BGP-LS EPE InterAS TE IETF 106

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I E T F

Agenda

- Background
- Problem statement
- Proposal
- Updates from previous version
- Ask & Next step

Inter-AS SR TE Background

- Draft regarding BGP-LS extensions for BGP EPE; Not related to IGPs running (passive) on Inter-AS links.

- draft-ietf-idr-bgpls-segment-routing-epe-17 describes mechanism to carry BGP peering segments in BGP-LS.

    - Refers to RFC7752 for relevant TE link attributes.

- Gaps in BGP-LS EPE in scenarios where centralized Controller needs to build paths for inter-AS TE purposes.

Inter-AS SR TE Problem-1 & Proposal

AS1 **R1** **R2** AS2

◄——— Single Administrative domain ———►

- Managed as single administrative domain and centralized Controller to establish Inter-AS SR TE.
 - Issue: No mechanism to inform links used for providing FRR protection.

- Proposal

V	L	B	P	F	Rsvd

  - Introduces 'F' flag for the peering SID
  - FRR SID will be included in corresponding PeerNodeSID/PeerAdjSID advertisement with F bit set
  - Links represented by FRR SIDs will carry traffic when there is a failure.

Inter-AS SR TE Problem-1 & Proposal

PeerAdjSID: 1000

AS1 **R1** **R2** AS2

PeerAdjSID: 2000

Single Administrative domain
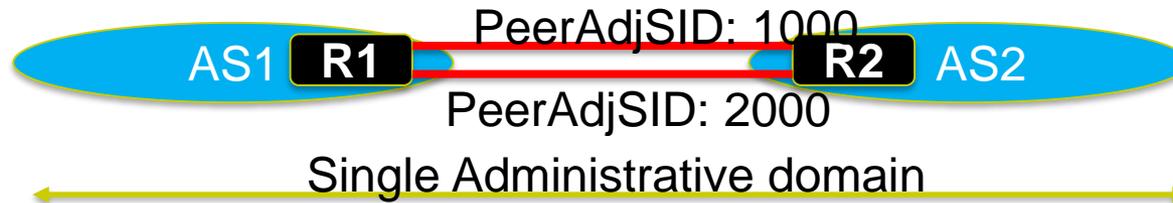
- PeerAdjSID 2000 is backup for PeerAdjSID 1000
- If link representing PeerAdjSID 1000, traffic is forwarded along link 2 represented by PeerAdjSID 2000
  - Issue: Controller is not informed link2 is being used as backup for link 1

V	L	B	P	F	Rsvd

- Proposal
  - Introduces 'F' flag for the peering SID.
  - BGP-LS attribute for PeerAdj SID advertisement for 1000 will also include another Peering segment attribute with label 2000 and with flag having F bit set

Inter-AS SR TE Problem-2

AS1 **R1** **R2** AS2

Single Administrative domain

- eBGP multi-hop peering across multi-AS network, parallel links used for load-sharing & network managed by centralized Controller.

    - Issue: Local & Remote BGP peering addresses are not sufficient to identify the underlying links.

Inter-AS SR TE Proposal-2

- PeerAdjSID MUST be advertised for Inter-AS links.
  - Should contain TE attributes, local, remote interface addresses.
- PeerNodeSID should contain link local IP address
  - Hence, Controller can co-relate the Inter-AS links.
- Caveat: Unnumbered interfaces for Inter-AS links are not supported.
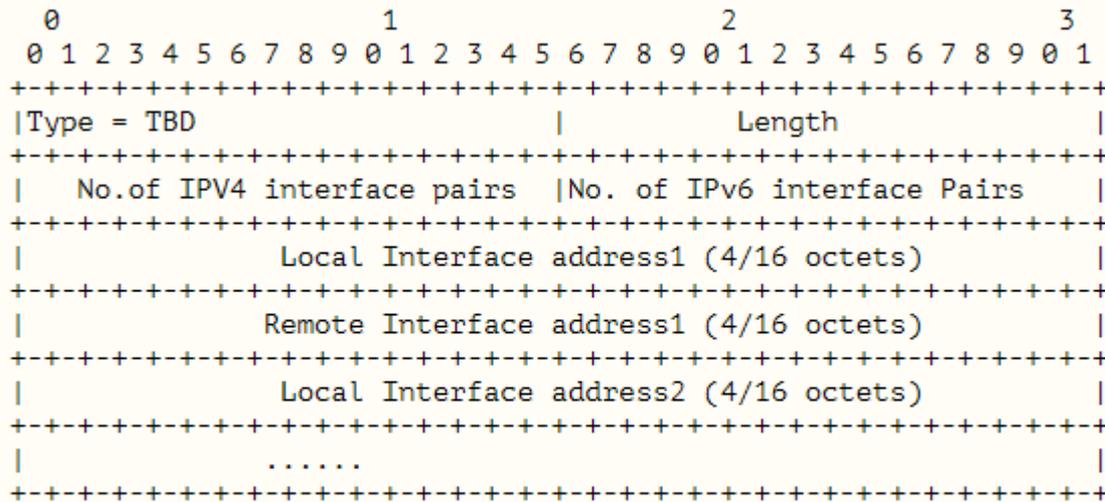
Updates in -02 version

```
 0                   1                   2                   3
 0 1 2 3 4 5 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 = TBD                    |              Length            |
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
|   No.of IPV4 interface pairs  |No. of IPv6 interface Pairs    |
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
|                 Local Interface address1 (4/16 octets)        |
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
|                 Remote Interface address1 (4/16 octets)       |
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
|                 Local Interface address2 (4/16 octets)        |
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
|                 ......                                         |
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
```

Figure 3: Link Address TLV carried as attribute

➢ Multiple pairs of interface local/remote address
   pairs
➢ IPv4/IPv6 address pairs
➢ IPv4 followed by IPv6 address pairs

Summary & Next steps

- Proposal strengthens Inter-AS SR TE in the mentioned scenario.

- Request review and comments

Thank you