td>RFC</td>
<td>Request For Comments</td>
</tr>
<tr>
<td>RPC</td>
<td>Remote Procedure Call</td>
</tr>
<tr>
<td>SOAP</td>
<td>Simple Object Access Protocol</td>
</tr>
<tr>
<td>TLS</td>
<td>Transport Layer Security</td>
</tr>
<tr>
<td>TMP</td>
<td>Traffic Modernization Program</td>
</tr>
<tr>
<td>URI</td>
<td>Uniform Resource Identifier</td>
</tr>
<tr>
<td>URL</td>
<td>Uniform Resource Locator</td>
</tr>
<tr>
<td>UTC</td>
<td>Coordinated Universal Time</td>
</tr>
<tr>
<td>VFR</td>
<td>Visual Flight Rules</td>
</tr>
<tr>
<td>W3C</td>
<td>World Wide Web Consortium</td>
</tr>
<tr>
<td>WSDD</td>
<td>Web Service Description Document</td>
</tr>
<tr>
<td>WSDL</td>
<td>Web Services Description Language</td>
</tr>
</tbody>
</table>
**WSRD**  Web Service Requirements Document

**WSS**  Web Service Security

**XML**  eXtensible Mark-up Language
4 Service Profile

Name: Flight Plan Service (FPS)
Description: Service for filing, deleting, and modifying an IFR flight plan for subsequent automatic submission to FAA flight data processing

Revision: A
Service Category:
- Air Traffic Control Information Service [urn:us:gov:dot:faa:taxonomies:service-category#1.3.1.3]
- Flight Information Service [urn:us:gov:dot:faa:taxonomies:service-category#1.3.1.3.2]
Lifecycle Stage:
Criticality Level:

4.1 Service Provider

Name: FAA En Route Services Modernization Group (ESMG)
Description: A program within the FAA Air Traffic Organization responsible for developing Web services
Namespace: urn:us:gov:dot:faa:example:atm
Web Page: http://www.faa.gov/air_traffic/flight_info/

4.1.1 Point of Contact

Name: John D. Doe
Title: ATO-X ESMG Manager
Telephone: (609) 444-5555
E-mail Address: Joe.doe@faa.gov
Postal Address: Bldg. 300 FAA William J. Hughes Technical Center Atlantic City International Airport Atlantic City, NJ
4.2 Service Consumers

4.2.1 Traffic Modernization Program (TMP)
Name: FAA Traffic Modernization Program (TMP)
Description: The FAA-maintained program responsible for regulating traffic during arrival, departure, or approach stages of flights with the goal to avoid exceeding airport or air traffic control capacity.
Web Page: http://www.faa.gov/air_traffic/TMP/ *

4.2.2 Alpha Airline
Name: Alpha Airline
Description: A United States commercial air carrier headquartered in Atlanta, Georgia. Alpha Airline provides air transport services for passengers and freight.
Web Page: http://www.example.alpha.com *

* The URLs in section 4.2 are provided as examples only and do not resolve to any resource.

4.3 Service Functionality
Table 4-1 describes the business functions of the FPS in terms of the real world effects that result from invoking these functions.

<table>
<thead>
<tr>
<th>Business Function</th>
<th>Real World Effect</th>
</tr>
</thead>
<tbody>
<tr>
<td>File a flight plan.</td>
<td>A flight plan has been filed and persists in the FAA Web server for distribution to the FAA flight data processing application within some parameter time of the estimated departure time.</td>
</tr>
<tr>
<td>Change destination aerodrome of a flight plan.</td>
<td>The destination aerodrome of a filed flight plan has been changed.</td>
</tr>
<tr>
<td>Cancel a flight plan.</td>
<td>A previously filed flight plan has been retracted before being submitted to FAA ATS, thereby reducing the flight plan processing load and systemic workload of the FAA air traffic planning system.</td>
</tr>
</tbody>
</table>
4.4 Security

4.4.1 Security Policies


4.4.2 Security Mechanisms
FPS deploys the following security mechanisms: authentication, authorization, integrity, non-repudiation, and audit. Each is described in a separate section below.

4.4.2.1 Authentication
The FPS requires each service consumer to authenticate itself to the FPS at the transport level by deploying a Username/Token credential in accordance with the Web Services Security UsernameToken Profile 1.0, OASIS Standard 200401, March 2004, available at http://docs.oasis-open.org/wss/2004/01/oasis-200401-wss-username-token-profile-1.0.pdf [16].


4.4.2.2 Authorization
The FPS uses the credentials received as part of the authentication process described above for future determinations of whether or not a service consumer is authorized to invoke an operation it may request.

Two roles are defined, “Reader” and “Originator”. These are described in Table 4-2 and further depicted in Figure 4-1.

