

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

CCSDS RECORD

CCSDS 313.0-Y-3

YELLOW BOOK

October 2020

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AUTHORITY

Issue:	CCSDS Record, Issue 3
Date:	October 2020
Location:	Washington, DC, USA

This document has been approved for publication by the Management Council of the Consultative Committee for Space Data Systems (CCSDS). The procedure for review and authorization of CCSDS documents is detailed in *Organization and Processes for the Consultative Committee for Space Data Systems* (CCSDS A02.1-Y-4).

This document is published and maintained by:

CCSDS Secretariat
National Aeronautics and Space Administration
Washington, DC, USA
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FOREWORD

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- Space and Upper Atmosphere Research Commission (SUPARCO)/Pakistan.
- Swedish Space Corporation (SSC)/Sweden.
- Swiss Space Office (SSO)/Switzerland.
- United States Geological Survey (USGS)/USA.

DOCUMENT CONTROL

Document	Title	Date	Status
CCSDS 313.0-Y-1	Space Assigned Numbers Authority (SANA)—Role, Responsibilities, Policies, and Procedures, CCSDS Record, Issue 1	July 2011	Original issue, superseded
CCSDS 313.0-Y-2	Space Assigned Numbers Authority (SANA)—Role, Responsibilities, Policies, and Procedures, CCSDS Record, Issue 2	May 2016	Issue 2, superseded
CCSDS 313.0-Y-3	Space Assigned Numbers Authority (SANA)—Role, Responsibilities, Policies, and Procedures, CCSDS Record, Issue 3	October 2020	Current issue

NOTE – Changes from the previous issue are too numerous to permit meaningful application of change bars.

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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 and SANA Operator 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). The processes, roles, and responsibilities of CCSDS Working Groups related to the SANA are defined in *Procedures for SANA Registry Specification* (see reference [8]).

1.3 APPLICABILITY

This document is applicable to the CCSDS processes for defining specifications of space communication protocols and related standards. It defines an operational entity called the SANA and a process that will allow creation and operation of registries for several different kinds of objects that will be used by protocol and data exchange standard designers, implementers, and users. The SANA registries are designed to be persistent and accessible, and the policies are intended to keep the contents up to date. This document is administrative in nature, but it defines CCSDS roles, 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 Partnership 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 operators of these registries on behalf of the engineering community. Separating such 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 are maintained on line and offer Web access as well as 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, WGs, and the CCSDS Secretariat.

The processing of registry additions and updates is described along with the required SANA infrastructure used to provide its services.

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

1.6 CONVENTIONS AND DEFINITIONS

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

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

SANA Steering Group, SSG: 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.

Review Authority: The person or organization that has responsibility for governance and engineering review of a registry and its contents.

Registration Authority: An entity such as an organization, a standard, or an automated facility that performs registration of one or more types of objects.

NOTE – Compliant with the CCSDS SANA Registry Management Policy (reference [3]), the above definition of Registration Authority covers the SANA and other CCSDS organizations that perform registration, such as the Secretariat.

¹ From [ebXML Registry Information Model](#).

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 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*. Issue 4. CCSDS Record (Yellow Book), CCSDS A02.1-Y-4. Washington, D.C.: CCSDS, 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 2. CCSDS Record (Yellow Book), CCSDS 313.1-Y-2. Washington, D.C.: CCSDS, October 2020.
- [4] “Contacts.” Space Assigned Numbers Authority. <https://sanaregistry.org/r/contacts>.
- [5] “Organizations.” Space Assigned Numbers Authority. <https://sanaregistry.org/r/organizations>.
- [6] “Roles.” Space Assigned Numbers Authority. <https://sanaregistry.org/r/roles>.
- [7] “OID Tree.” Space Assigned Numbers Authority. <https://sanaregistry.org/oid/tree/>.
- [8] *Procedures for SANA Registry Specification*. Issue 2. CCSDS Record (Yellow Book), CCSDS 313.2-Y-2. Washington, D.C.: CCSDS, October 2020.
- [9] R. Fielding and J. Reschke. *Hypertext Transfer Protocol (HTTP/1.1): Message Syntax and Routing*. RFC 7230. Reston, Virginia: ISOC, June 2014.

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 design and usage 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]). Specific guidance to Working Groups for specifying and documenting registries, and for interacting with the SANA Operator, is provided in *Procedures for SANA Registry Specification* (reference [8]).

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 in the Beta Web site, which must be in existence prior to the first Agency review of the standard, and approval, update, and promotion of the final registry to an Approved registry in the SANA Production Web site following Blue or Magenta Book publication.

3 SANA SCOPE AND ROLE

3.1 SCOPE

The SANA is the primary registration authority for any registries created by all CCSDS Areas and Working Groups.

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, contacts, service sites and apertures, data providers, XML schemas, Quasar catalogs, a glossary of terms, and other information that is used across CCSDS.

