



Service Description Conceptual Model (SDCM)

Version 3.0.0 (Internal Review Draft)

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1 Introduction

The Service Description Conceptual Model (SDCM) provides a graphical and lexical representation of the properties, structure, and interrelationships of all service metadata elements, collectively known as a Service Description.

The SDCM is maintained by the U.S. Federal Aviation Administration (FAA) System Wide Information Management Program (SWIM).

1.1 Purpose

The objectives of the SDCM are:

- To define a conceptual model of a service description based on consistent application of Service Oriented Architecture (SOA) principles;
- To establish adequate and consistent semantics for concepts used in documentation for SOA based services;
- To advance a common and shared understanding of SOA concepts among international partners;
- To promote a technological means for describing all relevant aspects of a service in a manner suitable for both human-readable and machine-processable representations.

The SDCM adheres to the following design principles:

- It shall be based on widely-used industry service description standards and models (e.g., OWL-S, WSDL, OASIS SOA Reference Model);
- It shall be extensible to allow deriving and adding more elements to address organization-specific tasks;
- It shall be neutral to any organizational governance model;
- It shall be vendor neutral (e.g., it shall not support any proprietary implementation of UML and/or vocabularies).

1.2 Background

The rapid proliferation of SOA-based systems has led to a reevaluation of existing documentation practices by IT communities. One piece of documentation in particular, the service description, is integral to establishing resource-to-resource interoperability among SOA components and critical to supporting various aspects of SOA governance.

Because the service description plays such an important role in SOA, both academia and industry have invested significant efforts in developing different realizations of the concept. The most fundamental and recognizable standard in this area is the Web Services Description Language (WSDL) specification [\[WSDL\]](#) set forth by the World Wide Web Consortium (W3C). Other notable developments include the Open Geospatial Consortium (OGC) Web Services Common Standard [\[OGC-STD\]](#), W3C's Semantic Markup for Web Services [\[OWL-S\]](#), and the OpenAPI Initiative's (OAI) OpenAPI Specification [\[OPENAPI\]](#).

The FAA has also applied considerable effort toward the development and utilization of its own version of a service description. It was recognized that for this document to be used effectively in the FAA, it had to be aligned to established FAA system engineering practices as well as to consistent application of SOA

principles, common standards, methodologies, and best practices. To address these concerns, the FAA developed a standard for Preparation of Web Service Description Documents (WSDD) [\[STD-065\]](#).

This standard has been successfully deployed in FAA's SOA-based implementations and has been followed by two related standards, Preparation of Service Requirements Documents [\[STD-074\]](#) and Preparation of Java Messaging Service Description Documents (JMSDD) [\[STD-073\]](#). To provide a means for describing all relevant aspects of services in machine-processable format (as opposed to the human readable documents based on the FAA standards), the FAA also developed a Web Service Description Ontological Model (WSDOM) [\[WSDOM\]](#), an ontology conceptually inspired by W3C's OWL-S and the OASIS SOA Ontology [\[OASIS-RO\]](#).

In 2015, the FAA and Single European Sky ATM Research (SESAR) collaborated to develop SDCM 1.0. It was followed by SDCM 2.0 [\[SDCM-2\]](#) in 2016.

The FAA has extensively used the SDCM in the context of SWIM Governance. Currently, there are hundreds of SDCM-compliant human-readable service description documents registered in the FAA's SWIM service registry, the NAS Service Registry and Repository (NSRR), which is also SDCM-conformant. In recent years, SDCM realizations in formal languages (e.g., XML, JSON) have gained popularity in the area of global service discovery. The SDCM in its JSON formalization has been used to develop a SWIM Discovery Service (SDS) [\[SDS\]](#), an international collaborative project currently supported by the FAA, the Korea Airports Corporation (KAC), the People's Republic of China's Air Traffic Management Bureau (ATMB), and Japan's Electronic Navigation Research Institute (ENRI).

1.3 Architecture

From an architectural perspective, the SDCM defines service meta-information elements organized in a way that allows users and software agents to discover, invoke, and compose services.

From a conceptual perspective, SDCM is motivated by the need for three types of knowledge about services, each of which can be portrayed as a question:

- **What does the service provide for prospective service consumer?** The answer to this question is given in the *Profile* part of the *Service Description*, which includes information about who provides the service, capabilities offered by the service, limitations on service applicability, quality of service, and other non-functional characteristics.
- **How is it used?** The answer to this question is given in the *Model* part of the *Service Description* by describing the interface, detailing the content of requests, message formats, data types, etc.
- **How can it be accessed?** The answer to this question is given in the *Grounding* part of the *Service Description*, which describes the details about communications protocols and service endpoints.

The SDCM includes one more part that is discussed separately, *Utility*. This part does not define information items (classes) used for describing a service (e.g., *Provider*, *Interface*) but presents a set of abstract classes (e.g., *Organization*, *Document*) which purpose is to be extended and reused by other SDCM classes.

1.4 New in Version 3.0

To align with the ICAO Service Overview standard [SWIM-Manual], and to address new technological advances in the area of service developments, as well as the emergence of new types of service descriptions and to align with Service , this new version of SDCM introduces the following enhancements:

- Streamlining and simplification, e.g., *Policies, Security Mechanisms*.
- Addition of new classes, e.g., *Geographical Extent, Taxonomy, Enumeration*.
- Addition of elements for describing REST Web Services, e.g., *Resource, Parameter*.