<table>
<thead>
<tr>
<th>Name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reader</td>
<td>A user who only has permission to read or examine (‘view only’) a filed flight plan.</td>
</tr>
<tr>
<td>Originator</td>
<td>A user, generally a pilot or operator, who submits a flight plan and has permission to file and subsequently modify or cancel the filed flight plan. Since the Reader role is derived from the Originator role, an Originator role inherently includes the “view” privileges.</td>
</tr>
</tbody>
</table>

**Figure 4-1 FPS Roles Use Case Diagram**

4.4.2.3 Integrity

Because the FPS uses the TLS protocol cited in section 4.4.1 above, data is checked for possible corruption.

4.4.2.4 Non-repudiation

The FPS complies with XML Signature Syntax and Processing (Second Edition), W3C Recommendation, 10 June 2008, available at http://www.w3.org/TR/xmldsig-core [18] to ensure that each user's message is digitally signed.
4.4.2.5 Auditing
The FPS keeps an audit trail of all service requests. Each FPS service request is timestamped with the date and time the request was made. Each audit trail record includes user ID (using credentials received as part of the authentication process), date, time, operation requested, and an error description if the operation failed. Access to the audit trail is limited to users with system administrator privileges.

4.5 Qualities of Service
The qualities of service (QoS) that the FPS is expected to meet or possess are listed in Table 4-3.

<table>
<thead>
<tr>
<th>QoS Parameter Name</th>
<th>Value</th>
<th>Definition</th>
<th>Calculation Method</th>
<th>Unit of Measure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Availability</td>
<td>≥ 99.900</td>
<td>Probability that the service is present or ready for immediate use.</td>
<td>100 * ((24 - Total Outage Time) / 24). Measurements are taken daily and apply to the preceding 24-hour period.</td>
<td>Percentage, accurate to 3 decimal places</td>
</tr>
<tr>
<td>Capacity</td>
<td>20 per minute</td>
<td>Number of service requests that the service can accommodate within a given time period.</td>
<td>Simple count.</td>
<td>Whole positive number, per period of time.</td>
</tr>
<tr>
<td>Response Time</td>
<td>3</td>
<td>Maximum time required to complete a service request.</td>
<td>Measured from the time the service provider agent receives the request to the time the service provider transmits the response.</td>
<td>Seconds.</td>
</tr>
</tbody>
</table>

4.6 Service Policies
The policy document [6] associated with FPS can be found at: https://www.faa.gov/atm/policies/fps-policy.xml. * Note: proper authentication may
be required to access the document. For information about obtaining access to the policy document, contact the individual indicated in section 4.1.1 of this WSDD.

* The URL does not resolve to any resource and is provided as an example only.

4.7 Environmental Constraints
The FPS operates within the FAA Telecommunications Infrastructure (FTI) and is subject to its performance constraints. It is also available over the public Internet.

5 Service Interface

5.1 Interfaces
The FPS exposes a single interface called “FlightPlanInterface” which includes three (3) operations and is described in Table 5-1.

<table>
<thead>
<tr>
<th>Name</th>
<th>Description</th>
<th>Operations</th>
</tr>
</thead>
</table>
| FlightPlanInterface | FlightPlanInterface allows a service consumer to file and subsequently modify or cancel a flight plan. | FileFlightPlan
|                   |                                                | UpdateDestinationAerodrome
|                   |                                                | CancelFlightPlan                    |

5.2 Operations
Messages exchanged during execution of the operations are described in section 5.3 of the WSDD. Faults generated as a result of operation failure are described in section 5.4 of the WSDD.
5.2.1 Operation FileFlightPlan

![Sequence Diagram](image)

**Figure 5-1 Operation FileFlightPlan Sequence Diagram**

<table>
<thead>
<tr>
<th>Name</th>
<th>FileFlightPlan</th>
</tr>
</thead>
<tbody>
<tr>
<td>Description</td>
<td>The FileFlightPlan operation allows the creation of persistent information defining an intended flight (flight plan).</td>
</tr>
<tr>
<td>Message Exchange Pattern</td>
<td>In-Out</td>
</tr>
<tr>
<td>Precondition</td>
<td>Service consumer has been authenticated and authorized to perform the FileFlightPlan operation.</td>
</tr>
<tr>
<td>Input</td>
<td>Message FileFlightPlanRequest containing required flight plan information encapsulated in FlightPlan element.</td>
</tr>
<tr>
<td>Output</td>
<td>Message FileFlightPlanResponse containing FlightPlanId for filed flight plan.</td>
</tr>
<tr>
<td>Effect</td>
<td>Flight plan has been submitted (filed).</td>
</tr>
<tr>
<td>Faults</td>
<td>Fault InvalidDataFault is returned when submitted flight plan data is not valid and service is unable to process the flight plan.</td>
</tr>
</tbody>
</table>
5.2.2 Operation UpdateDestinationAerodrome

