The Consultative Committee for Space Data Systems

**Draft Recommendation for
Space Data System Standards**

CROSS SUPPORT SERVICE MANAGEMENT— SERVICE PACKAGE DATA FORMATS

DRAFT RECOMMENDED STANDARD

CCSDS 902.4-R-1

RED BOOK

September 2022

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**RED BOOK
September 2022**

AUTHORITY

Issue:	Red Book, Issue 1
Date:	September 2022
Location:	Not Applicable

(WHEN THIS RECOMMENDED STANDARD IS FINALIZED, IT WILL CONTAIN THE FOLLOWING STATEMENT OF AUTHORITY:)

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This document is published and maintained by:

> CCSDS Secretariat
> National Aeronautics and Space Administration
> Washington, DC, USA
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STATEMENT OF INTENT

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-- The **standard** itself.

-- The anticipated date of initial operational capability.

-- The anticipated duration of operational service.

o Specific service arrangements shall be made via memoranda of agreement. Neither this **Recommended Standard** nor any ensuing **standard** is a substitute for a memorandum of agreement.

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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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PROPOSED DRAFT CCSDS RECOMMENDED STANDARD FOR
SERVICE PACKAGE DATA FORMATS SPECIFICATION

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PREFACE

This document is a draft CCSDS Recommended Standard. 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.

Recipients of this draft are invited to submit, with their comments, notification of any relevant patent rights of which they are aware and to provide supporting documentation.

DOCUMENT CONTROL

Document	Title	Date	Status
CCSDS 902.4-R-1	Cross Support Service Management—Service Package Data Formats, Draft Recommended Standard, Issue 1	September 2022	Current proposed draft

CONTENTS

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1 INTRODUCTION

1.1 PURPOSE AND SCOPE

1.1.1 PURPOSE

This Service Package Data Formats (SPDF) Recommended Standard specifies a standard for expressing a package of one or more services from a service provider to a mission user. The services are typically telecommand, telemetry, and tracking. The SPDF is generally expected to be utilized in support of mission operations in order to inform spacecraft operators of resource allocation and configuration data pertaining to ground-station or relay-spacecraft resources scheduled to serve their missions.

1.1.2 SCOPE

1.1.2.1 General

The scope of this Recommended Standard is limited to the exchange of scheduled service package information required in the context of CCSDS Service Management. In figure 1-1, the Service Package Data Formats Specification is put into context with the various standards that together form the Space Communications Cross Support (SCCS) Service Management (SM) suite.
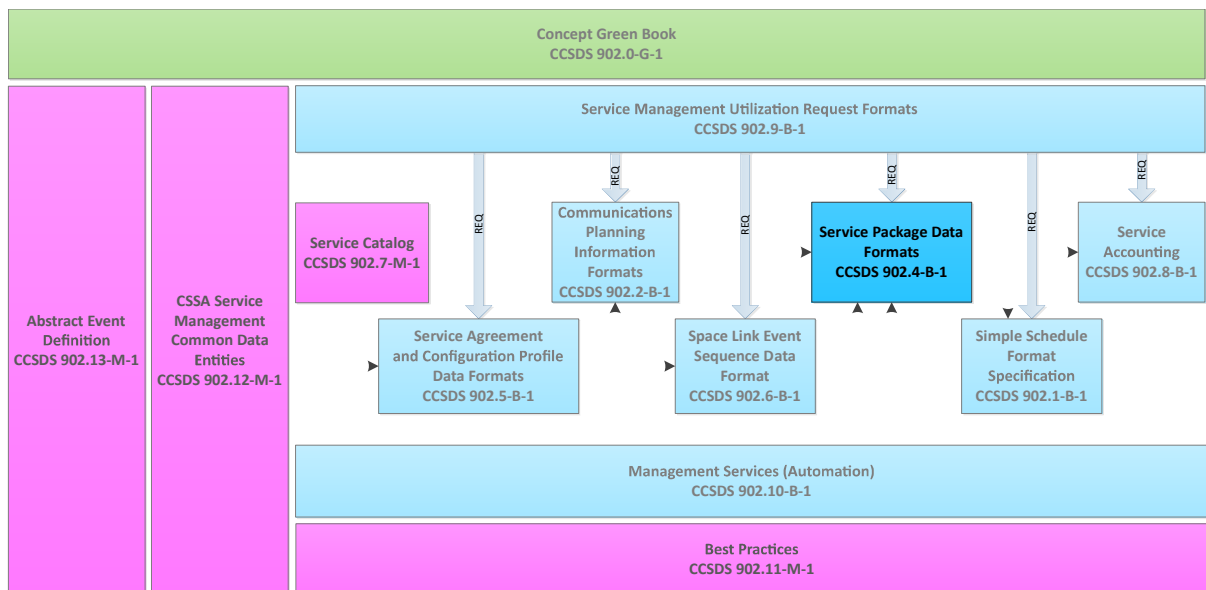

Figure 1-1: Service Package Data Formats in the Context of Space Communication Cross Support Service Management

1.1.2.2 Service Packages

1.1.2.2.1 General

In the SCCS-SM concept, service requests are typically submitted from a mission user to a Tracking, Telemetry, and Command (TT&C) service provider managing ground station(s) and/or relay asset(s). The Service Package Data Format described in this document is used to convey information about the resulting service packages. The purpose of the SPDF is to communicate to user missions the requested service packages that have been successfully scheduled. This includes identification of the necessary apertures, configuration information, and absolute timing information resulting from specific user mission constraints or from consideration by the service provider of user mission supplied timing flexibility.

Within the SPDF, service package data can be conveyed in one of two alternative formats, 'Type 1' and 'Type 2'. There is no difference in functionality between the two formats, only in how much information is directly conveyed versus referenced.   The 'Type 1' format shares motivations similar to those of the Simple Schedule Format (reference [F3]), including only basic information referencing the service configuration details that can be found separately in the referenced Service Configuration Profiles (see reference [F1]). In contrast, the 'Type 2' format directly includes the complete service configuration as defined in the Service Configuration Profiles, so a user might not need to reference them separately. For different users and network providers, one or the other approach may be favourable. This specification provides the flexibility for providers and users to make use of either mode (Type 1 or Type 2).

It should be noted that while this Recommended Standard has been developed within the scope of the Space Communication Cross Support Service Management (reference [F1]) activity, it is intended that the SPDF be used to exchange configuration information and references to both CCSDS configuration profiles (see reference [4]) and to bilateral configuration profiles.

1.1.2.2.2 Type 1 Service Package

The purpose of the Type 1 format is to supply the minimum and most common ground-station or relay-satellite service identification and configuration information needed by user missions to configure connections to the service provider at the scheduled times for the scheduled services.

The Type 1 format references the configuration profiles that are the basis of the scheduled Service Package, but it does not identify individual resources or their configuration parameter values. The concept behind the Type 1 format is that when no modification of configuration profile parameter values occurs, merely referencing the mutually agreed and mutually known configuration profiles is sufficient to identify all of the configuration parameter values. However, in order to be robust enough for cases in which modification of parameters does take place, the Type 1 format is also able to report the modified (or re-specified) configuration profile parameters from the Service Package Request (reference [F2]).

1.1.2.2.3   Type 2 Service Package

The purpose of the Type 2 format is to explicitly state the complete service configuration(s). The Type 2 format can be used by user missions to explicitly configure connections to the service provider at the scheduled times for the scheduled services without having to reference data outside of the SPDF for the complete configuration profile.

1.2   APPLICABILITY

This Recommended Standard is applicable only to the service package data formats and contents, but not to protocols or methods of exchange and transmission.

1.3   RATIONALE

1.3.1   GENERAL

The primary goal of CCSDS is to increase the level of interoperability among Agencies. This Recommended Standard furthers that goal by establishing the means to exchange planning information relating to where most cross support activity occurs: between the tracking stations or ground data handling systems of various Agencies and the mission specific components of a mission ground system.

The use cases described in the following subsections were considered in deriving this Recommended Standard.

