SR Generic FEC TLV for LSP Ping
(draft-nainar-mpls-spring-lsp-ping-sr-generic-sid)

Nagendra Kumar Nainar, (Presenter)
Carlos Pignataro,
Zafar Ali,
Clarence Filsfils
(Cisco Systems, Inc.)
Tarek Saad,
(Juniper)
Problem Statement

- Requires new target FEC Stack sub-TLV definition and standardization efforts for each new Segment ID defined.
  - Define new TLV.
  - Update FEC validation procedure of RFC-8029

- Requires domain/node wide software upgrade depending on the type of the Segment ID defined.

- Raises scalability challenges.
Problem Statement (A partial list of New SR FECs)

BGP Peer Node SID

BGP Peer Adj-SID

BGP Peer Set SID

BGP Peer Set SID Sub-TLVs

FEC changes for Flex-Algo
Problem Statement (Cont’ed)

- Requires a lot of information to be derived by the Initiator to include in the Echo Request.
- Complex FEC filling procedures at Ingress (one for each Prefix SID type).
- Complex validation procedures at Egress (one for each Prefix SID type).
Solution

- **SR SID data model is:**
  - Segment ID (Label)

- **FEC validation Procedure**
  - Segment ID to Interface mapping is maintained by any node.
    - Local implementation matter
  - Initiator defines the SID value and LSP EndPoint while triggering LSP Ping
    - Manually defined via CLI or dynamic PCE query.
  - Responder validates if it is the LSP End Point and if the probe is received over the right incoming interface.
    - Respond based on the validation.
SR Generic Label Sub-TLV

- SR SID
  - Carries 20 bits of Segment ID used for validation.
Initiator (R1) triggers LSP Ping with below SR Generic Label Sub-TLV:
- For Prefix SID 160008 {SID=160008}
- For Prefix SID 161288 {SID=161288}

R8 validates if LSP-EndPoint is self; and if 160008 is assigned locally.
Procedure
Parallel Adj-SID Validation

- Initiator (R1) triggers LSP Ping with below SR Generic Label Sub-TLV:
  - For Parallel Adj SID 9378 {SID=9378}

- R8 validates if LSP-EndPoint == self; and if Interface-I matches interface for 9378.
Procedure
Parallel Adj-SID Validation

- Initiator (R1) triggers LSP Ping with below SR Generic Label Sub-TLV:
  - For Parallel Adj SID 9378 \{SID=9378\}

- Responder (R8 or R88) validates if SIDs are assigned by upstream; validates if Interface-I matches interface for 9378.
R8 maintains the below mapping:

- 160008 → Incoming Interface: {Any}
- 161288 → Incoming Interface: ({Any}
- 9178 → Incoming Interface: {Link 1}
- 9278 → Incoming Interface: {Link 2}
- 9378 → Incoming Interface: {Link 1 or Link 2}
In a nut shell

- One Target FEC Stack Sub-TLV that covers multiple Segment IDs.
- Drastically reduces the information required on the Initiator.
  - Ease of operation.
- Reduces the information to be processed by the responder.
- Extendable to accommodate future Segment IDs.
IANA Registry Allocation

- Request for a new Sub-TLV for TLV types 1, 16 and 21.
- Value from range 38-31743 (Unassigned range)
- Re-uses existing Return codes and Return Sub-codes
I-D Status

➢ Next Steps:
  o WG feedback sought
  o Textual Contributions Welcomed!
  o WG Adoption request

➢ Thank you!