1.5 Intended Audience

The intended audience for this new version of SDCM includes service users, people making decisions about service technologies, designers and developers of service software, personnel who develop and support service infrastructure, and service specification authors.

1.6 Use of Diagrams

In order to capture interrelationships among various types of service information, SDCM uses Unified Modeling Language (UML) [OMG-UML], a software modeling standard published by the Object Management Group (OMG).

Packages and classes are two main UML model elements used in the SDCM: packages are used to group classes into logical units, whereas classes represent specific concepts. Packages and classes are related in a variety of ways through UML-defined associations.

Fig. 1 shows the high-level architecture of the SDCM, where each part of the top, encompassing concept *Service Description* is shown as a package, which in its turn contains classes: *Profile* (section 2.2), *Model* (section 2.3), *Grounding* (section 2.4) and *Utility* (section 2.5)).

The aggregation association between Service Description and Profile, Model, and Grounding indicates that these are all *parts of* the Service Description, and the dependency relationship between Utility and Service Description signifies that changes to Utility's classes *affect* classes in other packages.

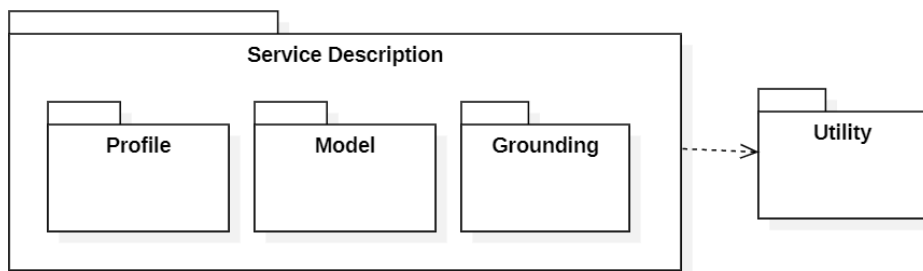


Figure 1 Package diagram of the SDCM

1.7 Usage Examples

All examples provided in this document (denoted as “Example of use”) are **non-normative** and are not intended to be used as a specification in SDCM-based service description documentation.

2 Components

2.1 Service Description

Definition The information needed in order to use, or consider using, a service. [\[SOA-RM\]](#)

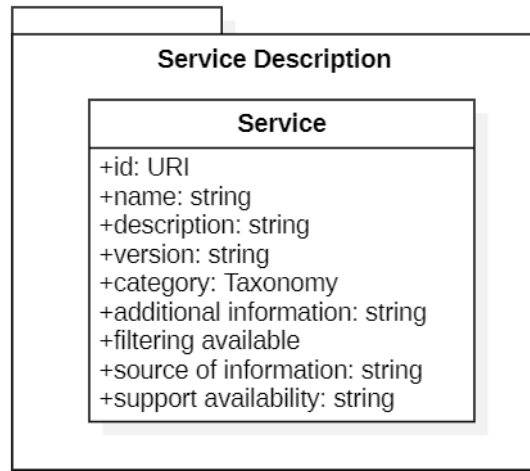


Figure 2 Service Description Package

2.1.1 Service

Definition A point of reference and identifying information for the Service Description.

Name	Definition	Notes
id	A unique persistent identifier of the service within a global context.	Recommended practice is to identify the service by means of an HTTP URI conforming to [RFC3986] .
name	The full name (and acronym, if any) of the service.	
description	A brief summary of the service.	
version	The current version of the service.	Recommended practices for assigning version identifiers can be found in Software Specification Artifacts Versioning for SWIM-enabled Services [SWIM-005]

category	A taxonomy used to classify a service by the type of service provided or by some other technological or architectural solution.	The value of the attribute "category" is an instance of the class Taxonomy . Recommended practice is to tag the service using one or more taxonomies available at semantics.aero .
additional-information	Additional information about the service.	
filtering-available	Description of how responses from the service can be filtered	
source-of-information	Source of information returned by the service	
support-availability	Overview of support offered to consumers	

Example of use

id	<code>http://swim.faa.gov/services/fps</code>
name	<code>Flight Plan Service (FPS)</code>
description	<code>Service for filing, deleting, and modifying a flight plan for subsequent automatic submission to FAA flight data processing.</code>
version	<code>1.0.0</code>
additional-information	<code>https://nsrr.faa.gov/services/fps</code>
filtering-available	<code>Filtering by flight ID and destination airport is available</code>
source-of-information	<code>FAA National Airspace System</code>
category	
id	<code>http://semantics.aero/service-category#flight</code>
name	<code>Flight</code>
description	<code>A service that provides information used to describe, manage, and control the safe movement of aircraft in the airspace, including information such as flight itinerary, flight identification, flight planning, flight events and status, and air traffic management (ATM) control events associated with a single flight, where a flight normally includes one takeoff and one landing.</code>
source	<code>http://semantics.aero/service-category</code>

2.2 Profile

Definition The part of a service description that advertises the service to potential consumers by describing the parties responsible for providing the service, what is accomplished by the service, and limitations on service applicability.