1.3.2   USE CASE—MISSION PLANNING

The SPDF specifies the values of service configuration parameters and can be used to:

–   confirm settings expected between the user and provider;

–   specify exact configurations/values when the flexibilities of the Service Package Request allow for multiple possible configurations/settings;

–   convey the values of the configuration parameters for the services comprising the Service Package;

–   indicate the time(s) at which the service will be available;

–   identify the 'locations' where the services will be provided.

The SPDF contains the feedback needed to close the feedback loop on Service Package Requests. It also represents the expected values for service execution and could be used in support of accountability.

1.4 DOCUMENT STRUCTURE

This document is organized as follows:

a) Section 1 provides the purpose, scope, applicability, and rationale of this Recommended Standard 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 CCSDS-recommended Service Package Data Format.

c) Section 3 provides details about the structure and content of the Service Package Data Format.

d) Annex A provides the normative Implementation Conformance Statement (ICS) proforma.

e) Annex B discusses security, SANA, and patent considerations.

f) Annex C provides an informative description of the XML schema organization and packaging as well as the location of examples for the Service Management Utilization Request Formats (SMURFs).

g) Annex D is a list of informative references.

h) Annex **E** provides an informative overview of the intended uses for SPDF parameters.

1.5 DEFINITIONS

For the purposes of this document, the following definitions apply:

a) in addition to the conventional usage, the word 'agencies' may also be construed as meaning 'satellite operators' or 'satellite service providers';

b) the notation 'N/A' signifies 'not applicable'.

1.6 NOMENCLATURE

1.6.1 NORMATIVE TEXT

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

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 set off from the normative specifications either in notes or under one of the following subsection headings:

– Overview;

– Background;

– Rationale;

– Discussion.

1.7 CONVENTIONS

1.7.1 THE UNIFIED MODELING LANGUAGE

The Unified Modeling 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]).

Within the document use is made only of class diagrams. A UML class diagram describes the structure of a message, its parts, and how those parts interrelate. A UML class, represented in the diagram as a box, represents a data set. Class diagram conventions include composition, generalization, multiplicity, and constraints. Enumeration notation is also used but only when it is involved in a composition constraint.

1.7.2 XML SCHEMA DATATYPES

Many of the datatype definitions in this Recommended Standard are the same as definitions defined by XML Schema, Part 2 Datatypes (see reference [5]). Wherever an XML Schema datatype is indicated in this Recommended Standard, it is prefixed with the string 'xsd:'.

1.8   REFERENCES

The following publications contain provisions which, through reference in this text, constitute provisions of 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]   *Cross Support Service Management—Service Agreement and Configuration Profile Formats*. Recommendation for Space Data System Standards (Blue Book), CCSDS 902.5-B-1. Proposed.

[4]   *Cross Support Service Management—Common Data Entities*. Issue 1. Recommendation for Space Data System Practices (Magenta Book), CCSDS 902.12-M-1. Washington, D.C.: CCSDS, February 2021.

[5]   David Peterson, et al., eds. *W3C XML Schema Definition Language (XSD)*. Version 1.1. W3C Recommendation.

[6]   *Cross Support Service Management—Space Link Event Sequence Data Format*. Recommendation for Space Data System Standards (Blue Book), CCSDS 902.6-B-1. Proposed.

[7]   *Abstract Event Definition*. Issue 1. Recommendation for Space Data System Practices (Magenta Book), CCSDS 902.13-M-1. Washington, D.C.: CCSDS, February 2021.

2 OVERVIEW

2.1 GENERAL

This section provides an overview of the CCSDS-recommended Service Package Data Formats, designed to facilitate standardized exchanges of detailed operational configuration information between space agencies preparing for spacecraft tracking support events.

The two formats are functionally equivalent in combination with the data for the service agreement and profiles. The elements of each format are defined through specializations within the same parent class structure. The difference is that when the Type 1 format is used, references to the configuration profiles, event sequences, and Delta-Differential One-Way Ranging (DDOR) scan patterns need to be followed externally to obtain specific configuration profile data, whereas in the Type 2 format the complete set of these data elements are explicitly contained.

It is expected that the provider and user will agree on which Service Package format should be exchanged as a part of the service agreement, or through some other out of band process. The reason for having two formats is primarily to support both providers or users who would prefer a (comparatively) basic and compact data exchange using the Type 1 format and providers or users who might be migrating from legacy messaging systems that include all parameters, similar to the Type 2 format.

2.2 SERVICE PACKAGE DATA FORMAT

2.2.1 GENERAL

The intent of the Service Package as it relates to other SCCS-SM information entities is described in reference [F1]. Significant features include the following:

– A Service Package describes the services that are scheduled as the result of a single Service Package Request.

– The contents of a Service Package can include online or offline Space Links Session (SLS) or retrieval services.

– The Service Package is communicated from the Provider Cross Support Service System (CSSS) to the Mission. It is nominally sent when the source Service Package Request has been scheduled, and subsequently in response to a query from the Mission. The Service Package may also be sent to document modifications made by the Provider CSSS subsequent to the initial scheduling of the Service Package.

– One or more Service Packages may be grouped according to predefined selection criteria into a Service Package Set (described in reference [F1]).

The SPDF defined in detail in this document supports all of these features, as they are described at high-level in the Green Book (reference [F1]).

The SPDF is used to create messages or files in an XML format. SPDF data is suitable for automated exchanges, yet is also human-readable (with a suitable XML editor). The use of XML and the basic style of the schema are common between the SPDF and other SCCS-SM data types.

Fields within the SPDF are indicated in the schema as either mandatory, in which case suitable values must be present, or optional, in which case values may be present or not. It is also possible to extend some of the contents by defining additional parameters. The content of any parameters defined is outside the scope of this document and should be documented in an ICD agreed by the involved parties and registered with SANA.

2.2.2   COMMON PORTIONS

Both the SPDF Type 1 and Type 2 formats have a structure that follows the common pattern for service management data, having header and body portions as defined in reference [4]:

– The Service Package Header (abbreviated 'ServicePkgHeader') includes common SCCS-SM message header data, such as a generation timestamp, version number, and start and end times, plus a usage field indicating whether the following service package is understood as being for a test, provisional, or operational event.

– The Service Packages body (abbreviated 'ServicePkgBody') contains a set of Service Package Details.

The Service Package Details may be absent (e.g., if no package was generated), but nominally will be present. Multiple instances of the Service Package (ServicePkg) element can be included in a ServicePkgBody, to meet the functionality of the 'Service Package Set' concept described in reference [F1].   Each instance of the SrvPkg corresponds to an individual service package and includes:

– an identifier for the service package;

– start and stop times for the service package;

– an optional status sting for the service provider to convey additional scheduling status information.

It is only the contents below the Service Package Details that differ between the Type 1 and Type 2 formats.

An individual SPDF instance can contain multiple ServicePkg elements (e.g., batched together, when a request results in multiple service packages), each of which may technically be in either the Type 1 or Type 2 format. However, the details for the entire set of contained service packages are expected to consistently all be either Type 1 or Type 2.

2.2.3 TYPE 1 SERVICE PACKAGE

The structure for a Type 1 SPDF contains either an Online or Offline Service Package (OnlineSrvPkgType1 or OfflineSrvPkgType1). (See reference [F5] for definitions of *online* and *offline* services.) Both online and offline service descriptions can include an optional SICF reference.

The Online description includes:

– a configuration profile reference;

– an optional trajectory reference;

– an optional event sequence reference;

– an optional DDOR scan pattern reference;

– a list of any modified parameters (differing from the service profile), with an identification of the resource, parameter, and modified value to be used.

For a service package that includes multiple services, ServicePkg elements are included for each component service.

2.2.4 TYPE 2 SERVICE PACKAGE

A Type 2 Service Package contains:

– the same ServicePkg structure used for the Type 1 format;

– the complete configuration profile contents for each of the ServicePkg instances;

– the complete contents of an event sequence, if needed;

– the complete contents of a DDOR scan pattern, if needed.