Service Consumer

UpdateDestinationAerodromeRequest(FlightPlanId, DestinationAerodrome)

UpdateDestinationAerodromeResponse(DestinationAerodrome)

InvalidDataFault

Service Provider

(OR)

Figure 5-2 Operation UpdateDestinationAerodrome Sequence Diagram

Table 5-3 Operation UpdateDestinationAerodrome

<table>
<thead>
<tr>
<th>Name</th>
<th>UpdateDestinationAerodrome</th>
</tr>
</thead>
<tbody>
<tr>
<td>Description</td>
<td>The UpdateDestinationAerodrome operation allows updating the destination aerodrome information within a filed flight plan.</td>
</tr>
<tr>
<td>Operation Type</td>
<td>Synchronous</td>
</tr>
<tr>
<td>Idempotency</td>
<td>Idempotent</td>
</tr>
<tr>
<td>Precondition</td>
<td>Service consumer has been authenticated and authorized to update flight plan information. The referenced flight plan has been filed.</td>
</tr>
<tr>
<td>Input</td>
<td>Message UpdateDestinationAerodromeRequest containing FlightPlanId and the new destination aerodrome.</td>
</tr>
<tr>
<td>Output</td>
<td>Message UpdateDestinationAerodromeResponse containing Flight Plan ID of the updated flight plan (FlightPlanId) and Aerodrome data for the destination aerodrome as it is recognized by the service.</td>
</tr>
<tr>
<td>Effect</td>
<td>Originally indicated flight destination aerodrome has been changed.</td>
</tr>
<tr>
<td>Faults</td>
<td>Fault InvalidDataFault is returned when submitted flight plan ID or aerodrome ID is not valid.</td>
</tr>
</tbody>
</table>
5.2.3 Operation CancelFlightPlan

**Table 5-4 Operation CancelFlightPlan**

<table>
<thead>
<tr>
<th>Name</th>
<th>CancelFlightPlan</th>
</tr>
</thead>
<tbody>
<tr>
<td>Description</td>
<td>The CancelFlightPlan operation allows canceling a previously filed flight plan.</td>
</tr>
<tr>
<td>Operation Type</td>
<td>Synchronous</td>
</tr>
<tr>
<td>Idempotency</td>
<td>Idempotent</td>
</tr>
<tr>
<td>Precondition</td>
<td>Service consumer has been authenticated and authorized to perform the CancelFlightPlan operation. The referenced flight plan has been filed.</td>
</tr>
<tr>
<td>Input</td>
<td>Message CancelFlightPlanRequest containing FlightPlanId of a FlightPlan to be canceled.</td>
</tr>
<tr>
<td>Output</td>
<td>Message CancelFlightPlanResponse containing confirmation of canceling the flight plan.</td>
</tr>
<tr>
<td>Effect</td>
<td>Flight plan has been canceled.</td>
</tr>
<tr>
<td>Faults</td>
<td>Fault InvalidDataFault is returned when submitted flight plan ID is not valid</td>
</tr>
</tbody>
</table>
5.3 Messages

FPS messages are listed and described in Table 5-5.

Table 5-5 FPS Messages

<table>
<thead>
<tr>
<th>Name</th>
<th>Description</th>
<th>Direction</th>
<th>Data Elements</th>
</tr>
</thead>
<tbody>
<tr>
<td>FileFlightPlanRequest</td>
<td>Used by a service consumer to submit (file) a flight plan.</td>
<td>Input</td>
<td>FlightPlan</td>
</tr>
<tr>
<td>FileFlightPlanResponse</td>
<td>Used to inform a service consumer that flight plan information has been accepted and returns the ID that has been assigned to the flight plan.</td>
<td>Output</td>
<td>FlightPlanId</td>
</tr>
<tr>
<td>UpdateDestinationAerodromeRequest</td>
<td>Used by a service consumer to change a destination aerodrome.</td>
<td>Input</td>
<td>DestinationAerodrome, FlightPlanId</td>
</tr>
<tr>
<td>UpdateDestinationAerodromeResponse</td>
<td>Used to inform a service consumer that the original destination aerodrome has been changed.</td>
<td>Output</td>
<td>DestinationAerodrome, FlightPlanId</td>
</tr>
<tr>
<td>CancelFlightPlanRequest</td>
<td>Used by a service consumer to cancel a previously filed flight plan.</td>
<td>Input</td>
<td>FlightPlanId</td>
</tr>
<tr>
<td>CancelFlightPlanResponse</td>
<td>Used to inform a service consumer that the flight plan has been canceled.</td>
<td>Output</td>
<td>FlightPlanId</td>
</tr>
</tbody>
</table>

5.4 Faults

If the value of a flight plan element is invalid or missing from the consumer request and no default value is established, then the FPS responds with an InvalidDataFault fault message as described in Table 5-6.

