Space Link Identifiers
Potential SANA Registries

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Purpose

- « Convert » Space Link Identifiers Blue Book (135) into SANA registries

- SANA will then maintain the registries based on the registration policies defined.

- No more need to update the Blue book for new assignments

Standard in Registries

- Included but not mentioned in following slides:

  - All registry assignment have a reference column (ccsds book, …)

- « Best » Current Practices:

  - On limited length fields, reserve one codepoint (usually all 0 or all 1) for future extensions.

- Possible practices:

  - Different ranges with different policies

3. CFDP Entity ID

- 135: «Managed by projects; No value is reserved »

- Parameter shall be unique (session). But store and forward (source, destination, reporting eid)?

- Choices:
  - No registry
  - SANA managed registry
    - registration policy: agency rep?
    - Variable length
    - Schema: entity id, length, agency, start/end time

4. SCPS-TP Connection ID

- 135: «Managed by projects; No value is reserved »

- Choices:

  - No registry

  - SANA managed registry

    - registration policy: agency rep?
    - 8 bit field
    - Schema: connection id, agency, start/end time

5.1 Application Process ID

- 135: «Managed by projects; Some id reserved »

- Choices:

  - SANA managed registry

    - registration policy:
      - Range for CCSDS (color) books? 2040-2047
      - 0-2039: agency rep?

      11 bit field

    - Schema: apid, apid qualifier, description, agency, start/end time?

5.1 Application Process ID

APID	APID Qualifier Type	APID Qualifier Value	Description	Agency	Reference
2040-2044			Reserved		CCSDS 133
2045			CFDP		CCSDS 727
2046			ISO		ISO 8473
2047			Idle Packet		CCSDS 133

6 SCPS-NP Domain ID

- 135: No procedure defined

- IP addresses: 10.X.Y.Z (X.Y = Domain ID). (IP addresses are classless these days...)

- Choices:
  - No Registry
  - SANA managed registry
    - registration policy:
      - agency rep?
    16 bit field
    - Schema: Domain ID, description, agency, start/end time?

6 SCPS-NP End-System ID

- 135: Managed by projects.

- IP addresses: 10.X.Y.Z (Z = End system ID)

- Choices:

  - No Registry

  - SANA managed registry

    – registration policy:

      - agency rep?

      7 bit field

    – Schema: End System ID, description, agency, start/end time?

6 SCPS-NP Path ID

- 135: Managed by projects

- IP addresses: 10.X.Y.Z (Z = Path ID)

- Choices:

  - No Registry

  - SANA managed registry (combined with end-system id?)

    - registration policy:

      - agency rep?

      7 bit field

    - Schema: Path ID, description, agency, start/end time?

6 SCPS-NP Transport Protocol ID

- 135: See values in 713

- Choices:
  - No Registry
  - SANA managed registry
    - registration policy:
      - book?

      4 bit field
    - Schema: TP ID, description, IP mapping?

6 SCPS-NP Transport Protocol ID

Value	Description	IP number

Table 3-2: Assigned TP-ID Values

Binary Value	Protocol	Binary Value	Protocol
0000	Reserved	1000	SCPS-SP (reference [B7])
0001	SCMP (see 3.1.2.1)	1001	Unassigned
0010	Unassigned	1010	IPv6 ATH (reference [B9])
0011	Unassigned	1011	IPv6 ESP (reference [B10])
0100	Compressed SCPS-TP TCP (reference [B8])	1100	Unassigned
0101	SCPS-TP UDP (reference [B8])	1101	Unassigned
0110	SCPS-TP TCP (reference [B8])	1110	Unassigned
0111	Unassigned	1111	Unassigned

NOTE – Correspondence between TP-ID values and IP numbers is indicated in table 3-3.

Table 3-3: Mapping of Assigned SCPS TP-ID Values to IP Numbers

Protocol	SCPS TP-ID Number	IP Number
SCMP	1	None
Compressed SCPS-TP TCP (reference [B8])	4	105
(SCPS-TP) UDP (reference [B8])	5	17
(SCPS-TP) TCP (reference [B8])	6	6
SCPS-SP (reference [B7])	8	99
IPv6 ATH (reference [B9])	10	51
IPv6 ESP (reference [B10])	11	50

7 Transfer Frame Version

- 135: table defined.

- Choices:

  - No Registry

  - SANA managed registry

    – registration policy:

      - book?

      2 bit field

    – Schema: TF Version, description

7 Transfer Frame Version

Table 7-2: Defined Transfer Frame Version Numbers

Version Number	Binary Encoded Version Number	Transfer Frame	Reference
1	00	TM Transfer Frame	[8]
1	00	TC Transfer Frame	[9]
2	01	AOS Transfer Frame	[10]
3	10	Version 3 Transfer Frame	[11]

7 Spacecraft ID

- 135: « assigned by CCSSD ». 320 describes the registration policies.

- Choices:

  - Registry currently managed by WDC

  - SANA managed registry would require update of 320.

  - Plan for now is that SANA creates a copy of the spacecraft id registry, SANA formatted (XML, tagged, structured, schema, …) and note to refer to WDC for normative version.