2.3 MAPPING TO W3C XML SCHEMA

This Recommended Standard includes the specification of a mapping to World Wide Web Consortium (W3C) Extensible Markup Language (XML) schema. The normative mapping of this Recommended Standard to XML W3C schemas is in reference [F4].

NOTE – The XML schema has been elaborated on the basis of the mapping guidelines described in reference [F5].

3 SERVICE PACKAGE DATA FORMAT

3.1 OVERVIEW

The Service Management Service Package Data Formats form the basis of the data entities that are used to return Service Package information to the requesting organization.

3.2 SERVICE PACKAGE DATA FORMATS CONTENT/STRUCTURE

3.2.1 OVERVIEW

Figure 3-1 shows the UML class diagram for the SPDF. It should be noted that for clarity, *abstract* classes are highlighted in green. The Type 1 and Type 2 SPDF options both are represented using specializations within this class diagram, as described in 3.3 and 3.4, respectively.
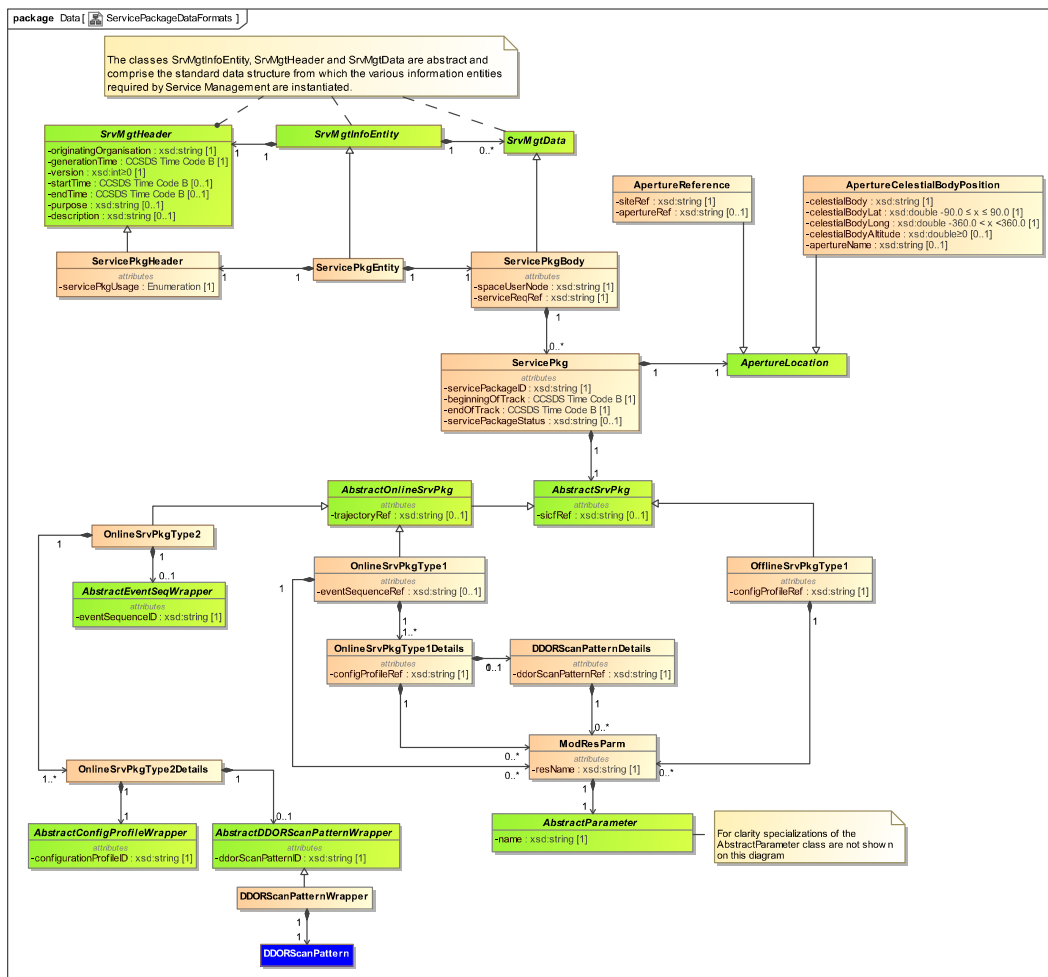
Figure 3-1: Service Package Data Format Class Diagram

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

3.2.2 CLASS ServicePkgEntity

3.2.2.1 The ServicePkgEntity class is mandatory and shall constitute the Service Package information entity.

NOTE – The ServicePkgEntity class is a specialization of the class SrvMgtInfoEntity class described in reference [4].

3.2.2.2 The ServicePkgEntity class shall contain parameters as specified in table 3-1.

Table 3-1: Class ServicePkgEntity Parameters

Parameter	Description	Data Type	Data Units
Not applicable	(See reference [4] subsection 3.1.2.)	N/A	N/A

3.2.3 CLASS ServicePkgHeader

3.2.3.1 The ServicePkgHeader class is mandatory and shall constitute the 'header' that is common to both Type 1 and Type 2 styles of the SPDF.

NOTE – The ServicePkgHeader class is a specialization of the class SrvMgtHeader class described in reference [4], and the generic description of the parameters is given there.

3.2.3.2 In addition to the parameters of the SrvMgtHeader, the ServicePkgHeader shall contain parameters as specified in table 3-2.

Table 3-2: Class ServicePkgHeader Parameters

Parameter	Description	Data Type	Data Units

servicePkgUsage	Mandatory parameter. The intended usage of the contained set of Service Packages, whether for testing of interfaces, for operational services, or for other uses.	Enumeration
		
		The following values are permitted:
		– INTERFACE-TEST
		  indicates that the service package set has been generated for test exchange purposes only.
		– OPERATIONAL
		  indicates that this is an operational service package set.
		– OTHER
		  indicates any other potential uses for the service package set.
			N/A

3.2.3.3 Since multiple services may be described in a single SPDF instance, the SrvMgtHeader startTime and endTime fields must reflect the earliest respective start and end timesfor the contained services.

3.2.4   CLASS ServicePkgBody

3.2.4.1   The ServicePkgBody class is mandatory and shall constitute the 'body' of the SPDF.

NOTE   –   The ServicePkgBody class is a specialization of the SrvMgtData class described in reference [4], and the generic description of the parameters is given there.

3.2.4.2   Multiple ServicePkg elements may be included within the ServicePkgBody.

3.2.4.3   In addition to the parameters of SrvMgtData, ServicePkgBody class shall contain parameters as specified in table 3-3.

Table 3-3: Class ServicePkgBody Parameters

Parameter	Description	Data Type	Data Units
spaceUserNode	Mandatory Parameter. The user of the scheduled package. These will typically be spacecraft names as specified in SANA.	xsd:string Permitted values are registered in SANA.	N/A
serviceReqRef	Mandatory parameter. Service request identifier.	xsd:string	N/A

3.2.5   CLASS ServicePkg

3.2.5.1   The ServicePkg class shall contain the information for an individual service package included within the ServicePkgBody.

3.2.5.2   The ServicePkg class shall contain parameters as specified in table 3-4.

Table 3-4: Class ServicePkg Parameters

Parameter	Description	Data Type	Data Units
servicePackageID	Mandatory parameter.	xsd:string	N/A
beginningOfTrack	Mandatory parameter. Time at which the Service Package is scheduled to start.	CCSDS ASCII Time Code B (reference [1])	N/A
endOfTrack	Mandatory parameter. The time at which the Service Package is scheduled to stop.	CCSDS ASCII Time Code B (reference [1])	N/A
servicePackageStatus	Optional parameter. This may be used by the provider to indicate the status of the service package, for instance, within a service package state machine.	xsd:string	N/A

3.2.6 CLASS ApertureLocation (ABSTRACT)

3.2.6.1 ApertureLocation is an abstract class that shall be used to instantiate the various classes of aperture location required by service management; it is fully described in reference [4].

