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SR Policy for Reverse Path draft-lp-spring-sr-policy-reverse-path-00

Abstract

This document introduces a method of dynamically configuring the return path for an SR path.

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S. Pena

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1. Introduction

Echo-BFD [RFC5880] can be used to monitor an SR Policy between the local and the remote BFD peers. As defined in [RFC5880], the remote BFD system does not process the payload of an Echo BFD.

A BSID can be used to specify the return path of an Echo BFD packet.

As introduced in [I-D.ietf-spring-bfd], the sender MAY use a Binding SID (BSID) [RFC8402] that has been bound with the SR Policy that ensures the return of a packet to that particular node and a BSID MAY be associated with the SR Policy that is the reverse to the SR Policy programmed onto the BFD Echo packet by the sender.

One way to implement this is through static configuration, e.g, configure the BSID corresponding to the return path for each segment list when enable BFD for an SR policy or an segment list.

This document introduces a method of dynamically configuring the return path for an SR path, which can be used to specify the return path in Echo BFD for SR, ICMPv6 for SRv6, etc.

2. SR Policy for Bidirectional Path

In order to specify the return path for an segment list when delivering the SR Policy, and the tail node can return the packet according to the specified return path, this document proposes extensions of SR Policy. It allows the segment list to have its own BSID.

When delivering SR policy, the BSID of the segment list and the corresponding BSID of the return segment list can be carried together.

2.1. BGP Extensions for Advertising Segment List

Segment List sub-TLV is introduced in [I-D.ietf-idr-segment-routing-te-policy] and it includes the elements of the paths (i.e., segments).

This document introduces two optional sub-sub-tlvs of Segment List sub-TLV, Binding SID Sub-TLV and Reverse Binding SID Sub-TLV.

The Binding SID sub-TLV has the following format:

0	1	2	3		
0 1 2 3 4 5 6	6 7 8 9 0 1 2 3 4	5 6 7 8 9 0 1 2 3 4	5 6 7 8 9 0 1		
+-+-+-+-+-	-+-+-+-+-+-+-+	-+-+-+-+-+-+-+-+-			
Type	Length	Flags	RESERVED		
+-+-+-+-+-	+-+-+-+-+-+-+-+	-+-+-+-+-	+-+-+-+-+-+-+		
1	Binding SID (var	iable, optional)	1		
+-					

Figure 1: Binding SID Sub-TLV

where:

Type: TBD.

Length: specifies the length of the value field not including Type and Length fields.

Binding SID: the BSID of the segment list.

The Reverse Binding SID sub-TLV has the following format:

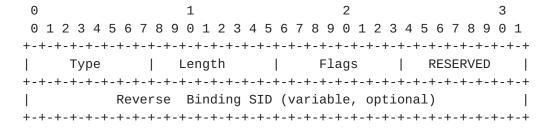


Figure 2: Reverse Binding SID Sub-TLV

where:

Type: TBD

Length: specifies the length of the value field not including Type and Length fields.

Reverse Binding SID: the BSID of the reverse SR path. If it is encapsulated in the packet, the Reverse Binding SID must the last segment to be processed.

The extended 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
                 Binding SID
                 Reverse Binding SID
                 Weight
                 Segment
                 Segment
                 . . .
```

Whether to carry RBSID in the packet can be configured according to service requirements. For example, when echo BFD packets are encapsulated, RBSID is carried in segment list, while packets of other services do not carry RBSID by default. Thus BFD packets and common service packets can share the same SR Policy.

2.2. Illustration

```
+-+ +-+ +-+
|A|-----|D|
   +-+
       +-+
           +-+
```

Figure 3: Reference Topology

The content of Segment List1 in SR Policy1 received by A is:

```
Segment List1
        Reverse Binding SID D1
        Segment B
        Segment C
        Segment D
```

The content of Segment List2 in SR Policy2 received by D is:

```
Segment List2
Binding SID D1
Segment C
Segment B
Segment A
```

The SID-List of the BFD ECHO sent by A is < B, C, D, D1 >.

After the packet arrives at node D, D1 is Segment List2 BSID. BFD packets are returned from node D according to segment list < C, B, A >.

2.3. Difference from Path Segment

TBD

3. Security Considerations

Procedures and protocol extensions defined in this document do not affect the security considerations discussed in [I-D.ietf-idr-segment-routing-te-policy] and [I-D.ietf-spring-segment-routing-policy].

4. IANA Considerations

TBD

5. Normative References

[I-D.ietf-spring-bfd]

Mirsky, G., Tantsura, J., Varlashkin, I., Chen, M., and J. Wenying, "Bidirectional Forwarding Detection (BFD) in Segment Routing Networks Using MPLS Dataplane", draft-ietf-spring-bfd-00 (work in progress), September 2020.

[I-D.ietf-spring-segment-routing-policy]

Filsfils, C., Talaulikar, K., Voyer, D., Bogdanov, A., and P. Mattes, "Segment Routing Policy Architecture", <u>draft-ietf-spring-segment-routing-policy-09</u> (work in progress), November 2020.

[RFC5880] Katz, D. and D. Ward, "Bidirectional Forwarding Detection (BFD)", RFC 5880, DOI 10.17487/RFC5880, June 2010, https://www.rfc-editor.org/info/rfc5880.

[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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