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