3.2.6.2 In the SPDF, the ApertureLocation shall indicates the service provider's specific antenna resource supporting each ServicePkg.

3.2.7 CLASS ApertureReference

3.2.7.1 The ApertureReference class shall be used to specify the location of an aperture by the site name where it is located and the name of the aperture; it is fully described in reference [4].

NOTE – The ApertureReference class is a specialization of class ApertureLocation mentioned in 3.2.6 and fully defined in reference [4].

3.2.8 CLASS ApertureCelestialBodyPosition

3.2.8.1 The ApertureCelestialBodyPosition class shall be used to specify the location of an aperture by the site name where it is located and the name of the aperture; it is fully described in reference [4].

NOTE – The ApertureCelestialBodyPosition class is a specialization of class ApertureLocation mentioned in 3.2.6 and fully defined in reference [4].

3.2.9 CLASS AbstractSrvPkg (ABSTRACT)

3.2.9.1 The AbstractSrvPkg class is an abstract class that shall be used to hold the additional information for either online or offline service packages.

3.2.9.2 The AbstractSrvPkg is defined in subsection 3.7 of reference [4].

3.2.9.3 There shall be one instance of the AbstractSrvPkg for each ServicePkg.

NOTE – The SPDF includes the specializations of the AbsractSrvPkg defined in reference [4] for the AbstractOnlineSrvPkg and OfflineSrvPkgType1.

3.2.10 CLASS AbstractOnlineSrvPkg (ABSTRACT)

The AbstractOnlineSrvPkg class is an abstract class that shall be used to hold the additional information for online service packages either in the Type 1 or Type 2 SPDF formats.

NOTE – The AbstractSrvPkg is defined in subsection 3.7.3 of reference [4].

3.2.11 CLASS OnlineSrvPkgType1

The OnlineSrvPkgType1 class shall be used by the Type 1 SPDF to include references to the configuration profile and any relevant event sequence, DDOR scan patterns, and sets of parameters that have been modified from the values within the reference elements.

NOTE – The OnlineSrvPkgType1 is defined in subsection 3.7.4 of reference [4].

3.2.12 CLASS OnlineSrvPkgType1Details

The OnlineSrvPkgType1 Details class shall be as defined in subsection 3.7.5 of reference [4].

3.2.13 CLASS DDORScanPatternDetails

The DDORScanPatternDetails class shall be as defined in subsection 3.7.6 of reference [4].

3.2.14 CLASS OfflineSrvPkgType1

The OfflineSrvPkgType1 class shall be as defined in subsection 3.7.7 of reference [4].

3.2.15 CLASS ModResParm

The ModResParm class shall be used to modify the value of a parameter of a resource. The Resource for which the parameter value is to be modified is specified by the resource name.

NOTE – The ModResParm class is fully described in reference [4].

3.2.16 CLASS AbstractParameter (ABSTRACT)

The AbstractParameter class is abstract and optional and may be used to derive parameters.

NOTE – The AbstractParameter class is fully described in reference [7].

3.2.17 CLASS OnlineSrvPkgType2

3.2.17.1 The OnlineSrvPkgType2 class is a specialization of the AbstractOnlineSrvPkg and shall be used by the Type 2 SPDF to include the contents of relevant Configuration Profiles and any needed Event Sequences or DDOR Scan Patterns.

3.2.17.2 Each OnlineSrvPkgType2 shall contain one or more OnlineSrvPkgType2Details and may contain an AbstractEventSeqWrapper, as defined in subsection 3.6.8 of reference [4].

3.2.18 CLASS AbstractEventSeqWrapper (ABSTRACT)

3.2.18.1 AbstractEventSeqWrapper is an abstract class that shall be used to instantiate the wrapper classes required for Event Sequence data entities.

NOTES

1   The AbstractEventSeqWrapper class is a specialization of class AbstractDataSubWrapper described in reference [4], and the generic description of the parameters is given in that document.

2   The AbstractEventSeqWrapper class is fully described in reference [4].

3.2.18.2 For a fully compliant CCSDS Event Sequence,

   a) the concrete Event Sequence Wrapper derived from the AbstractEventSeqWrapper class shall be as specified in reference [6];

   b) this Event Sequence Wrapper shall contain one, and only one, instance of the Event Sequence class defined in reference [6].

3.2.19 CLASS OnlineSrvPkgType2Details

Each OnlineSrvPkgType2Details shall contain an AbstractConfigProfileWrapper, as described in reference [4], and may contain an AbstractDDORScanPatternWrapper, as defined in reference [4].

3.2.20 CLASS AbstractConfigProfileWrapper (ABSTRACT)

3.2.20.1 AbstractConfigProfileWrapper is an abstract class that shall be used to instantiate the wrapper classes required for Configuration Profile data entities.

NOTES

1   The AbstractConfigProfileWrapper class is a specialization of class AbstractDataSubWrapper described in reference [4], and the generic description of the parameters is given in that document.

2   The AbstractConfigProfileWrapper class is fully described in reference [4].

3.2.20.2 For a fully compliant CCSDS Configuration Profile,

a) the concrete Configuration Profile Wrapper derived from the AbstractConfigProfileWrapper class shall be as specified in reference [3];

b) this Configuration Profile Wrapper shall contain one, and only one, instance of the Configuration Profile class defined in reference [3].

3.2.21 CLASS AbstractDDORScanPatternWrapper (ABSTRACT)

AbstractDDORScanPatternWrapper is an abstract class that shall be used to instantiate the wrapper classes required for DDOR Scan Pattern data entities.

NOTES

1 The AbstractDDORScanPatternWrapper class is a specialization of class AbstractDataSubWrapper described in reference [4], and the generic description of the parameters is given in that document.

2 The AbstractDDORScanPatternWrapper class is fully described in reference [4].

3.2.22 CLASS DDORScanPatternWrapper

The DDORScanPatternWrapper is a class that shall be used to wrap a Delta DOR Scan Pattern data entity.

NOTES

1 The DDORScanPatternWrapper class is a specialization of class AbstractDDORScanPatternWrapper described in reference [4], and the generic description of the parameters is given in that document.

