CCSDS

The Consultative Committee for Space Data Systems

SPACE ASSIGNED NUMBERS AUTHORITY (SANA)—ROLE, RESPONSIBILITIES, POLICIES, AND PROCEDURES

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FOREWORD

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DOCUMENT CONTROL

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CONTENTS

1 INTRODUCTION

1.1 PURPOSE

The purpose of this document is to define the Space Assigned Numbers Authority (SANA), its role, responsibilities, policies, and procedures within the Consultative Committee for Space Data Systems (CCSDS).

1.2 DOCUMENT SCOPE

This document defines the SANA realm of responsibilities. The assignment of the SANA operator and the liaison roles to other standards organizations or space-related organizations is the responsibility of the CCSDS Management Council (CMC).

1.3 APPLICABILITY

This document is applicable to the CCSDS process of defining specifications of space communication protocols and related standards. It defines an operational entity called the SANA and a process that will constitute a registryallow creation and operation of registries of objects that will be used by protocol and data exchange standard designers and implementers. However, this This document, like the SANA entity, is administrative in nature and does not contain any protocol specification, but it defines CCSDS policies and procedures for the operation of the SANA and the registries.

1.4 RATIONALE

As in many protocol engineering standards organizations such as the Internet Engineering Task Force (IETF), the Institute of Electrical and Electronics Engineers (IEEE), or the Third-Generation Project (3GPP), there is a need to separate mutable and quickly changing objects from the more stable protocol specifications. These objects are put into registries and managed by the operator of the registries on behalf of the engineering community. Separating the objects from the protocol specification enables the updating of the objects without modifying the protocol specification, which is a much longer and more tedious process than modifying the corresponding registry.

It is important to note that SANA is being run as a service to the CCSDS Areas and Working Groups (WGs) and to the space engineering and operations community. SANA registries will be maintained on-line, provide Web access, and also programmatic access via HTTP interfaces.

1.5 DOCUMENT STRUCTURE

After providing an overview, the document describes the scope and the role of the SANA. Then the requirements for running SANA are listed. The registration rules that govern how the SANA operator will accomplish its duties are defined.

The document describes the relationship between SANA and the other stakeholders within CCSDS, such as the CCSDS Engineering Steering Group (CESG), the CMC, and WGs.

The work on registries is then described along with the required SANA infrastructure to provide its services.

An appeal process is described in case of issues regarding the work of SANA.

Finally, a process is described for the few pre-SANA registries that existed before the creation of SANA.

1.6 CONVENTIONS AND DEFINITIONS

SANA: The on-line ~~registry~~set of registries of CCSDS protocol numbers and other CCSDS information that needs to be publically accessible in an on-line, easily located form.

SANA operator: The organization that manages and operates the SANA.

SANA Steering Group: Group that provides operational oversight of SANA, validation and confirmation SANA activities, and the first level of appeal for issues.

registry: "[A]n information system that securely manages any content type and the standardized metadata that describes it."[1] The registry manages the registration of the content. The associated repository is a store for the content.

registration rules: The specified rules used to manage the creation and update of a registry.

delegation: The act of assigning responsibility for a registry to an organization.

registration authority: The person or organization that has responsibility for governance of a registry and its contents.

1.7 REFERENCES

The following documents contain provisions which, through reference in this text, constitute provisions of this Record. At the time of publication, the editions indicated were valid. All documents are subject to revision, and users of this Recommended Practice are encouraged

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[1] From *ebXML Registry Information Model*.

to investigate the possibility of applying the most recent editions of the documents indicated below. The CCSDS Secretariat maintains a register of currently valid CCSDS documents.

[1]   *Organization and Processes for the Consultative Committee for Space Data Systems*. ~~Draft Space Data System Standards,~~Issue 4. CCSDS Record (Yellow Book), CCSDS A02.1-Y-~~2.1d.   Draft Yellow Book.   Issue 2.1d.~~ 4. Washington, D.C.: CCSDS, ~~June 2011~~April 2014.

