

**Draft Recommendation for
Space Data System Practices**

**CROSS SUPPORT
SERVICE MANAGEMENT—
COMMON DATA ENTITIES**

DRAFT RECOMMENDED PRACTICE

CCSDS 902.12-R-1

RED BOOK
August 2019

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FOREWORD

Through the process of normal evolution, it is expected that expansion, deletion, or modification of this document may occur. This Recommended Standard is therefore subject to CCSDS document management and change control procedures, which are defined in the *Organization and Processes for the Consultative Committee for Space Data Systems* (CCSDS A02.1-Y-4). Current versions of CCSDS documents are maintained at the CCSDS Web site:

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PREFACE

This document is a draft CCSDS Recommended Practice. Its ‘Red Book’ status indicates that the CCSDS believes the document to be technically mature and has released it for formal review by appropriate technical organizations. As such, its technical contents are not stable, and several iterations of it may occur in response to comments received during the review process.

Implementers are cautioned **not** to fabricate any final equipment in accordance with this document’s technical content.

DOCUMENT CONTROL

Document	Title	Date	Status
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1 INTRODUCTION

1.1 PURPOSE AND SCOPE

1.1.1 PURPOSE

The purpose of this Magenta Book is to specify the various data entities defined in the scope of service management that are applicable to more than one Service Management Blue Book. These data entities are referred to as ‘Common’ data entities.

1.1.2 SCOPE

The scope of this book is all of the Service Management Common Data Entities used in the various Service Management Recommended Standards and Practices.

Figure 1-1 puts the Service Management Common Data Entities into context with the various standards that together form the Space Communication Cross Support Service Management.

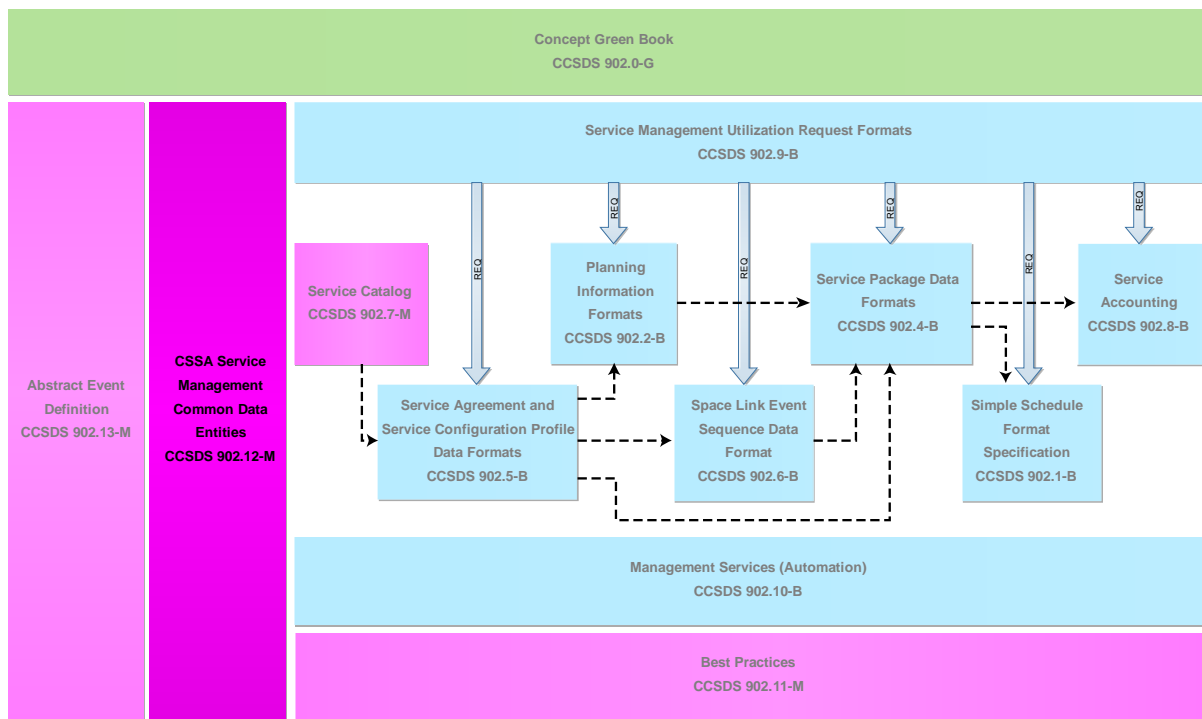


Figure 1-1: Service Management Common Data Entities in the Context of Space Communication Cross Support Service Management

1.2 APPLICABILITY

These common data entities are defined in the context of service management and thus are implicitly applicable to the various Service Management Recommended Standards and Practices.

1.3 RATIONALE

The rationale for this document is that there is some overlap between the various Service Management Recommended Standards and Practices in terms of commonality of data structures. This document is used to record these common data entities.

