SR P2MP Policy
draft-ietf-pce-sr-p2mp-policy

Authors:
Hooman Bidgoli, Nokia
Daniel Voyer, Bell Canada
Anuj Budhiraja, Cisco
Saranya Rajarathinam, Nokia
Rishabh Parekh, Cisco
Siva Sivabalan, Ciena

Major Contributor:
Andrew Stone
Update/Relevant Drafts

draft-spring-sr-replication-segment-19 (RFC9524, MPLS and SRv6 encap)

draft-ietf-pim-sr-p2mp-policy-07 (Last call passed, added SRv6)

draft-ietf-pim-p2mp-policy-ping-07 (last call passed)

draft-ietf-bess-mvpn-evpn-sr-p2mp-07 (work in progress)

draft-ietf-pce-sr-p2mp-policy-01 (work in progress, under implementation by multiple vendors, last call by end of 2024)

draft-ietf-idr-sr-p2mp-policy-04 (draft now, need to progress the work here)

draft-hb-spring-sr-p2mp-policy-yang-02 (need to revive it)
Extend PCEP Open object

- P2MP Capability during discover via a new optional TLV
- Path Computation Capabilities

```
0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-
|                     Type=TBD                      |                     Length=4                      |
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-
|                     Number of Instances            |                     number of replication            |
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-
|                     Flags                         |                     reserved                         |
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-
```

Number of Instances 16 bits - Number of instances the advertising PCEP speaker supports. This is meaningful for PCEs. PCEs can determine the least number of instances that could be created for a SR P2MP policy.

Flags 16 bits

Number of replication 16 bits - number of out going interfaces that the system is capable of having per multicast state.
New Procedures

• Local Optimization
  • When pcc lacks the support of multiple instances global MBB is not possible.
  • However, with knowledge of the PCCs' advertised capabilities, the PCE can detect this limitation and instead opt for local re-optimization of the candidate path.
  • In such cases, the PCE can compute the optimized LSP by send the PCU upd message using the existing Instance for candidate path, specifically targeting the PCCs where the optimized LSP triggers a change in forwarding state.
Reuse of draft multi-path

• This draft uses the draft-ietf-pce-multipath for backup path instances (i.e. protection)
• For P2MP Policy the multipath weight tlv should not be used. Weighted ECMP is no recommended for multicast.
Instance ID

- A candidate path can have 2 path Instances for global optimization.
- Path Instance assigned by PCE and consistent for all nodes on the P2MP tree end-to-end.
- Two CP within the same P2MP policy cannot have the same instance-id, i.e. instance ID is unique per P2MP policy. That said, 2 different policy can use the same Instance-ID value.
- Instance-id 0 should be reserved.
Slicing for P2MP replication

- For setting up P2MP Policy and its replication segments over different slices, Segment Routing CCI object is used in draft: https://datatracker.ietf.org/doc/html/draft-ietf-pce-pcep-extension-pce-controller-sr-07#name-cci-object is used
Next Steps

- Asking for early IANA assignment
- Comments, suggestions are welcome
- This draft is being implemented as we speak, any concerns feedback should be provided sooner to ensure it is part of the implementation.
Thank You!