[2]   *CCSDS Publications Manual*. Issue 4. CCSDS Record (Yellow Book), CCSDS A20.0-Y-4. Washington, D.C.: CCSDS, April 2014.

[3]   *CCSDS SANA Registry Management Policy*. Issue 0. Draft CCSDS Record (Draft Yellow Book), CCSDS 313.1-Y-0. Washington, D.C.: CCSDS, October 2015.

[4]   "Spacecraft Identifier Agency Representatives." Space Assigned Numbers Authority (SANA). http://sanaregistry.org/r/agency_representatives.

[5]   "CCSDS Agency Registry." Space Assigned Numbers Authority (SANA). Forthcoming.

[6]   "CCSDS Agency HoD Registry." Space Assigned Numbers Authority (SANA). Forthcoming.

[7]   "CCSDS OID Registry." Space Assigned Numbers Authority (SANA). Forthcoming.

[8]   *CCSDS Working Group Procedures for SANA Registry Specification*. Issue 0. Draft CCSDS Record (Draft Yellow Book), CCSDS 313.2-Y-0. Washington, D.C.: CCSDS, November 2015.

2   OVERVIEW

The *Organization and Processes for the Consultative Committee for Space Data Systems* Yellow Book (reference [1]) defines SANA as follows:

1.3.1.4.7   Space Assigned Numbers Authority (SANA)

The core registrar for the CMC's activities is the SANA. Many space-mission protocols require that someone keep track of key protocol numbering assignments that were added after the protocol came out. Typical examples of the kinds of registries needed are for spacecraft IDs, protocol version numbers, reserved APIDs, and SFDU control authorities. The SANA provides this key configuration management service for CCSDS. The CMC approves the organization that will act as the SANA. Its public interface is focused through Web-based services provided by the Secretariat.

This document defines the roles, responsibilities, policies, and procedures that will be used to implement and guide the work of the SANA implementation and services. Specific policies for the SANA, and for CCSDS Areas and WGs, governing the creation, management, and use of certain CCSDS-wide or global registries is provided in the CCSDS Registry Management Policy (RMP) (reference [3]).

CCSDS WGs are strongly encouraged to contact the SANA at the earliest possible opportunity. The SANA Operator, in addition to operating the SANA registry, has an engineering role in working with each WG to design and deploy any registries that they require. This will include creation of a candidate registry, which must be in existence prior to Agency Review of the standard, and approval and documentation of the final registry prior to Blue or Magenta Book publication. *CCSDS Working Group Procedures for SANA Registry Specification* (reference [8]) is provided as a quick reference for WGs to develop registries.

3   SANA SCOPE AND ROLE

3.1   SCOPE

The SANA operator assigns and registers CCSDS protocol parameters and other CCSDS objects as directed by the criteria and procedures specified in CCSDS documents. SANA is the core registrar and first-level authority for CCSDS registries. The SANA registers a variety of standards-related information, such as protocol identifiers, agencies, service and data providers, XML schema, a glossary of terms, and other information that is used across CCSDS.

SANA manages only the protocol registries of the CCSDS, which owns the corresponding protocol space. Whenever a protocol space is not owned by CCSDS but its registry is of use to the CCSDS community, SANA may make reference to that external registry. For example, if CCSDS is using IP port numbers, SANA may reference the Internet Assigned Numbers Authority (IANA) port numbers registry within the SANA site, for convenience to the CCSDS community. However, the SANA operator shall not make any assignments of that protocol space, since it is not owned by CCSDS.

Any liaison role to other standards bodies is defined and coordinated by CMC, with direct liaison responsibility assigned as needed by the CMC.