1.4 DOCUMENT STRUCTURE

This document is organized as follows:

- a) Section 1 provides the purpose, scope, applicability, and rationale of this Recommended Practice and identifies the conventions and references used throughout the document. This section also describes how this document is organized. A brief description is provided for each section and annex so that the reader will have an idea of where information can be found in the document. It also identifies terminology that is used in this document but is defined elsewhere.
- b) Section 2 provides a brief overview of the common data entities.
- c) Section 3 provides details about the common data entities.
- d) Annex A discusses security, Space Assigned Numbers Authority (SANA), and patent considerations.
- e) Annex B provides an informative listing of the XML schema for the service management information entity header.
- f) Annex C is a list of informative references.
- g) Annex D contains a list of abbreviations and acronyms applicable to the Service Management Common Data Entities.

1.5 DEFINITIONS

For the purposes of this document, the following definition applies:

agency: A satellite operator or satellite service provider.

1.6 NOMENCLATURE

1.6.1 NORMATIVE TEXT

The following conventions apply for the normative specifications in this Recommended Practice:

- a) the words ‘shall’ and ‘must’ imply a binding and verifiable specification;
- b) the word ‘should’ implies an optional, but desirable, specification;
- c) the word ‘may’ implies an optional specification;
- d) the words ‘is’, ‘are’, and ‘will’ imply statements of fact.

NOTE – These conventions do not imply constraints on diction in text that is clearly informative in nature.

1.6.2 INFORMATIVE TEXT

In the normative sections of this document, informative text is offset from the normative specifications either in notes or under one of the following subsection headings:

- Overview;
- Background;
- Rationale;
- Discussion.

1.7 CONVENTIONS—THE UNIFIED MODELING LANGUAGE

The Unified Modelling Language (UML) diagrams used in the specification (including class diagrams, package diagrams, sequence diagrams, and activity diagrams) follow the notation, semantics, and conventions imposed by the Version 2.4.1 UML specification of the Object Management Group (OMG) (reference [2]).

1.8 REFERENCES

The following publications are referenced in this document. At the time of publication, the editions indicated were valid. All publications are subject to revision, and users of this document are encouraged to investigate the possibility of applying the most recent editions of the publications indicated below. The CCSDS Secretariat maintains a register of currently valid CCSDS publications.

- [1] *Time Code Formats*. Issue 4. Recommendation for Space Data System Standards (Blue Book), CCSDS 301.0-B-4. Washington, D.C.: CCSDS, November 2010.

- [2] *Unified Modeling Language (UML)*. Version 2.4.1. Needham, Massachusetts: Object Management Group, August 2011.
- [3] *CCSDS SANA Registry Management Policy*. Issue 1. CCSDS Record (Yellow Book), CCSDS 313.1-Y-1. Washington, D.C.: CCSDS, May 2016.
- [4] *CCSDS Space Assigned Numbers Authority (SANA)--Role, Responsibilities, Policies, and Procedures*. Issue 2. CCSDS Record (Yellow Book), CCSDS 313.0-Y-2. Washington, D.C.: CCSDS, May 2016.
- [5] *Extensible Space Communication Cross Support—Service Management—Concept*. Issue 1. Report Concerning Space Data System Standards (Green Book), CCSDS 902.0-G-1. Washington, D.C.: CCSDS, September 2014.
- [6] *Abstract Event Definition*. Issue 0. Proposed Draft Recommendation for Space Data System Practices (Proposed Red Book), CCSDS 902.13-R-0. Washington, D.C.: CCSDS, June 2019.
- [7] “Planet and Satellite Names and Discoverers.” Gazetteer of Planetary Nomenclature. <https://planetarynames.wr.usgs.gov/Page/Planets>.
- [8] “Minor Planet Names: Alphabetical List.” Minor Planet Center. <https://minorplanetcenter.net/iau/lists/MPNames.html>.
- [9] B. A. Archinal, et al. “Report of the IAU Working Group on Cartographic Coordinates and Rotational Elements: 2015.” *Celestial Mechanics and Dynamical Astronomy* 130, no. 22 (March 2018).
- [10] “Functional Resources.” Space Assigned Numbers Authority. http://sanaregistry.org/r/functional_resources/.

2 OVERVIEW

2.1 GENERAL

This section provides a high-level overview of the common data entities defined within the scope of service management.

2.2 DATA ENTITIES

Within the scope of service management, data entities are defined as XML constructs. Thus the data entities are defined in XML Schema files.

Data is either mandatory, in which case, suitable values must be present, or optional, in which case, values may be present or not. In addition, it is possible to extend the contents of the data entities by defining additional parameters. The content of any additional parameters so defined is outside the scope of this document and should be documented in an ICD agreed upon by the involved parties.

2.3 MAPPING TO W3C XML SCHEMA

This Recommended Practice includes the specification of a mapping to World Wide Web Consortium (W3C) eXtensible Markup Language (XML) schema. The normative mapping of this Recommended Practice to W3C XML schemas is a virtual annex to this Recommended Practice and is contained in a stand-alone set of schema files.

NOTE – The XML schema has been elaborated on the basis of the mapping guidelines described in reference [C1].

3 SERVICE MANAGEMENT COMMON DATA ENTITIES

3.1 SERVICE MANAGEMENT INFORMATION ENTITY CONTENT/STRUCTURE

3.1.1 OVERVIEW

The Service Management Information Entity forms the basis for defining information entities required by service management. Figure 3-1 shows the UML Class diagram for the Service Management Information Entity. For clarity, abstract classes are highlighted in green.

