

# **RDAP for Space Objects**

**draft-blanchet-regex-rdap-space**

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# Introduction

- Objects and networks in space are owned by entities, have locations and have identity or network address.
  - Browse <https://sanaregistry.org> to have an (incomplete) view
    - Space Assigned Numbers Authority(SANA) was created using the IANA model to provide registry services to the space standards community, mainly CCSDS , ISO, IOAG
- Requirements for providing an access protocol to those objects are 99% in line with the requirements and implementation of RDAP, including REST API, **authenticated-authorized access** to some objects or objects data, **redacting** some fields, ...
- An RDAP space objects server may also serve RDAP Internet objects too.
- Reinvent the wheel or re-use RDAP? This work is to reuse RDAP.

# Queries

- Proposal to have a prefix in the path to create its own namespace for the queries. « /space » for now. Enables each namespace to evolve without having to take care of the possible clash of queries
- Two examples: OID and CBHE Node Numbers. Many others: assets, service sites, ...

# Queries: OID

- OID: all objects are identified uniquely by an object ID, from the official ISO OID tree.
- Syntax: space/oid/<oid>
  - <https://examplespacerdapserver.org/rdap/space/oid/1.3.112.4.7.84>
    - returns data for the NASA Mars Reconnaissance Orbiter spacecraft.
  - <https://examplespacerdapserver.org/rdap/space/oid/1.3.112.4.34.1>
    - returns the data for a range of Bundle Protocol Node numbers belonging to NASA Goddard.

# Queries: CBHE Node Numbers Path Segment

- Bundle protocol CBHE node numbers[RFC5050] are specified by a range of two unsigned integers separated by '-'. In case of a single node number, only the number is specified.
- Syntax: space/cbhe/<number-range>
- <https://examplespacerdapserver.org/rdap/space/cbhe/100-256>
  - returns the data for this range.
- <https://examplespacerdapserver.org/rdap/space/cbhe/45623>
  - returns the data for this specific node.

# JSON Responses

- Use JSContact instead of jCard as in RFC9083
- Some examples: service site, aperture
- Nota Bene: current examples are straight from current database objects converted to JSON. Final properties naming and syntax TBD (for example, align with current RDAP data model, specially for common objects).

# Service Site

- {
- "objectClassName": "serviceSite",
- **"OID": "1.3.112.4.9.76"**,
- "Name": "Svalbard",
- "Abbreviation": "SVLBRD",
- "Aliases": [],
- "Location Type": "Surface",
- "Planetary Body": "Earth",
- "Country": "Norway",
- "City": "Svalbard",
- "Latitude": "-02.996090",
- "Longitude": "+040.194663",
- "Elevation": 456.01,
- "Requestor": "1.3.112.4.2.222",
- "Affiliation": "1.3.112.4.1.37",
- "Apertures": [
  - **"1.3.112.4.9.76.1"**,
  - "1.3.112.4.9.76.2",
  - "1.3.112.4.9.76.3"],
- "Owner": "1.3.112.4.1.37",
- "CreatedBy": "1.3.112.4.2.2",
- **"Creation date":**  
"2018-11-01T14:21:19.891375+00:00",
- "UpdatedBy": "1.3.112.4.2.2",
- "Update date":  
"2018-11-01T15:00:00.255626+00:00"
- }
-

# Apertures

- {
- "OID": "1.3.112.4.9.76.3",
- "Name": "SDA5",
- "Aliases": [],
- "Forward Links": [],
- "Return Links": [  
• "1.3.112.4.9.76.3.1"
- ],
- "Location Type": "Surface",
- "Planetary Body": "Earth",
- "Latitude": "+781339.72",
- "Longitude": "+0152531.8",
- "Elevation": 460.68,
- "Diameter": null,
- "Aperture Type": null,
- "Pointing Constraints": [],
- "Available Services": [],
- "Created By": "1.3.112.4.2.2",
- "Creation date":  
"2018-11-01T14:58:33+00:00",
- "Updated By": "1.3.112.4.2.2",
- "Update date":  
"2018-11-01T17:54:58.889530+00:00"
- }



# Considerations

- Transport
  - This document assumes that queries about space objects and networks are done on the regular Internet to servers located on Earth, therefore the transport of such queries would use the same transport as specified by standard RDAP queries for domain names or IP addresses. It should be possible to carry those queries in space over an appropriate transport, such as DTN. However, this specification does not describe such transport.
- Finding Authoritative Servers
  - The space community runs a service similar (and in fact inspired by) to IANA, named Space Assigned Numbers Authority (SANA) [sana]. Similar to [RFC9224], this document specifies the bootstrap registry located at IANA with initial values
- OID Bootstrap Registry
  - IANA will setup a new bootstrap registry for OIDs. The keys are the root of the OID subtree delegated to a specific RDAP server. The registry will be initially populated with a single entry ["1.3.112.4"], ["https://rdap.sanaregistry.org/"]

# Conclusion and Next Steps

- Space objects and networks have similar properties as RDAP objects: owner, id, contact, ...
- Registration access has very similar requirements as RDAP, including authentication-authorization, redaction, ...: re-invent the wheel or reuse?
- Examples of queries and responses has been presented. Final syntax TBD.
- Interest in regext? Valuable as this would be really RDAP.