

BGP Extensions of SR Policy for Composite Candidate Path

draft-jiang-idr-sr-policy-composite-path-00

Presenter: [Changwang Lin \(New H3C Technologies\)](#)

Co-authors: Wenying Jiang (China Mobile)

Changwang Lin (New H3C Technologies)

Ran Chen (ZTE Corporation)

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Motivation

AS described in RFC 9256 ,a composite candidate path acts as a container for grouping SR Policies.

Consider the following Composite Candidate Path, taken from [RFC9256].

As described in draft-ietf-pce-multipath-11, section 4.5 composite candidate path .

But there is no similar mechanism in BGP SR Policy. This document defines extensions for BGP to distribute SR policies carrying composite candidate path information.

RFC9256 Composite candidate path

```
SR Policy POL100 <Headend = H1, Color = 100, Endpoint = E1>  
  Candidate Path CP1 <Protocol-Origin = 20, Originator =  
    64511:192.0.2.1, Discriminator = 1>  
    Preference 200  
    SR Policy <Color = 1>, Weight W1  
    SR Policy <Color = 2>, Weight W2
```

PCE distribute composite candidate path

```
<LSP PLSP_ID=100>  
  <ASSOCIATION>  
  <END-POINT>  
  <PATH-ATTRIB Path_ID=1  
    <WEIGHT-TLV Weight=W1>  
    <COLOR-TLV Color=1>>  
  <ERO (empty)>  
  <PATH-ATTRIB Path_ID=2  
    <WEIGHT-TLV Weight=W2>  
    <COLOR-TLV Color=2>>  
  <ERO (empty)>
```

Extensions for BGP SR Policy

SR Policy SAFI NLRI: <Distinguisher, Policy-Color, Endpoint>

Attributes:

Tunnel Encaps Attribute (23)

Tunnel Type: SR Policy

Binding SID

SRv6 Binding SID

Preference

Priority

Policy Name

Policy Candidate Path Name

Explicit NULL Label Policy (ENLP)

Segment List

Weight

Segment

Segment

...

Constituent SR Policy

Color

Weight

Fowarding Class

...

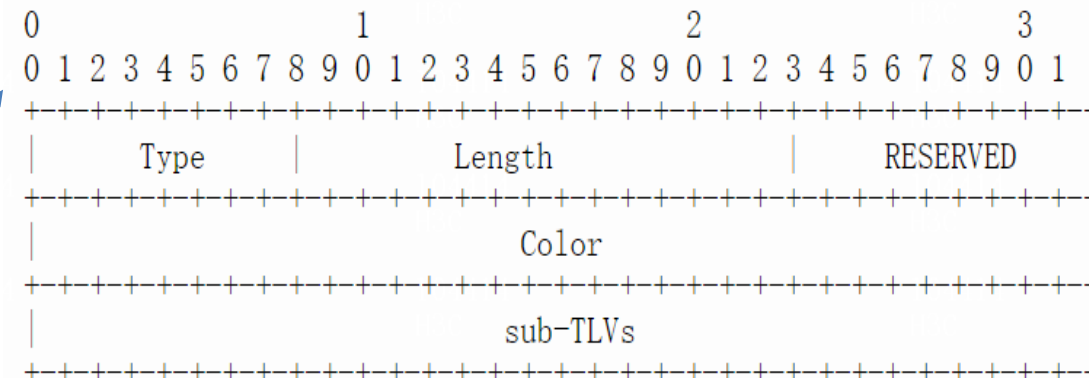
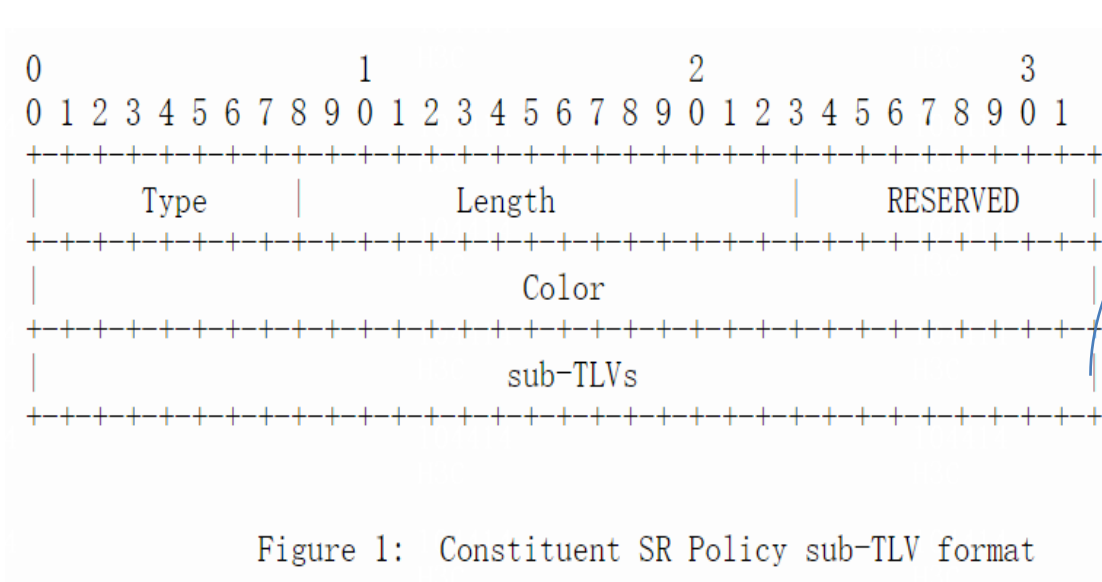


Figure 1: Constituent SR Policy sub-TLV format

The Constituent SR Policy sub-TLV encodes a single composite path towards the endpoint. The Constituent SR Policy sub-TLV is an optional sub-TLV of BGP Tunnel Encapsulation Attribute, and MAY appear multiple times in the SR Policy encoding.