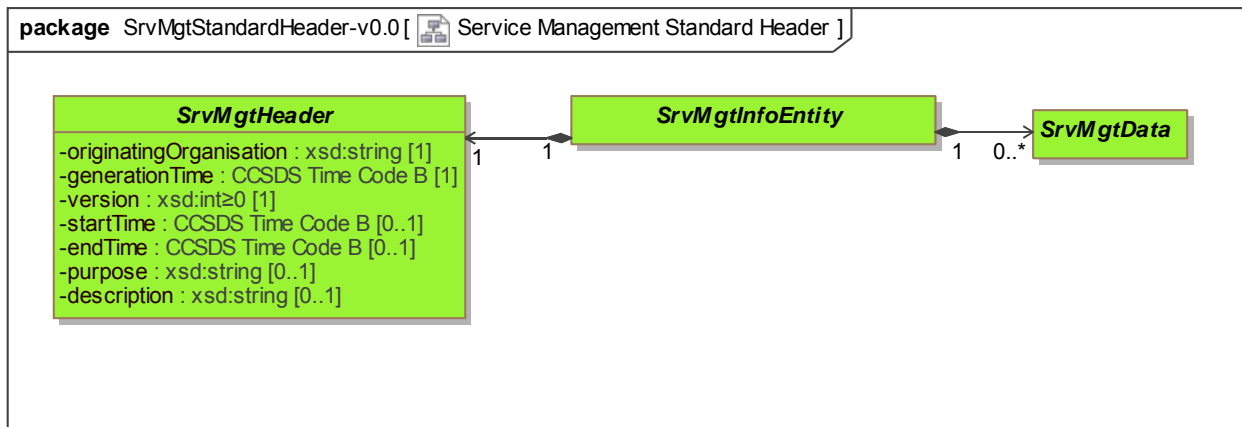


Figure 3-1: Service Management Information Entity Class Diagram

The attributes of each class are described further in the following subsections and tables.

3.1.2 CLASS SrvMgtInfoEntity (ABSTRACT)

3.1.2.1 The SrvMgtInfoEntity is an abstract class that is used to instantiate the various classes of information entity required by service management.

3.1.2.2 The SrvMgtInfoEntity class contains no parameters.

3.1.3 CLASS SrvMgtHeader (ABSTRACT)

3.1.3.1 SrvMgtHeader is an abstract class that is used to instantiate the header required by service management.

3.1.3.2 The SrvMgtHeader class parameters specified in table 3-1 shall be used to identify the originating organization, status of the schedule, status, version, time at which the information entity was generated, start time to which the information entity applies, and end time to which it applies. Optional parameters allow for further definition of the purpose of the message and a description of its contents.

Table 3-1: Class SrvMgtHeader Parameters

Parameter	Description	Data Type	Data Units
originatingOrganization	The organization that generated the information entity.	xsd:string Permitted values are registered in SANA (see [3] for further information).	n/a
generationTime	Time at which the information entity was generated.	CCSDS ASCII Time Code B (reference [1])	UTC
version	The version of the information entity. This increments every time an information entity of the same concrete type, status, and time range is generated (i.e., has the same <code>startTime</code> and <code>endTime</code>). NOTE – The version may increment by 1 every time but is not constrained to do so. The only constraint is that each version number is greater than the previous.	xsd:positiveInteger	n/a
startTime	Optional parameter: The start time to which the information entity applies. NOTE – For certain Service Management Information Entity types, use of this parameter is mandatory.	CCSDS ASCII Time Code B (reference [1])	UTC
endTime	Optional parameter: The end time to which the information entity applies. NOTE – For certain Service Management Information Entity types, use of this parameter is mandatory.	CCSDS ASCII Time Code B (reference [1])	UTC
purpose	Optional parameter: May be used to specify the purpose of the information entity.	xsd:string Exact use of this may be specified in other Service Management Recommended Standards and Practices in which the <code>SrvMgtHeader</code> class is used or in an ICD between relevant parties.	n/a
description	Optional parameter: May be used to describe the contents of the information entity, for example, any filter criteria used in the generation of the information entity.	xsd:string Exact use of this may be specified in an ICD between relevant parties.	n/a

3.1.4 CLASS SrvMgtData (ABSTRACT)

3.1.4.1 SrvMgtData is an abstract class that is used to instantiate the various classes of data required by service management.

3.1.4.2 The SrvMgtData class contains no parameters.

3.2 SrvMgtAbstractEvent AND SrvMgtEventTime CONTENT/STRUCTURE

3.2.1 OVERVIEW

The SrvMgtAbstractEvent and SrvMgtEventTime define the event and associated time classes required for the definition of events in Service management. The SrvMgtAbstractEvent is derived from the AbstractEvent class and the SrvMgtEventTime is derived from the AbstractEventTime class (see reference [6]).

Figure 3-2 shows the UML Class diagram for the SrvMgtAbstractEvent and SrvMgtEventTime classes. It should be noted that, for clarity, abstract classes are highlighted in green. These classes are used to instantiate events needed in the context of Service Management. They are specializations of the AbstractEvent and AbstractEventTime classes described in reference [6].