2 The DDORScanPatternWrapper class is fully described in reference [4].

3.3 TYPE 1 SERVICE PACKAGE DATA FORMAT

3.3.1 OVERVIEW

The Type 1 SPDF can include data for either online or offline services by including either the OnlineSrvPkgType1 or OfflineSrvPkgType1 instances. Figure 3-2 illustrates the UML class diagram containing only components pertinent to the Type 1 SPDF.
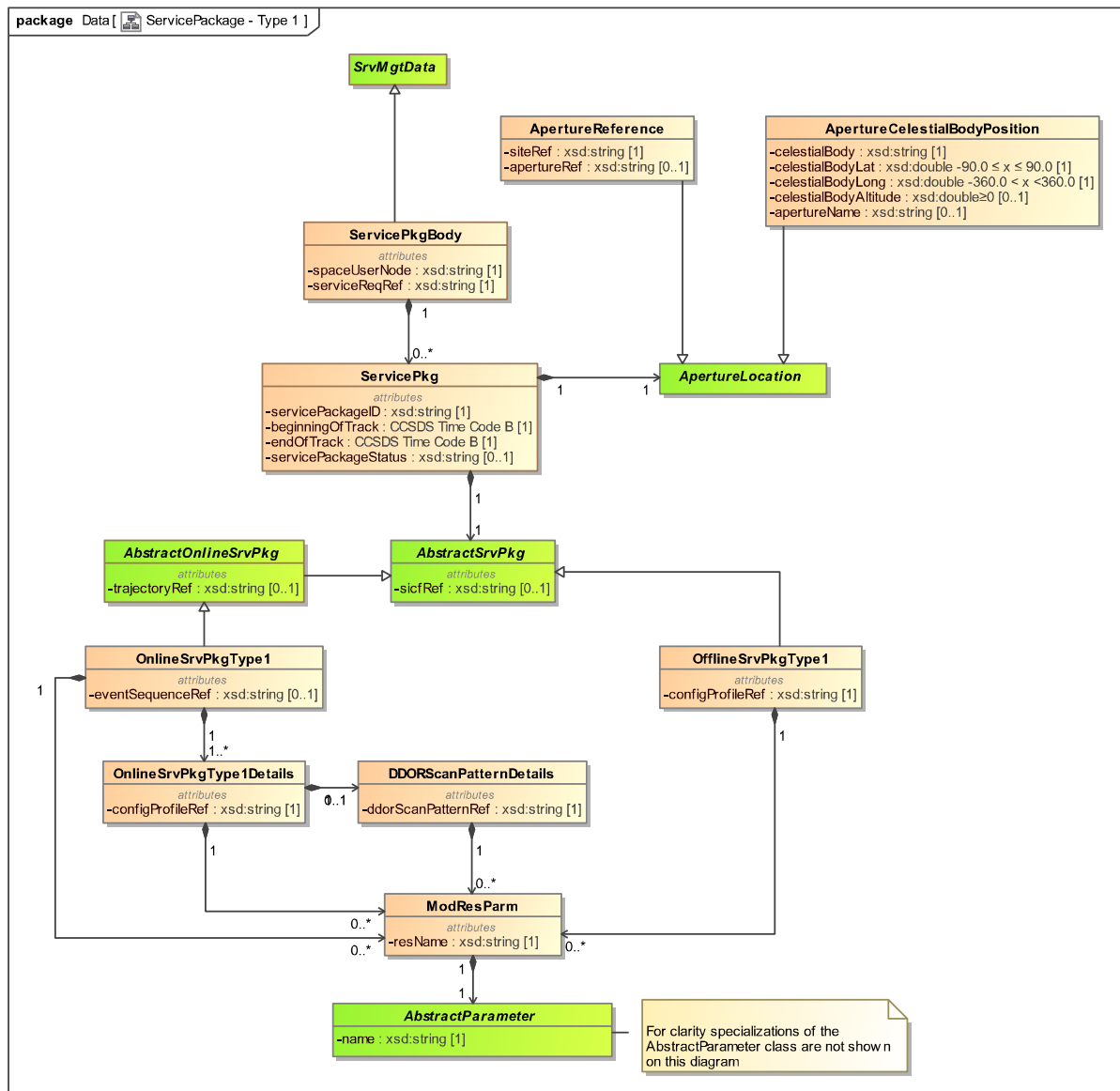
Figure 3-2: Type 1 Service Package Data Format Class Diagram

3.3.2   TYPE 1 SERVICE PACKAGE DATA FORMAT REQUIREMENTS

3.3.2.1   For online services, the OnlineSrvPkgType1 shall be as defined in reference [4].

3.3.2.2   The OnlineSrvPkgType1 shall include an optional event sequence reference, OnlineSrvPkgType1Details with a configuration profile reference and an optional DDOR scan pattern reference, and any number modified parameters from the configuration profile, event sequence, or DDOR scan pattern.

3.3.2.3   For offline services, the OfflineSrvPkgType1 shall be as defined in reference [4].

3.3.2.4   It shall contain a configuration profile reference, along with any number of modified parameters from the configuration profile.

3.3.3   USAGE OF ModResParm

3.3.3.1   The ModResParm (short for Modified Resource Parameter) class shall be as defined in reference [4].

3.3.3.2   Instances of ModResParm shall be used in the Type 1 SPDF to specify the values of functional resource parameters that have been modified from their values as originally specified in the referenced Configuration Profile, for example, because the Service Package Request included the value changes.

3.3.3.3   The ModResParm class shall be present for each modified functional resource parameter in a Type 1 Service Package.

3.3.3.4   The ModResParm class shall be as defined in reference [4]. As used in the Service Package Data Format:

a)   the resName parameter shall contain the functional resource nickname (see the definition of the resName parameter of the ModResParm class in reference [4]) of the FR instance that contains the parameter for which the value has been modified;

b)   the name parameter of the AbstractParameter shall contain the classifier (see the definition of the name parameter of the ModResParm class in reference [4]) of the parameter for which the value has been modified; and

c)   the value parameter of the AbstractParameter shall contain the value (see the definition of the value parameter of the ModResParm class in reference [4]) of the parameter for which the value has been modified, where the data type of the containing AbstractParameter is the type of the named parameter.

3.4 TYPE 2 SERVICE PACKAGE DATA FORMAT

3.4.1 OVERVIEW

The Type 2 SPDF uses OnlineSrvPkgType2 to include applicable event sequences via the optional AbstractEventSeqWrapper, one or more OnlineSrvPkgType2Details including the Type 2 configuration profiles via an AbstractConfigProfileWrapper, and any applicable DDOR scan patterns via inclusion of zero or more AbstractDDORScanPatternWrapper instances.

Figure 3-3 illustrates the UML class diagram containing only elements that pertain to the Type 2 SPDF.
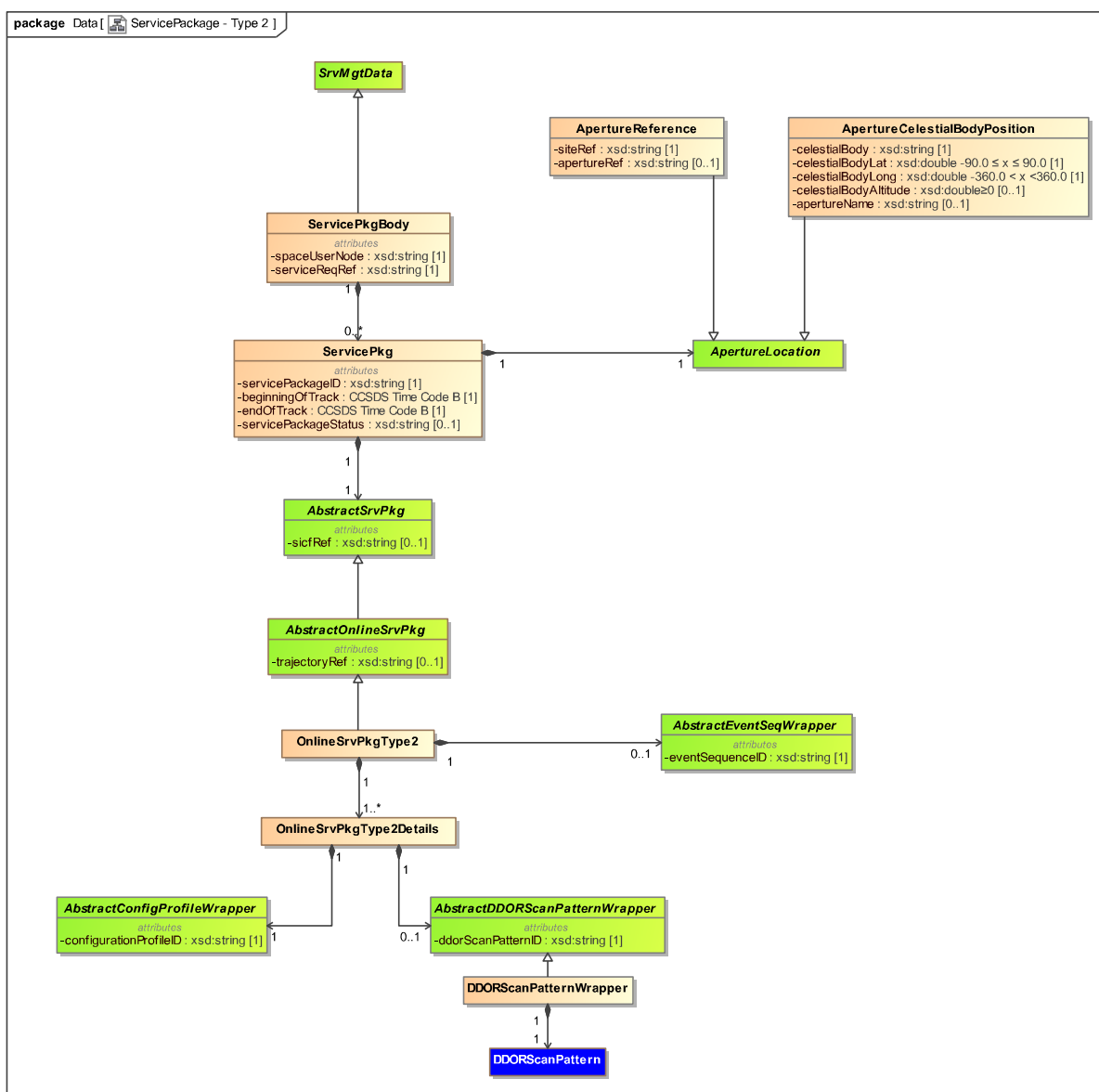
Figure 3-3: Type 2 Service Package Data Format Class Diagram

3.4.2 TYPE 2 SERVICE PACKAGE DATA FORMAT REQUIREMENTS

3.4.2.1   The Type 2 SPDF shall contain the complete set of all configuration profile, event sequence, and DDOR scan pattern data elements needed to describe the service package instance.