3.2   ROLE

SANA is a service that provides technical configuration management and public access to registries of the CCSDS engineering community. The engineering design of CCSDS standards track and other documents is done within CCSDS WGs. SANA does not do such engineering. However, SANA staff will have to do some technical interpretation of CCSDS WGs' requirements, so SANA should be staffed appropriatelyThe SANA Operator has an engineering role in designing, creating, and deploying the actual registries. The SANA will interact with each WG to design and deploy any registries that they require. This includes creation of candidate registries prior to prototyping and interoperability testing of the standards that create them, and assisting in the registry approval process prior to final publication of the standards.

It is expected that the vast majority of SANA registries will be publicly available, but some provisions are made for restricted access to some registries. The SANA operator will maintain the SANA registries as an on-line, Web-accessible, presence.

From time to time, the work and services that the SANA operator provides will evolve as the engineering needs change.

3.3   CREATION AND TERMINATION

The existence and role of SANA are defined in this document and approved by the CMC. SANA is created by the CMC and reports administratively to the CMC and technically to the CESG. The CMC may terminate SANA operations at any time but must determine what alternative approach is to be used to maintain the registries after SANA termination. The CMC may change the SANA operator contract as necessary, but must ensure that the contract preserves the databases and transfers them to the new SANA operator.

3.4   REQUIREMENTS

The SANA role and function must adhere to the following requirements:

−   **Accountability**: requests to create or modify registries are tracked and managed.

−   **Traceability**: all requests and changes can be viewed or audited by the community, to the extent permitted by the CCSDS standards track document that specified the particular registry, and to the extent permitted by security concerns.

−   **Security**: Registries shall be verifiable for their content in a secure manner based on best practices. Registry files shall be copied and used by the CCSDS community, the space agencies, and industry. Some registries might also be embedded into products. Therefore, a digital signature is required to provide a way of verifying the consistency of the registry by the community at any time. The digital signature provides both the integrity validation and the source validation. SANA will provide registry support to all CCSDS members in a non-discriminatory manner. However, there may be security processes that could restrict access to certain entries or to distributed sections of the registry as specified in the defining document.

−   **Accessibility:** The SANA registries shall be accessible on line via a standard Web interface. Programmatic access to the SANA registries shall be provided via an HTTP/REST query interface.

3.5   SANA OPERATOR

The CMC appoints an organization or individual(s) to carry the task of creating, managing, modifying, and publishing the CCSDS registries. This organization is defined as the SANA operator. The process of choosing and designating the SANA operator is carried out by the CMC.

3.6   CESG RELATIONSHIP

The ~~CESG~~ SANA Operator should be informed by a WG of any new registries, or of changes to existing registries, prior to submitting the Red Book (or Pink Sheet) for agency review. The Secretariat shall notify SANA when a document ~~is being considered for~~ has

been submitted, prior to CESG approval. The SANA operator shall then provide to the CESG an assessment of whether a new registry, a new entry in an existing registry, or a modification to an existing registry is required and whether SANA has all the information it needs to execute such a task. When clarifications are needed, they should be handled prior to final approval of the document.

Once the candidate registry has been created, the SANA shall submit a resolution to notify the CESG of the registry status.

NOTE – The CESG will not permit any standard specifying a registry to be sent for agency review until a resolution documenting the existence of the registry has been provided by the SANA.

3.7 SANA STEERING GROUP

A SANA Steering Group (SSG) is appointed by the CMC to provide to the SANA operator technical and programmatic guidance related to ongoing operational and policy matters. The SSG is delegated responsibility for oversight of SANA operations, validation and confirmation of SANA operations, and acting as the first level of appeal for issues. In the event of issues with registries, policies, or practices, the SANA operator may ask the SSG for guidance. SANA issues to be resolved by the SSG should be sent to ssg@sanaregistry.org. The Membership of the SANA Steering Group is determined and approved by the CMC.

As needed, the SSG will meet with the SANA operator during CCSDS working meetings. Otherwise the SSG will work electronically or by teleconference as issues arise.