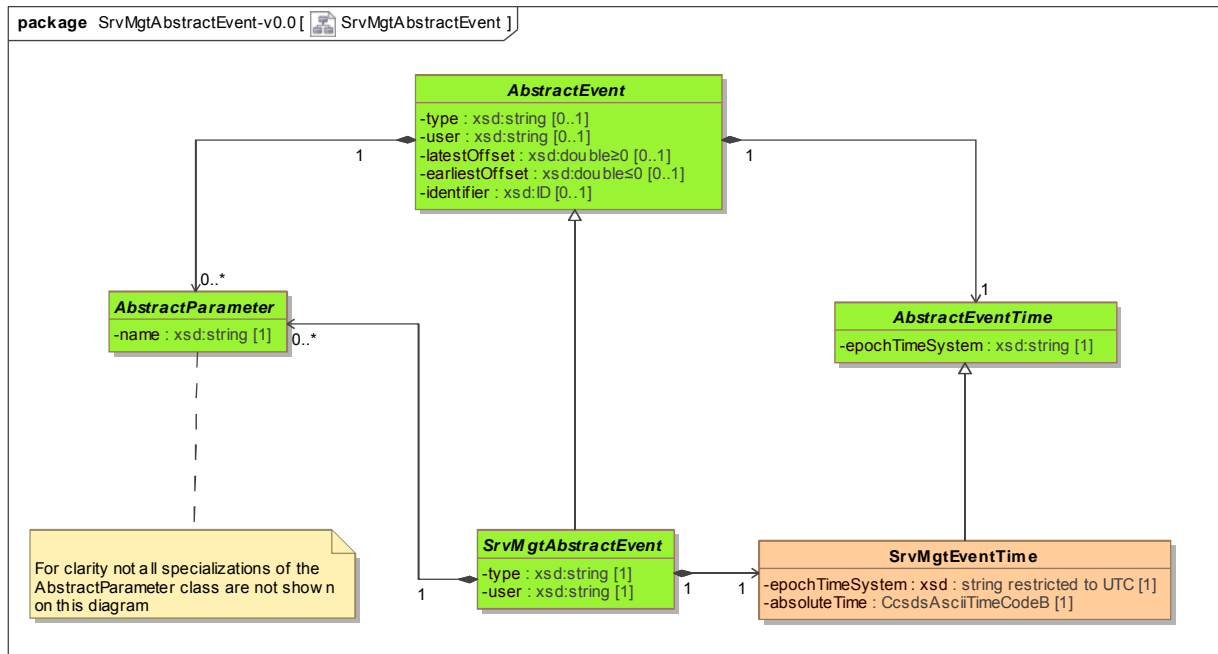


Figure 3-2: SrvMgtAbstractEvent Class Diagram

The attributes of each class are described further in the following subsections and tables.

3.2.2 CLASS SrvMgtAbstractEvent (ABSTRACT)

3.2.2.1 The SrvMgtAbstractEvent class is an abstract class that is used to instantiate the various events that are required in service management.

NOTE – The SrvMgtAbstractEvent class is a specialization of class AbstractEvent described in reference [6]) and the generic description of the parameters is given in that document.

3.2.2.2 In the context of the SrvMgtAbstractEvent class, the usage of the AbstractEvent parameters in table 3-2 (as described in reference [6]) should be noted.

Table 3-2: Class SrvMgtAbstractEvent Use of Class AbstractEvent Parameters

Parameter	Description	Data Type	Data Units
type	In the context of the SrvMgtAbstractEvent, this parameter is mandatory and is used to specify the type of the event. The various types of event that can be contained in a planning information are discussed in reference [5], subsection 5.3.	xsd:string – permitted values – COMMS Predicted communications geometry events (see reference [5], subsection 5.6) – DATARATE Sustainable data rates & volume estimate events (see reference [5], subsection 5.7); – RFI Predicted radio frequency interference events (see reference [5], subsection 5.8); – CONFLICTS Predicted resource conflict events (see reference [5], subsection 5.9) – COSTS Cost estimates (see reference [5], subsection 5.10) – OTHER Any event type not covered by the above list.	n/a
user	In the context of the SrvMgtAbstractEvent, this parameter is mandatory and is used to specify the user to which the event is relevant. These will typically be spacecraft names as specified in SANA.	Xsd:string—Permitted values registered in SANA	n/a

3.2.3 CLASS SrvMgtEventTime

3.2.3.1 The SrvMgtEventTime class is used to specify the time at which an event occurs in the context of service management.

NOTE – The SrvMgtEventTime class is a specialization of class AbstractEventTime described in reference [6], and the generic description of the parameters is given in that document.

3.2.3.2 In the context of the SrvMgtEventTime class, the usage of the following AbstractEventTime parameters in table 3-3 (as described in reference [6]) should be noted.

Table 3-3: Class SrvMgtEventTime Use of Class AbstractEventTime Parameters

Parameter	Description	Data Type	Data Units
epochTimeSystem	This is used to specify the Epoch Time System to which the time is relative.	xsd:string In the context of the SrvMgtEventTime, the permitted values are restricted to – UTC	n/a
absoluteTime	The absolute time at which the event occurs.	CCSDS ASCII Time Code B (reference [1])	UTC

3.3 SERVICE MANAGEMENT COMMON CLASSES—Aperture Location

3.3.1 OVERVIEW

The ApertureLocation class is one of the data entities that compose Service Management Common Classes that are used in various parts of data management.