3.4.2.2   When the Type 2 SPDF is used, any modified parameter values from the configuration profile, event sequence, or DDOR scan patterns shall be directly included within those data elements, rather than being separately indicated as they are in the Type 1 SPDF.

ANNEX A

IMPLEMENTATION CONFORMANCE STATEMENT (ICS) PROFORMA

(NORMATIVE)

A1 INTRODUCTION

A1.1 OVERVIEW

This annex provides the ICS Requirements List (RL) for an implementation of the Service Package Data Formats Specification (CCSDS 902.4-B-1). The ICS for an implementation is generated by completing the RL in accordance with the instructions below. An implementation shall satisfy the mandatory conformance requirements referenced in the RL.

– The RL in this annex is blank. An implementation's completed RL is called the ICS. The ICS states which capabilities and options have been implemented. The following can use the ICS:

– the implementer, as a checklist to reduce the risk of failure to conform to the standard through oversight;

– a supplier or potential acquirer of the implementation, as a detailed indication of the capabilities of the implementation, stated relative to the common basis for understanding provided by the standard ICS proforma;

– a user or potential user of the implementation, as a basis for initially checking the possibility of interworking with another implementation (it should be noted that, while interworking can never be guaranteed, failure to interwork can often be predicted from incompatible ICSes);

– a tester, as the basis for selecting appropriate tests against which to assess the claim for conformance of the implementation.

A1.2 ABBREVIATIONS AND CONVENTIONS

A1.2.1 General

The RL consists of information in tabular form. The status of features is indicated using the abbreviations and conventions described below.

A1.2.2   Item Column

The item column contains sequential numbers for items in the table.

A1.2.3   Feature Column

The feature column contains a brief descriptive name for a feature. It implicitly means: 'Is this feature supported by the implementation?'

NOTE –   The features itemized in the RL are elements of the Service Package Data Formats. Therefore support for a mandatory feature indicates that a generated file will include that feature, and support for an optional feature indicates that generated files can include that feature.

A1.2.4   Class Column/Parameters

The Class/Parameters column contains, when applicable, the Service Package Data Format class associated with the feature.

A1.2.5   Reference Column

The reference column indicates the relevant subsection or table in the *Service Package Data Formats Specification* (CCSDS 902.4-B-1) (this document).

A1.2.6   Status Column

The status column uses the following notations:

> M   mandatory.
>
> O   optional.
>
> C<n>   conditional as defined in corresponding expression below the table.
>
> N/A   not applicable.

It should be noted that a parameter may be marked as M while the class that contains it is marked O. This should be interpreted to mean that while the class is optional if it is present, the parameter must be present.

A1.2.7   Support Column Symbols

The support column is to be used by the implementer to state whether a feature is supported by entering Y, N, or N/A, indicating:

Y   Yes, supported by the implementation.

N   No, not supported by the implementation.

N/A   Not applicable.

A1.3   INSTRUCTIONS FOR COMPLETING THE RL

An implementer shows the extent of compliance to the Recommended Standard by completing the RL; that is, the state of compliance with all mandatory requirements and the options supported are shown. The resulting completed RL is called an ICS. The implementer shall complete the RL by entering appropriate responses in the support or values supported column, using the notation described in A1.2. If a conditional requirement is inapplicable, N/A should be used. If a mandatory requirement is not satisfied, exception information must be supplied by entering a reference Xi, where i is a unique identifier, to an accompanying rationale for the noncompliance.

Some elements can be included a variable number of times in an SPDF instance. For instance, there may be multiple ServicePkgDetails elements when there are related forward, return, and tracking services indicated. If an implementation has limitations on the numbers of particular elements that can be included or processed, this should be indicated in a note.

A2   ICS PROFORMA FOR SERVICE PACKAGE DATA FORMATS

A2.1   GENERAL INFORMATION

A2.1.1   Identification of ICS

Date of Statement (DD/MM/YYYY)	
ICS serial number	
System Conformance statement cross-reference	

A2.1.2   Identification of Implementation Under Test (IUT)

Implementation name	
Implementation version	
Special Configuration	
Other Information	

A2.1.3   Identification of Supplier

Supplier	
Contact Point for Queries	
Implementation Name(s) and Versions	
Other Information necessary for full identification, e.g., names(s) and version(s) for machines and/or operating systems.	

A2.1.4   Document Version

CCSDS 902.4-B-1	
Have any exceptions been required? (Note: A YES answer means that the implementation does not conform to the Recommended Standard. Non-supported mandatory capabilities are to be identified in the ICS, with an explanation of why the implementation is non-conforming.	Yes _____ No _____

A2.1.5 Requirements List

A2.1.5.1 Class ServicePkgEntity

A2.1.5.1.1 General

Item	Description	reference	Status	Support
1.	ServicePkgEntity	3.2.2	M	

A2.1.5.1.2 Class ServicePkgEntity Parameters

N/A.

A2.1.5.2 Class ServicePkgHeader

A2.1.5.2.1 General

Item	Description	reference	Status	Support
2.	ServicePkgHeader	3.2.3	M	

A2.1.5.2.2 Class ServicePkgHeader Parameters

Item	Parameter	reference	Status	Item Support or Values Supported
2.1.	originatingOrganization	reference [4], table 3-1	M	
2.2.	generationTime	reference [4], table 3-1	M	
2.3.	version	reference [4], table 3-1	M	
2.4.	startTime	reference [4], table 3-1	O	
2.5.	endTime	reference [4], table 3-1	O	
2.6.	purpose	reference [4], table 3-1	O	
2.7.	description	reference [4], table 3-1	O	
2.8.	servicePkgUsage	table 3-2	M	

A2.1.5.3   Class ServicePkgBody

A2.1.5.3.1   General

Item	Description	reference	Status	Support
3.	ServicePkgBody	3.2.4	M	

A2.1.5.3.2   Class ServicePkgBody Parameters

Item	Parameter	reference	Status	Item Support or Values Supported
3.1.	spaceUserNode	table 3-3	M	
3.2.	serviceReqRef	table 3-3	M	

A2.1.5.4   Class ServicePkg

A2.1.5.4.1   General

Item	Description	reference	Status	Support
4.	ServicePkg	3.2.5	O	

A2.1.5.4.2   Class ServicePkg Parameters

Item	Parameter	reference	Status	Item Support or Values Supported
4.1.	servicePackageID	table 3-4	M	
4.2.	beginningOfTrack	table 3-4	M	
4.3.	endOfTrack	table 3-4	M	
4.4.	servicePackageStatus	table 3-4	O	

A2.1.5.5   Class ApertureLocation

A2.1.5.5.1   General

Item	Description	reference	Status	Support
5.	ApertureLocation	3.2.6	O	

A2.1.5.5.2   Class ApertureLocation Parameters

N/A.

