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

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SR P2MP Objects

Non-SR-P2MP nodes

A → B → C → D

SR P2MP Policy
• ROOT Node, key
• Tree-ID, key

Candidate path
Path-Instance-1

Candidate path
Path-Instance-1

Replication segment
• Node-ID
• Tree-ID
• Root
• Instance ID
• Inc Rep SID
• Rep SID Action

Forwarding Info
• Next-hop-group-id [nh-id] //array of nh
  • Next-hop-id <id>
  • Next-hop-add
  • Next-hop-int
  • Protect-nh <id>
  • Sid-list [list of outgoing labels]

Identifier of a tree:
- root-id
- tree-id
- path-instance-id

Head-end policy
= PMSI

P2MP LSP Redundancy

End to End Optimization

Forwarding info
Sid-List
Fast Reroute

Path-Instance-N

Path-Instance-N

Path-Instance-N

Fast Reroute
Extend PCEP Open object

- P2MP Capability during discover via a new optional TLV
- Path Computation Capabilities
- Leaf type as per RFC 8306
  - P2MP only will support leaf type 1 (new leaves to add), 2 (old leaves to remove) and 5 (the entire leaf list is overwritten and replaced with new leaf list).

```
+---------------------------------------------+
|                      Type=1                  |                   Length=4                     |
+---------------------------------------------+
|           Number of Instances     |          Flags                            | I |O|
+---------------------------------------------+
```

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

I-bit indicates the support for Leaf type 1 and 2.
O-bit indicates the support for Leaf Type type 5.
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 PCUpd message using the existing Instance for candidate path, specifically targeting the PCCs where the optimized LSP triggers a change in forwarding state.
Active/Standby instances

- A P2MP LSP is identified via:
  - Root-id
  - Tree-id
  - Instance-id (16 bits)

Flags: 8 bits
- A – Activate the Instance-ID
- R – Remove the Instance-ID

SR-IPV4-P2MP-POLICY-ID TLV:
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

• Comments, suggestions are welcome
• The authors are working on this implementation and updating the draft.
Thank You!