Figure 3-3 shows the UML Class diagram for the Service Management ApertureLocation Class.

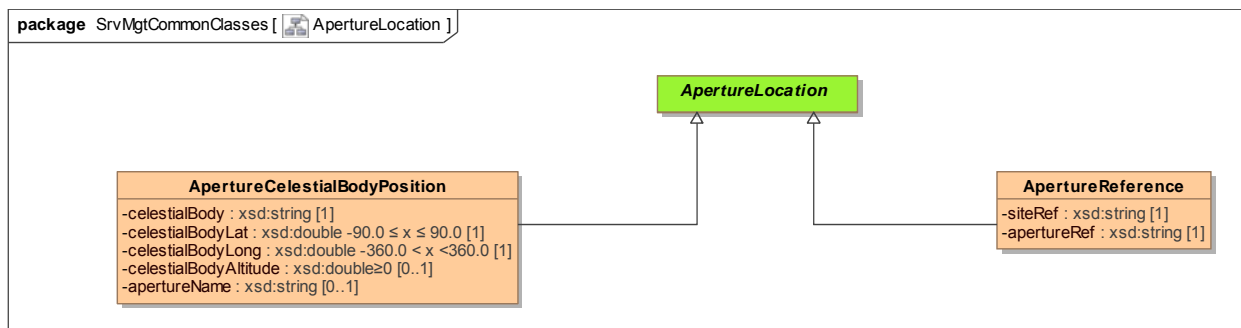


Figure 3-3: Service Management ApertureLocation Class Diagram

3.3.2 CLASS ApertureLocation (ABSTRACT)

3.3.2.1 ApertureLocation is an abstract class that is used to instantiate the various classes of aperture location required by service management.

3.3.2.2 The ApertureLocation class contains no parameters.

3.3.3 CLASS ApertureReference

3.3.3.1 The ApertureReference class allows the specification of the location of an aperture by the site name where it is located and the name of the aperture.

NOTE – The ApertureReference class is a specialization of class ApertureLocation described in 3.3.2.

3.3.3.2 The parameters of the ApertureReference class are specified in table 3-4.

Table 3-4: Class ApertureReference Parameters

Parameter	Description	Data Type	Data Units
apertureRef	Identifier of the aperture (ground or spacecraft) to which the event refers.	xsd:string Permitted values are registered in SANA (see A2.4 for further information).	n/a
siteRef	Name of the site (ground or spacecraft) to which the event refers.	xsd:string Permitted values are registered in SANA (see A2.4 for further information).	n/a

3.3.4 CLASS ApertureCelestialBodyPosition

3.3.4.1 The ApertureCelestialBodyPosition class allows the specification of an arbitrary location on a celestial body by means of latitude and longitude. The conventions adopted for the specification of the latitude and longitude on a particular celestial body shall be as specified in reference [9].

NOTE – The ApertureCelestialBodyPosition class is a specialization of class ApertureLocation described in 3.3.2.

3.3.4.2 The parameters of the ApertureCelestialBodyPosition class are specified in table 3-5.

Table 3-5: Class ApertureCelestialBodyPosition Parameters

Parameter	Description	Data Type	Data Units
celestialBody	Celestial body on which the location is being specified.	xsd:string – Permitted values are as follows: – Planet and Satellite Names – as specified in reference [7] – Minor Planet Names – as specified in reference [8]	n/a
celestialBodyLat	The latitude on the celestial body.	xsd:double $-90.0 \leq x \leq 90.0$ The conventions adopted for the specification of the latitude on a particular celestial body shall be as specified in reference [9].	Degrees
celestialBodylong	The longitude on the celestial body.	xsd:double $-360.0 < x < 360.0$ The conventions adopted for the specification of the longitude on a particular celestial body shall be as specified in reference [9].	Degrees
celestialBodyAltitude	Optional Parameter. The altitude of the aperture above the center of the celestial body.	xsd:double $x \geq 0$	Meters
apertureName	Optional Parameter. This is used to specify the name of the aperture.	xsd:string	n/a

3.3.4.3 Some provider CSSSs make the approximation that an aperture is located at the center of a celestial body when calculating occultations. The ApertureCelestialBodyPosition class can also be used to specify the position of an aperture as though it was located at the center of a celestial body.¹ To do this, the following values must be specified for the following parameters of the ApertureCelestialBodyPosition class;

- celestialBodyLat 0.0
- celestialBodylong 0.0
- celestialBodyAltitude 0.0
- apertureName "" (i.e., an empty string)

¹ This is obviously only an approximation; however, it is one that some Provider CSSSs make when calculating occultations from distant celestial bodies. For example, when calculating the times at which the occultations of a spacecraft orbiting Mars starts and ends as seen from Earth, if a Provider CSSS used the center of the Earth as the reference for its calculation, it would obtain the same occlusion start and end times for all Earth-based apertures. In this case, the ApertureCelestialBodyPosition class would have the following parameters:

- celestialBody "Earth"
- celestialBodyLat 0.0
- celestialBodylong 0.0
- celestialBodyAltitude 0.0
- apertureName ""

3.4 SERVICE MANAGEMENT COMMON CLASSES—PlanningInfoTypeList LIST

3.4.1 OVERVIEW

The PlanningInfoTypeList class is one of the data entities that compose Service Management Common Classes that are used in various parts of data management.