In addition to other kinds of registries, the SANA manages 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 cannot 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. The SANA Operator does have an engineering role in designing, creating, and deploying the actual registries that are specified in CCSDS Blue and Magenta documents. The SANA will interact with each WG to design and deploy any registries that they require. This includes:

- creating Candidate registries on a Beta site (<https://beta.sanaregistry.org>) prior to prototyping and interoperability testing of the standards that create them;
- assisting in the registry review and approval process; and
- performing the promotion from Beta to Production status after both the CESG and CMC give final approval to publish 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 all of the SANA registries as an on-line, Web-accessible, presence. Those that have access restrictions will require a login using the CCSDS Collaborative Work Environment (CWE) login ID and a SANA specific password.

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 ask the Secretariat to change the SANA Operator contract as necessary, but must ensure that the contract preserves intact the databases, services, interfaces, and processes, and transfers them to the new SANA Operator to support on-going operations and maintenance of the SANA for CCSDS and the user community.

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 style query interface using the GET method (see reference [9]).

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 Secretariat with CMC concurrence.

3.6 CESG RELATIONSHIP

The SANA Operator shall be informed by a WG of any new registries, or of changes to existing registries, prior to when the WG submits the Red Book (or Pink Sheet) for its first Agency review. The SANA Operator shall provide notice to the SSG that there is a new registry and a technical assessment of whether SANA has all the information it needs to create the registry. This notice shall be via an email to ssg@ccsds.mailman.org.

The new Candidate registry, or any alterations to the structure of an existing registry, will be managed by the SANA in the SANA Beta site, <https://beta.sanaregistry.org>. The CESG shall review the document (including the annex with Candidate registry) during the CESG Poll for releasing the document for its first Agency review. When clarifications or changes are required, they must be performed by the WG prior to the request for approval of the document for Agency review.

As part of the final CESG review and approval of CCSDS Blue and Magenta documents prior to publication, the CESG will again review the documents and what should, at this point in the process, be the final form of the registry, with at least representative contents. This last technical review of the registry and representative contents will be done as part of the normal CESG review prior to approval to publish. As a consequence of the CESG and the CMC approval of the document for publication the registry is also approved. This will trigger promotion of the registry from Candidate status on the Beta site to Approved status on the SANA Production site.

The CESG will not permit any standard specifying a registry to be sent for Agency review until the existence of the registry, and a check of its structure and contents, has been verified and approved on the SANA Beta site.

3.7 SECRETARIAT RELATIONSHIP

The Secretariat has four key roles vis-à-vis the SANA.

- a) The Secretariat is the Registration Authority for the Organizations and related Contacts in these registries. It processes all requests for new Member or Observer Agencies and for changes to Heads of Delegation. It makes these updates directly in these SANA registries via a SANA-provided Web interface.
- b) The Secretariat (Tech Support) processes all requests for CCSDS CWE access, which is used to control access to the CCSDS CWE Web site and for meeting registration.

This CWE user registry is accessed by the SANA using a Web interface provided by the Secretariat Web site. This is used to update the SANA list of Contacts who have CWE credentials, and this is used to control access to the small number of SANA Web sites that require such controls.

- c) The Secretariat (Chief Technical Editor [CTE]) is responsible for editing, processing, formatting, and managing the review of all CCSDS documents. The CTE is the source of CCSDS document numbers as well as documenting the results of the CESG, CMC, and Agency document reviews. The CTE is the 'gatekeeper' for document approvals.
- d) Once a document is approved for publication by the CESG and CMC, the CTE will finalize the document by making any necessary editing changes. One of these changes will be to point any registry URLs to the Production SANA site and to notify the CCSDS technical support team that the new document contains a registry. The CTE passes the document to the CCSDS technical support team, who load the document into the Publications area of the CCSDS Web site, notify the SANA of publication, and provide a normalized URL for the document to the SANA. The SANA then moves the Candidate registry from the Beta site to the Production site, promotes the registry to Approved, and updates the References registry to point to the normalized URL for the document.

3.8 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@mailman.ccsds.org.

The Membership of the SANA Steering Group is determined and approved by the CMC. By default the chair of the SSG is the Systems Engineering Area Director (SEA AD), who is also a member of the CESG. Key stakeholders, including a representative of the SANA Operator, CCSDS Secretariat staff (the CTE and CCSDS technical support team), and representatives of affected Areas and WGs, will be the other members.

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.

3.9 SANA CONSIDERATIONS

A SANA Considerations subsection shall be included in an annex of all CCSDS standards-track documents. In a draft Recommended Standard/Practice (i.e., Red or Pink book) the SANA Considerations annex subsection shall document the registry, its design, and operating rules, to provide guidance to the SANA Operator on how to implement it. In the published version of the document only the documentation of the final registry, guidance to the user, and a pointer to the Production registry shall remain.

In situations where the CCSDS standards track document does not add requirements to registries managed by SANA, the document's SANA Considerations shall explicitly indicate that.

Other details about the required contents and structure of SANA Considerations annex subsection, guidance to the WG in documenting it, and the process for creating and validating the registry, are to be found in the *Procedures for SANA Registry Specification* (reference [8]).