3.8 SANA CONSIDERATIONS

SANA Considerations shall be included in all CCSDS standards track documents. The SANA Considerations shall give sufficient information for SANA to make assignments, changes, or new registries. Even if the CCSDS standards track document does not add requirements to registries managed by SANA, the document's SANA Considerations shall indicate that. In a draft Recommended Standard the SANA Considerations section shall document the registry and provide guidance to the SANA Operator to implement it. In the published version of the document only the documentation of the final registry, and guidance to the user, shall remain.

3.9 CCSDS WORKING GROUP RELATIONSHIP

The CCSDS WGs requiring development of a new registry, or adaptation of an existing registry, shall contact the SANA operator at the earliest opportunity. The SANA operator shall work with CCSDS working groupsWGs to support them in the development of their registry requirements and registry contents, and to describe the types of parameters and objects that should be registered. The SANA operator shall work with CCSDS WGs to develop any missing criteria and procedures, which the SANA operator shall adopt when so

instructed by the CESG or when a new issue of this document with the new procedures is approved.

~~The SANA operator shall provide~~Annex B of this document provides guidelines to help protocol authors to write their SANA Considerations with the appropriate information. These guidelines ~~should~~ include the various ways to handle registration ~~and shall include~~ along with a template for the SANA Considerations. ~~The template should be incorporated in Publication Manual.~~The WG should also review *CCSDS Working Group Procedures for SANA Registry Specification* (reference [8]) for WG guidelines and the CCSDS RMP (reference [3]) for descriptions and use of Enterprise and Global registries. The RMP defines a set of CCSDS Organization and Person registries as well as policies on creation of Global registries. The SANA Operator is responsible for identifying any issues relating to proposed registries that do not align with this policy. All SANA relevant documents and guidelines will be available on the SANA Web site, along with SANA operator contact information.

3.10 NEW REGISTRIES

Starting at SANA creation, all new protocol registries required by CCSDS documents shall be created as part of SANA operations. A new registry shall be created by the SANA operator based on a CCSDS-approved document where the instructions to create the registry and the registration rules to add new registrations are documented. New registries and their associated policies must be specified in a Blue Book (Recommended Standard), Magenta Book (Recommended Practice), or Yellow Book that is normative upon CCSDS (such as this document). Working Groups that are planning addition of new registries shall first evaluate whether or not an existing registry may be adopted or easily adapted. In particular, re-use or extension of the existing Contact Registry (for all persons, HoD, AR, MACAO originator and reviser) or CCSDS Organization Registry (agency, observer, affiliate) must be considered. (See references [4], [5], [6], [7].) The SANA operator will review any requests for new registries and notify the CESG of any issues such as similar registries or objects being registered more than once.

The SANA operator shall notify the ~~CESG and the related~~ WG chairs when a new registry is ready for a preliminary ~~or final~~ review. Once the candidate registry has been created and approved by the WG, the SANA shall submit a resolution to notify the CESG of the registry status. It is the responsibility of the WG to test and validate the registry according to the rules that it established in the registry creation document. The Area Director for that WG or the CESG chair shall approve the registry. The SANA operator shall publish the approved registry prior to the final publication of the document that creates it.

3.11 REGISTRATION RULES

The SANA operator is the registration clerk, and it does not define the registration rules. Its role is to apply the rules defined in ~~CCSDS protocol~~the CCSDS Registry Management Policy or in CCSDS documents approved by the CMC to any new registration requests or changes to the registries.

The CCSDS document requesting the creation of a new registry must define which one of the following registration rules is to be used for adding new entries or for making changes to the registry:

a) Change requires a CCSDS approved document.

b) Change requires an engineering review by a designated expert. The expert or expert group (see 3.18). This is the Registration Authority for the registry. The Registration Authority for that registry is assigned by the CESG based on the WG recommendation.

c) Change requires no engineering review, but the request must come from the official representative of a space agency, or other registered organization, that is a member of the CCSDS. The official representative of an agency may differ for each registry.

d) Change requires no review; assignments are done on a first-come, first-served basis.

