Reactive Fragmentation: *Observations and Thoughts*

William Ivancic (NASA GRC)

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DTN Multi-Ground Terminal Tests

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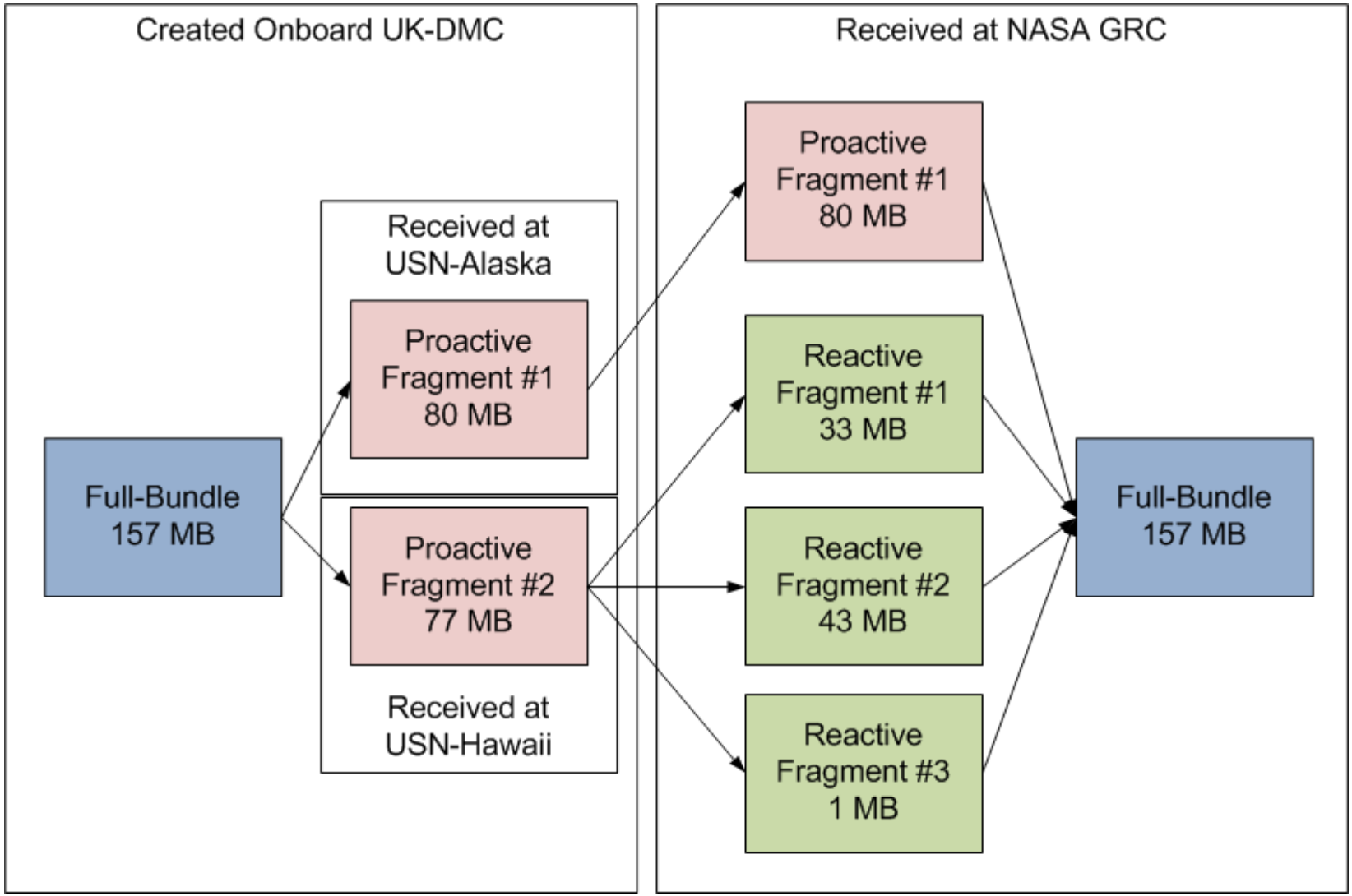

Observations

- TCP convergence layer transmission between Australia ground station and Cleveland destination was problematic.
  - Cause has yet to be determined.
- Without reactive fragmentation, these tests would have failed.
  - If bundle security protocol (BSP) bundle authentication block (BAB) was used, reactive fragmentation would have failed.
  - If per-hop reliability checks via the BSP payload confidentiality block (PCB), or even some other per-hop reliability check, were used, reactive fragmentation would have failed.
- This suggests need for outer bundle reliability wrapper, as discussed in **draft-irtf-dtnrg-bundle-checksum** section 4, to be able to confirm that a bundle is correctly reassembled and received after fragmentation.
- Conclusion: It is desirable to be able to perform reactive fragmentation and still be able to utilize BAB and some form of hop-by-hop reliability.

Thoughts

- If the bundle fragments take *the same path*, it may be possible to recombine the reactive fragments at the next hop and then check the BAB or bundle integrity.
  - This may not be *too* difficult.
  - This may be the dominant way in which bundles are forwarded. Only after large amount of deployments will we know if this is true.
- If the bundle fragments take *different paths* . . .
  - Requires some thought.
  - Integrity check may still be possible by per-calculations on chunks of the bundle.
    - But is this close to proactive fragmentation?
    - If a full chunk is not sent, next fragment must start at beginning of last partial chunk sent.
  - Other techniques may be available to perform integrity checks.