Figure 3-4 shows the UML Class diagram for the Service Management PlanningInfoTypeList Class.

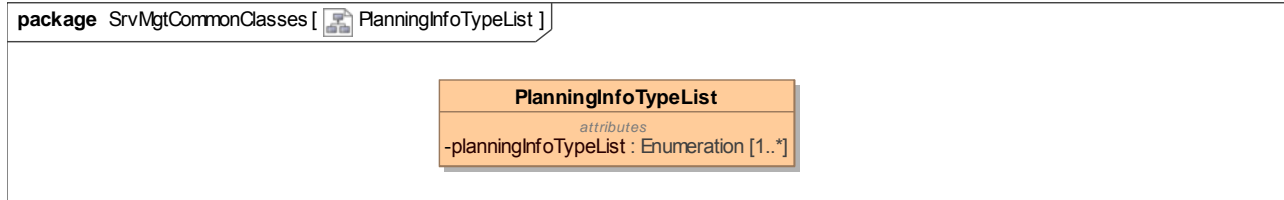


Figure 3-4: Service Management PlanningInfoTypeList Class Diagram

3.4.2 CLASS PlanningInfoTypeList

3.4.2.1 The PlanningInfoTypeList class allows the specification of a list of Planning Info Types.

3.4.2.2 The parameters of the PlanningInfoTypeList class are specified in table 3-6.

Table 3-6: Class PlanningInfoTypeList Parameters

Parameter	Description	Data Type	Data Units
planningInfoTypeList	This specifies the type of data that is contained in the planning information. The various types of data that can be contained in a planning information are discussed in reference [5], subsection 5.3. Planning information may contain 1 or more of these different planning types.	Array of Enumerations – COMMS Predicted communications geometry events – DATARATE Sustainable data rates & volume estimate – RFI Predicted radio frequency interference events CONFLICTS Predicted resource conflict events – COSTS Cost estimates – OTHER Any event type not covered by the above list	n/a

3.5 SERVICE MANAGEMENT COMMON CLASSES—ModResParm

3.5.1 OVERVIEW

The ModResParm (short for Modified Resource Parameter) class is one of the data entities that make up the Service Management Common Classes that are used in various parts of data management.

Figure 3-5 shows the UML Class diagram for the Service Management ModResParm Class.

