

BGP SR Policy Extensions for BFD Configuration

draft-li-idr-bgp-sr-policy-bfd-extension-01

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Motivation

- In controller-based deployments, SR Policies are typically distributed using BGP SR Policy (RFC 9830) or PCEP. However, in current deployments SR Policy provisioning and BFD/S-BFD configuration are performed independently, often through manual configuration, NETCONF/YANG, or additional automation mechanisms.
- This separation introduces several operational challenges:
 - *Increased operational complexity*
 - *Longer provisioning time*
 - *Potential inconsistencies between SR Policy and monitoring configuration*
- While PCEP extensions to carry S-BFD parameters for SR Policies are already available as a WG document
 - *draft-ietf-pce-pcep-bfd-parameters*
- This proposal focuses on BGP extensions.

Revision History

Version 01

Updated TLV encoding with BFD/S-BFD parameters.

Clarified the relationship to RFC 9026.

Relationship to RFC 9026

- RFC 9026 defines a new BGP Path Attribute to associate BFD sessions with BGP routes.
- However, to use RFC9026 for the SR Policy use case, additional considerations would be needed.
- In particular, it may require enhancements to the SRPM to interpret and act upon BFD state at the Candidate Path level.
- In addition, support for S-BFD would need to be considered.
- These aspects would likely require further discussion in the working group.

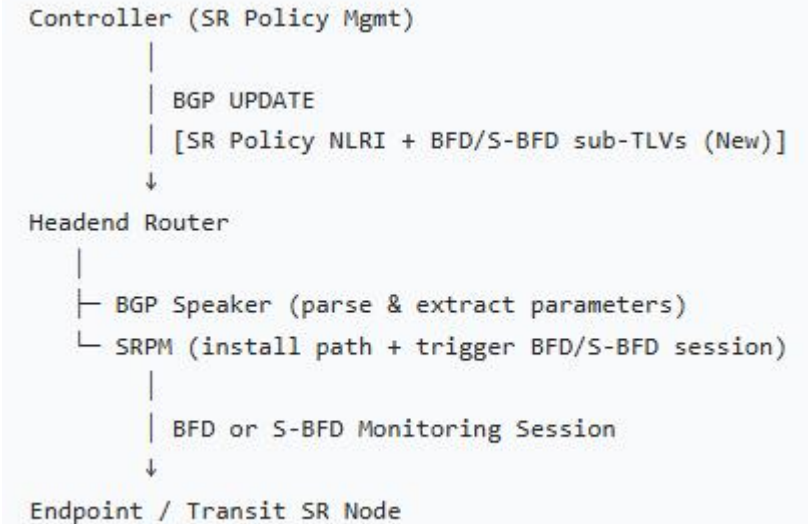
Overview

- This document extends BGP SR Policy (RFC 9830) to distribute BFD/S-BFD configuration parameters alongside SR Policy Candidate Paths.
- New optional sub-TLVs for BFD/S-BFD monitoring are defined within the Tunnel Encapsulation Attribute (RFC 9012).
- These sub-TLVs let the controller specify BFD/S-BFD settings per SR Policy Candidate Path. These parameters allow a controller to specify BFD or S-BFD settings for a specific Candidate Path.

Workflow (as shown in the diagram):