NOTE: A service will ordinarily have more than one fault message.

Table 5-6 FPS Fault Messages

<table>
<thead>
<tr>
<th>Name</th>
<th>Description</th>
<th>Data Elements</th>
</tr>
</thead>
<tbody>
<tr>
<td>InvalidDataFault</td>
<td>Used to inform a service consumer that submitted flight plan data is not valid and FPS is unable to process the flight plan.</td>
<td>InvalidDataError</td>
</tr>
</tbody>
</table>
5.5 Data Elements

NOTE: Section 5.9.5 requirement (u) of FAA-STD-065A [3] states that a conceptual data model of all data used by the service shall be included in this section of the WSDD. A data model is usually the result of an architectural effort, and a reference to the model’s location in the architecture can be made instead of reproducing the model in the WSDD.

In this WSDD example, we have simulated a scenario in which a data model has been developed as a separate effort. Because the example is unable to supply a real URL for the model, a conceptual model of the data elements that appear in the FlightPlan XML schema is provided in Figure 5-4, and the XML schema itself is provided in Appendix A (a diagram of the schema appears in Appendix B.) An example of an instantiation of this schema is provided in Appendix C. Note also that the WSDL document in Appendix D refers to the same XML schema.

All data exchanged by the FPS conforms to the FPMX 1.0, Flight Plan Exchange Model, 10 January 2006, available at http://faa.gov/fpxm/2006/ [5]. A conceptual data model (Figure 5-4) is available at http://faa.gov/fpxm/2006/FPXM_Conceptual Model.pdf. * All data elements provided by the FPS conform to definitions, syntax, and constraints as defined in the XML schema found at http://faa.gov/fpxm/2006/fpxm10.xsd. * (See Appendix A for a copy of the schema.)

Data elements are also described in Table 5-7 in accordance with FAA-STD-065A section 5.9.5 [3].

* The URLs in section 5.5 are provided as examples only and do not resolve to any resource.
Figure 5-4 Flight Plan Exchange Conceptual Model
NOTE: Section 5.9.5 requirement (a) of FAA-STD-065A [3] states that section 5.5 of the WSDD shall list and describe all data elements, complex or primitive, that appear in messages (or faults) to be sent or received via the Web service. The following table does not contain an exhaustive list of all of the data elements but rather provides a subset of elements selected to exemplify how data elements should be presented in a WSDD.

Note also that all metadata is required (Unit of Measure and Permissible Values are required if applicable) except for Maximum Length and Format which are optional.

All data elements in Table 5-7 are defined in the namespace urn:us:gov:dot:faa:example:atm:enroute:fps:entities

<table>
<thead>
<tr>
<th>Name</th>
<th>Definition</th>
<th>Permissible Values</th>
<th>Unit of Measure</th>
<th>Datatype</th>
<th>Format</th>
<th>Obligation</th>
<th>Occurrence</th>
</tr>
</thead>
<tbody>
<tr>
<td>FlightPlan</td>
<td>The outmost container (root) element for all data provided by the pilot or his/her designated representative to air traffic services units, relative to the intended flight or portion of the flight of the aircraft.</td>
<td>N/A</td>
<td>N/A</td>
<td>Complex</td>
<td></td>
<td>Required</td>
<td>1</td>
</tr>
<tr>
<td>FlightPlanId</td>
<td>An element that uniquely identifies the flight plan.</td>
<td>N/A</td>
<td>N/A</td>
<td>String</td>
<td>[A-Za-z0-9]*</td>
<td>Required</td>
<td>1</td>
</tr>
<tr>
<td>FlightPlan.flightRule</td>
<td>A code representing regulations (i.e., instrument or visual flight rules) under which the pilot is flying or intends to fly the aircraft.</td>
<td>&quot;I&quot; - IFR only, &quot;V&quot; - VFR only, &quot;Y&quot; - IFR first, &quot;Z&quot; - VFR first</td>
<td>N/A</td>
<td>String</td>
<td></td>
<td>Required</td>
<td>1</td>
</tr>
<tr>
<td>Name</td>
<td>Definition</td>
<td>Permissible Values</td>
<td>Unit of Measure</td>
<td>Datatype</td>
<td>Format</td>
<td>Obligation</td>
<td>Occurrence</td>
</tr>
<tr>
<td>-----------------------------------</td>
<td>-------------------------------------------------------------------------------------------------------------------------------------------</td>
<td>-------------------</td>
<td>-----------------</td>
<td>----------</td>
<td>------------------------</td>
<td>------------</td>
<td>------------</td>
</tr>
<tr>
<td>FlightPlan.filingTime</td>
<td>The point in time (UTC) at which the flight plan is filed.</td>
<td>N/A</td>
<td>N/A</td>
<td>dateTime</td>
<td>CCYY-MM-DDTh:mm:ssZ</td>
<td>Required</td>
<td>1</td>
</tr>
<tr>
<td>Altitude</td>
<td>An element that indicates the pressure altitude above mean sea level (MSL) at which the aircraft is flying or is intended to be flown.</td>
<td>N/A</td>
<td>N/A</td>
<td>Complex</td>
<td></td>
<td>Required</td>
<td>1</td>
</tr>
<tr>
<td>Altitude.uom</td>
<td>A code representing the units of measure of the aircraft's altitude.</td>
<td>N/A</td>
<td>N/A</td>
<td>String</td>
<td></td>
<td>Required</td>
<td>1</td>
</tr>
<tr>
<td>Altitude.referenceDatum</td>
<td>A code representing the atmospheric pressure reference used to adjust a pressure altimeter.</td>
<td>N/A</td>
<td>N/A</td>
<td>String</td>
<td></td>
<td>Required</td>
<td>1</td>
</tr>
<tr>
<td>Aircraft</td>
<td>A container element for all data related to the aircraft.</td>
<td>N/A</td>
<td>N/A</td>
<td>Complex</td>
<td></td>
<td>Required</td>
<td>1</td>
</tr>
<tr>
<td>Aircraft.aircraftType</td>
<td>An aircraft type designator that informs an air traffic controller of the performance characteristics of the aircraft.</td>
<td>N/A</td>
<td>N/A</td>
<td>String</td>
<td></td>
<td>Required</td>
<td>1</td>
</tr>
</tbody>
</table>

