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C. Lin
M. Chen
New H3C Technologies
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BGP SR Policy Extensions for Segment List Identifier
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Abstract

Segment Routing is a source routing paradigm that explicitly indicates the forwarding path for packets at the ingress node. An SR Policy is a set of candidate paths, each consisting of one or more segment lists. This document defines extensions to BGP SR Policy to specify the identifier of segment list.

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BGP SR Policy Segment List Identifier

March 2022

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[1.](#) Introduction

Segment routing (SR) [[RFC8402](#)] is a source routing paradigm that explicitly indicates the forwarding path for packets at the ingress node. The ingress node steers packets into a specific path according to the Segment Routing Policy (SR Policy) as defined in [[I-D.ietf-spring-segment-routing-policy](#)]. In order to distribute SR policies to the headend, [[I-D.ietf-idr-segment-routing-te-policy](#)] specifies a mechanism by using BGP.

However, there is no identifier for segment list in BGP SR Policy, which may cause inconvenience for other mechanisms to designate segment lists distributed by BGP.

For example, a network controller distributes SR policies to the headend nodes, and the headend nodes collect traffic forwarding statistics per segment list. When a headend node report each statistic to the controller, it needs to specify the segment list

which the statistic belongs to. Due to the lack of identifier, the headend node usually reports all SIDs in the associated segment list along with the statistic, and the controller needs to distinguish the segment list by comparing the SIDs one by one. The advertisement

of all SIDs in the segment list consumes a lot of octets, and the comparison of SIDs can be complicated.

For another example, a network controller distributes SR policies using BGP, and then it uses NETCONF to set some configurations of the segment lists, which are not suitable to be carried in BGP. So the controller needs to specify the segment list which the configurations belong to. In this case, a simple identifier of segment list can also be helpful.

This document defines extensions to BGP SR Policy to specify the identifier of segment list.

1.1. Requirements Language

The key words "MUST", "MUST NOT", "REQUIRED", "SHALL", "SHALL NOT", "SHOULD", "SHOULD NOT", "RECOMMENDED", "NOT RECOMMENDED", "MAY", and "OPTIONAL" in this document are to be interpreted as described in [BCP 14](#) [[RFC2119](#)] [[RFC8174](#)] when, and only when, they appear in all capitals, as shown here.

2. Segment List Identifier in SR Policy

As defined in [[I-D.ietf-idr-segment-routing-te-policy](#)], 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

 Explicit NULL Label Policy (ENLP)

 Segment List

```
        Weight
        Segment
        Segment
        ...
    ...
```

SR policy with segment list identifier is expressed as below:

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 List Identifier

 Segment

 Segment

 ...

 ...

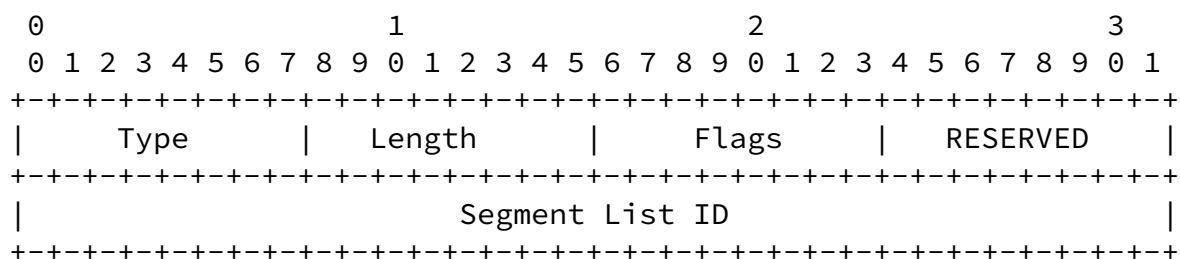
The segment list identifier can be advertised using the Segment List ID sub-TLV or the Segment List Name sub-TLV, as defined in [Section 2.1](#) and 2.2.

