RIFT Specification

Problems Understood, Spec’ed & Needing Bricking Up vs. Problems in Fluid State vs. Open Parts and Problems

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Requirements

• Should Be Likely Split into Separate Document
Schema

- Versioning
- Sharing Between Drafts
  - Optional Elements Without Defaults
  - Capabilities with “Mount-points”
  - Periodic Schema Reconciliation
  - Schema as Separate Document (?)
- Other Schema Languages
  - Encoding Variants (binary, compressed)
- Strongly Standardized IDL
  - IETF Reference to Thrift
LIEs

- FSM Needed
- ZTP Negotiation
- Security Hooks
- Default Addresses and Ports
Transport

- UDP
- No L2 SNAP, no L3 Protocol (?)
- No TCP Support (?)
- Transport Security (?)
TIEs & Flooding

- Scopes
- FSM & Procedures
- Serialization Optimizations

Local Flooding Reduction

Global Flooding Reduction

<table>
<thead>
<tr>
<th>UDP Header</th>
<th>Security Fingerprint Length</th>
<th>TIE Lifetime</th>
<th>Security Fingerprint (e.g. SHA)</th>
<th>LIE Nonces</th>
<th>Serialized RIFT Object</th>
</tr>
</thead>
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PGP

• Schema Definition
• Policy Definition
ZTP

- FSM
- LIE Extensions
- Level Selection Procedures
- Automatic System ID Selection
- Automatic Interface Addresses (?)
Reachability Computation

- All Paths Computation
- East-West Link
Automatic Disaggregation

- Normal Scenario
- Transitive Disaggregation on Super-Spine Partitioning
Southbound Default Route Origination

- Default Route Origination Southbound
- Using Non-Default Route
Update: Northbound Bandwidth Balancing

RIFT calculates the amount of northbound bandwidth available towards a node compared to other nodes at the same level and adjusts the default route distance accordingly to allow for the lower level to have different weights on load balancing.

**BAD_N:** Bandwidth Adjusted Metric to N

- **L_N_u:** as sum of the bandwidth available from L to N
- **N_u:** as sum of the uplink bandwidth available on N
- **T_N_u:** \( L_N_u + N_u \)
- **M_N_u:** \( \log_2(\text{next}\_\text{power}\_2(T_N_u)) \)
- **BAD_N:** \( D \times (1 + \text{maximum}\_\text{of}\_\text{all}(M_N_u) - M_N_u) \)

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Fabric Bandwidth Balancing

- Northbound Balancing
- Southbound Balancing
- Influence of N/S Traffic Ratio on BAD calculation
Key/Value Store

- Schema
- Use Cases
- Maximum Scale
- TIE-Breaking Rules
Other Technologies & Loose Ends

- Segment Routing
  - Node SIDs from Controller via KV or
  - Flat Flooding
- BIER
- BFD
  - S-BFD (?)
- Yang Models
- Route Redistribution
Implementations

• Public Binary Package Release in Immediate Preparation:
  • Announcement Will Be Posted to List
  • Standalone Binary Package Available in Next Few Weeks from Juniper for OSX & Linux
  • Large Parts of RIFT Implemented
  • Contains Environment to Build Fabrics Easily and Experiment With RIFT
  • Can Be Used to Test Interoperability Against It

• Open Source Implementation Encouraged
  • Leaf Version Much Simpler to Build