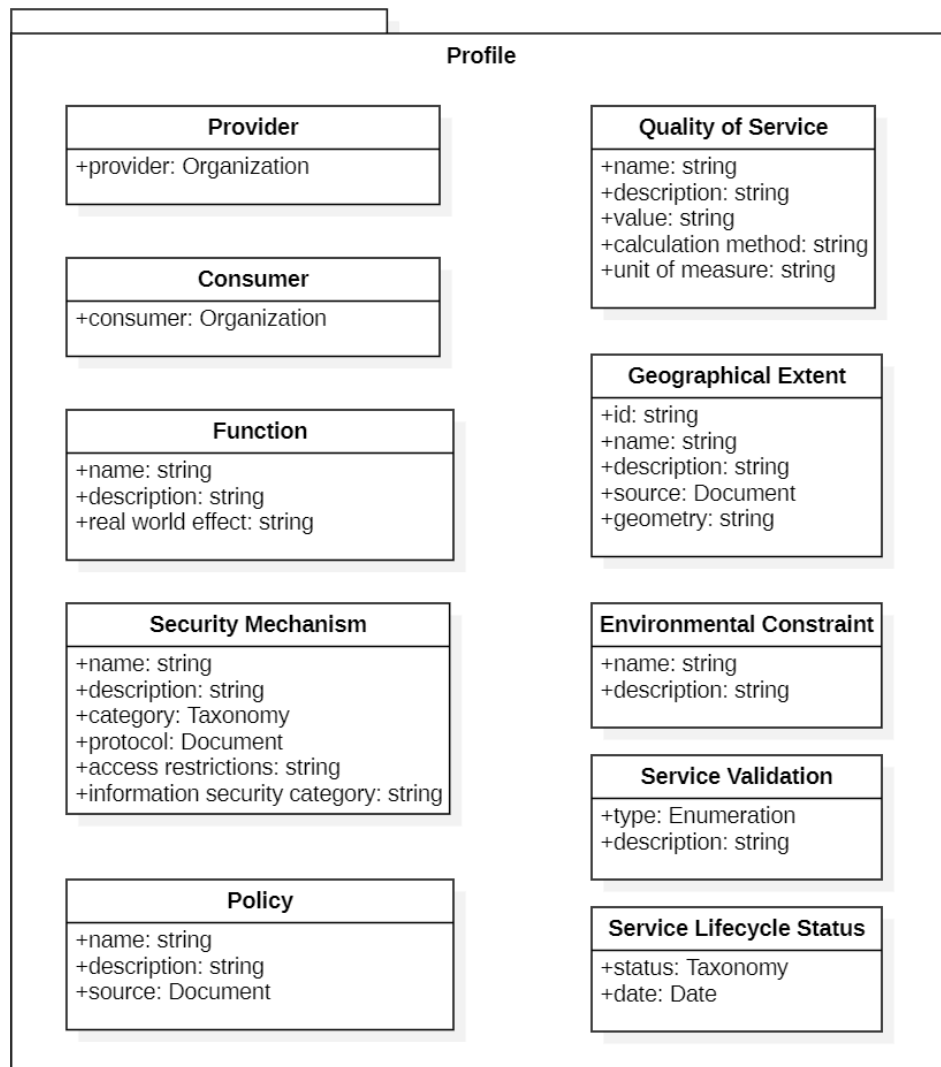


Figure 3 Profile Package

2.2.1 Provider

Definition An organizational entity responsible for making the service available.

Name	Definition	Notes
provider	Service provider organization	The value of the attribute "provider" is an instance of the class Organization .

Example of use

id	http://faa.gov/ato/en-route/esmg
name	FAA En Route Services Modernization Group (ESMG)
point of contact	
name	John D. Doe
function	ATO-X ESGM Manager
phone-number	(609) 444-5555
email	Joe.doe@faa.gov

2.2.2 Consumer

Definition An organizational entity that uses the service.

Notes Consumer information is often unavailable when a service description is developed and therefore is optional. If such information is available and could be helpful to service description users, the Consumer element may be included.

Attribute	Definition	Notes
consumer	Service consumer organization	The value of the attribute "consumer" is an instance of the class Organization .

2.2.3 Function

Definition A type of activity describing the functionality of a service. [\[NAF\]](#)

Notes Every function usually (but not always) can be mapped to an operation defined as a part of the service's interface; i.e., functions provide a "business view" and operations provide a "technical view" of a particular service activity.

Name	Definition	Notes
name	A name given to the function in the context of the service description.	
description	A description of the function.	

real-world-effect	An ultimate purpose associated with the interaction with the service. It may be the response to a request for information or the change in the state of some entities shared between the participants in the interaction. [OASIS-RO]	
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Example of use

name	Update Destination Aerodrome
description	Changing destination aerodrome on a flight plan.
real-world-effect	The destination aerodrome of a filed flight plan has been changed.

2.2.4 Security Mechanism

Definition A process (or a device incorporating such a process) that is used by or within a service to prevent unauthorized or accidental access, change, destruction, or loss of data.

