Multipath Traffic Engineering for Segment Routing

draft-stone-spring-mpte-sr

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-01 changes

- New co-authors

- Construct differentiation (Ingress vs Junction Segment)

- Color mapping

- DAG reusability

- Path protection clarifications

- Local and Global optimization

    - Guidelines

    - Procedures

    - Examples

Recap - draft-stone-spring-mpte-sr

- How to achieve MPTE (draft-kompella-teas-mpte) with SR and a controller

  - ECMP + Non-ECMP Slack + TE

- Junction Segments deployed throughout DAG

  - Incoming SID (Binding SID)

  - Outgoing SID list(s)

    - SR Path to Junction + Junction SID

    - Weight

- Junction segments realized with an SR Policy Candidate Path
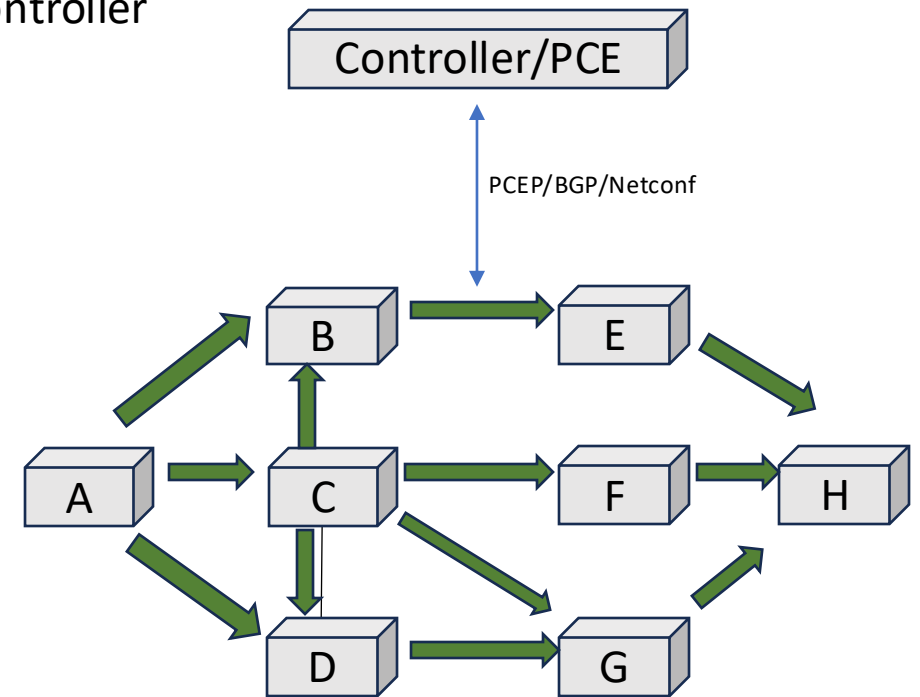
SR-MPLS Example
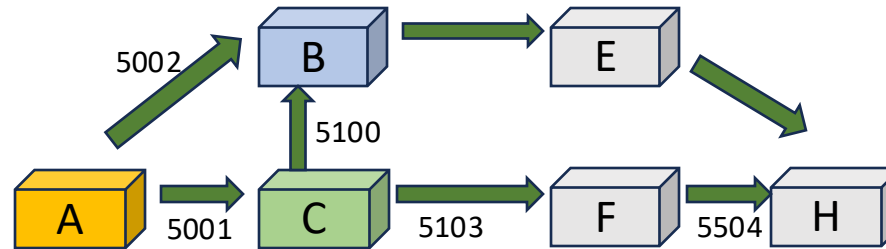
SR Policy (ingress)

Headend: A, Color: 50 Endpoint: H

SID List:

   [ADJ-5002, **100**], 0.5

   [ADJ-5001, **101**], 0.5

Junction Segment B

Headend: B, Color: 100, Endpoint: null

Binding SID = **100**

   SID List:

      [NodeSID-H], 1.0

Junction Segment C

Headend: C, Color: 100, Endpoint: null

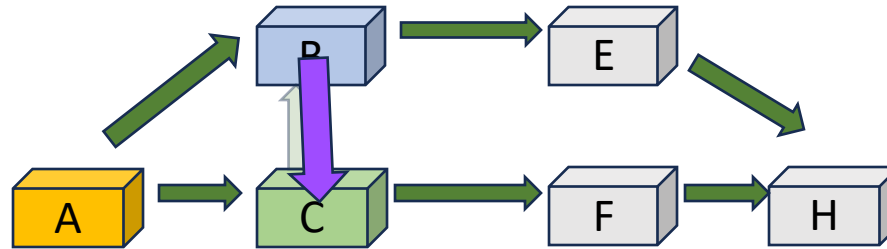Binding SID = **101**

   SID List:

