Routing in Fat Trees (RIFT) Update
draft-rift-rift-04

IETF 104, 3/19, Prague

The RIFT Authors
Update from -03

• Last version presented in Montreal -03
• We went to -04 since then
• Specification Holes pretty much all closed now
• Lost of Open Source Code written and interop’ed
• Once or twice weekly online meetings has been held by the ‘core crew’ on ongoing basis
  • Most meetings recorded and posted to mailing list
Update -03/-04, Green is Done

- Optimal Flooding Reduction and Load Balancing
- Fabric Bandwidth Balancing
- LIE FSM
- BFD Interactions
- Mobility
- ZTP FSM
- Security Envelope
- Positive Disaggregation
- Negative, Transitive Disaggregation
- Multi-Plane Super-Spine
- Flooded FSM and Procedures
- Multicast?
Rough Statistics

• Emails on “core contributor” email threads since last IETF: hundreds
• Commits on Open Source version since last IETF without branch merges: 380 (last time was 205)
• Lines on Open Source version patch since last IETF: 24’622 (last time was 15’897)
• Diff Size Between -03 and -04 specification: 5’683 lines of text (last time was 6’574) Objects on encoding model changed 3 (last time was 7)
• Ideas Discussed and Scrapped: Dozens and dozens ;-)
What Changed?

• Security Envelope and Security Model
• Packet Numbering (Debugging and Loss Detection)
• Sequence Number Arithmetic
• Link Capabilities
• More Tightening of Flooding Rules
• Clarifications on Flood Reduction Based on Open Source Implementation
  • Flooding In-Cast Reduction Explanation
Security Model

• Port-Association Model
• Node-Association Model
• Fabric-Association Model

• Can prevent all known attacks
  • Lifetime protected
  • Nonce exchange prevents replay
  • Origin integrity

• Does NOT
  • Provide confidentiality
  • Provide a chain-of-trust
Security Envelope

- RIFT Magic
- Outer Key Envelope
  - Generated link by link
  - Protected by Nonces, encapsulates TIE Lifetime
- Inner Key Envelope (only on TIEs)
  - Protects TIE
  - TIE can be passed through opaquely without deserialization
  - Allows to extend the model with optional elements without breaking backwards compatibility
New Link Capabilities

• Link
  • BFD available or not
Final Cases and Tightening of Flooding Rules

• Open Source Implementors ask lots of questions ;-) 
• Lifetime difference where lifetimes equal specified (60 secs) 
• Last case of flooding inconsistency
  • Only occurs if 3 levels reboot in a specific sequence and the bottom generates a lower number on its N-TIE that the biggest held and middle cannot get 
• Cosmetic change that asks a node to flush all other TIEs than its own on level change
  • Was leading to harmless but also useless TIEs hanging in a node until expiry
Flooding Incast Solved and Explained
Smaller Stuff

• Packet numbering on each packet type
  • Optionally increasing on each sent packet
    • Allows detection of losses on remote side and throttling

• Sequence Number Arithmetic
  • On TIE Types
  • Sequence Numbers

• Type Tightening
  • Types got smaller to save space (we don’t be too concerned about it but wasting if we can be more frugal is not wise)
    • Seq#
    • Packet Numbers
    • Level Type
    • Version Types

• Unsolicited, optional downstream label
THANK YOU FOR YOUR ATTENTION