<i>Name</i>	<i>Definition</i>	<i>Notes</i>
name	A name given to the security mechanism in the context of the service description.	
description	A description of the security mechanism.	
category	The type of security mechanism that the service employs.	The value of the attribute "category" is an instance of the class Taxonomy .
protocol	A formal document prescribing rules for secure coordination of interacting components.	The value of the attribute "protocol" is an instance of the class Document .
access-restrictions	Description of access constraints	
information-security-category	Information security category	

Example of use

name	Authentication
------	----------------

description	A security mechanism that enables FPS to validate the identity of a service consumer.
category	
id	http://semantics.aero/service-security-mechanism#authentication
name	Authentication
description	A security mechanism that verifies an identity claimed by or for an entity.
source	http://semantics.aero/ service-security-mechanism
protocol	
id	https://www.w3.org/Protocols/HTTP/1.0/spec.html#BasicAA
title	Hypertext Transfer Protocol -- HTTP
publisher	HTTP Working Group
date-issued	February 19, 1996
version	1.0
source	https://www.w3.org/Protocols/HTTP/1.0/spec.html#BasicAA
access-restrictions	Access restricted to authorized NAS users
information-security-category	INTERMEDIATE

2.2.5 Policy

Definition A statement that defines constraints on the behavior of a managed resource, a user or an organization.

Name	Definition	Notes
name	A name given to a policy in the context of the service description.	
description	A description of the policy.	
source	A document from which the policy is derived or cited.	The value of the 'source' attribute is an instance of the class Document .

Example of use

name	Secure Web Service Policy
description	The FPS complies with NIST Special Publication 800-95, Guide to Secure Web Services

```

source
id          http://csrc.nist.gov/publications/nistpubs/800-95/SP800-95.pdf
title       Guide to Secure Web Services
publisher   National Institute of Standards and Technology
date-issued August 2007
version     800-95
source      http://csrc.nist.gov/publications/nistpubs/800-95/SP800-95.pdf

```

2.2.6 Quality of Service (QoS)

Definition A parameter that specifies and measures the value of the provided service.

<i>Name</i>	<i>Definition</i>	<i>Notes</i>
name	The name of the QoS parameter.	
value	The value or range of values that the QoS parameter is expected to meet or possess.	
description	A description of the QoS parameter.	
calculation-method	A description of how the QoS values are measured or calculated.	
unit-of-measure	The unit of measure in which the QoS values are expressed.	

Example of use

```

name          Response Time
value         3
description   Maximum time required to complete a service request.
calculation-  Measured from the time the service receives the request to the
method        time the service transmits the response.
unit-of-measure Seconds

```

2.2.7 Geographical Extent

Definition A specified geographic area to which the service applies.

Notes A Geographical Extent may be a named place, administrative entity, or location specified by its geographic coordinates.

Name	Definition	Notes
id	A code or a URI that references a label in a specified scheme.	Example: a value derived from the set of codes listed in [ISO 3166-1] for the representation of names of countries.
name	A name given to the geographical extent.	
description	A description of the geographical extent.	
source	A document from which the geographical extent is derived or cited.	
geometry	A set of points in coordinate reference system used to model the geographical extent or shape.	Examples: bounding box, polygon.

Example of use

id	NAM
name	North American Region
description	The area embracing the United States and Canada and north to the North Pole.
geometry	Bounding Box [-178.2,6.6,-49.0,83.3]
source	
id	Doc 8144-AN/874/6
title	Directives to Regional Air Navigation Meetings and Rules of Procedure for their Conduct
publisher	INTERNATIONAL CIVIL AVIATION ORGANIZATION (ICAO)
date issued	10 July 1990
version	6
location	http://icscc.org.cn/upload/file/20200511/20200511090523_57346.pdf

2.2.8 Environmental Constraint

Definition A characteristic of the environment or larger system within which the service operates.

Notes Examples include: capacity of existing enterprise network, firewalls, physical computing resources, etc.

Name	Definition	Notes
name	A name given to the environmental constraint in the context of the service description.	
description	A description of the environmental constraint.	

Example of use

name	Operational Environment
description	The FPS operates within the FAA Telecommunications Infrastructure (FTI) and is subject to its performance constraints.

2.2.9 Service Validation

Definition Validation method used to assess a service

Name	Definition	Notes
type	Type of service validation	See 2.2.9.1 Service Validation Type (Enumeration)
description	The description of the service validation	

2.2.9.1 Service Validation Type (Enumeration)

Value	Description	Notes
independent-validation		
collaborative-validation		

user-validation		
self-validation		

2.2.10 Service Lifecycle Status

Definition The lifecycle status of a service in accordance with relevant governance policies.

Name	Definition	Notes
status	Taxonomy	
date	Effective data of the lifecycle status	

Example of use

status	http://semantics.aero/availability-status#operational
date	2025-10-03

2.3 Model

Definition The part of the Service Description that describes the service interface and its operations, including the contents of requests, message formats, data types, and how to construct an invocation message and interpret a response message.