Note: "m", "meter" - altitude in meters
"foot" - altitude in feet
"Local" - local pressure extrapolated to zero MSL.
"Standard" - pressure with respect to the pressure datum 1013.2 hectopascals (hPa). Values are listed in ICAO 8643, Aircraft Type Designators, [http://legacy.icao.int/anb/ais/8643/](http://legacy.icao.int/anb/ais/8643/).
<table>
<thead>
<tr>
<th>Name</th>
<th>Definition</th>
<th>Permissible Values</th>
<th>Unit of Measure</th>
<th>Datatype</th>
<th>Format</th>
<th>Obligation</th>
<th>Occurrence</th>
</tr>
</thead>
<tbody>
<tr>
<td>WakeTurbulenceCategory</td>
<td>A code that classifies the aircraft for the purpose of wake turbulence separation minima, based on the maximum certified takeoff mass of the aircraft.</td>
<td>“H”, “HEAVY” - aircraft having a maximum certificated take-off mass of 136,000 kg (300,000 lb) or more. “M”, “MEDIUM” - aircraft having a maximum certificated take-off mass of less than 136,000 kg (300,000 lb) and more than 7,000 kg (15,500 lb). “L”, “LIGHT” - aircraft having a maximum certificated take-off mass of 7,000 kg (15,500 lb) or less.</td>
<td>N/A</td>
<td>String</td>
<td>N/A</td>
<td>Required</td>
<td>1</td>
</tr>
<tr>
<td>DestinationAerodrome</td>
<td>A container element for all data related to the primary aerodrome to which the flight is destined.</td>
<td>N/A</td>
<td>N/A</td>
<td>Complex</td>
<td>N/A</td>
<td>Required</td>
<td>1</td>
</tr>
<tr>
<td>DestinationAerodrome.Name</td>
<td>An element that contains the name or location (nearest city) of the destination aerodrome.</td>
<td>N/A</td>
<td>N/A</td>
<td>String</td>
<td>N/A</td>
<td>Optional</td>
<td>1</td>
</tr>
</tbody>
</table>
All data elements in Table 5-8 are defined in the namespace `urn:us:gov:dot:faa:example:atm:enroute:fps:entities`.