[2.1](#). Segment List ID Sub-TLV

The Segment List ID sub-TLV specifies the identifier of the segment list by a 4-octet number.

The Segment List ID sub-TLV is optional and it MUST NOT appear more than once inside the Segment List sub-TLV.

The Segment List ID sub-TLV has the following format:



where:

- o Type: TBD.
- o Length: 6.

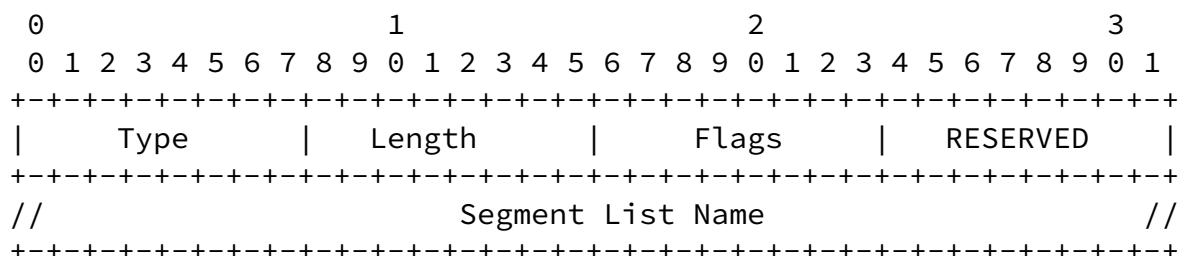
- o Flags: 1 octet of flags. None are defined at this stage. Flags SHOULD be set to zero on transmission and MUST be ignored on receipt.
- o RESERVED: 1 octet of reserved bits. SHOULD be set to zero on transmission and MUST be ignored on receipt.
- o Segment List ID: 4 octet of ID for the segment list.

2.2. Segment List Name Sub-TLV

The Segment List Name sub-TLV specifies the identifier of the segment list by a symbolic name.

The Segment List Name sub-TLV is optional and it MUST NOT appear more than once inside the Segment List sub-TLV.

The Segment List Name sub-TLV has the following format:



where:

- o Type: TBD.
- o Length: Variable.
- o 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.
- o RESERVED: 1 octet of reserved bits. SHOULD be set to zero on transmission and MUST be ignored on receipt.
- o Segment List Name: Symbolic name for the segment list. It SHOULD be a string of printable ASCII characters, without a NULL terminator.

3. Security Considerations

TBD

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4. IANA Considerations

Segment List ID sub-TLV and Segment List Name sub-TLV (TBD)

5. References

5.1. Normative References

- [RFC2119] Bradner, S., "Key words for use in RFCs to Indicate Requirement Levels", [BCP 14](#), [RFC 2119](#), March 1997.
- [RFC8174] Leiba, B., "Ambiguity of Uppercase vs Lowercase in [RFC 2119](#) Key Words", [BCP 14](#), [RFC 8174](#), May 2017
- [RFC8402] Filsfils, C., Ed., Previdi, S., Ed., Ginsberg, L., Decraene, B., Litkowski, S., and R. Shakir, "Segment Routing Architecture", [RFC 8402](#), DOI 10.17487/RFC8402, July 2018, <<https://www.rfc-editor.org/info/rfc8402>>.
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<<http://www.ietf.org/internet-drafts/draft-ietf-idr-segment-routing-te-policy-16.txt>>.

5.2. Informative References

[I-D.ietf-spring-segment-routing-policy] Filsfils, C., Talaulikar, K., Voyer, D., Bogdanov, A., and P. Mattes, "Segment Routing Policy Architecture", Work in Progress, Internet-Draft, [draft-ietf-spring-segment-routing-policy-22](#), 22 March 2022, <<http://www.ietf.org/internet-drafts/draft-ietf-spring-segment-routing-policy-22.txt>>.

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Authors' Addresses

Changwang Lin
New H3C Technologies

Email: linchangwang.04414@h3c.com

Mengxiao Chen
New H3C Technologies

Email: chen.mengxiao@h3c.com