A2.1.5.6   Class ApertureReference

A2.1.5.6.1   General

Item	Description	reference	Status	Support
6.	ApertureReference	3.2.7	C1	

C1 – Mandatory if ApertureCelestialBodyPosition (A2.1.5.7) class is not included, shall not be present if ApertureCelestialBodyPosition is present.

A2.1.5.6.2   Class ApertureReference Parameters

Item	Parameter	reference	Status	Item Support or Values Supported
6.1.	apertureRef	reference [4], table 3-5	M	
6.2.	siteRef	reference [4], table 3-5	M	

A2.1.5.7   Class ApertureCelestialBodyPosition

A2.1.5.7.1   General

Item	Description	reference	Status	Support
7.	ApertureCelestialBodyPosition	3.2.8	C2	

C2 – Mandatory if ApertureReference (A2.1.5.6) class is not present, shall not be present if ApertureReference class is present.

A2.1.5.7.2   Class ApertureCelestialBodyPosition Parameters

Item	Parameter	reference	Status	Item Support or Values Supported
7.1.	celestialBody	reference [4], table 3-6	M	
7.2.	celestialBodyLat	reference [4], table 3-6	M	
7.3.	celestialBodyLong	reference [4], table 3-6	M	
7.4.	celestialBodyAltitude	reference [4], table 3-6	O	
7.5.	apertureName	reference [4], table 3-6	O	

A2.1.5.8   Class AbstractSrvPkg (ABSTRACT)

A2.1.5.8.1   General

Item	Description	reference	Status	Support
8.	AbstractSrvPkg	3.2.9	M	

A2.1.5.8.2   Class AbstractSrvPkg Parameters

Item	Parameter	reference	Status	Item Support or Values Supported
8.1.	sicfRef	reference [4], table 3-20	O	

A2.1.5.9   Class AbstractOnlineSrvPkg (ABSTRACT)

A2.1.5.9.1   General

Item	Description	reference	Status	Support
9.	AbstractOnlineSrvPkg	3.2.10	M	

A2.1.5.9.2   Class AbstractOnlineSrvPkg Parameters

Item	Parameter	reference	Status	Item Support or Values Supported
9.1.	trajectoryRef	reference [4], table 3-21	O	

A2.1.5.10 Class OnlineSrvPkgType1

A2.1.5.10.1 General

Item	Description	reference	Status	Support
10.	OnlineSrvPkgType1	3.2.11	C3	

C3 – Mandatory if OnlineSrvPkgType2 (A2.1.5.16) or OfflineSrvPkgType1 (A2.1.5.13) is not present, shall not be present if either OnlineSrvPkgType2 or OfflineSrvPkgType1 is present.

A2.1.5.10.2 Class OnlineSrvPkgType1 Parameters

Item	Parameter	reference	Status	Item Support or Values Supported
10.1.	eventSequenceRef	reference [4], table 3-22	M	

A2.1.5.11 Class OnlineSrvPkgType1Details

A2.1.5.11.1 General

Item	Description	reference	Status	Support
11.	OnlineSrvPkgType1Details	3.2.12	M	

A2.1.5.11.2 Class OnlineSrvPkgType1Details Parameters

Item	Parameter	reference	Status	Item Support or Values Supported
11.1.	configProfileRef	reference [4], table 3-23	M	

A2.1.5.12 Class DDORScanPatternDetails

A2.1.5.12.1 General

Item	Description	reference	Status	Support
12.	DDORScanPatternDetails	3.2.13	O	

A2.1.5.12.2 Class DDORScanPatternDetails Parameters

Item	Parameter	reference	Status	Item Support or Values Supported
12.1.	DDORScanPatternRef	reference [4], table 3-24	M	

A2.1.5.13 Class OfflineSrvPkgType1

A2.1.5.13.1 General

Item	Description	reference	Status	Support
13.	OfflineSrvPkgType1	3.2.14	C4	

C4 – Mandatory if OnlineSrvPkgType1 (A2.1.5.11) or OnlineSrvPkgType2 (A2.1.5.16) is not present, shall not be present if either OnlineSrvPkgType1 or OnlineSrvPkgType2 is present.

A2.1.5.13.2 Class OfflineSrvPkgType1 Parameters

Item	Parameter	reference	Status	Item Support or Values Supported
13.1.	configProfileRef	reference [4], table 3-25	M	

A2.1.5.14 Class ModResParm

A2.1.5.14.1 General

Item	Description	reference	Status	Support
14.	ModResParm	3.2.15	O	

A2.1.5.14.2 Class ModResParm Parameters

Item	Parameter	reference	Status	Item Support or Values Supported
14.1.	resName	reference [4], table 3-8	O	

A2.1.5.15 Class AbstractParameter (ABSTRACT)

A2.1.5.15.1 General

Item	Description	reference	Status	Support
15.	AbstractParameter	3.2.16	C5	

C5 – Mandatory if ModResParm (A2.1.5.14) is present.

A2.1.5.15.2 Class AbstractParameter Parameters

Item	Parameter	reference	Status	Item Support or Values Supported
15.1.	name	reference [7], table 3-2	M	

A2.1.5.16 Class OnlineSrvPkgType2

A2.1.5.16.1 General

Item	Description	reference	Status	Support
16.	OnlineSrvPkgType2	3.2.17	C6	

C6 – Mandatory if OfflineSrvPkgType1 (A2.1.5.13) or OnlineSrvPkgType1 (A2.1.5.11) is not present, shall not be present if either OfflineSrvPkgType1 or OnlineSrvPkgType1 is present.

A2.1.5.16.2 Class OnlineSrvPkgType2 Parameters

N/A.

A2.1.5.17 Class AbstractEventSeqWrapper (ABSTRACT)

A2.1.5.17.1 General

Item	Description	reference	Status	Support
17.	AbstractEventSeqWrapper	3.2.18	M	

A2.1.5.17.2 Class AbstractEventSeqWrapper Parameters

Item	Parameter	reference	Status	Item Support or Values Supported
17.1.	eventSequenceID	reference [4], table 3-10	M	

A2.1.5.18 Class OnlineSrvPkgType2Details

A2.1.5.18.1 General

Item	Description	reference	Status	Support
18.	OnlineSrvPkgType2Details	3.2.19	O	

A2.1.5.18.2 Class OnlineSrvPkgType2Details Parameters

N/A.

A2.1.5.19 Class AbstractConfigProfileWrapper (ABSTRACT)

A2.1.5.19.1 General

Item	Description	reference	Status	Support
19.	AbstractConfigProfileWrapper	3.2.20	M	

A2.1.5.19.2 Class AbstractConfigProfileWrapper Parameters

Item	Parameter	reference	Status	Item Support or Values Supported
19.1.	configurationProfileID	reference [4], table 3-16	M	

A2.1.5.20 Class AbstractDDORScanPatternWrapper (ABSTRACT)

A2.1.5.20.1 General

Item	Description	reference	Status	Support
20.	AbstractDDORScanPatternWrapper	3.2.21	O	

A2.1.5.20.2 Class AbstractDDORScanPatternWrapper Parameters

Item	Parameter	reference	Status	Item Support or Values Supported
20.1.	ddorScanPatternID	reference [4], table 3-17	M	

A2.1.5.21 Class DDORScanPatternWrapper

A2.1.5.21.1 General

Item	Description	reference	Status	Support
21.	DDORScanPatternWrapper	3.2.22	C7	

C7 – Mandatory if AbstractDDORScanPatternWrapper (A2.1.5.20) is present.

A2.1.5.21.2 Class DDORScanPatternWrapper Parameters

Item	Parameter	reference	Status	Item Support or Values Supported
21.1.	ddorScanPatternID	reference [4], table 3-17	M	

ANNEX B

SECURITY, SANA, AND PATENT CONSIDERATIONS

(INFORMATIVE)

B1   SECURITY CONSIDERATIONS

B1.1   OVERVIEW

This annex presents the results of an analysis of security considerations applied to the technologies specified in this Recommended Standard.