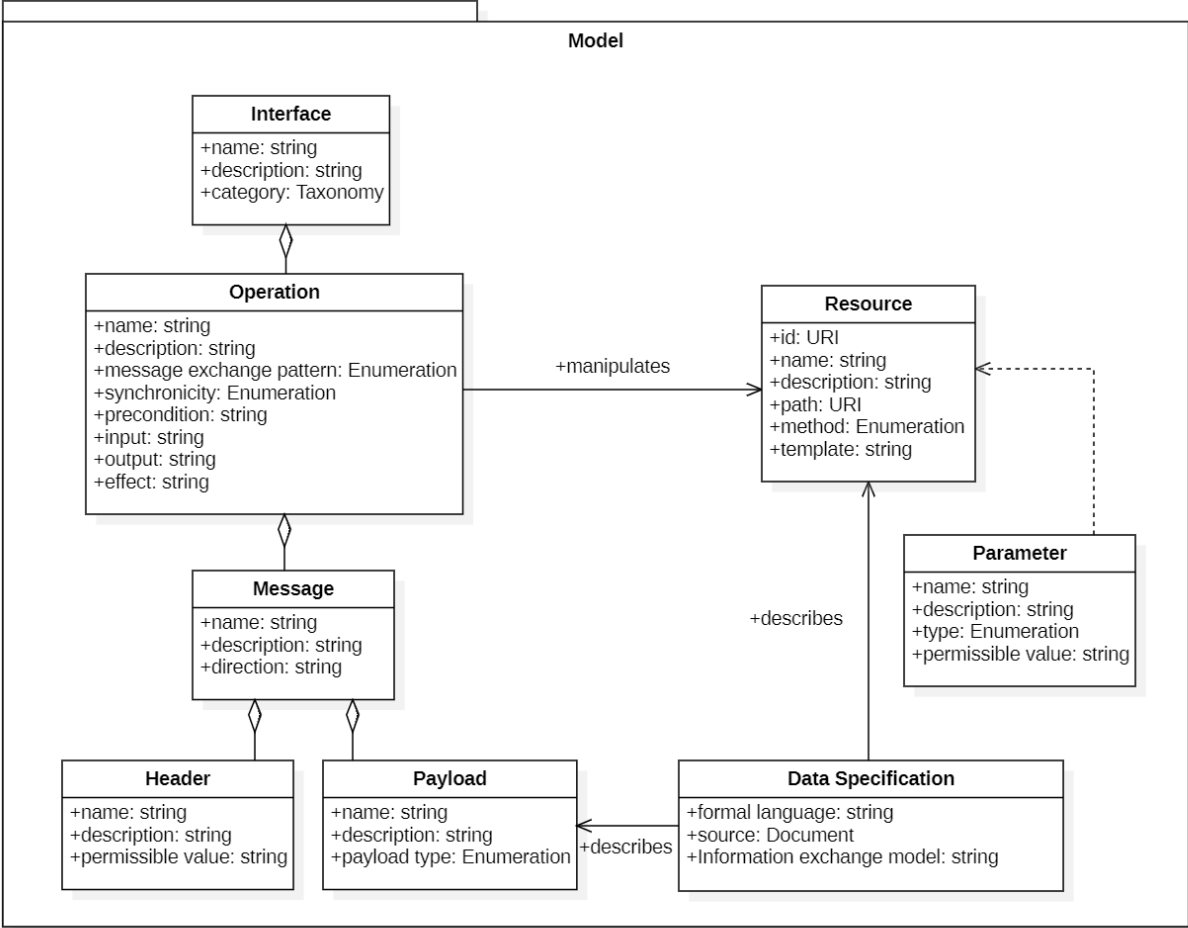


Figure 4 Package Model

2.3.1 Interface

Definition A named set (logical grouping) of operations. [\[WSDL-0\]](#)

Notes The Model part of the service description may include one or more Interfaces.

Name	Definition	Notes
name	The name of the interface.	

description	A description of the interface.	
category	The type of the interface the service deploys.	The value of the attribute "category" is an instance of the class Taxonomy .

Example of use

name	FlightPlanInterface
description	FlightPlanInterface allows a service consumer to file and subsequently modify or cancel a flight plan.
category	Method-Oriented

2.3.2 Operation

Definition A named set of messages related to a single service action. [[WSD-REQ](#)]

<i>Name</i>	<i>Definition</i>	<i>Notes</i>
name	The name of the operation.	
description	A description of the operation.	
synchronicity	A value that indicates whether the operation is synchronous.	See enumeration Synchronicity .
precondition	A description of the state or condition that should be true before the operation can proceed.	
input	The name of the input message that initiates interaction with the operation.	Sometimes known as notification scenarios.
output	The name of the output message produced in response to a service request.	Sometimes known as solicitation scenarios.

effect	A description of the state or condition that exists after the operation is completed, assuming no error has occurred.	
message-exchange-pattern	A value that indicates the pattern of message exchange between interacting components. [WSDL-2]	See enumeration Message Exchange Pattern .

2.3.2.1 Synchronicity (Enumeration)

Value	Description	Notes
synchronous	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. [WS-GLOSS]	
asynchronous	A type of operation whose message exchange pattern allows messages to be sent without precise sequencing, e.g., a flow of sensor event messages which need not be individually acknowledged. [WS-GLOSS]	

2.3.2.2 Message Exchange Pattern (Enumeration)

Value	Description	Notes
in-out	Indicates the operation where input message is sent to the service first and output message (or a fault message) is generated in response. [WSDL-2]	
in-only	Indicates the operation which has only an input message, that is, a message is sent to the service and service does not produce any output message. [WSDL-2]	

<i>Value</i>	<i>Description</i>	<i>Notes</i>
out-in	Indicates the operation where the service generates the output message and in return the input message (or a fault message) is received. [WSDL-2]	
out-only	Indicates the operation which has only an output message, that is, the service generates the output message but does not expect to receive any response message or fault messages. [WSDL-2]	

Example of use

name	UpdateDestinationAerodrome
description	The UpdateDestinationAerodrome operation allows updating the destination aerodrome information within a filed flight plan.
message-exchange-pattern	in-out
synchronicity	synchronous
precondition	Service consumer has been authenticated and authorized to update flight plan information.
input	The referenced flight plan has been filed.
output	Message UpdateDestinationAerodromeRequest containing FlightPlanId and the new destination aerodrome.
effect	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.

