BIER BAR & IPA

Zhaohui Zhang, Antoni Przygienda (Juniper)
Andrew Dolganow, Hooman Bidgoli (Nokia)
IJsbrand Wijnands (Cisco)
Arkadiy Gulko (Thomson Reuters)

Problem Statement

- A copy of an incoming BIER packet is sent to the neighbor on the path towards a set of BFERs identified in the bitstring

- How is the path determined?

- BIER-OSPF/ISIS specifications specify the BAR/IPA used for each subdomain

  - How are they used?

BIER Routing Underlay

- All the paths towards all BFERs in a subdomain make up a *Routing Underlay* for the subdomain

  - Each BIER subdomain could have its own routing underlay

- The routing underlay is the result of applying a calculation algorithm to the underlying topology subject to some constraints

  - Congruent or incongruent with unicast forwarding

Topology/Algorithm/Constraints

- Topology
  - A graph with nodes and links
  - Link characteristics (metric, "color", etc.)

- Algorithm
  - Shortest Path First
  - Spanning Tree
  - Etc.

- Constraints
  - "use TE metric"
  - "exclude red links"

BAR/IPA, BA/BC, RA/RC

- BAR: BIER AlgoRithm
  - BIER-specific algorithm & constraints
    - BA: BIER-specific Algorithm
    - BC: BIER-specific Constraints
- IPA: IGP Algorithm
  - Non-BIER-specific algorithm & constraints
    - RA: Routing Algorithm
    - RC: Routing Constraints

General Calculation Rules

- Start with the topology X (MT-0 or MT-x)
- Apply BC: resulting in BC(X)
- Apply RC: resulting in RC(BC(X))
- Determine Algorithm:
  - Algo = BA if BA is not NULL
  - Algo = RA if BA is NULL
- Apply Algo to RC(BC(X))

A Few Notes

- BAR 0: BA/BC are all NULL
  - IPA alone dictates the calculation
- *General rules could be overridden for individual BAR/IPA values in the future*
- Routers signaling a mismatched <BAR, IPA> for the subdomain are treated as if BIER incapable

Next Steps

- Seeking Comments
- Seeking WG Adoption