7 Virtual Channel ID

- 135: « Managed by projects ». see table

- Choices:

  - No registry

  - SANA managed registry

    - registration policy:

      - Book? agencies?

      6 bit field

    - Schema: VC ID, description

7 Virtual Channel ID

Table 7-3: Reserved Virtual Channel Identifiers (AOS Space Data Link Protocol Only)

VCID (binary)	Utilization	Reference
111111	Idle Transfer Frames	[10]

7 Frame Secondary Header ID

- 135: « Defined by CCSDS ». see table

- Choices:

  - No registry

  - SANA managed registry

    - registration policy:

      - CCSDS Book

      2 bit field

    - Schema: FS HID, description

7 Frame Secondary Header ID

Table 7-4: Defined Frame Secondary Header Version Numbers

Version Number	Binary Encoded Version Number	Frame Secondary Header	Reference
1	00	Version 1 Frame Secondary Header	[8]

7 CLCW Version

- 135: « Defined by CCSDS ». see table

- Choices:

  - No registry

  - SANA managed registry

    - registration policy:

      - CCSDS Book

    2 bit field

    - Schema: CLCW Version, description

7 CLCW Version

Table 7-5: Defined CLCW Version Numbers

Version Number	Binary Encoded Version Number	CLCW	Reference
1	00	Version 1 CLCW	[9]

7 Packet Version

- 135: « Defined by CCSDS ». see table

- Choices:

  - No registry

  - SANA managed registry

    - registration policy:
      - CCSDS Book

      3 bit field

    - Schema: Packet Version, description

7 Packet Version

Table 7-6: Defined Packet Version Numbers

Version Number	Binary Encoded Version Number	Packet	Reference
1	000	Space Packet	[6]
2	001	SCPS-NP	[7]
8	111	Encapsulation Packet	[13]

7 Protocol Id

- 135: « Defined by CCSDS ». see table

- Choices:

  - No registry

  - SANA managed registry

    – registration policy:

      - CCSDS Book

    3 bit field + 4bit (extended field)

    – Schema: Protocol ID, Extended field, description

7 Protocol Id

Table 7-7a: Defined Protocol Identifiers

Protocol Identifier (binary)	Protocol	Reference
000	Fill (the encapsulation data field, if present, contains no protocol data)	N/A
001	Reserved by CCSDS	N/A
010	Internet Protocol Extension (IPE)	annex A
011	CFDP	[4]
100	Reserved by CCSDS	N/A
101	Reserved by CCSDS	N/A
110	Extended Protocol ID for Encapsulation Service	[13]
111	Arbitrary Aggregations of Octets	N/A

Table 7-7b: Extended Protocol Identifiers

Protocol Identifier (binary)	Protocol	Reference
0000 through 1111	Reserved by CCSDS	N/A

7 Proximity Port ID

- 135: « Defined by CCSDS ». see table

- Choices:

  - No registry

  - SANA managed registry

    - registration policy:

      - CCSDS Book

      3 bit field

    - Schema: Port ID, Forward/Return, description

7 Proximity Port ID

Table 7-8a: Proximity-1 Port ID Assignments for the Forward Link for Both Physical Channels

Port Identifier (binary)	Usage	Reference
000	Bitstream	N/A
001	Hardware Commands	N/A
010	Packets	[6], [7], [13], [17]
011	Reserved by CCSDS	N/A
100	Reserved by CCSDS	N/A
101	Reserved by CCSDS	N/A
110	Reserved by CCSDS	N/A
111	Reserved by CCSDS	N/A

Table 7-8b: Proximity-1 Port ID Assignments for the Return Link for Both Physical Channels

Port Identifier (binary)	Usage	Reference
000	Bitstream	N/A
001	Reserved by CCSDS	N/A
010	Packets	[6], [7], [13], [17]
011	Reserved by CCSDS	N/A
100	Reserved by CCSDS	N/A
101	Reserved by CCSDS	N/A
110	Reserved by CCSDS	N/A
111	Reserved by CCSDS	N/A

7 IPE header

- 135: « Defined by CCSDS ». see table

- Choices:

  - No registry

  - SANA managed registry

    – registration policy:

      - CCSDS Book

      8 bit field (1 bit reserved for extension

    – Schema: IPE header number, description

7 IPE header

Table A-1: Enumerations for the IPE Header Values

IPE Header Value	Protocol Encapsulated	Reference
33	IPv4 datagram	[17]
35	Frame Relay IP Header Compression Control Protocol (NOTE 1)	[21], section 4
87	IPv6 datagram	[18]
97	FULL_HEADER	[19]
99	COMPRESSED_TCP	[19]
101	COMPRESSED_TCP_NO_DELTA	[19]
103	COMPRESSED_NON_TCP	[19]
105	COMPRESSED_RTP_8	[20]
107	COMPRESSED_RTP_16	[20]
109	COMPRESSED_UDP_8	[20]
111	COMPRESSED_UDP_16	[20]
113	CONTEXT_STATE	[19], [20]

Next Steps

- Other registries from Space link protocols?
- Looks like an update to 135, with SANA Considerations section.

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