PCEP P2MP SR Policy

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Update/Relevant Drafts

RFC9524 segment routing replication for multipoint service delivery

draft-ietf-pim-sr-p2mp-policy-07 (Last call soon, added SRv6)
draft-ietf-pim-p2mp-policy-ping-04 (we have a implementation now, asking for last call)

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

draft-ietf-pce-sr-p2mp-policy-05 (work in progress, under implementation by multiple vendors)

draft-ietf-idr-sr-p2mp-policy-04 (draft now, need to progress the work here)
SR P2MP Objects

Non-SR-P2MP nodes

A

B

C

D

E

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

Candidate path Preference
Path-Instance-1

Candidate path N preference
Path-Instance-1

Path-Instance-N

Path-Instance-N

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]

SR P2MP Objects

Head-end policy = PMSI
P2MP LSP Redundancy
End to End Optimization
Forwarding info
Sid-List
Fast Reroute

Identifier of a tree:
- root-id
- tree-id
- path-instance-id
Major Changes to draft version 5

- In P2MP SR Policy each candidate path has 2 or more path-instances for global optimization
  - Previously the path-instance identifier was assigned by the PCC
  - This has changed, and PCE now assigns the path-instance identifier.
  - Path-instance identifier is unique per P2MP SR Policy
  - Since the PCE now assigns the path-instance ID, all replication segments within the tree (root, transit, leaf) SHOULD have the same path-instance for easy identification of the tree “end-to-end”

- Detail procedure for deletion of path-instances and candidate-paths
  - PCC Initiated
    - Delete the entire candidate-path and its path-instances by sending a PCRpt message from PCC to PCE with the “R” flag set and the path-instance ID set to 0. In response PCE will send PCInit to all replication segment with “R” flag set for that tree-id to remove all the path-instances
    - Delete a specific path-instance under CP, PCC sends a PCRpt message from PCC to PCE with the “R” flag set and the path-instance ID set to specific path-instance to be deleted. In response PCE will send PCInit to all replication segments with “R” flag set for that tree-id and specific path-instance ID.
Major Changes to draft version 5 (Cont)

- **Symbolic Name**
  - Symbolic name is per Candidate path and need to be unique on the PCC. It is recommended for the symbolic name to be root-id+tree-id+cp discriminator

- **Aligned SR P2MP policy with unicast counterpart and reuse unicast concepts in SRPA and CCI**
  - In par with [draft-ietf-pce-segment-routing-policy-cp] section 4.2, P2MP policy reuses the four TLVs used in the SRPA object.
    1. **SRPOLICY-POL-NAME TLV**: (optional) encodes P2MP SR Policy Name
    2. **SRPOLICY-CPATH-ID TLV**: (mandatory) encodes P2MP SR Policy Candidate path Identifier
    3. **SRPOLICY-CPATH-NAME TLV**: (optional) encodes P2MP SR Policy Candidate path name.
    4. **SRPOLICY-CPATH-PREFRENCE TLV**: (optional) encodes P2MP SR Policy Candidate path preference value.
- P2MP Policy extended association object

```
0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1
+----------------------------------------+-
| Type = 31                                |
| Length = 8 or 20                         |
|                                          |
| TREE-ID                                 |
+----------------------------------------+
```

Length: 8 or 20, depending on length of Root (IPv4 or IPv6)

Tree-ID: Tree ID that the replication segment is part of as per draft-ietf-spring-sr-p2mp-policy

- The Central Control Instructions (CCI) Object used by the PCE to specify the controller instructions is defined in [RFC9050].
  defines CCI object-type for SR-MPLS. This document reuses the SR-MPLS CCI object-type for SR P2MP Policy, to incorporate some common ideas like multi-topology etc...
What is next

• The team is working on implementation and improvements to the draft.
• Soon we will need early assignment of IANA values for this draft.
• Any comment/suggestion is welcome.