<table>
<thead>
<tr>
<th>Name</th>
<th>Definition</th>
<th>Permissible Values</th>
<th>Unit of Measure</th>
<th>Datatype</th>
<th>Obligation</th>
<th>Occurrence</th>
</tr>
</thead>
<tbody>
<tr>
<td>InvalidDataError</td>
<td>A field that contains the invalid value(s).</td>
<td>One or more (separated by a comma and a space) of the following values:</td>
<td>N/A</td>
<td>String</td>
<td>Required</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>&quot;Flight Rule&quot;,</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>&quot;Number Of Aircraft&quot;,</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>&quot;Filing Time&quot;,</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>&quot;Flight Plan Id&quot;,</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>&quot;Airman Id&quot;,</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>&quot;Originator Name&quot;,</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>&quot;Aircraft Type&quot;,</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>&quot;Aircraft Id&quot;,</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>&quot;Equipage Communication&quot;,</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>&quot;Equipage Navigation&quot;,</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>&quot;Equipage Surveillance&quot;,</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>&quot;Wake Turbulence Category&quot;,</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>&quot;Altitude Reference Datum&quot;,</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>&quot;Altitude Unit of Measure&quot;,</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>&quot;Estimated Departure Time&quot;,</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>&quot;Estimated Enroute Time&quot;,</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>&quot;True Speed Unit of Measure&quot;,</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>&quot;True Speed&quot;,</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>&quot;Mach Number&quot;,</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>&quot;Departure Aerodrome Id&quot;,</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>&quot;Destination Aerodrome Id&quot;,</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>&quot;Alternate Aerodrome Id&quot;</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
5.6 Machine-Processable Service Description Document

<table>
<thead>
<tr>
<th>Name</th>
<th>FlightPlanService.wsdl</th>
</tr>
</thead>
<tbody>
<tr>
<td>Version</td>
<td>1.0</td>
</tr>
</tbody>
</table>
| Location   | 1. http://faa.gov/example/FlightPlan/wsdl/FlightPlanService.wsdl *  
|            | 2. Appendix D           |

* The URL does not resolve to any resource and is provided as an example only.

NOTE: Appendix D contains an example of a machine-processable service description document that might be used for this service. It is provided for instructional purposes only. If there were an actual persistent URL for the WSDL file, reference could be made to it rather than including the file in an appendix.
6 Service Implementation

6.1 Bindings

6.1.1 Binding “SOAPoverHTTPBinding"
The FPS deploys the protocols described in sections 6.1.1.1 through 6.1.1.3 for the binding to the interface “FlightPlanInterface”.

6.1.1.1 Data Protocol

6.1.1.2 Message Protocol

NOTE: An example of an FPS message constructed in accordance with the SOAP protocol appears in Appendix C.

6.1.1.3 Transport Protocol

6.2 End Points

6.2.1 End Point “HTTPExternalFlightPlanEndPoint”
Associated binding: “SOAPoverHTTPBinding”
Network address: http://esmg.faa.gov/dev/flight-plan.do *

* The URL does not resolve to any resource and is provided as an example only.
7 Appendixes

Appendix A. FlightPlan.xsd

<?xml version="1.0" encoding="UTF-8"?>
<xs:schema xmlns:xs="http://www.w3.org/2001/XMLSchema"
xmlns="urn:us:gov:dot:faa:example:atm:enroute:fps:entities"
targetNamespace="urn:us:gov:dot:faa:example:atm:enroute:fps:entities"
elementFormDefault="qualified" attributeFormDefault="unqualified">
  <xs:annotation>
    <xs:documentation xml:lang="en">
      Title: FlightPlan schema for WSDD Example.
      Description: This schema declares XML elements for defining a Flight Plan transmitted by FlightPlanService
      Creator: Mark Kaplun (mark.kaplun@faa.gov)
      Date: 2010-01-21
    </xs:documentation>
  </xs:annotation>

  <!---/////////////////////////////////////////////////////////////////////////////////////////////////
  Global types
  /////////////////////////////////////////////////////////////////////////////  -->
  <xs:element name="FlightPlan">
    <xs:complexType>
      <xs:sequence>
        <!--- "FlightPlanId" is always required.
        When flight plan is filed and the "FlightPlanId" element has no content
        - the content is nil. -->
        <xs:element name="FlightPlanId" type="FlightPlanIdType" nillable="true"/>
        <xs:element name="Originator" type="OriginatorType"/>
        <xs:element ref="Aircraft"/>
        <xs:element ref="Route"/>
      </xs:sequence>
      <xs:attribute name="filingTime" type="xs:dateTime" use="required"/>
      <xs:attribute name="flightRule" type="FlightRuleType" use="required"/>
      <xs:attribute name="numberOfAircraft" type="xs:positiveInteger" default="1"/>
    </xs:complexType>
  </xs:element>
  <xs:element name="Aircraft" type="AircraftType"/>
  <xs:element name="Route" type="RouteType"/>
  <!---/////////////////////////////////////////////////////////////////////////////////////////////////
  Types definitions
  /////////////////////////////////////////////////////////////////////////////  -->
</xs:schema>
<xs:simpleType name="FlightPlanIdType">
   <xs:restriction base="xs:string">
      <xs:pattern value="[A-Za-z0-9]*"/>
   </xs:restriction>
</xs:simpleType>