In the CCSDS document that defines the creation of a registry, the registration rule for that registry must be defined either within the above set of rules or by another rule. This provides guidance to the SANA operator on how to make assignments of new parameters for that registry. The CCSDS document that defines the registry must define the rules to be followed for update, modification, or removal of entries. The template for the specification of these rules is part of the template included in the SANA Considerations, annex B, of thethis document.

3.12 DELEGATION

Sub-registries, such as ranges of code points or sub-namespaces within a registry, may be delegated to other organizations, such as CCSDS member agencies or other organizations. In these cases, the delegated space within the SANA registry points to the delegated registry.

For registries that existed before SANA was created, the whole registry may be grandfathered and delegated to the organization already handling the registry. The SANA operator will create a link to the registry.

3.13 MODIFICATION TO THE STRUCTURE OF REGISTRIES

The SANA operator must not change the structure of any CCSDS registry without prior consent of the CESG or without a change in the CCSDS specification that created the registry. An example of a structure change is a change to the data model, such as the addition of a field or a change to the length or characteristics of a field.

Working Groups may request extension or adaptation of existing registries by describing that update in the SANA Considerations section of a new or updated CCSDS document. These changes will require concurrence of the identified SANA registration authority for the affected registry. The SANA operator, during design of the registry, may identify new fields that must be added to enable proper integration of the registry with other related registries.

An example is adding an organization Object Identifier (OID) reference to the related Organization registry entry. This shall be permitted as needed.

Working Groups may request changes to an existing registry by describing that update in the SANA Considerations section of a new or updated CCSDS document. These changes will require concurrence of the identified SANA registration authority for the affected registry.

If a registry space is full and cannot accommodate more registrations, the SANA operator cannot change the field length to accommodate more registrations until such a change is documented appropriately (such as in a CCSDS standards track document) and approved. This structure change requires an engineering review and should be done using the normal CCSDS engineering process, such as review by the appropriate WG and approval by the CESG and CMC.

The SANA operator shall advise the CESG about other considerations related to system engineering of the CCSDS registries. For example, the SANA operator shall notify the CESG when a registry space is nearing its full capacity, based on the rate of registration requests.

The SANA operator shall create a Object Identifier (OID) registry as defined in the RMP. It shall define procedures for automatically assigning new OIDs for contacts, organizations, assets, protocols and other objects, as required, to ensure that there is a consistent set of unique 'handles' for all identified objects that need such identifiers.

3.14 ASSIGNMENT REQUESTS TO AN EXISTING REGISTRY

Upon receiving assignment requests, the SANA operator shall, in a timely manner, either execute such assignments under the registration rule specified in the CCSDS standards track document that created the registry, or deny them for non-conformance with applicable technical requirements, based on the instructions to the SANA operator given in the related protocol documents.

3.15 SOURCE REGISTRY FILES

The SANA operator is responsible for maintaining the source of the CCSDS registry files. The SANA operator shall publish the CCSDS registries as well as related documents and objects to the appropriate places and services defined by the CESG, nominally by a Web interface.

While the SANA operator will follow the instructions in the CCSDS documents on how to structure a registry, a registry should normally have strong data typing. Currently, it is envisioned that the native format of the SANA source registries will be XML. However, presentation formats such as XHTML might also be provided by the SANA operator. Related files such as schemas and style sheets are to be designed and provided by the SANA operator.

3.16 SANA INFRASTRUCTURE

In order to carry its custodianship of the CCSDS registries, the SANA operator should have the following infrastructure in place for its operations.

– **File or database system to hold the registries and related files**.

– **A ticket tracking system, to track all requests for registrations, as well as requests from WGs for new registries or modifications to registries**. All electronic communications with a registrant or other CCSDS members regarding a specific request should go through the ticket tracking system. Any other communications means, such as fax, voice or video call, or paper shall be referenced in the relevant ticket. The ticket tracking system may be viewed or audited by the CCSDS management (CMC and CESG). Whenever feasible, SANA customers should be able to check the status of their requests online.

