

BGP Extension for Distributing CP Threshold Constraints of SR Policy

draft-liu-idr-bgp-sr-policy-cp-threshold

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Introduction

● Background

Per [RFC9256], as long as there is a valid segment list in the active candidate path, the active candidate path is valid. But the paths of remaining segment lists may not meet the SR policy forwarding performance requirements, such as:

- Bandwidth
- Delay
- Packet loss rate

```
SR Policy POL1
Candidate Path CP1
Preference 200
Segment List 1 <SID11...SID1i>, Weight 1 //100M
Segment List 2 <SID21...SID2j>, Weight 1 //100M
Segment List 3 <SID31...SID3k>, Weight 1 //100M
Candidate Path CP2
Preference 100
Segment List 4 <SID41...SID4i>, Weight 1 //100M
Segment List 5 <SID51...SID5j>, Weight 1 //100M
Segment List 6 <SID61...SID6k>, Weight 1 //100M
```

○ Requirement: Bandwidth $\geq 200M$
When segment lists 1 and 2 become invalid, even if there is CP2 with lower preference that can meet the bandwidth requirement in the SR policy, the traffic will continue to be forwarded along CP1.

To address this issue, [draft-liu-spring-sr-policy-flexible-path-selection] propose a flexible SR policy candidate path selection method . It takes the forwarding quality and resource requirements of candidate paths as the selection criteria of candidate paths.

● Extension of control plane

This proposal defines extensions of BGP to distribute forwarding quality threshold and metric constraint parameters of candidate path for an SR Policy.

SR Policy encoding structure

Define two SR Policy sub-TLVs

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

Attributes:

Tunnel Encaps Attribute (23)

Tunnel Type: SR Policy (15)

Binding SID

SRv6 Binding SID

Preference

Priority

Policy Name

Policy Candidate Path Name

Explicit NULL Label Policy (ENLP)

SR Bandwidth Constraint Sub-TLV

SR Metric Constraint Sub-TLV

Segment List

Weight

Segment

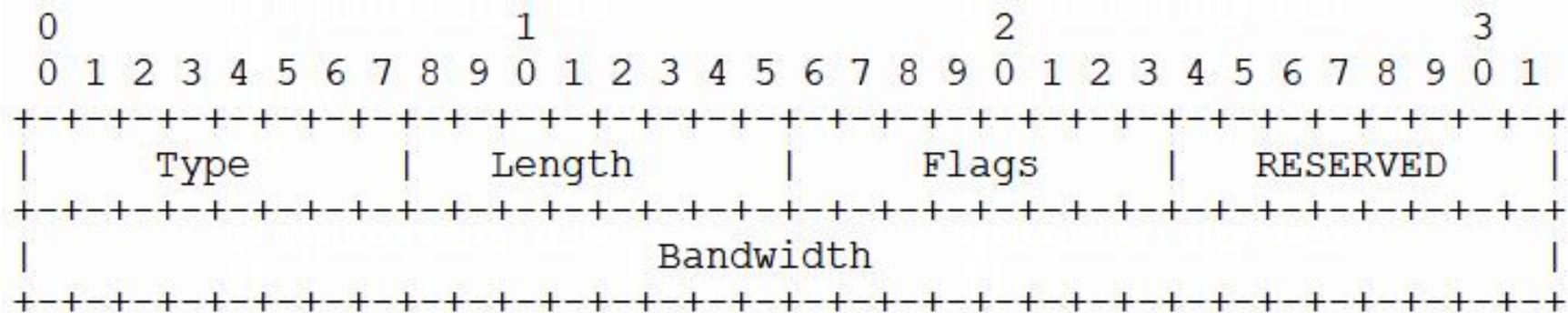
Segment

...

...

SR Bandwidth Constraint sub-TLV

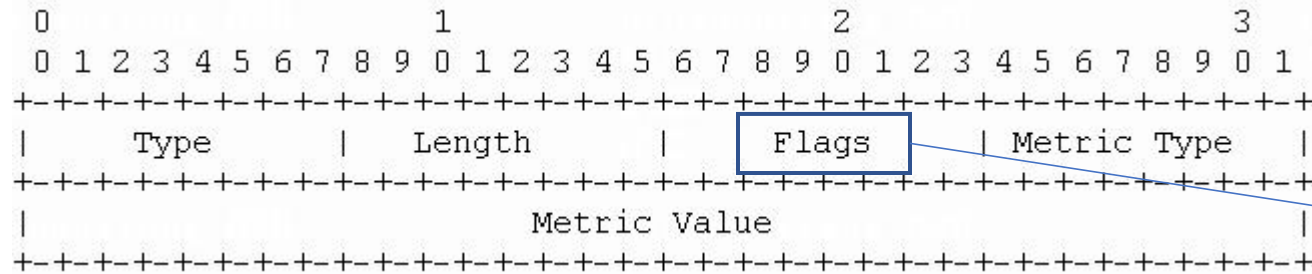
The SR Bandwidth Constraint sub-TLV is used to carry the bandwidth threshold constraint parameter of a candidate path.



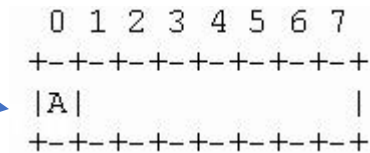
- **Type:** TBA
- **Length:** 4.
- **Flags:** None are defined at this stage.
- **Bandwidth:** 4 octets which specify the bandwidth threshold in unit of bytes per second.

SR Metric Constraint sub-TLV

The SR Metric Constraint sub-TLV is used to carry the metric constraint of a candidate path.



Flags:



- **Type:** TBA
- **Length:** 4.
- **Flags:** Indicate the semantics of Metric Value.
- **Metric Type:** The type of metric.
 - 0 - IGP Metric
 - 1 - Min Unidirectional Link Delay
 - 2 - TE Metric;
 - 3 - Hop Count
 - 4 - SID List Length
- **Metric Value:** The value of metric. The metric value is specified as either an absolute value or as a percentage of the computed path metric based on the A-Flag.

- **A-Flag:** 1 - Represents an absolute value.
0 - Represents a percentage.

Next Steps

- Questions and comments
- Seeking for feedback from WG