<xs:complexType name="AircraftType">
   <xs:sequence>
      <xs:element name="Equipage">
         <xs:complexType>
            <xs:sequence>
               <xs:element name="Communication" type="xs:string"/>
               <xs:element name="Navigation" type="xs:string"/>
               <xs:element name="Surveillance" type="xs:string"/>
            </xs:sequence>
         </xs:complexType>
      </xs:element>
      <xs:element name="WakeTurbulenceCategory" type="WakeTurbulenceCategoryType"/>
   </xs:sequence>
   <xs:attribute name="aircraftId" type="xs:string"/>
   <xs:attribute name="aircraftType" type="xs:string"/>
</xs:complexType>

<xs:complexType name="OriginatorType">
   <xs:sequence>
      <xs:element name="Name" type="xs:string"/>
   </xs:sequence>
   <xs:attribute name="airmanId" type="xs:string" use="required"/>
</xs:complexType>

<xs:complexType name="RouteType">
   <xs:sequence>
      <xs:element name="Altitude" type="AltitudeType"/>
      <xs:element name="EstimatedTime">
         <xs:complexType>
            <xs:sequence>
               <xs:element name="EstimatedDepartureTime" type="xs:time"/>
               <xs:element name="EstimatedEnRouteTime" type="xs:duration"/>
            </xs:sequence>
         </xs:complexType>
      </xs:element>
      <xs:element name="AirSpeed" type="AirSpeedType"/>
      <xs:element name="DepartureAerodrome" type="AerodromeType"/>
      <xs:element name="DestinationAerodrome" type="AerodromeType"/>
      <xs:element name="AlternateAerodrome" type="AerodromeType"/>
      <xs:any minOccurs="0" maxOccurs="unbounded">
         <!--This element is declared as "any" to indicate that Route element can be extended with elements such as: fixes (significant points), route names, route segments and etc. -->
      </xs:any>
   </xs:sequence>
</xs:complexType>
<!-- Code types -->

<xsd:simpleType name="AerodromeIdType">
  <xsd:restriction base="xsd:string">
    <xsd:maxLength value="4"/>
    <xsd:pattern value="[A-Z][A-Z][A-Z][A-Z]"/>
  </xsd:restriction>
</xsd:simpleType>
<!--
////////////////////////////////////////////////////////////////////////////
Enumerations types
////////////////////////////////////////////////////////////////////////////
-->
<xs:simpleType name="FlightRuleType">
    <xs:restriction base="xs:string">
        <xs:enumeration value="I"/>
        <xs:enumeration value="V"/>
        <xs:enumeration value="Y"/>
        <xs:enumeration value="Z"/>
    </xs:restriction>
</xs:simpleType>
<xs:simpleType name="WakeTurbulenceCategoryType">
    <xs:restriction base="xs:string">
        <xs:enumeration value="H"/>
        <xs:enumeration value="HEAVY"/>
        <xs:enumeration value="M"/>
        <xs:enumeration value="MEDIUM"/>
        <xs:enumeration value="L"/>
        <xs:enumeration value="LIGHT"/>
    </xs:restriction>
</xs:simpleType>
<xs:simpleType name="ReferenceDatumType">
    <xs:restriction base="xs:string">
        <xs:enumeration value="local"/>
        <xs:enumeration value="standard"/>
    </xs:restriction>
</xs:simpleType>
<!--
/////////////////////////////////////////////////////////////////////
Units of Measurement enumerations
/////////////////////////////////////////////////////////////////////
-->
<xs:simpleType name="UnitOfSpeedType">
    <xs:restriction base="xs:string">
        <xs:enumeration value="km/h"/>
        <xs:enumeration value="knots"/>
    </xs:restriction>
</xs:simpleType>
<xs:simpleType name="UnitOfAltitudeType">
    <xs:restriction base="xs:string">
        <xs:enumeration value="m"/>
        <xs:enumeration value="meter"/>
        <xs:enumeration value="foot"/>
    </xs:restriction>
</xs:simpleType>
</xs:schema>
Appendix B. FlightPlan.xsd - diagram
Fragment - Route element
Appendix C. Example of FPS Request Message

```xml
<?xml version="1.0" encoding="UTF-8"?>
<soapenv:Envelope
xmlns:soapenv="http://schemas.xmlsoap.org/soap/envelope/
xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xsi:schemaLocation="http://schemas.xmlsoap.org/soap/envelope/
xmlns:fp="http://esmg.faa.gov/flight-plan">
  <soapenv:Header/>
  <soapenv:Body>
    <fp:FileFlightPlan>
      <FlightPlan
        xmlns="urn:us:gov:dot:faa:example:atm:enroute:fps:entities"
        xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
        xsi:schemaLocation="/FlightPlan.xsd"
        flightRule="I"
        numberOfAircraft="1"
        filingTime="2001-12-17T09:47Z">
        <FlightPlanId xsi:nil="true"/>
        <Originator airmanId="215336745">
          <Name>John Doe</Name>
        </Originator>
        <Aircraft aircraftType="PA-32R" aircraftId="JHB426E">
          <Equipage>
            <Communication>V</Communication>
            <Navigation>C</Navigation>
            <Surveillance>OL</Surveillance>
          </Equipage>
          <WakeTurbulenceCategory>LIGHT</WakeTurbulenceCategory>
        </Aircraft>
        <Route>
          <Altitude>
            <Altitude referenceDatum="local" uom="foot">7000</Altitude>
          </Altitude>
          <EstimatedTime>
            <EstimatedDepartureTime>14:20:00.0Z</EstimatedDepartureTime>
            <EstimatedEnRouteTime>PT3H30M</EstimatedEnRouteTime>
          </EstimatedTime>
          <AirSpeed>
            <TrueSpeed uom="knots">170</TrueSpeed>
            <MachNumber>0.12</MachNumber>
          </AirSpeed>
          <DepartureAerodrome aerodromeId="KBWI">
            <Name>Baltimore-Washington International, MD</Name>
          </DepartureAerodrome>
          <DestinationAerodrome aerodromeId="KBOS">
            <Name>Logan International Airport, Boston, MA</Name>
          </DestinationAerodrome>
          <AlternateAerodrome aerodromeId="KJFK">
            <Name>John F. Kennedy International Airport, NY, NY</Name>
          </AlternateAerodrome>
        </Route>
      </FlightPlan>
    </fp:FileFlightPlan>
  </soapenv:Body>
</soapenv:Envelope>
```
Appendix D. FlightPlanService.wsdl