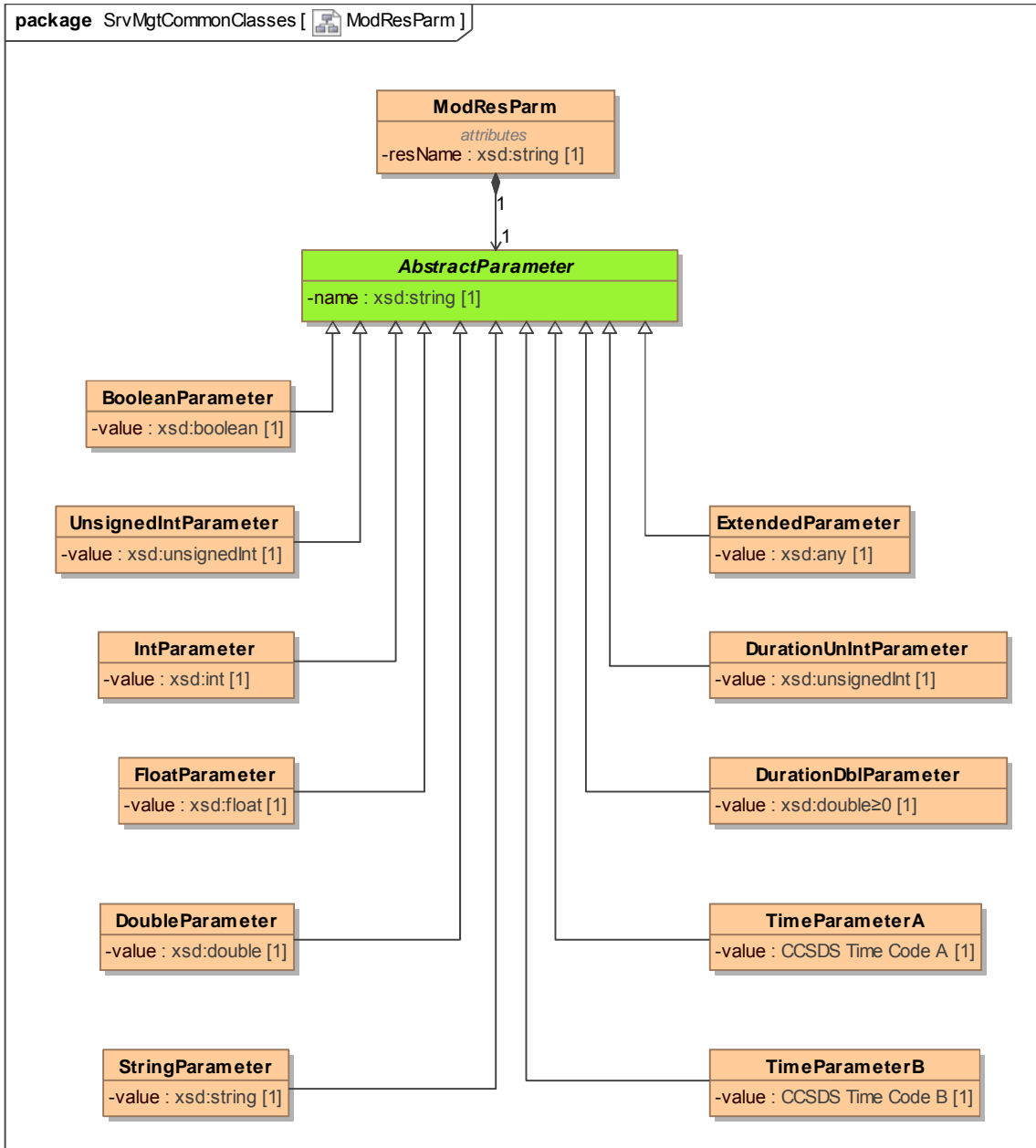


Figure 3-5: Service Management ModResParm Class Diagram
CLASS MODRESPARM

3.5.1.1 The ModResParm class allows a value to be assigned to a resource parameter. The resource to which the value is to be assigned is specified by the resName parameter, and the parameter of the Resource that is to be modified is specified by the name parameter in classes derived from the AbstractParameter class.

3.5.1.2 Each instance of the ModResParm class must contain one and only one instance of a parameter class derived from the abstract AbstractParameter class described in reference [6].

3.5.1.3 The parameters of the ModResParm class are specified in table 3-7.

Table 3-7: Class ModResParm Parameters

Parameter	Description	Data Type	Data Units
resName	The name of the resource for which the modified parameter value is to be specified.	xsd:string	n/a

3.5.1.4 In the event that the ModResParm class is used to specify modified values of Functional Resources (see reference [10]), the following should be noted:

- The resName parameter of the ModResParm must contain the fRNickname of the function resource that is to be modified.
- The name parameter of AbstractParameter class is used to specify the name of the parameter of the functional resource for which the parameter value is to be modified.

ANNEX A

SECURITY, SANA, AND PATENT CONSIDERATIONS

(INFORMATIVE)

A1 SECURITY CONSIDERATIONS

Security considerations are not applicable, as these are addressed in the Recommended Standards and Practices that reference the data structures contained in this document.

A2 SANA CONSIDERATIONS

A2.1 GENERAL

The recommendations of this document rely on the SANA registries described below. New assignments in these registries, in conformance with the policies identified, will be available at the SANA registry Web site: <http://sanaregistry.org>. Therefore the reader shall look at the SANA Web site for all the assignments contained in these registries.

A2.2 REGISTRY FOR `originatingOrganization`

The values for `originatingOrganization` (see table 3-1) are those listed in the ‘Name’ field of the CCSDS Organizations registry. The CCSDS Organization’s registry is located at:

<http://sanaregistry.org/r/organizations/>

The CCSDS Organizations registry also lists roles that organizations fulfill. The following roles are relevant to Service Management:

- ‘SchedulePublisher’ This role is assigned to organizations that publish schedules.
- ‘Provider CSSS’ This role is assigned to organizations that provide planning info, service packages and suchlike (i.e., the responses to requests).
- ‘User CSSS’ This role is assigned to organizations that submit requests to Provider CSSSes.

Organizations may be assigned any combination of the above and additional roles.

The policy that governs updates to the Organizational Roles registry is that defined in subsection 3.3.2.3 of reference [3].

A2.3 REGISTRY FOR user

The values for the `user` parameter (see table 3-2) are those listed in the Spacecraft Abbreviation field of the CCSDS Spacecraft Identifiers registry. The Spacecraft Identifiers registry is located at:

<http://sanaregistry.org/r/spacecraft/>

The policy that governs updates to this registry is that defined in subsection 3.3.2.1 of reference [3].

A2.4 REGISTRY FOR SITEREF AND APERTUREREF

The values for the `siteRef` parameter (see table 3-4) of this Recommended Practice are those of the Site Name Abbreviation field of the Service Sites and Apertures registry. The Service Sites and Apertures registry is located at:²

http://sanaregistry.org/r/service_sites_apertures/

Although the registry allows for Site Name records with no Aperture Name field records, for effective use with this Recommended Practice, any referenced Site Name needs to contain at least one Aperture Name field. It may contain as many fields as needed to list as many apertures found at one site as needed. The Aperture Name and Aperture Name Abbreviations are unique with respect to any other Aperture Name or Aperture Name Abbreviations for the particular Site Name.

The values for the `apertureRef` parameter (see table 3-4) of this Recommended Practice are those of the Aperture Name Abbreviation field.

The policy that governs updates to this registry is that defined in subsection 3.3.2.4 of reference [3].

A2.5 USE OF UNREGISTERED VALUES

Only values that have been registered should be used for the `originatingOrganization` and `user` parameters. Unregistered values for the `originatingOrganization` and `user` parameters may be used. If unregistered values are used, they should be prefixed with the string ‘UNR::’.

NOTES

- 1 ‘UNR::’ indicates an unregistered value.
- 2 This helps eliminate potential confusion in a multi-agency cross support context.
- 3 Use of unregistered values is not recommended and should be avoided if possible.

