

# **BGP SR Policy Extension for Metric**

<https://datatracker.ietf.org/doc/draft-zhang-idr-sr-policy-metric/>

K. Zhang (Huawei Technologies)

J. Dong (Huawei Technologies)

# Backgrounds

- BGP can be used to propagate the SR Policy candidate paths to the headend nodes in the network.
- The SR Policy Encoding structure is as follows:

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

Segment List

Weight

Segment

...

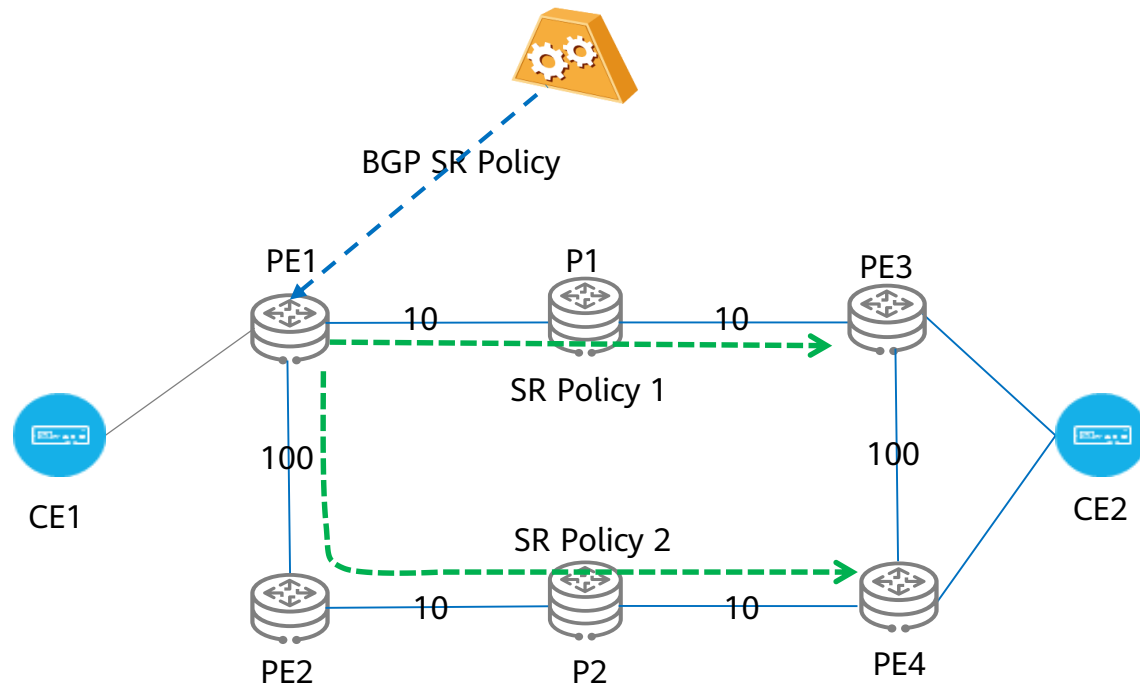
...

# Motivation & Problem Statement

By using BGP SR Policy NLRI, controllers may deliver different SR Policies which satisfy the constraints of VPNs. But sometimes the VPN route need choose next hop according to the IGP metric of each SR Policy.

For example, in this scenario:

- on PE1, the route prefix CE2 has two different next hop PE3 and PE4, each has one SR Policy, SR Policy1 and SR Policy2.
- Both SR Policies satisfies the delay and bandwidth constraints. And the IGP metric of the actual path of SR Policy1, which is PE1-P1-PE3, is 20; whereas the IGP metric of the actual path of SR Policy2, which is PE1-PE2-P2-PE4, is 120.
- In this case, PE1 want to choose the next hop according to the IGP metric of SR Policies, thus can have the path with less cost.



Thus controller should deliver the IGP metric of SR Policies using BGP SR Policy protocol.

# BGP SR Policy extensions

- To solve this problem, we propose to add the metric Sub-TLV to BGP SR Policy. The Metric Sub-TLV is added as an Sub-TLV of Segment List.

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

**Metric**

Segment

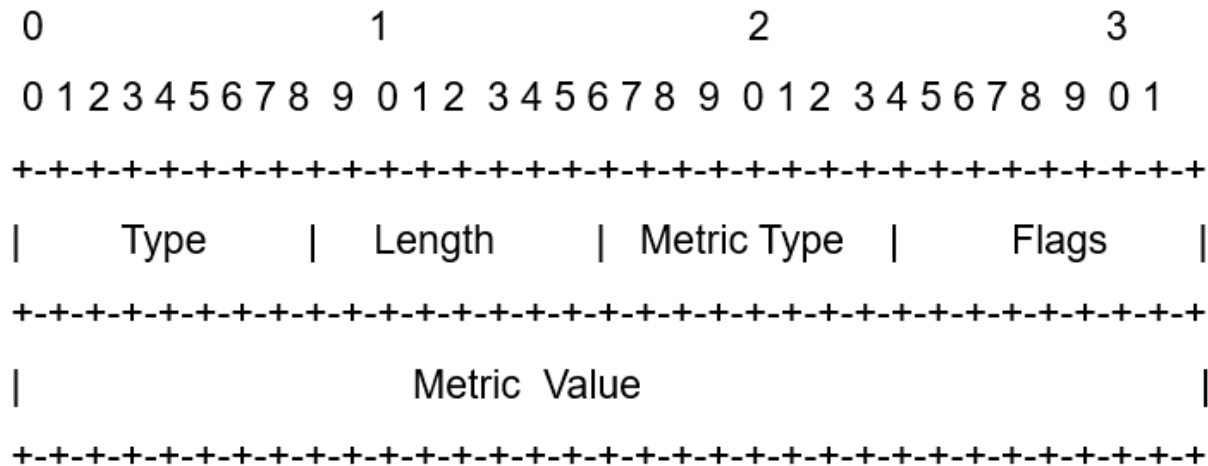
Segment

...

