

# LTP, CBHE, and BP Registries

draft-dtnrg-ltp-cbhe-registries

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# Background

- Licklider Transmission Protocol (LTP, RFC5326), Compressed Bundle Header Encoding (CBHE, RFC6260) – which also defines the ‘ipn’ bp naming scheme – and Bundle Protocol (BP, RFC5050) are being adopted by the Consultative Committee for Space Data Systems (CCSDS) as the reliable data link layer, naming/addressing scheme, and internetworking layer for use in the Solar System Internet (SSI)
- This document establishes registries for the fields that need to be managed in LTP, CBHE, and BP in order to use them for space missions and, where applicable, assigns portions of the namespaces to the Space Assigned Numbers Authority (SANA) for use by CCSDS space agencies
  - Reserves shorter (SDNV-encoded) values for space missions with extreme bit efficiency concerns

# Overview of Requested Registries

- LTP
  - Cancel Reason Codes
  - LTP Engine ID
  - LTP Client Service ID
- CBHE (IPN Name Scheme)
  - CBHE Node Numbers
  - CBHE Service Numbers
- BP
  - Bundle Administrative Record Types

# LTP Cancel Reason Codes

- Identifies to the peer LTP engine why an LTP session was canceled
- Registration Policy: RFC Required
- Initial Values:

Value	Description	Reference
0	Client service canceled session	<a href="#">[RFC5326]</a>
1	Unreachable client service	<a href="#">[RFC5326]</a>
2	Retransmission limit exceeded	<a href="#">[RFC5326]</a>
3	Miscolored data received	<a href="#">[RFC5326]</a>
4	System error caused termination	<a href="#">[RFC5326]</a>
5	Retransmission limit exceeded	<a href="#">[RFC5326]</a>
0x06-0xFF	Unassigned	This document

# LTP Engine ID

- Uniquely identifies an LTP Engine among all its peers
- SDNV encoded value
- Could re-use LTP engine IDs so long as the same engine ID is never re-used within a 2-hop neighborhood
  - Deployments can use private/experimental space if they want to do this, e.g.
- There is a desire to use the same LTP Engine ID and CBHE Node Number (discussed later) to simplify binding BP node to LTP engine in space applications
  - Requires a registry / global allocation

# LTP Engine ID

- Registration Policy:

1—(2\*\*14)-1 (1- and 2-byte IDs):

Expert review by dtng or as designated by IRSG

2\*\*14 – (2\*\*21)-1 (3-byte IDs):

Allocated to SANA for use by space missions

2\*\*21 – (2\*\*28)-1 (4-byte IDs):

Private / experimental use

2\*\*28 – (2\*\*42)-1:

First-come, first-served for requests of (2\*\*14)-1 or fewer values; expert review by dtng or as designated by IRSG for larger requests

- Initial Values

Value	Description	Reference
0	Reserved	This document
1--(2**14)-1	Unassigned	This document
(2**14)--(2**21)-1	Allocated to CCSDS (SANA)	This document
(2**21)--(2**28)-1	Private/Experimental Use	This document
(2**28)--(2**42)-1	Unassigned	This document
>=(2**42)	Reserved	This document

# LTP Client Service ID

- Identifies the protocol layer service above LTP (next-proto field)
- SDNV encoded value
- Registration Policy:
  - 4 –  $(2^{14})-1$  (1- and many of the 2-byte service IDs):
    - Allocated to SANA for use by space missions
  - $2^{14}$  –  $(2^{16})-1$  (the rest of the 2-byte service IDs):
    - Private / experimental use
  - $\geq 2^{16}$ 
    - Expert review by dtnrg or as designated by IRSG
- Initial Values:

Value	Description	Reference
0	Reserved	<a href="#">[RFC5326]</a>
1	Bundle Protocol	This document
2	LTP Service Data Aggregation	This document
3	CCSDS File Delivery Service	This document
4-- $(2^{14})-1$	Allocated to CCSDS (SANA)	This document
$(2^{14})--32,767$	Private / Experimental Use	This document
$\geq 32,768$	Unassigned	This document

*LTP Service Data Aggregation (SDA) is defined in the 'LTP for CCSDS' specification; defines a way to MUX/DEMUX multiple bundles into a single LTP Block*

# CBHE Node Number

- Uniquely identifies the BP node in the ‘ipn’ scheme (akin to IP address)
- SDNV encoded value
- Registration Policy:

1 – (2\*\*14)-1 (1- and 2-byte service IDs):

Expert review by dtng or as designated by IRSG

2\*\*14 – (2\*\*21)-1 (2- and 3-byte service IDs):

Allocated to SANA for use by space missions

2\*\*21 – (2\*\*28)-1 (4-byte service IDs):

Private / experimental use

2\*\*28 – (2\*\*42)-1 (4-byte service IDs):

First-come, first-served for requests of (2\*\*14)-1 or fewer values; expert review by dtng or as designated by IRSG for larger requests

- Initial Values:

Value	Description	Reference
0	Reserved	This document
1--(2**14)-1	Unassigned	This document
(2**14)--(2**21)-1	Allocated to CCSDS (SANA)	This document
(2**21)--(2**28)-1	Private/Experimental Use	This document
(2**28)--(2**42)-1	Unassigned	This document
$\geq(2**42)$	Reserved	This document



# CBHE Service Number

- Uniquely identifies the BP ‘service’ in the ‘ipn’ scheme (like a port number)
- SDNV-encoded value
- Registration Policy
  - 2 – 63 (some 1-byte service IDs):  
RFC Required
  - 64 – 127 (more 1-byte service IDs):  
Allocated to SANA for use by space missions
  - 128– (2\*\*16)-1 (2-byte service IDs):  
Specification required
  - >= (2\*\*16) (3+ -byte service IDs):  
Private / experimental use

- Initial Values:

Value	Description	Reference
0	Bundle Protocol Administrative Record	<a href="#">[RFC6260]</a>
1	CCSDS File Delivery Service	<a href="#">[CFDP]</a>
2-63	Unassigned	This document
64-127	Allocated to CCSDS (SANA)	This document
128 - 2**16-1	Unassigned	This document
>=2**16	Private/Experimental Use	This document

# Bundle Protocol Administrative Record Types

- Used to identify administrative information for Bundle Protocol (e.g. status reports, custody acknowledgements)
- 4-bit field in administrative records
  - Admin records are identified by a flag in the bundle processing control field of the primary bundle block
- Registration Policy:  
3 – 15:

RFC Required

- Initial Values

Value	Description	Reference
0	Reserved	This document
1	Bundle status report	<a href="#">[RFC5050]</a>
2	Custody signal	<a href="#">[RFC5050]</a>
3-15	Unassigned	This document