Advertising Redundancy Policy in BGP

draft-yang-idr-bgp-redundancy-policy-00

Fan Yang, Xuesong Geng, Tianran Zhou @Huawei
Background

Redundancy protection is a generalized protection mechanism by
- replicating the service packets on redundancy node
- transmitting copies of flow packets over multiple different and disjoint paths
- eliminating the redundant packets at merging node

- **draft-ietf-spring-redundancy-protection-01** introduces Redundancy SID (R SID) and Merging SID (M SID) to execute replication and elimination behavior in data plane
- **draft-geng-spring-redundancy-policy-04** introduces Redundancy Policy to instruct multiple redundancy forwarding paths in control plane
- **draft-yang-pce-pcep-redundancy-policy-00** introduces PCEP extensions to request path computation and protection method, advertise Candidate Path Flag sub-TLV in control plane
- **This I-D** introduces BGP extensions to advertise Redundancy Policy attribute in control plane
What is Redundancy Policy?

• is a variant of SR Policy with minimum changes
• to instruct the replication of service packets and assign more than one redundancy forwarding paths
• applies to both SR-MPLS and SRv6
BGP Encoding Structure of Redundancy Policy

• Information model structure

Redundancy policy POL1 <R Node= R, Color = 1, M Node = M>
Candidate-path CP1 <protocol-origin = 20, originator = 100:1.1.1.1, discriminator = 1>

Flag Redundancy
Preference 200
SID-List1 <R, P1, M>
SID-List2 <R, P2, M>

• BGP encoding structure

SR Policy SAFI NLRI: <Distinguisher, Policy-Color, Endpoint>
Attributes:
Tunnel Encaps Attribute (23)
Tunnel Type: SR Policy
Binding SID
SRv6 Binding SID
Redundancy Flag
Preference
Priority
Policy Name
Policy Candidate Path Name
Explicit NULL Label Policy (ENLP)
Segment List 1
Weight
Segment R
Segment P1
Segment M
Segment List 2
Weight
Segment R
Segment P2
Segment M
Flag Sub-TLV

• A new Flag sub-TLV is attached at the candidate path level.
• The Flag sub-TLV is optional and MUST NOT appear more than once in the Redundancy Policy encoding.

- Type: to be allocated by IANA.
- Length: specifies the length of the value field not including Type and Length fields.
- Flags: 1 octet of flags. It is requested to IANA to create a new registry "SR Policy Candidate Path Flags". One flag R is defined at this writing.
- RESERVED: 1 octet of reserved bits.
Redundancy Policy with a BSID

• Redundancy policy can be **optionally** associated with a Binding Segment, which can only be Redundancy Segment

• Redundancy Segment is required to be distributed by the Binding SID Sub-TLV or SRv6 Binding SID Sub-TLV under BGP SR Policy SAFI (37) defined in *draft-ietf-idr-segment-routing-te-policy*

• In SRv6, the endpoint behavior End.R of Redundancy Segment is required to be distributed with SRv6 Binding SID Sub-TLV at the same time
Redundancy Protection Protocol Extensions

• Data Plane:
  • **Redundancy SID (R SID), Merging SID (M SID):** draft-ietf-spring-redundancy-protection

• Control Plane:
  • **Redundancy Policy:** draft-geng-spring-redundancy-policy-04
  • **IGP advertisement of R SID and M SID:** IANA allocation
  • **BGP for Redundancy Policy:** draft-yang-idr-bgp-redundancy-policy-00
  • **PCEP for Redundancy Policy:** draft-yang-pce-pcep-redundancy-policy-00
Next step

1. Discussion on mailing list
2. Keep align with progress in SPRING

As always, comments and suggestions are greatly welcome!
Thank you for listening!