SR Policy Group
draft-cheng-spring-sr-policy-group-02

Weiqiang Cheng (China Mobile)
Wenying Jiang (China Mobile)  (Presenter)
Changwang Lin (New H3C Technologies)
Yuanxiang Qiu (New H3C Technologies)
Yawei Zheng (Huawei Technologies)
Ran Chen (ZTE Corporation)
Yanrong Liang(Ruijie Networks)

IETF-117
Why we need Parent SR Policy

• Parent SR Policy

According to section2.2 of [RFC9256], a Parent SR Policy is the composite candidate path that acts as a container for grouping SR policies which meet different service optimization objectives and constraints and have the same destination endpoint.

• Application Scenarios for Parent SR Policy

One enterprise customer often have several different kinds of services with different SLA requirements.

- Point-to-point leased line customers have multiple services.
- These services need to be forwarded through different SR policy paths with different SLAs.
How to use Parent SR Policy

A enterprise customer has a leased line demand from PE1 to PE2, and three types of services need to be transferred between PE1 and PE2.

1. Identify the customer's service through DSCP.
2. Generate a Parent SR Policy between PE1 and PE2.
3. When PE1 receives traffic, it first matches to the parent SR policy according to the next hop and color of the route, and then finds the mapped SR policy in the parent SR policy according to the DSCP carried in the IP/IPv6 packet header.
4. The voice traffic is forwarded according to the path of low-delay Policy-A, Video traffic is forwarded according to the path of high-bandwidth Policy-B, and other traffic are carried by Policy-C.

- DSCP mapping to color:
  - Voice Service: DSCP10 -> Color1
  - Video service: DSCP20 -> Color2
  - Other service: Other DSCPs -> Color3

- Parent SR policy (PE1->PE2):
  - Policy-A (Color1, PE2)
  - Policy-B (Color2, PE2)
  - Policy-C (Color3, PE2)
Requirements and proposal for SR Policy Group

• SR Policy Group

An SR policy Group is an instantiation of a group of constituent Parent SR Policies to different destination endpoints with the same service forwarding model.

◦ Represents a composite candidate path defined in draft [ietf-spring-segment-routing-policy].
◦ Is identified by <color, endpoint> on the headend, same with an SR Policy.

• Application Scenarios for SR policy group

In a multi-site VPN scenario, there are multiple service types of traffic between each two nodes, and these traffic need to be forwarded on SR policy paths with different SLA.

• Benefits

◦ Simplify deployment
◦ Effectively solving the problem of complex configuration in multi-point scenarios
A Parent SR Policy is a group of SR policies which have the same destination endpoint.

A SR Policy Group represents a service forwarding model that is associated with one or more Parent SR Policies.

- A SR Policy Group contains one or more Parent SR policies.
- The Colors of SR Policy group and its each Parent SR Policy MUST be identical \((\text{color-1} = \text{color2})\).
- The colors of SR Policy group and its each constituent SR Policy of echo constituent Parent SR Policies MUST be different \((\text{color-1} \neq \text{color-3})\).
- There can be only one parent SR policy with the same source endpoint and the same destination endpoint in an SR policy group.
Information Model

SR Policy Group PG-1 <Color = 1>
  Parent SR Policy PP-1 <Color = 1, Endpoint = E1>
    Service Service-1 mapping-to color 100
    Service Service-2 mapping-to color 200
    Service Service-3 mapping-to color 300

Parent SR Policy PP-2 <Color = 1, Endpoint = E2>
  Service Service-1 mapping-to color 100
  Service Service-2 mapping-to color 200
  Service Service-3 mapping-to color 300

// H1 -> E1 (Parent SR Policy PP-1)
SR Policy POL1-11 <Headend = H1, Color = 100, Endpoint = E1>
  Candidate Path CP1 <Protocol-Origin = 20, Originator = 64511:192.0.2.1,
  Discriminator = 1>
    Preference 200
    Priority 10
    Segment List 1 <SID11...SID1i>