      [ADJ-5100, **100**], 0.4
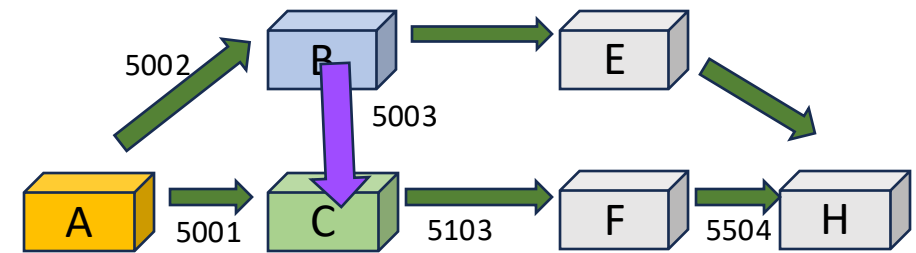
      [ADJ-5103, ADJ-5504], 0.6

Global optimization

Example newly computed DAG

Global optimization

1. Deploy new Junction Segments (SR Policies)

C deployed before B

SR Policy (ingress)

Headend: A, Color: 50 Endpoint: H

SID List:

[ADJ-5002, **100**], 0.5

[ADJ-5001, **101**], 0.5

Junction Segment B

Headend: B, Color: 100, Endpoint: null

Binding SID = **100**

Junction Segment C

Headend: C, Color: 100, Endpoint: null

Binding SID = **101**

Junction Segment B

*Headend: B, Color: **200**, Endpoint: null*

Binding SID = **101**

SID List:

[NodeSID-H], 0.5

[ADJ-5003, **102**], 0.5

Junction Segment C

*Headend: C, Color: **200**, Endpoint: null*

Binding SID = **102**

SID List:

[ADJ-5103, ADJ-5504], 1.0

Global optimization

2. Update ingress with new SID list (local MBB)

SR Policy (ingress)

Headend: A, Color: 50 Endpoint: H

SID List:

    [ADJ-5002, **101**], 0.5

    [ADJ-5001, **102**], 0.5

Junction Segment B

Headend: B, Color: 100, Endpoint: null

Binding SID = **100**

Junction Segment B

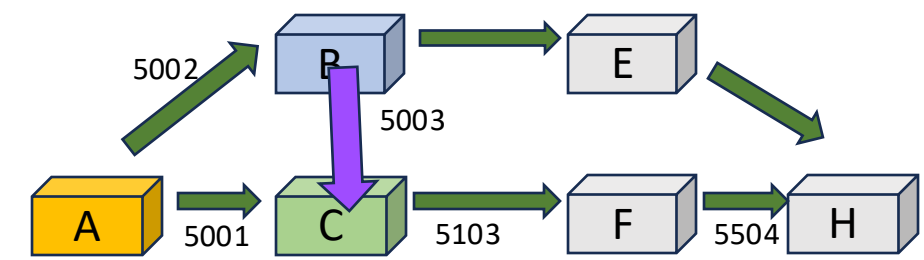*Headend: B, Color: 200, Endpoint: null*

Binding SID = 101

    SID List:

        [NodeSID-H], 0.5

        [ADJ-5003, 102], 0.5

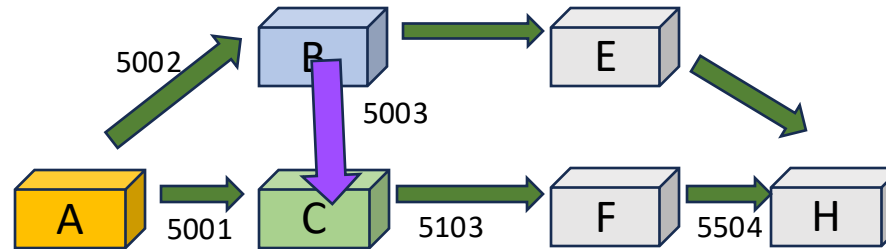Junction Segment C

Headend: C, Color: 100, Endpoint: null

Binding SID = **101**

Junction Segment C

Headend: B, Color: 200, Endpoint: null

Binding SID = 102

    SID List:

        [ADJ-5103, ADJ-5504], 1.0

Global optimization

3. Delete unused junction segments

SR Policy (ingress)

Headend: A, Color: 50 Endpoint: H

SID List:

    [ADJ-5002, **101**], 0.5

    [ADJ-5001, **102**], 0.5

Junction Segment B

Headend: B, Color: 101, Endpoint: null

Binding SID = **101**

    SID List:

        [NodeSID-H], 0.5

        [ADJ-5003, **102**], 0.5

Junction Segment C

Headend: B, Color: 101, Endpoint: null

Binding SID = **102**

    SID List:

        [ADJ-5103, ADJ-5504], 1.0

Next steps

- Open to discussions and feedback

- Stay aligned with concepts and feed comments back into:

  - TEAS WG: draft-kompella-teas-mpte

  - PCE WG: draft-beeram-pce-pcep-mpted

- Work on content for manageability considerations

- Co-author discussions on information model for MPTE and information signalling