Bundle Protocol Status IETF 99

Scott Burleigh

Jet Propulsion Laboratory

California Institute of Technology

17 July 2017

This research was carried out at the Jet Propulsion Laboratory, California Institute of Technology, under a contract with the National Aeronautics and Space Administration. © 2017 California Institute of Technology. Government sponsorship acknowledged.



draft-ietf-dtn-bpbis-07

- Posted 22 June 2017.
- Reflects consensus decisions on all comments received on draft-ietf-dtn-bpbis-06 except:
 - Still need to add authoritative references to CRC-16 and CRC-32 algorithms.
 - Failed to move CRC to the end of the Canonical Block header, an oversight.
- Includes removal of custody transfer.

17 July 2017



Custody Transfer in BIBE

- Posted Internet Draft draft-burleigh-dtn-bibect-00, a proposal to move Custody Transfer procedures into the Bundle-in-Bundle Encapsulation convergence-layer protocol specification rather than into a BP extension block specification.
- In this formulation Custody Transfer would be an optional feature of BIBE, turning BIBE into a reliable CL protocol like TCPCL except able to operate over disrupted links.

17 July 2017



Advantages of BIBE-CT (1)

- Preserves key benefit of CT: enables reliable bundle forwarding over a possibly disrupted unidirectional path with acknowledgments arriving over a different, possibly disrupted unidirectional path.
- Removal of CT from BP simplifies BP; smaller BP implementations.
- Clean interface, self-contained within BIBE, rather than injection of CT procedures at various points in BP processing.
- Can be combined with BIBE bpsec confidentiality and integrity, e.g., for defense against traffic analysis.

17 July 2017 4



Advantages of BIBE-CT (2)

- Simplifies CT itself:
 - No need for procedures to deal with partial custody transfer resulting from bundle fragmentation.
 - No need for special procedures in forwarding nodes that don't want to take custody.
- Compatible with multi-point delivery: each forwarding branch is a separate convergence-layer transmission, which can be BIBE-CT.
- Bundle Delivery Time Estimation (delivery at destination) can be used to compute CT retransmission timeout interval.

17 July 2017 5



Disadvantages of BIBE-CT

- Encapsulation in another bundle entails adding a second bundle header (primary block and extension blocks).
 Somewhat more overhead.
- Next custodian must be known, as it is the destination of the encapsulating bundle.
 - Not necessarily a problem for opportunistic forwarding, as the discovered neighboring node may typically be the node you want to transfer custody to.
 - Knowing the next custodian enables somewhat efficient timeouttriggered custodial retransmission.

17 July 2017 6