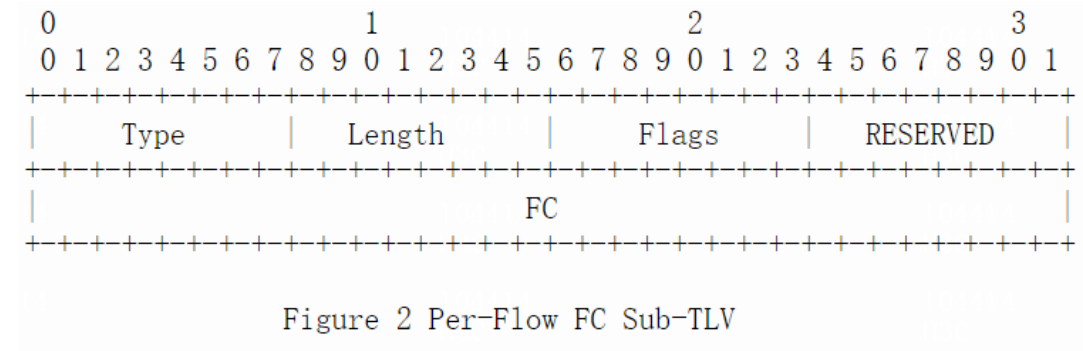
Constituent SR Policy Sub-TLV

The Constituent SR Policy sub-TLV has the following format:



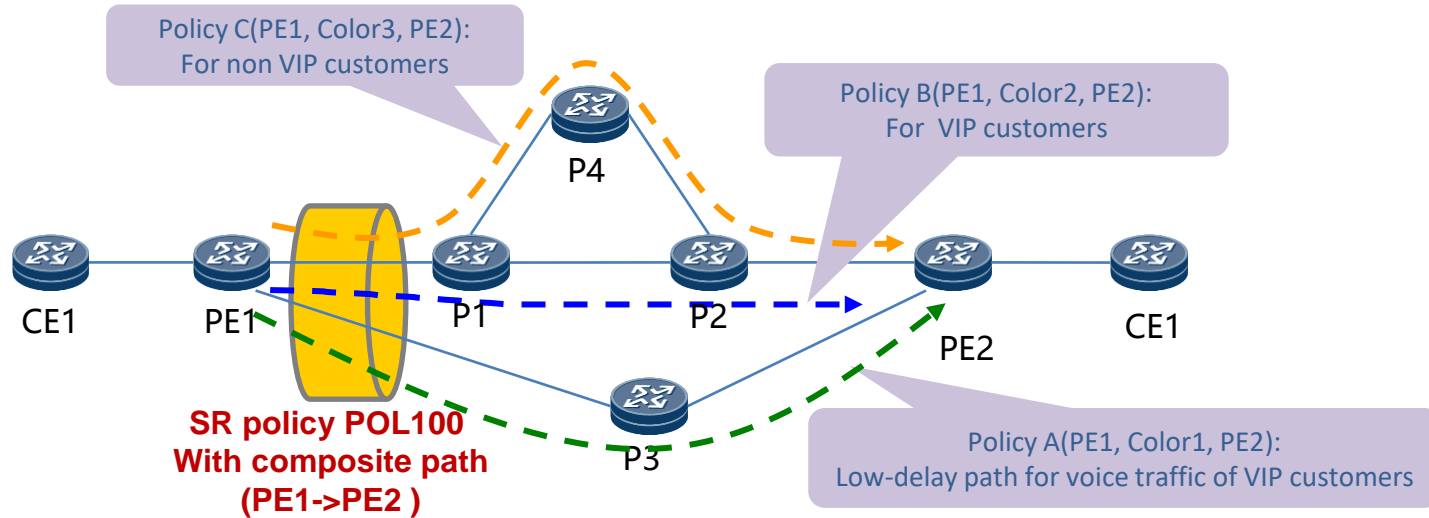
Weight sub-tlv

Per-Flow FC sub-tlv



- sub-TLVs currently defined:
 - An optional single Weight sub-TLV which is defined in section 2.4.4.1 in [I-D.ietf-idr-sr-policy- safi].
According to [RFC9256], the fraction of flows steered into each constituent SR Policy is equal to the relative weight of each constituent SR Policy.
 - An optional single Per-Flow Forwarding Class sub-TLV which is defined in section 2.2 on this document.

Usecase



- DSCP mapping to color:
 - Forwarding Class 1->DSCP1 -> Color1
 - Forwarding Class 2->DSCP2 -> Color2
 - Forwarding Class 3->Other DSCPs -> Color3
- SR policy (PE1->PE2):
 - Constituent SR policy A (Color1, PE2)
 - Constituent SR policy B (Color2, PE2)
 - Constituent SR policy C (Color3, PE2)

SR Policy POL100 <Headend = H1, Color = 100, Endpoint = E1>

Candidate Path CP1 <Protocol-Origin = 20, Originator =

64511:192.0.2.1, Discriminator = 1>

Preference 200

SR Policy A<Color = 1>, Forwarding Class = 1

SR Policy B <Color = 2>, Forwarding Class = 2

SR Policy C <Color = 3>, Forwarding Class = 3

- Identify the customer's service through DSCP.
- Services with different forwarding class carry different DSCP values in the packet.
- The voice traffic of VIP customers is forwarded according to the path of low-delay Constituent SR policy A, other traffic of VIP customers is forwarded according to the path of Constituent SR policy B, and all businesses of non VIP customers are carried by Constituent SR policy C.
- Use BGP distribute SR Policy POL100、SR Policy A、B、 and C.

Next Steps

- Any questions or comments are Welcomed.

Thanks