BIER Brownfield Migration Frameworks
draft-przygienda-bier-migration-options

BIER WG
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Tony Przygienda
Jeffrey Zhang
Juniper
Why

• BIER moved from “will it happen?” to “how do I brownfield BIER”
• We don’t have the luxury of greenfield deployments but that should not be a surprise
• Customers have different technology mixes in their networks and different comfort levels, timelines to introduce new ones
• This draft allows a “guided” framework what “brownfield” options are available and their properties
What

• Draft holding possible frameworks to brownfield BIER layer with
  – IGP underlay
  – Controller “underlay”
• Different solutions to get “around” or “through” non-BFRs
• BIER overlay is not in scope of this draft
Multi Topology Only Solution

- Confine BFRs in own on multi-topology
- Properties
  - Needs MT deployed
    - MT has been around for different purposes since many years
  - MT can be connected by any tunnel that looks like L3
  - Allows for unicast and multicast path to BFER to deviate
  - “Partial” BFR routers are possible where only some interfaces support BIER
  - Standard IGP computation and protection in IGP used
  - Links can be in multiple MTs at the same time and used as 2ndary backup for each other since IGP metric is per MT
  - tunnel & IGP link metrics may end up doing ECMP
  - Any change necessitates “touching” the link configuration on both sides
Section 6.9 Solution, Modified Step 2)

• “Re-parenting” solution RFC 8279 section 6.9 mod’ed step 2)

• Properties:
  – When dynamic tunnel technologies (like SR) are deployed and used
    • Can “tunnel through” any non-BFR without additional configuration
    • Provide immediate full node protection coverage
    • Tunnels do not show up in IGP as Fas
    • Each change in tunnel signaling may lead to BIFT recomputation
    • They normally lack OAM available with static tunnels
  – BIER multicast traffic path to BFER is same as unicast
BIER Specific Algorithm

• Use a signaled BAR to compute paths that guarantee black-hole-free BIER in a distributed fashion

• Properties
  – Tunnels necessary if no direct BFR-only path available
  – Can take into account things like fan-out-degree or subdomain inter-dependencies or partial BFR support (with more BIER TLVs)
  – Unicast and multicast path to BFER can diverge
  – Computation of all IGP protections is possible
Controller Based Solutions

• Controllers are “omnipotent” and see whole topology
  – Quis custodiet ipsos custodes?
• Controller downloads computed BIRTs and/or BIFTs (that’s the r/w object in Yang model discussion)
• Properties:
  – Anything can be taken into account on computation
  – Signaling that a node is using controller based BIER tables is desirable operationally
  – Failure re-convergence slower than IGP
    • Backup tables/next-hops for a single failure scenario could be also controller computed