PCEP Extension to support BFD parameters
IETF 116 Yokohama

• New Draft: https://datatracker.ietf.org/doc/draft-fizgeer-pcep-bfd-parameters/

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Motivation

• Seamless BFD (S-BFD, RFC 7880) is a proactive OAM tool that provides fast and reliable monitoring of liveness of forwarding paths
  • As per RFC 7881, S-BFD can be used with IPv4, IPv6 and MPLS paths
  • S-BFD is applicable for monitoring liveness of SR LSPs including candidate paths of SR Policies (RFC 9256)
• Stateful PCEP can be used to set up LSPs including candidate paths of SR Policies (https://www.ietf.org/archive/id/draft-ietf-pce-segment-routing-policy-cp-09.html)
• This document defines extensions to PCEP that are required to enable S-BFD for different types of paths (including but not limited to the candidate paths of SR Policies) and configure its parameters. These extensions:
  • Are applicable to all path setup types
  • Are applicable to SR paths that use SR-MPLS and SRv6
  • Facilitate:
    • Negotiation of Seamless BFD capabilities
    • Enabling and disabling Seamless BFD on specific paths
    • Setting parameters of specific Seamless BFD sessions.
The LSP-SBFD-Capability TLV is an optional TLV. It MAY be carried within an OPEN object sent by PCEP speaker in an Open message to a PCEP peer to indicate it supports SBFD capability.
LSPA Object

- The PCEP LSP-SBFD TLV is an optional TLV. It MAY be carried within the LSPA object. B flag indicates Enable/Disable S-BFD for this LSP.

```
0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1
+-------------------------------+-------------------------------+
| 0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1 |
| +-------------------------------+-------------------------------+
| Type | Length |
| +-------------------------------+-------------------------------+
| Reserved |
| +-------------------------------+-------------------------------+
| B |
| +-------------------------------+-------------------------------+
| Optional sub-TLVs |
| +-------------------------------+-------------------------------+

- Type: TBD
- Length: The total length in bytes of the remainder of the TLV, that is, excluding the Type and Length fields.
- B flag: Enable/Disable S-BFD for this LSP. If B=1 then S-BFD will be enabled. If B=0 then S-BFD will be disabled for that LSP. If the PCEP speaker received LSP-SBFD TLV from PCEP peer with B flag is set to 0 then S-BFD shall be removed for specified LSP.
LSPA Object new Sub-TLVs

- The PCEP LSP-SBFD-Parameters sub-TLV is optional. It MAY be carried within the LSP-SBFD TLV. Parameters:

  ![Type: TBD3
Length: 8
Min Tx Interval: 32 bits - Specify the Minimal Transmit Interval (microseconds). Default "1000000".
Multiplier: 1..255](image1)

- LSP-SBFD-Discriminator sub-TLV and is optional TLV. It MAY be carried within the LSP-SBFD TLV.

  ![Type: TBD4
Length: 4
Remote Discriminator: 32 bits](image2)
If a PCEP speaker is capable of S-BFD and its peer is capable of S-BFD, then the PCEP speaker MAY send LSP-SBFD TLV towards that peer, to report the S-BFD state (Enabled/Disabled) for the configured LSP. The LSP-SBFD TLV shall be sent as an optional TLV in the LSPA object.

- A PCC shall send it in the PCRpt message.
- A PCE shall send it in the PCInit or in the PCUpd message. If the LSP-SBFD TLV is received from a PCEP peer with the B flag set to 1, then S-BFD shall be applied for specified LSP.
### PCEP Errors

<table>
<thead>
<tr>
<th>Error Type</th>
<th>Error Value</th>
<th>Meaning</th>
<th>Reference</th>
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<tbody>
<tr>
<td>19</td>
<td>TBD5</td>
<td>SBFD capability is not negotiated</td>
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<tr>
<td>23</td>
<td>TBD6</td>
<td>Multiplier is out of range</td>
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<tr>
<td>26</td>
<td>TBD7</td>
<td>Invalid S-BFD parameter value</td>
<td>This document</td>
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<tr>
<td>26</td>
<td>TBD8</td>
<td>Remote Discriminator is out of range</td>
<td>This document</td>
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Next Steps

The authors solicit feedback from PCE Work Group