2.3.3 Message

Definition A basic unit of communication from one software agent to another sent in a single logical transmission.

<i>Name</i>	<i>Definition</i>	<i>Notes</i>
name	The name of the message.	
description	A description of the message.	
direction	A value that indicates whether the message is the input or the output.	See enumeration Direction .

2.3.3.1 Direction (Enumeration)

Value	Description	Notes
in	Message data is entered into the system.	
out	Message data is transferred out of the system.	

Example of use

name	UpdateDestinationAerodromeResponse
description	Used to inform a service consumer that the original destination aerodrome has been changed.
direction	out

2.3.4 Header

Definition The part of a message that precedes the payload; typically contains message identification and routing information generally consisting of name-value pairs (header fields) that provide information about how the message should be processed or interpreted.

Name	Definition	Notes
name	The name of the header field.	
description	A description of the header field.	
permissible-value	Values permitted for the header field.	A value can either be defined in a specification that the service complies with or be service-specific.

Example of use

name	JMSMessageID
description	The JMSMessageID header field contains a value that uniquely identifies each message sent by a provider.

2.3.5 Payload

Definition The data entity transferred by a message.

Name	Definition	Notes
name	The name given to the data entity that constitutes the payload.	

description	A description of the payload data entity.	
payload-type	A value that indicates the type of the actual (business) data transferred by the message.	For the list of permissible values for attribute “type” see enumeration Payload Type.

2.3.5.1 Payload Type (Enumeration)

Name	Description	Notes
text	The payload contains text, i.e., data is stored as a string.	
stream	The payload contains a stream of primitive values that are written and read sequentially.	
map	The payload contains a set of namevalue pairs, where names are strings, and values are primitives.	
object	The payload contains a serialized object.	
byte	The payload contains an array of primitive bytes.	

Example of use

name	Flight Plan
description	An identifiable collection of data that describes the intended flight or portion of the flight of an aircraft.
type	text

2.3.6 Resource

Definition An information item identified by a URI [[RFC-3986](#)] that a client can interact with through a set of standard methods [[RFC-2068](#)].

Notes See the [enumeration Method](#) for a list of methods that can be used to manipulate the Resource.

Name	Definition	Notes
id	The unique persistent resource identifier presented as an HTTP URI.	

name	A name given to the resource.	
description	A description of the resource.	
path	A relative path to the URI that identifies the resource.	
method	One or more methods allowed by the service for accessing/manipulating a particular resource.	For a list of all methods see the Enumeration Method.
template	A resource URI syntax that includes variables (parameters) that must be substituted before the URI is resolved.	

2.3.6.1 Method (Enumeration)

Value	Definition	Notes
GET	Used to request a representation of the target resource.	
POST	Used to submit an entity to the specified resource, often causing a change in the state of the resource.	
PUT	Used to replace the current resource representation with the request payload.	
DELETE	Used to delete the specified resource.	
PATCH	Used to apply partial modifications to the specified resource.	
CONNECT	Used to establish a tunnel to the server identified by the target resource.	
TRACE	Used to perform a message loop-back test along the path to the target resource.	

Example of use

id	http://ats.example/flights/flight-plans/flight-id
name	FlightID
description	A resource that allows a client to retrieve information about a Flight Plan specified by a Flight ID.
path	flights/flight-plans/flight-id
method	GET, POST
template	flights/flight-plans/{flight-id}

2.3.7 Parameter

Definition A variable included in a request to alter the response.

Name	Definition	Notes
name	The name of the parameter.	
description	A description of the parameter.	
type	A value that indicates the type of the parameter.	See enumeration Parameter Type .
permissible-value	An allowable value of the parameter.	

2.3.7.1 Parameter Type (Enumeration)

Name	Definition	Notes
path	Parameter in the path of a resource.	
query	Parameter in the query appended to the URI of a resource.	
header	Parameter included in the request header.	

Example of use

name	flight-id
description	The parameter that indicates a specific flight that a user wishes to retrieve.
type	query

permissible-value flight-id=UA123

2.3.8 Data Specification

Definition One or more document that defines and describes the meaning, structure, interrelationships, permissible values, and other aspects of a data entity.

Note The Data Specification can be presented in either a machine-readable format (such as programming language) or in natural language. Documents such as XML schemas, Exchange Models, Resource Models, and Resource Representation schemas are examples of machine-readable documents.

Name	Definition	Notes
formal-language	The language in which the document is written.	
source	A document from which the data specification is derived or cited.	The value of the 'source' attribute is an instance of the class Document .
information-exchange-model	Name of the information exchange model that the payload data conforms to	

```
formal-language  JSON
source
id              http://swim-faa-api/fps/1.0.1/fps-api.jms
title           Flight Plan API Representation Schema
description     A JSON schema used for generating responses by FPS API service.
publisher       Federal Aviation Administration
date-issued:    July, 2022
version:        2.0.0
location:       http://nsrr.faa.gov/documents/fps-api.json
information-exchange model FIXM 4.2.0
```

2.4 Grounding

Definition The part of a service description that describes the means by which the service is invoked, including the underlying technology protocols and network locations of the service.