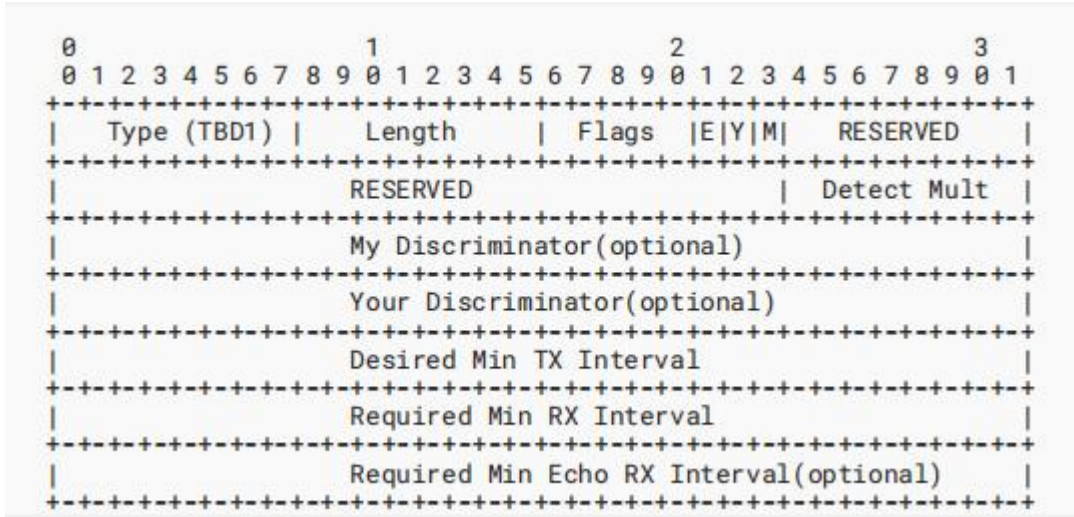
1. Controller sends a BGP UPDATE containing SR Policy NLRI + new BFD/S-BFD sub-TLVs.
2. Headend router parses the message, extracts BFD/S-BFD parameters, and passes them to the SR Policy module (SRPM).
3. SRPM installs the Candidate Path and instantiates the corresponding BFD/S-BFD monitoring session.

```
SR Policy SAFI NLRI: <Distinguisher, Color, Endpoint>
Attributes:
  Tunnel Encapsulation Attribute (23)
    Tunnel Type: SR Policy (15)
      Binding SID
      Preference
      Priority
      BFD Parameters (This Document)
      S-BFD Parameters (This Document)
      SR Policy Name
      SR Policy Candidate Path Name
      Explicit NULL Label Policy (ENLP)
      Segment List
        Weight
        Segment
        Segment
        ...
      ...
```



Encoding Extension

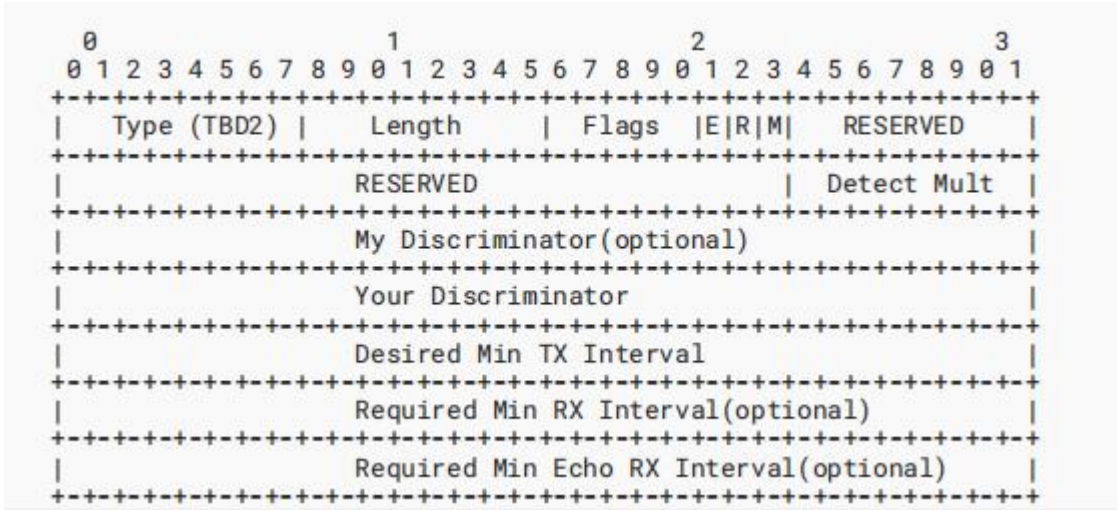
The format of this BFD Parameters Sub-TLV is as follows.



Flag’s meaning

- *M bit: When set, My Discriminator field is present in this Sub-TLV*
 - *Y bit: When set, Your Discriminator field is present in this Sub-TLV*
 - *E bit: When set, Required Min Echo RX Interval field is present in this Sub-TLV.*
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- In BFD, the Your Discriminator can be learned during session establishment.
 - In S-BFD, the reflector does not establish a session or perform discriminator negotiation. Therefore, the initiator must know the reflector discriminator in advance, which is carried in the Your Discriminator field.

The format of this S-BFD Parameters Sub-TLV is as follows.



Flag’s meaning

- *M bit: When set, My Discriminator field is present in this Sub-TLV*
- *R bit: When set, Required Min RX Interval field is present in this Sub-TLV*
- *E bit: When set, Required Min Echo RX Interval field is present in this Sub-TLV.*

Next Steps

Welcome questions and comments

Thanks!