² The URL for this Registry may not be finalized prior to final publication of this document; at time of release of this current draft, it can be found at http://beta.sanaregistry.org/r/service_sites_apertures/.

A3 PATENT CONSIDERATIONS

No patent rights are known to adhere to any of the specifications of the Recommended Practice.

ANNEX B

XML SCHEMA ORGANIZATION AND PACKAGING FOR THE COMMON DATA ENTITY CLASSES

(INFORMATIVE)

B1 PURPOSE

This annex provides an informative description of XML schema organization and packaging for the Common Data Entity classes as defined in section 3.

B2 SCHEMA ORGANIZATION AND PACKAGING

B2.1 SERVICE MANAGEMENT INFORMATION ENTITY HEADER SCHEMA

The normative Service Management Information Entity Header schema types and global elements are contained in the file '902x12w0_02-SchemaCcssmSmInfoEntityHeader.xsd'.

The SM Information Entity Header types and global elements are registered in the 'urn:ccsds:schema:cssm:1.0.0' name space.

The Service Management Information Entity Header schema includes the following schemas:

- 902x13w0_04-SchemaCcsdsTimecodes.xsd

Types and global elements in this schema are registered in the 'urn:ccsds:schema:cssm:1.0.0' name space.

The source of the following schema files

- 902x12w0_04-SchemaCcssmSmInfoEntityHeader.xsd

is the SANA SCCS-SM Information Entity XML Schemas registry:

http://sanaregistry.org/r/service_management_xml_schemas/902Schema/902x12

The source of the following schema files

- 902x13w0_04-SchemaCcsdsTimecodes.xsd

is the SANA SCCS-SM Information Entity XML Schemas registry:

http://sanaregistry.org/r/service_management_xml_schemas/902Schema/902x13

B2.2 SERVICE MANAGEMENT ABSTRACT EVENT AND SERVICE MANAGEMENT EVENT TIME SCHEMA

The normative Service Management Abstract Event and Service Management Event Time schema types and global elements are contained in the file ‘902x12w0_02-SchemaCsmSmAbstractEvent.xsd’.

The SM Abstract Event and Service Management Event Time schema types and global elements are registered in the ‘urn:ccsds:schema:csm:1.0.0’ name space.

The Service Management Abstract Event and Service Management Event Time schema includes the following schemas:

- 902x13w0_03-SchemaAbstractParameter.xsd

Types and global elements in this schema are registered in the ‘urn:ccsds:schema:csm:1.0.0’ name space.

The source of the following schema files

- 902x12w0_03-SchemaCsmSmAbstractEvent.xsd

is the SANA SCCS-SM Information Entity XML Schemas registry:

http://sanaregistry.org/r/service_management_xml_schemas/902Schema/902x12

The source of the following schema files

- 902x13w0_03-SchemaAbstractParameter.xsd

is the SANA SCCS-SM Information Entity XML Schemas registry:

http://sanaregistry.org/r/service_management_xml_schemas/902Schema/902x13

B2.3 SERVICE MANAGEMENT COMMON CLASSES SCHEMA

The normative Service Management Common Classes schema types and global elements are contained in the file ‘902x12w0_03-SchemaCsmSmCommonClasses.xsd’.

The SM Common Classes schema types and global elements are registered in the ‘urn:ccsds:schema:csm:1.0.0’ name space.

The Service Management Common Classes schema includes the following schemas:

- 902x13w0_03-SchemaCcsdsTimecodes.xsd

Types and global elements in this schema are registered in the ‘urn:ccsds:schema:csm:1.0.0’ name space.

The source of the following schema files

- 902x12w0_03-SchemaCsmSmCommonClasses.xsd

is the SANA SCCS-SM Information Entity XML Schemas registry:

http://sanaregistry.org/r/service_management_xml_schemas/902Schema/902x12

The source of the following schema files

- 902x13w0_03-SchemaCcsdsTimecodes.xsd

is the SANA SCCS-SM Information Entity XML Schemas registry:

http://sanaregistry.org/r/service_management_xml_schemas/902Schema/902x13

ANNEX C

INFORMATIVE REFERENCES

(INFORMATIVE)

- [C1] *Space Communication Cross Support—Service Management—Operations Concept*. Issue 1-S. Report Concerning Space Data System Standards (Historical), CCSDS 910.14-G-1-S. Washington, D.C.: CCSDS, (May 2011) June 2017.

ANNEX D

ABBREVIATIONS AND ACRONYMS

(INFORMATIVE)

Abrv	abbreviation
ASCII	American Standard Code for Information Interchange
CCSDS	Consultative Committee for Space Data Systems
CSSM	Cross Support Service Management
CSSS	Cross Support Service System
Delta-DOR	delta-differential one-way range
FB	frequency band
ICD	interface control document
ICS	implementation conformance statement
IUT	implementation under test
MSPA	multiple spacecraft per aperture
n/a	not applicable
NCName	non-colonized name
OMG	Object Management Group
RL	requirements list
SANA	Space Assigned Numbers Authority
SCCS SM	Space Communication Cross Support Service Management
UML	Unified Modeling Language
UTC	Coordinated Universal Time
VLBI	very-long-baseline interferometry
W3C	World Wide Web Consortium
XML	eXtensible Markup Language