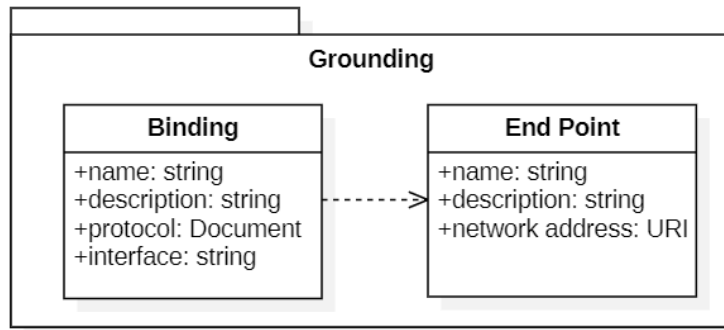


Figure 5 Grounding package

2.4.1 Binding

Definition A named collection of protocols and data formats used in transmitting messages defined by the associated interface.

Name	Definition	Notes
name	The name of the binding.	
description	A description of the binding.	
protocol	A document prescribing formal rules for the coordination of interacting components.	The class Protocol is a subclass of the class Document , and therefore inherits all of its properties.
interface	The name of the interface associated with the given binding.	The value of the attribute 'interface' must be consistent with the Interface defined in section 2.3.1 .

Example of use

name	SOAPoverHTTPBinding
description	The FPS deploys the protocols described here for the binding to the interface "FlightPlanInterface".

```

protocol:          https://datatracker.ietf.org/doc/html/rfc791
  id
  title           RFC 791, Internet Protocol (IP)
  publisher       Information Sciences Institute University of Southern California

  date-issued    September 1981
  version         1.0.0
  source         https://datatracker.ietf.org/doc/html/rfc791
  interface      FlightPlanInterface

```

2.4.2 End Point

Definition An association between a fully-specified binding and a physical point (i.e., a network address) at which the service may be accessed.

<i>Name</i>	<i>Definition</i>	<i>Notes</i>
name	The name of the end point.	
description	A description of the end point.	
network-address	A physical point at which the service may be accessed.	

Example of use

```

name           HTTPExternalFlightPlanEndPoint
description    The FPS End Point.
network-address http://esmg.faa.gov/fps/flight-plan.do

```

2.5 Utility

Definition The part of the Service Description that contains abstract classes for use by other classes.

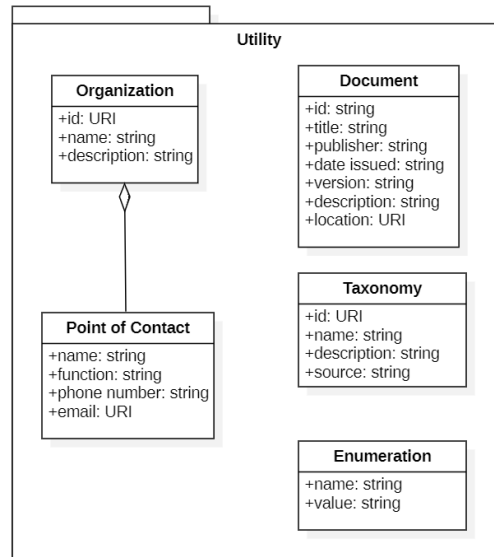


Figure 6 Package Utility

2.5.1 Organization

Definition A unique framework of authority within which a person or persons act, or are designated to act, towards some purpose. Any department, service, or other entity within an organization which needs to be identified for information exchange. [\[ISO-6523\]](#)

Name	Definition	Notes
id	A unique identifier that is used to designate or identify the organization.	
name	The full name (and acronym, if any) of the organization.	
description	A description of the organization.	

2.5.1.1 Point of Contact

Definition A person or group within an organization suitable for making human contact for any purpose.

Notes The organization may have multiple points of contact.

Name	Definition	Notes
name	The name of the point of contact.	
function	A designation of the position or responsibilities of the point of contact.	
phone-number	A telephone number used to communicate orally with the point of contact.	
e-mail	An electronic mail address used to correspond in writing with the point of contact.	Recommended practice is to identify the e-mail by means of an HTTP URI conforming to [RFC- 6068] .

2.5.2 Document

Definition Any medium with information recorded on or in it. [\[ISO-20944\]](#)

Notes Class Document defines a collection of metadata elements necessary for describing a document. However, in some cases, a hyperlink to the document can be used instead of a full description.

Name	Definition	Notes
id	The unique persistent identifier assigned to the document.	Recommended practice is to identify the service by means of an HTTP URI conforming to [RFC-3986] .
title	The name by which the document is formally known. [DCMI]	
publisher	The entity responsible for making the document available. [DCMI]	
date-issued	The date of formal issuance (e.g., publication) of the document. [DCMI]	
version	The current version or revision level of the document.	
description	A description of the document.	
location	The network address where a copy of the document can be obtained.	

2.5.3 Taxonomy

Definition A controlled list of well-defined concepts organized into a hierarchical structure.

Notes A taxonomy is a stand-alone document that is referenced by the model and is developed and maintained outside of it.

Name	Definition	Notes
id	A unique identifier that references a node within a taxonomy.	
name	The name of the taxonomy.	
description	A description of the taxonomy.	
source	The Web location where a copy of the taxonomy can be obtained.	

2.5.4 Enumeration

Definition A listing of possible values for an attribute.