– **A versioning and archiving system, to enable the viewing of the history of a registry**. Any modification to a registry should contain a note referring to the ticket number in the tracking system for that modification. This system should be viewable by the CCSDS community, by means proposed by the SANA operator and agreed to by the CESG. For a given registry, the CESG or the CCSDS document might request disabling this feature.

– **Digital signature system, for digitally signing registries**.

– **Web server to provide browser and programmatic access to the registries and related files.**

– **Ability to host other information structuring and access mechanisms, such as OWL / RDF and SPARQL databases.**

– **Registration tracking system identifying the Requesting organization, Registration Authority, and Registration Policy for each registry.**

– **An alert system to enable any organization or person to register for email alerts relating to any change to structure or content (or both) of one or more registries.**

The SANA operator shall make available to the CCSDS community, on-line and free of charge, information about each current assignment, according to the specified security requirements, whenever appropriate.

SANA shall provide on-line facilities for the interested and/or authorized parties to request CCSDS registry updates and protocol parameter assignments.

3.17 PROCESS AND APPEAL

In case of technical, procedural, or policy issues, the SANA operator shall seek and follow technical guidance from the SSG. The SSG is to provide first level operational guidance for the SANA and to resolve issues between the SANA and the CCSDS WGs and areas.

In the event of any dispute between the SANA operator and the SSG, both shall seek guidance from the CESG, and, if not resolved there, from the CMC, whose decision shall be final.

3.18 EXPERT GROUP POLICY

Some registries may require the services of an Expert Group in order to assist the SANA Operator in managing their contents. Each expert group shall have a chairperson who will serve as the SANA operator PoC for engineering review.

As with all other CCSDS processes an Expert Group makes decisions based on consensus, as defined in Organization and

Processes for the Consultative Committee for Space Data Systems (reference [1]).

A 'CCSDS Expert Group' shall have the following characteristics:

a) An Expert Group shall be created at request of a Area, SIG, or the CESG itself.

b) Expert Group formation shall be approved by the CESG with concurrence of the CMC.

c) The Expert Group role shall be to provide long term governance or management oversight for one or more registries.

d) Registries shall be managed in the SANA, the Expert Group supports SANA operations of type b) registries as stated in Sec 3.11.

e) Membership and chair shall be proposed by the group that requests creation of the registry and approved by the CESG

f) Membership shall have expertise in the technical topic that is the subject of the registry.

g) Membership should have Area and Agency balance consistent with the elements of the CCSDS community affected by the registry.

h) The Expert Group may be disbanded by consensus of the CESG and concurrence of the CMC.

This definition of Expert Group is specific to the SANA. It is not expected that there will be more than one or two of these Expert Groups and they will be regulated by the CESG. Each Expert Group is expected to operate using electronic communications such as email or the

occasional telecons, as needed. Expert Groups are not intended to require significant resources nor meeting rooms at bi-annual meetings.

3.19 REGISTRY REQUEST / CREATION PROCEDURE

This document primarily describes the processes to be followed by the SANA Operator in the management and creation of registries. Additional information for the CCSDS WGs that are creating new registries or adapting existing registries is provided in *CCSDS Working Group Procedures for SANA Registry Specification* (reference [8]) and the CCSDS RMP (reference [3]).

ANNEX A

REGISTRY CANDIDATES

This annex contains a set of registries identified as candidates for initial registries when this document is updated. This list is made of formally or informally requested registries from CCSDS WGs. This list is for information purposes only. Before these registries are created or maintained by the SANA operator, the process described in this document must be followed, including inclusion in the appropriate CCSDS documents.

