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Bundle Protocol Specification
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Summary

- New Bundle Protocol specification was posted 21 June 2015:
  - https://www.ietf.org/internet-drafts/draft-dtnwg-bp-00.txt
  - Authors: Scott Burleigh, Kevin Fall, Ed Birrane
  - Started from draft-burleigh-bpv7-00, removed items on which we clearly didn't have consensus and inserted new material on which we apparently do.
  - Includes a summary of ways in which this spec significantly differs from RFC 5050.
  - Includes a list of technical issues on which we have yet to come to agreement.

Differences from RFC 5050 (1 of 3)

- Clarify the difference between transmission and forwarding.
- Introduce the concept of "node ID" as functionally distinct from endpoint ID, while having the same syntax.
- Introduce a new method of encoding endpoint IDs (including node IDs) in a transmitted bundle, replacing both the "dictionary" and the CBHE compression mechanism. [Discussion on next slide.]
- Restructure primary block, making it immutable. Add ECOS features, optional CRC, optional inventory.

Endpoint ID Syntax

- Human-readable representation of EID is unchanged from RFC 5050: it's a URL, e.g.:
  - "dtn://bobs_iphone.xyz.com/files" (31 bytes)
  - "ipn:295.23" (10 bytes)
- "Encoded" representation in a transmitted bundle depends on (and indicates) URL scheme, e.g.:
  - 0x20 "//bobs_iphone.xyz.com/files" (28 bytes)
  - 0x01 0x82 0x27 0x17 (4 bytes)
- Analogous to IPv4 address encoding, e.g.:
  - "127.0.0.1" (9 bytes)
  - 0x7f 0x00 0x00 0x01 (4 bytes)

Differences from RFC 5050 (2 of 3)

- Clarify that the class of service field indicates priority and increase its size from 2 bits to 7 bits.
- Restrict the scope of bundle prioritization to all bundles from the same source.
- Add optional CRCs to non-primary blocks.
- Add block ID number to canonical block format (to support streamlined BSP).
- Amplify discussion of custody transfer. Move current custodian to an extension block, as it is mutable; define that block in this specification.

Differences from RFC 5050 (3 of 3)

- Add bundle age extension block, defined in this specification.
- Add previous node ID extension block, defined in this specification.
- Add flow label block, *not* defined in this specification.
- Add hop count extension block, defined in this specification.
- Clean up a disconnect between fragmentation and custody transfer that Ed pointed out.
- Remove “DTN time” values from admin records.

Open Technical Issues (1 of 5)

- "Definitions" section structure: one section or several?
- Payload nomenclature: nominal, fragmentary, partial?
- Application agent: description needed? Diagram needed?
- Can we define a procedure by which a set of nodes collectively transmits a bundle? Is there a use case that needs this capability?
- Can we define a procedure by which a set of nodes collectively takes custody of a bundle? Is there a use case that needs this capability?

Open Technical Issues (2 of 5)

- If BP were used for information-centric networking, would cache points “transmit” cached data to clients or would they just “forward” previously transmitted bundles of which they have retained copies?
- Should the BP spec be divided into two documents? One to talk about conops and context and one that focuses specifically on the protocol?
- Will the name of the DTN security protocol be Bundle Security Protocol or Streamlined Bundle Security Protocol?
- Bundle format: describe at start of section 4 or elsewhere?
- Should payload always be the last block in the bundle?

Open Technical Issues (3 of 5)

- Should the SDNV discussion in 4.1 be deleted? Should the structure of SDNVs be changed (in which case, should they be called “SDNVs” or something else)?
- Should the bit numbering convention described in section 4.2 be moved to another location in the document?
- ECOS features: omit some or all of these? Is “critical” the right name for the “critical” flag?
- Which specific CRC options should we require?
- Is the “inventory” mechanism in the spec good enough? Revise it, remove it?

Open Technical Issues (4 of 5)

- Should the payload always have block number zero?
- Should a node that is able to process a given extension block be permitted to clear block's "Block was forwarded without being processed" flag?
- Can supplementary DTN protocol specs contradict the BP spec?
- Who controls the time at which a bundle is forwarded to the next node, the BPA or the convergence-layer adapters?
- Should “DTN times” in status reports be retained but made optional? Or simply retained as mandatory?

Open Technical Issues (5 of 5)

- Should we prohibit multiple occurrences of any single block type, requiring that any necessary multiplicity be built into the block-type specific data structure?