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

BIER WG

IETF102# Montreal

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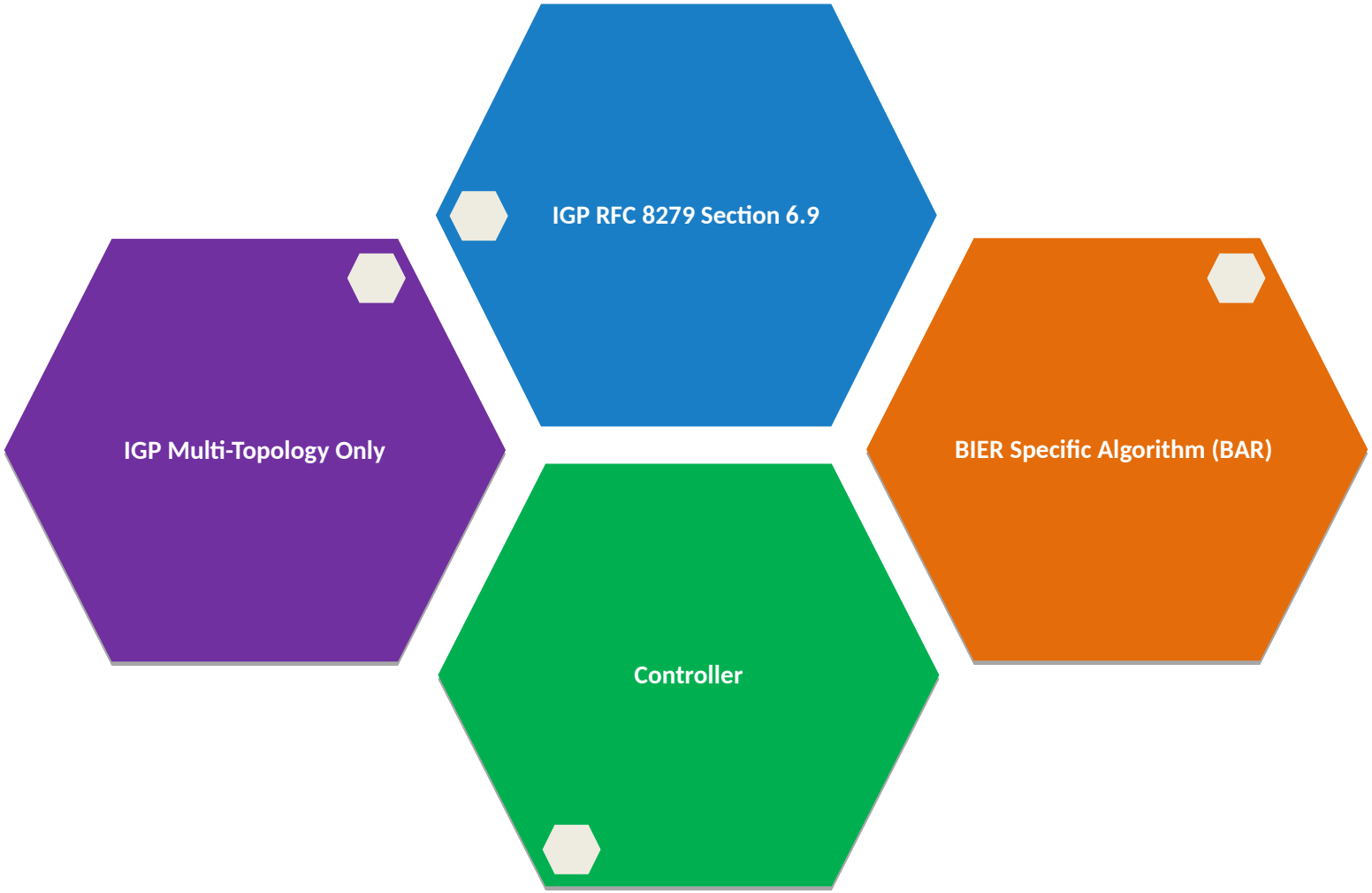
Why

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

What

- Draft holding possible frameworks to brownfie ld BIER layer with
  - IGP underlay
  - Controller “underlay”
- Different solutions to get “around” or “throug h” non-BFRs
- BIER overlay is not in scope of this draft

Frameworks


IGP RFC 8279 Section 6.9
IGP Multi-Topology Only
BIER Specific Algorithm (BAR)
Controller

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 BIE R
  - 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 st ep 2)
- Properties:
  - When dynamic tunnel technologies (like SR) are deployed an d 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 guaran tee 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 su bdomain 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 (t hat’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 i s desirable operationally
  - Failure re-convergence slower than IGP
    - Backup tables/next-hops for a single failure scenario could be als o controller computed