Registry candidates:

– SCID ~~registry (delegated)~~Registry changes

– CCSDS ~~objects and identifiers registry~~OID Registry and process updates

– Organization Registry and process updates

– Contact Registry and process updates

– URN Namespace Registry changes

ANNEX B

SANA CONSIDERATIONS

B1   OVERVIEW

This annex lists provides a template for the suggested SANA Considerations proposed for inclusionsection that is to be included in all CCSDS standardsnormative track documents. Examples of different customizations of the template are provided.

B2   NO SANA ACTION

When there is no SANA action required, the following text is suggested to be included into the CCSDS standards track document.

SANA Considerations

> *The recommendations of this document do not require any action from SANA.*

B3   NEW REGISTRY TO BE CREATED

When a new registry is requested to be created by the SANA operator, the following information should be included into the CCSDS standards track document. A SANA Considerations section that defines a new registry, as described in this section, shall be a Normative section in the CCSDS BB or MB document that defines it.

SANA Considerations for each new registry should contain:

−   the name of the registry

−   a short description of the registry purpose

−   the structure of the registry (column names, …)

−   a precise data type for each data, including boundaries

−   registration rule governing how the SANA operator will assign new parameters to that registry.

−   registry category (Enterprise [Organization, Person, Assets], global, WG/local) and Registration Authority

This text below is an example and should be adapted to the appropriate context. The initial version of this section, as shown, provides guidance to the SANA Operator.

Example B-1: New Registry

SANA Considerations

The recommendations of this document request SANA to create the following registry(ies).

Registry Description: The registry named FrameID documents mandatory and optional parameters that may be used in the FrameID field of XYZ link layer protocol.

The registry named FrameID consists of a table of parameters:

FrameID: an integer between 0 and 256

Description: a string of text describing the parameter

The initial registry should be filled with the following values:

FrameID	*Description*
0	*Reserved*
1	*Basic Frame*
2	*Extended Frame*

The registration rule for new values of this registry requires no engineering review, but the request must come from the official representative of a space agency, member of the CCSDS.

The final published version of the SANA Considerations should state:

The recommendations in this document have created the following SANA registry(ies), named {XYZ Registry} and located at http://sanaregistry.org.

B4   CHANGES TO AN EXISTING REGISTRY

When a change to an existing registry is requested to the SANA operator, the following information should be included into the CCSDS standards track document. The change may be adding new entries in the registry or a change in the structure of the registry. If a change in the structure of the registry is required, the SANA Considerations should contain the same information needed to create a new registry, such as data types, boundaries, registration rule, etc.

The text below provides examples and should be adapted to the appropriate context. The first example shows the addition of new records to an existing registry. The second example shows a structural change of an existing registry.

Example B-2: Change existing registry, add records

SANA Considerations

The recommendations of this document request SANA to update the FrameID registry by adding the following two new records.

FrameID	Description
3	*Compatibility Frame*
4	*IPv4 packet payload*

Example B-3: Change existing registry, add fields

SANA Considerations

The recommendations of this document request SANA to update the FrameID registry by adding the new name column.

The registry named FrameID consists of a table of parameters:

FrameID: an integer between 0 and 256

Name: a string of [a-zA-Z0-9] characters, limited to 256 chars maximum

Description: a string of text describing the parameter

The current registered entries will have the value as empty in their respective Name column.

The registration rule is not changed.

Example B-4: Change existing registry, add new organization role

SANA Considerations

The recommendations of this document request SANA to update the Enterprise Organization registry to add a new role for "relay spacecraft operator".

Registry Description: The registry named Organization documents mandatory and optional fields describing each of the CCSDS organizations. The Organization Role field identifies one or more roles that an organization may play in CCSDS.

The registry named Organization, as defined in reference [3], annex subsection B1, defines a field named "Organization Roles": Role name: Relay Spacecraft Operator

Description: Organization Roles types are defined in the OID registry, starting at OID 1.3.112.4.5.1. This is a new, unique OID that may be used to identify organizations of this type.

The current registered entries will remain as they were. This is to be added as a new role. The registration rule is not changed.