...

# BGP SR Policy Extensions

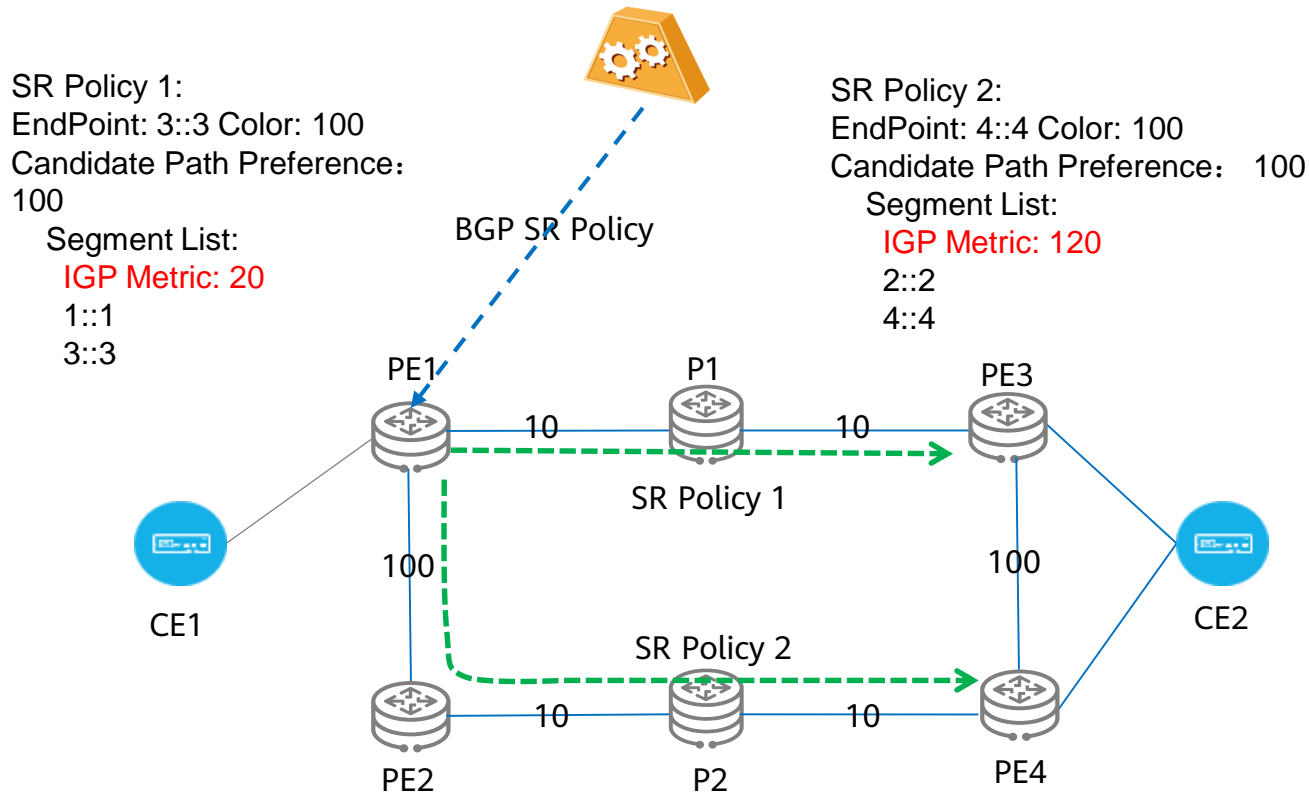
The format of metric Sub-TLV is defined as follows:



Where:

- Type: Metric, 1 octet, TBD.
- Length: 6.
- Flags: 1 octet of flags. None are defined at this stage. Flags SHOULD be set to zero on transmission and MUST be ignored on receipt.
- Metric Type: Specifies the metric type, Five values are currently defined: IGP metric(1)、TE Metric(2)、Hop counts(3)、Delay metric(4)、Loss Rate metric(5).
- Metric Value(32 bits): metric value encoded in 32 bits in IEEE floating point format (see [IEEE.754.1985])

# Processing of the Metric



- PE1 gets two different SR Policies. The next hop to PE3
- uses SR Policy1, metric is 20. The next hop to PE4 uses SR Policy2, metric is 120. And PE1 choose next hop according to IGP metric, and the result next hop is PE3.

# Processing of the Metric (cont.)

When SR Policy headend get the SR Policy segment list with metric, how to process the metric is local policy.

- The active candidate path of SR Policy may have several segment lists, each segment list have different metric.
- It is recommended that the segment lists in one candidate path have the same metric type.
- If the metric values of segment lists in one candidate path are different, the candidate path metric can use the minimum value as the metric of candidate path.
- And the SR Policy use the metric value of active candidate path.

The SR Policy metric value then can be used in routing preference.

# Next Steps

- Welcome questions and comments

Thank you!