B1.2   CONSEQUENCES OF NOT APPLYING SECURITY TO THE TECHNOLOGY

The consequences of not applying security to the systems and networks on which this Recommended Standard is implemented could include potential loss, corruption, and theft of data. Since it is possible to utilize these messages disseminating events relating to the availability of communications and tracking resources for spacecraft and other information, the consequences of not applying security to the systems and networks on which this Recommended Standard is implemented could include compromise or loss of the mission if malicious tampering of a particularly severe nature occurs.

B1.3   POTENTIAL THREATS AND ATTACK SCENARIOS

Potential threats or attack scenarios include, but are not limited to, (a) unauthorized access to the programs/processes that generate and interpret the messages, and (b) unauthorized access to the messages during transmission between exchange partners. Protection from unauthorized access during transmission is especially important if the mission utilizes open ground networks such as the Internet to provide ground station connectivity for the exchange of data formatted in compliance with this Recommended Standard. It is strongly recommended that potential threats or attack scenarios applicable to the systems and networks on which this Recommended Standard is implemented be addressed by the management of those systems and networks, and that adequate authentication, suitable protocols, and secured interfaces be utilized for the exchange of this information.

B1.4 SECURITY CONCERNS RELATED TO THIS RECOMMENDED STANDARD

B1.4.1 Data Privacy

Privacy of data formatted in compliance with the specifications of this Recommended Standard should be assured by the systems and networks on which this Recommended Standard is implemented.

B1.4.2 Data Integrity

Integrity of data formatted in compliance with the specifications of this Recommended Standard should be assured by the systems and networks on which this Recommended Standard is implemented.

B1.4.3 Authentication of Communicating Entities

Authentication of communicating entities involved in the transport of data that complies with the specifications of this Recommended Standard should be provided by the systems and networks on which this Recommended Standard is implemented.

B1.4.4 DATA TRANSFER BETWEEN COMMUNICATING ENTITIES

The transfer of data formatted in compliance with this Recommended Standard between communicating entities should be accomplished via secure mechanisms approved by the Information Technology Security functionaries of exchange participants.

B1.4.5 Control of Access to Resources

Control of access to resources should be managed by the systems upon which provider formatting and recipient processing are performed.

B1.4.6 Auditing of Resource Usage

Auditing of resource usage should be handled by the management of systems and networks on which this Recommended Standard is implemented.

B1.5 UNAUTHORIZED ACCESS

Unauthorized access to the programs/processes that generate and interpret the messages should be prohibited in order to minimize potential threats and attack scenarios.

B1.6   DATA SECURITY IMPLEMENTATION SPECIFICS

Specific information-security interoperability provisions that apply between agencies and other independent users involved in an exchange of data formatted in compliance with this Recommended Standard should be specified in an ICD.

B2   SANA CONSIDERATIONS

B2.1   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.

B2.2   REGISTRY FOR `originatingOrganization`

(See annex subsection A2.2 of reference [4].)

B2.3   REGISTRY FOR `spaceUserNode`

(For `spaceUserNode` see annex subsection A2.3 of reference [4].)

B2.4   REGISTRY FOR `siteRef` AND **apertureRef**

(See annex subsection A2.4 of reference [4].)

B2.5   USE OF UNREGISTERED VALUES

Only values that have been registered should be used for the `originatingOrganization`, `spaceUserNode`, `siteRef`, and `apertureRef` parameters. Unregistered values for the `originatingOrganization`, `spaceUserNode`, `siteRef`, and `apertureRef` 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.

B3   PATENT CONSIDERATIONS

No patent rights are known to apply to any of the specifications of the Recommended Standard.

ANNEX C

XML SCHEMA ORGANIZATION, PACKAGING AND EXAMPLES FOR THE SERVICE PACKAGE DATA FORMATS

(INFORMATIVE)

C1   PURPOSE

This annex provides an informative information regarding the XML Schema Organization and packaging.

C2   SCHEMA ORGANIZATION AND PACKAGING

The normative Service Package Data Formats schema types and global elements are contained in the file '902x04w0_14-SrvPkgDataFmt.xsd'.

The Service Package Data Formats types and global elements are registered in the 'urn:ccsds:schema:cssm:1.0.0' name space.

The Service Package Data Formats schema includes the following schemas:

   a) 902x12m1-SmCmnEnt-InfEntHdr.xsd

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

   b) 902x12w1_04-SmCmnEnt-DataWrp.xsd

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

   c) 902x12w1_04-SmCmnEnt-SrvPkg.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:

   – 902x04w0_14-SrvPkgDataFmt.xsd,

   – 902x12m1-SmCmnEnt-InfEntHdr.xsd,

   – 902x12w1_04-SmCmnEnt-DataWrp.xsd, and

   – 902x12w1_04-SmCmnEnt-SrvPkg.xsd

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

http://sanaregistry.org/r/service_management_xml_schemas

C3 EXAMPLES

Various examples of the use of SMURF are available. These are maintained in a git repository, the location of which is:

https://github.com/cssAreaGH/CSSM-XML-InstanceExamples

ANNEX D

ABBREVIATIONS AND ACRONYMS

(INFORMATIVE)

ASCII	American Standard Code for Information Interchange
CSSS	Cross Support Service System
CCSDS	Consultative Committee on Space Data Systems
DDOR	Delta-Differential One-Way Ranging
ICD	Interface Control Document
ICS	Implementation Conformance Statement
IUT	Implementation Under Test
N/A	not applicable
OMG	Object Management Group
RL	Requirements List
SANA	Space Assigned Numbers Authority
SCCS	Space Communications Cross Support
SLS	Space Links Session
SM	Service Management
SMURF	Service Management Utilization Request Format
SPDF	Sevice Packet Data Format
TT&C	Tracking, Telemetry, and Command
UML	Unified Modeling Language
UTC	Coordinated Universal Time
W3C	World Wide Web Consortium
XML	Extensible Markup Language

ANNEX E

INTENDED USES FOR SPDF PARAMETERS

(INFORMATIVE)

E1 OVERVIEW

This annex collects information on some ways that the SPDF parameters might be used, subject to agreement between a user and provider. These were indicated through examples and reviews during development of the SPDF.

E2 USE OF SERVICE PACKAGE ID

The servicePackageID value is intended to be unique for every service package within a provider's schedule.

It should be noted that if a schedule is regenerated then the set of Service Packages may be changed, and if so, new servicePackageID values should be used.

E3 USE OF MODIFIED RESOURCE PARAMETERS

The ModResParm might be used in two different ways.

a) Some network providers allow parameters to be modified or respecified within a service request, to take different values from the defaults indicated within the service profile. In this case, the ModResParm in the SPDF Type 1 format will echo back the modified values of these parameters.

b) Some network providers may support dynamic assignment of some values. For instance, the CSTS provider port information needed by a CSTS user could be dynamically assigned. In this case, the ModResParm in the SPDF Type 1 format will convey the provider's assigned values to the users.

E4 CONFIGURATION PROFILE CONTENTS

When parameter values in a referenced configuration profile are modified in the Service Package Request (see reference [F2]), then it might be expected that the contents of the configuration profile contained in SPDF Type 2 format reflect the changes requested.

ANNEX F

INFORMATIVE REFERENCES

(INFORMATIVE)

[F1] *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.

[F2] *Cross Support Service Management—Service Management Utilization Request Formats*. Issue 0. Proposed Draft Recommendation for Space Data System Standards (Proposed Red Book), CCSDS 902.9-R-0. Washington, D.C.: CCSDS, August 2022.

[F3] *Cross Support Service Management—Simple Schedule Format Specification*. Issue 1. Recommendation for Space Data System Standards (Blue Book), CCSDS 902.1-B-1. Washington, D.C.: CCSDS, May 2018.

[F4] "Service Management XML Schemas." Space Assigned Numbers Authority. https://sanaregistry.org/r/service_management_xml_schemas.

[F5] *Cross Support Reference Model—Part 1: Space Link Extension Services*. Issue 2. Recommendation for Space Data System Standards (Blue Book), CCSDS 910.4-B-2. Washington, D.C.: CCSDS, October 2005.