Notes Enumerations (unlike taxonomies) are defined within a model or its extensions.

Name	Definition	Notes
name	The name of the enumeration.	
value	One of the enumeration's listed values.	

3 References

- [DCMI] DCMI Glossary, Dublin Core Metadata Initiative, User Guide Committee, 23 April 2004.
<http://dublincore.org/documents/usageguide/glossary.shtml>
- [ISO-3166] ISO 3166-1:2020, Codes for the representation of names of countries and their subdivisions — Part 1: Country code, August 2020.
<https://www.iso.org/iso-3166-country-codes.html>
- [ISO-20944] ISO/IEC CD 20944-002, Information Technology – Metadata Interoperability and Bindings (MDIB) – Part 002, Common Vocabulary, 12 April 2004.
<http://jtc1sc32.org/doc/N1101-1150/32N1105T-CD20944-002.pdf>
- [ISO-6523] ISO/IEC 6523-1, Structure for the Identification of Organizations and Organization Parts, 1998.
http://www.iso.org/iso/catalogue_detail?csnumber=25773
- [NAF] NATO Architecture Description Framework, Version 3.0.
<https://nhqc3s.hq.nato.int/>
- [OASIS-RO] OASIS Reference Ontology for Semantic Service Oriented Architectures, Public Review 1, 5 November 2008. http://www.oasis-open.org/apps/group_public/download.php/29909/Reference_Ontology_for_Semantic_Service_Oriented_Architectures_Public_Review_1.doc
- [OGC-STD] OGC Web Services Common Standard, Version 2.0.0, Open Geospatial Consortium Inc., 7 April 2010.
<http://www.opengeospatial.org/standards/common>
- [OMG-UML] OMG Unified Modeling Language TM (OMG UML), Infrastructure, Version 2.4.1, August 2011. <http://www.omg.org/spec/UML/2.4.1/Infrastructure/PDF>
- [OPENAPI] OpenAPI Specification, Version 3.1.0, OpenAPI Initiative, 15 February 2021.
<https://spec.openapis.org/oas/v3.1.0>
- [OWL-S] OWL-S: Semantic Markup for Web Services, W3C Member Submission 22 November 2004.
<http://www.w3.org/Submission/OWL-S/>
- [RFC-2068] RFC 2068, Hypertext Transfer Protocol - HTTP/1.1, Network Working Group, January 1997. <https://datatracker.ietf.org/doc/html/rfc2068.html>
- [RFC-3986] RFC 3986, Uniform Resource Identifier (URI): Generic Syntax, Network Working Group, January 2005.
<http://www.rfc-editor.org/rfc/rfc3986.txt>
- [RFC-6068] RFC-6068, The 'mailto' URI Scheme; Internet Engineering Task Force (IETF); October 2010

- [SOA-RM] OASIS Reference Model for SOA 1.0, 12 October 2006. <http://docs.oasis-open.org/soa-rm/v1.0/soa-rm.pdf>
- [SDCM-2] Service Description Conceptual Model Version 2.0, 3 June 2016. <https://discovery.swim.aero/sdcm/2.0.0/sdcm-2.0.0.html>
- [SDS] SWIM Discovery Service Implementation and Related Artifacts, May 2022. <https://discovery.swim.aero/>
- [STD-065] FAA-STD-065B, Preparation of Web Service Description Documents, 15 July 2019. https://www.faa.gov/air_traffic/technology/swim/governance/standards/
- [STD-074] FAA-STD-074, Preparation of Service Requirements Documents, 20 July 2020. https://www.faa.gov/air_traffic/technology/swim/governance/standards/
- [STD-073] FAA-STD-073A, Preparation of Java Messaging Service Description Documents, 9 December 2019. https://www.faa.gov/air_traffic/technology/swim/governance/standards/
- [SWIM-005] SWIM-005, Artifacts Versioning for SWIM-enabled Services, Software Specification, Version 1.0.0; FAA, SWIM December 18, 2015 https://www.faa.gov/sites/faa.gov/files/air_traffic/technology/swim/governance/SWIM%20Service%20Versioning%20Spec.pdf
- [SWIM-Manual] ICAO, Manual on the System-Wide Information Management (SWIM) Implementation (Doc 10203)
- [WSDL] Web Services Description Language (WSDL) Version 2.0 Part 1: Core Language, W3C Recommendation, 26 June 2007. <http://www.w3.org/TR/wsdl20/>
- [WSDL-0] Web Services Description Language (WSDL) Version 2.0 Part 0: Primer, W3C Recommendation, 26 June 2007. <http://www.w3.org/TR/wsdl20-primer/>
- [WSDL-2] Web Services Description Language (WSDL) Version 2.0 Part 2: Message Exchange Patterns, W3C Working Draft 26 March 2004. <http://www.w3.org/TR/2004/WD-wsdl20-patterns-20040326/>
- [WSDOM] Web Service Description Ontological Model (WSDOM), latest version. https://www.faa.gov/air_traffic/technology/swim/governance/service_semantics/
- [WSD-REQ] Web Services Description Requirements, W3C Working Draft, 28 October 2002. <http://www.w3.org/TR/2002/WD-ws-desc-reqs-20021028/>
- [WS-GLOSS] Web Services Glossary, W3C Working Draft, 14 November 2002. <http://www.w3.org/TR/2002/WD-ws-gloss-20021114/>