In this exercise we assume that multiple services may use the common set of Flight Plan data elements and that all these definitions have been placed in an XML schema document. (The schema document named “FlightPlan.xsd” is found in Appendix A.)

Note also that recreating the WSDL file in an actual Web Service Description Document is not required by FAA-STD-065A [3] unless there is no accessible location (URL) for the file.

Finally, note that the URLs shaded in gray do not resolve to any actual location.

```xml
<?xml version="1.0" encoding="utf-8"?>
<description
targetNamespace="urn:us:gov:dot:faa:example:atm:enroute:fps"
xmlns="http://www.w3.org/ns/wsdl"
xmlns:tns="urn:us:gov:dot:faa:example:atm:enroute:fps"
xmlns:wsoap="http://www.w3.org/2003/05/soap-envelope"
xmlns:wsdlx="http://www.w3.org/ns/wsdl-extensions">
<documentation>
This WSDL document describes the FlightPlan service. Additional application-level information for use of this service -- beyond what this WSDL describes -- is available at http://www.faa.gov/examples/WSDD Flight Plan Service.doc</documentation>
</description>
</types>
<xs:schema xmlns:x="http://www.w3.org/2001/XMLSchema"
targetNamespace="urn:us:gov:dot:faa:example:atm:enroute:fps"
xmlns="urn:us:gov:dot:faa:example:atm:enroute:fps"
<xs:import
namespace="urn:us:gov:dot:faa:example:atm:enroute:fps:entities"
schemaLocation="/FlightPlan.xsd"/>
</schema>
</types>
</xs:schema>
```

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<xs:element name="DestinationAerodrome"
type="fpd:AerodromeType"/>
</xs:sequence>
</xs:complexType>
<!-- Faults -->
<xs:element name="InvalidDataError" type="xs:string"/>
</xs:schema>
</types>
<!-- INTERFACE -->
@interface name="FlightPlanInterface">
<!-- The 'fault' element here is established here at the same level as 'operation'. This allows one fault message to be reused across different operations. -->
<fault name="InvalidDataFault" element="tns:InvalidDataError"/>
</interface>
<interface name="FileFlightPlan">
</input>
<output messageLabel="Out" element="tns:FileFlightPlanResponse"/>
</operation>
<operation name="CancelFlightPlan">
</input>
<output messageLabel="Out" element="tns:CancelFlightPlanResponse"/>
</operation>
<operation name="UpdateDestinationAerodrome">
</input>
<output messageLabel="Out" element="tns:UpdateDestinationAerodromeResponse"/>
</operation>
</interface>
<!-- BINDING -->
<!-- We are deploying a reusable binding here -->
<binding name="SOAPoverHTTPBinding" type="http://www.w3.org/ns/wsd1/soap" wsoap:protocol="http://www.w3.org/2003/05 SOAP/bindings/HTTP"/>
<!-- SERVICE -->
<service name="FlightPlanService" interface="tns:FlightPlanInterface">
<endpoint name="HTTPExternalFlightPlanEndPoint"
binding="tns:SOAPoverHTTPBinding"
address="http://esmg.faa.gov/dev/flight-plan.do"/>
</service>
</description>