3.10 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. This must occur before the WG requests that any draft Blue or Magenta Book containing a registry be sent out for the first Agency review. The SANA Operator shall work with CCSDS WGs 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.

Annex A of *Procedures for SANA Registry Specification* (reference [8]) provides guidelines to help document authors to write their SANA Considerations and include the necessary information. These guidelines include the various ways to handle registration along with a template for the SANA Considerations. The WG may also need to review the CCSDS RMP (reference [3]) for descriptions and use of Enterprise and Global registries. The RMP defines the set of CCSDS Organization and Contacts Enterprise registries as well as policies on creation of Global and Local registries.

The SANA Operator is responsible for identifying any issues relating to proposed registries that do not align with this policy. During the CESG poll prior to first Agency review, the CESG is responsible for verifying that SANA and registry requirements are met, that the Candidate registry exists and is in appropriate form before approving the document for first Agency review. During the CESG poll for publication the CESG is responsible for verifying that the registry is in production form prior to approving the final document defining the registry for publication. Production form means that the registry exists, has appropriate structure, and is accessible. The contents of registries may change after publication. All SANA-relevant documents and guidelines will be available on both the SANA and CCSDS Web sites, along with SANA Operator contact information.

3.11 NEW REGISTRIES

Starting at SANA creation, all new protocol registries required by CCSDS documents shall be created as part of SANA operations. A new Candidate registry shall be created by the SANA Operator on the SANA Beta site based on a draft CCSDS 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 the RMP). In rare cases an Orange Book (Experimental) spec may create a registry, but these will never appear in the Approved list and will remain in Candidate status.

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, Head of Delegation [HoD], Agency Representation [AR]) 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 and SSG of any issues such as similar registries or objects being registered more than once.

The SANA Operator shall notify the WG chairs when a new registry is ready for a preliminary review. Once the Candidate registry has been created in the Beta site and approved by the WG, the SANA shall send an email to ssg@mailman.ccsds.org to notify the SSG 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 shall review the registry on the SANA Beta site prior to requesting that the document be sent out for its first Agency review.

The Candidate registry will persist on the SANA Beta site until the document is approved by the CESG for final publication. The WG may make any needed edits or changes to the registry on the Beta site by providing the change information to the SANA Operator and documenting the changes in the draft SANA Considerations annex subsection. The WG may load data into the Candidate registry on the Beta site.

NOTE – New Candidate registries on the Beta site have access to the full suite of other registries, which are also copied to the Beta site. Use of the Beta site is essential to preserving the stability and integrity of the Production Web site.

3.12 REGISTRATION RULES²

The SANA Operator is the registration clerk, and it does not define the registration rules. Its role is to apply the rules defined in the CCSDS Registry Management Policy (cf. reference [3]) or in CCSDS documents approved by the CMC to any new registration requests or changes to the registries.

² Repeated in reference [8].

The CCSDS Area or Working Group requesting creation of a new registry (cf. reference [8]) must state 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 or expert group (see 3.19). This is the Review Authority for the registry. The Review 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 an official representative of a space agency, or other registered organization, who is a registered 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 included in the SANA Considerations, annex A of *Procedures for SANA Registry Specification* (reference [8]).

3.13 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, Areas or Working groups, 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.

3.14 MODIFICATION TO THE STRUCTURE OF REGISTRIES

The SANA Operator must not change the structure of any CCSDS registry without prior consent of the SSG and 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 annex subsection of a new or updated CCSDS document. These changes will require concurrence of the identified SANA Review 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 or other fields to maintain referential integrity of the underlying databases. This shall be permitted as needed.

Working Groups may request changes to an existing registry by describing that update in the SANA Considerations annex subsection of a new or updated CCSDS document. These changes will require concurrence of the identified SANA Review 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 structural change requires an engineering review and should be done using the normal CCSDS engineering process, including review by the appropriate WG and the SSG, and approval by the CESC and CMC using the normal polling process.

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

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

3.15 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.

3.16 SOURCE REGISTRY FILES

The SANA Operator is responsible for maintaining the sources 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 CESC, 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.

3.17 SANA INFRASTRUCTURE

In order to execute 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 CESC). 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 CESC. For a given registry, the CESC 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, Review 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.**
- **A backup and recovery system.**

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

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

3.18 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.

3.19 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 point of contact 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 created with consensus of the CESG and with approval by 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 by acting as the Review Authority for type b) registries as stated in 3.12.
- 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 approval by 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 overseen 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 but may occasionally require meeting rooms at semiannual meetings.

3.20 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 *Procedures for SANA Registry Specification* (reference [8]) and the *CCSDS SANA Registry Management Policy* (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 changes;
- CCSDS OID Registry and process updates;
- Organization Registry and process updates;
- Contact Registry and process updates;
- URN Namespace Registry changes.

NOTE – At the time of publication of this update, all of these prior registries have been migrated to, updated, and approved on the SANA Web site.