SR Policy POL1-12 <Headend = H1, Color = 200, Endpoint = E1>
  Candidate Path CP1 <Protocol-Origin = 20, Originator = 64511:192.0.2.1,
  Discriminator = 2>
    Preference 200
    Priority 10
    Segment List 1 <SID21...SID2i>

SR Policy POL1-13 <Headend = H1, Color = 300, Endpoint = E1>
  Candidate Path CP1 <Protocol-Origin = 20, Originator = 64511:192.0.2.1,
  Discriminator = 3>
    Preference 200
    Priority 10
    Segment List 1 <SID31...SID3i>

// H1 -> E2 (Parent SR Policy PP-2)
SR Policy POL2-11 <Headend = H1, Color = 100, Endpoint = E2>
SR Policy POL2-12 <Headend = H1, Color = 200, Endpoint = E2>
SR Policy POL2-13 <Headend = H1, Color = 300, Endpoint = E2>
Use case for SR policy group: Multi-VPN Tenants Scenarios

Different service flows of the same VPN tenant have different requirements on the forwarding quality. Different traffic is forwarded through different SR Policy paths.

**Configuration**

- Configure service requirements for SR policy group (3 types of SLAs)
  - Service voice mapping-to color 100
  - Service video mapping-to color 200
  - Service others mapping-to color 300

- Automatically generate Parent SR Policy and its three constituent SR Policies with different colors.

- Generate a Parent SR Policy PP-1 for endpoint E1: Containing Policy1-1, Policy1-2, and Policy1-3 with three different SLAs.
  - Parent SR Policy PP-1 <Color = 1>
    - SR Policy1-1<100, E1>
    - SR Policy1-2<200, E1>
    - SR Policy1-3<300, E1>

- Generate a Parent SR Policy PP-2 for endpoint E2: Containing Policy2-1, Policy2-2, and Policy2-3 with three different SLAs.
  - Parent SR Policy PP-2 <Color = 1>
    - SR Policy2-1<100, E2>
    - SR Policy2-2<200, E2>
    - SR Policy2-3<300, E2>

- Other head nodes: Issue the same configuration as H1.

Except for the configuration of the SR policy group, all other configurations are automatically generated. Greatly simplifies the deployment process.

**Traffic steering process of H1**

1. Voice traffic from H1 to E1 (SLA-1)
   - After receiving the traffic, H1 steers the traffic to the SR Policy1-1<100, E1> path in Parent SR Policy PP-1 based on DSCP (1~30) and DA(E1)

2. Video traffic from H1 to E2 (SLA-2)
   - After receiving the traffic, H1 steers the traffic to the SR Policy2-2<200, E2> path in Parent SR Policy PP-2 based on DSCP (31~60) and DA(E2).

Note: Pre-configured on ingress node H1, DSCP values 1-30 correspond to voice Service; DSCP values 31-60 correspond to video service.
Running Code

**Lab Interop-test Status**

Hardware devices and software implementations which have passed SRv6 Policy Group interoperability tests hosted by China Mobile in 2023:

- Huawei: NE40E-X8A
- H3C: CR16010H-FA and CR19000-8
- ZTE: M6000-8S Plus and M6000-3S Plus
- Ruijie: RG-N8010-R

**Deployment Status**

Trials of SRv6 Policy Group in four province branch networks of China Mobile in 2023:

- Huawei devices, Guangdong Province.
- H3C devices, Shanxi Province.
- ZTE devices, Jiangxi Province.
- Ruijie devices, Fujian Province.
Next Steps

• This draft has been presented at the IETF-114 and IETF-115 meetings
• Added application scenarios for Parent SR Policy, refined scenario description for SR Policy Group, and added running code for SR Policy Group after IETF 115
• Any questions or comments are Welcomed
• Seeking WG adoption after revision
Thank You