

# Multipath Traffic Engineering for Segment Routing

draft-stone-spring-mpte-sr

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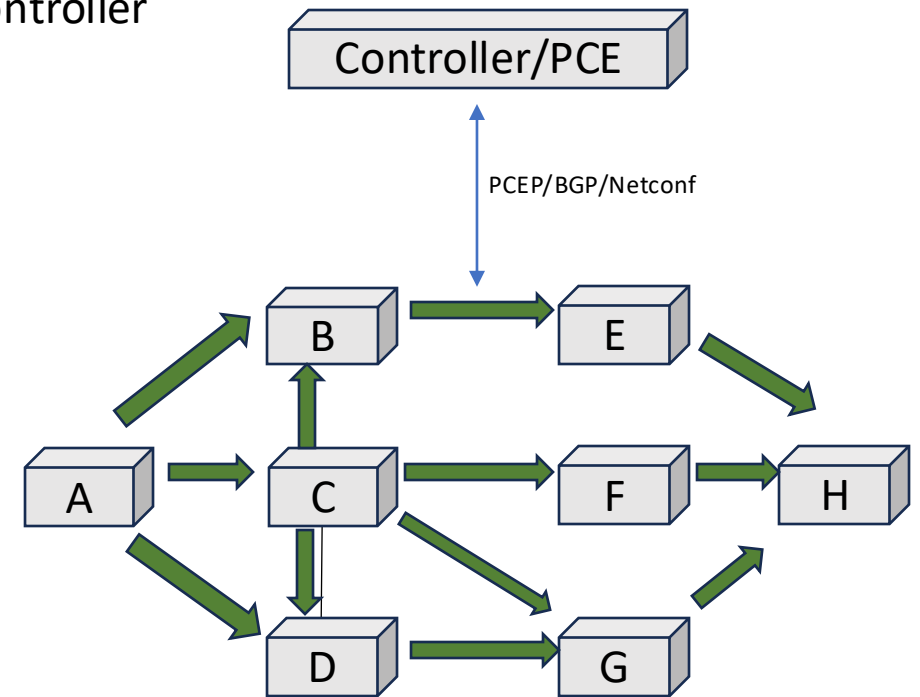
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# -01 changes

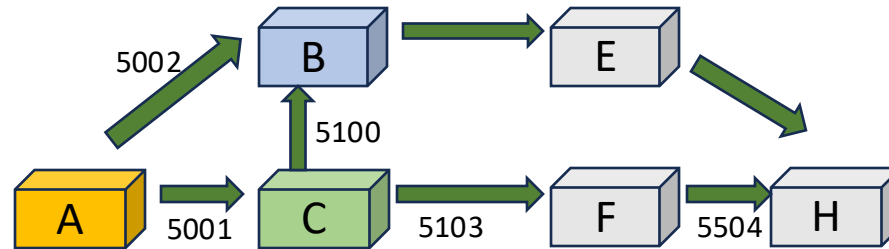
- New co-authors
- Construct differentiation (Ingress vs Junction Segment)
- Color mapping
- DAG reusability
- Path protection clarifications
- Local and Global optimization
  - Guidelines
  - Procedures
  - Examples

# 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

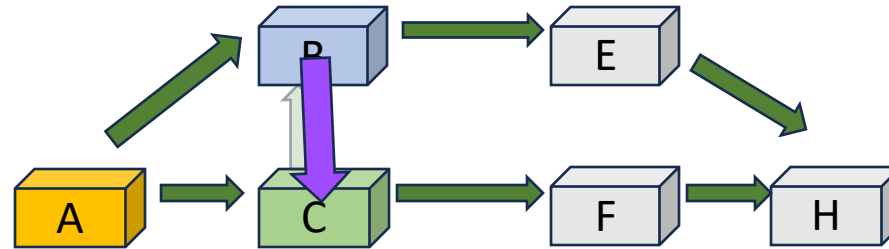
SID List:

[ADJ-5100, 100], 0.4

[ADJ-5103, ADJ-5504], 0.6

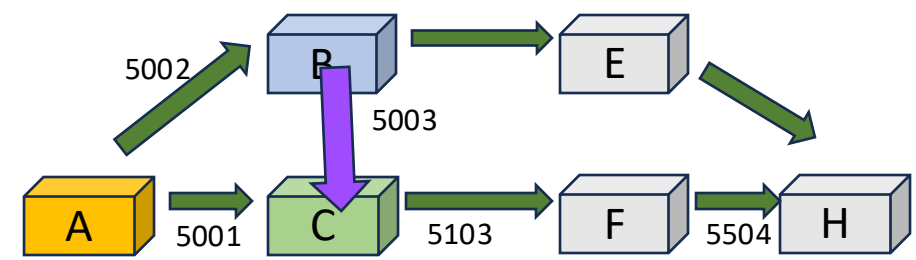
# Global optimization

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 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: C, Color: 200, Endpoint: null

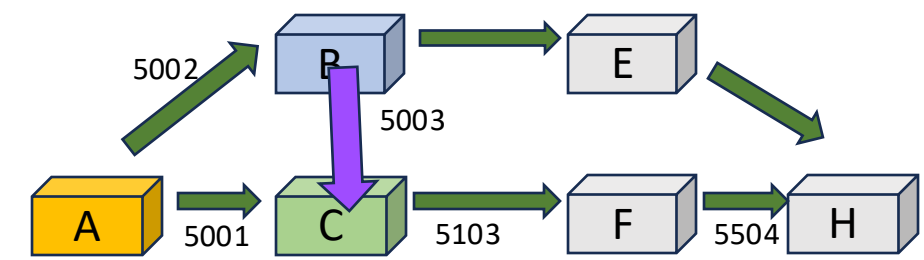
Binding SID = 102

SID List:

[ADJ-5103, ADJ-5504], 1.0

# Global optimization

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



Junction Segment B

Headend: B, Color: 100, Endpoint: null

Binding SID = 100

Junction Segment C

Headend: C, Color: 100, Endpoint: null

Binding SID = 101

**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: 200, Endpoint: null

Binding SID = 101

SID List:

- [NodeSID-H], 0.5
- [ADJ-5003, 102], 0.5

**Junction Segment C**

Headend: B, Color: 200, Endpoint: null

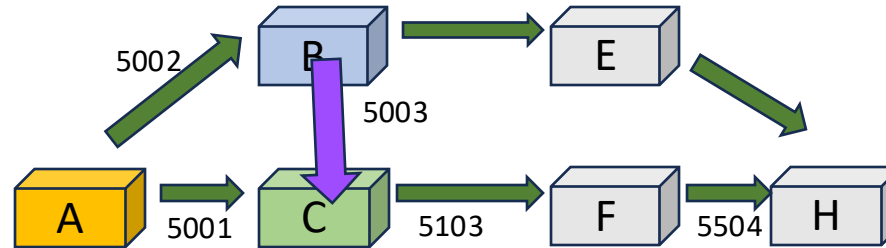
Binding SID = 102

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-mppte, draft-beeram-teas-yang-mpted-01
  - PCE WG: draft-beeram-pce-pcep-mpted
- Work on content for manageability considerations
- Co-author discussions on information model for MPTE and information signalling