

**IETF 102 – Montreal
July 2018**

Supporting Flexible Algorithm Prefix SIDs in LSP Ping/Traceroute

(draft-Iqbal-spring-mpls-ping-algo-00)

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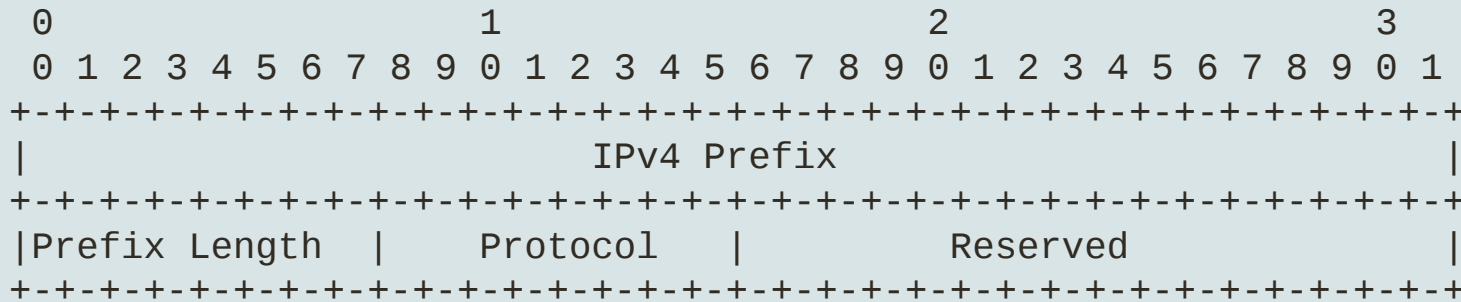
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Problem Statement

- RFC-8287 defines MPLS Ping/Traceroute extensions for Segment Routing with MPLS data plane.

- IPv4 IGP Prefix SID is defined as:



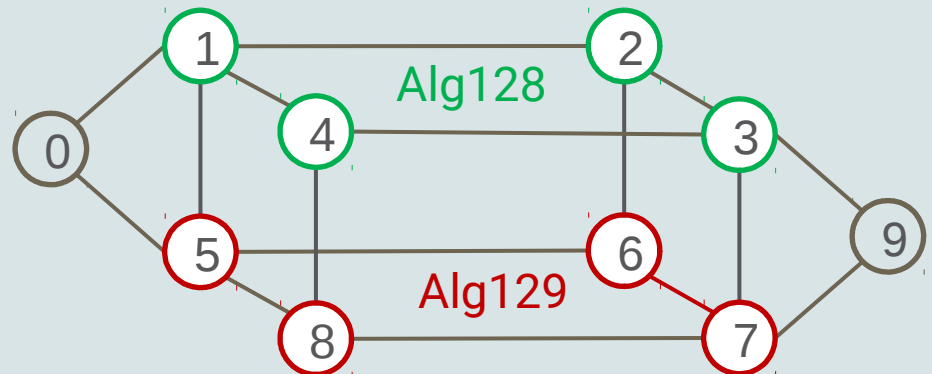
- I-D **ietf-lsr-flex-algo** introduces Flexible Algorithms to allow IGP to compute constraint based path over an SR network.

- Flexible Algorithm paths utilize the same IP Prefix but different Prefix SID labels for each path.

Nodes 0 and 9 participate to Algo 0, 128 and 129

Nodes 1/2/3/4 participate to Algo 0 and 128

Nodes 5/6/7/8 participate to Algo 0 and 129

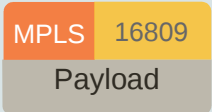


Problem Statement (contd.)

Incoming label (16809) does not match against default Prefix SID label (16009). Node 1 responds with error (Label Mismatch).

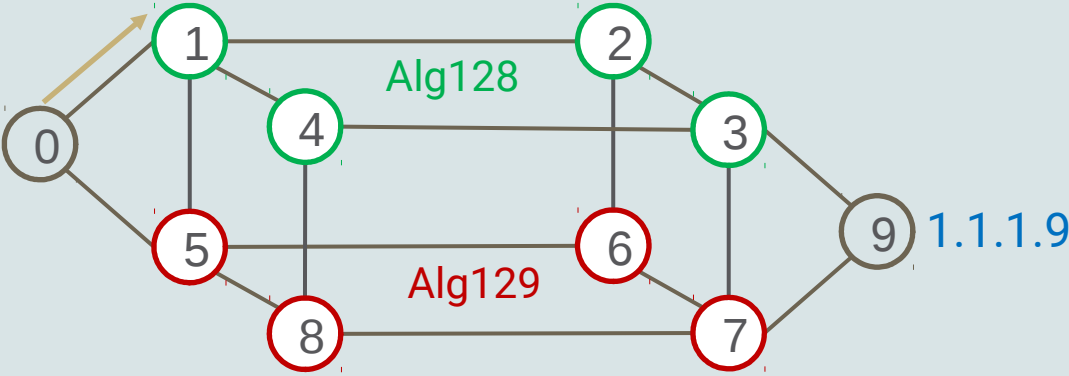
Node 1 receives MPLS echo request for target node 9. using Algo 128 Prefix SID label.

OAM Payload	Echo Request Header
	Target FEC Stack (IGP Pfx SID) (Pfx:1.1.1.9, L:32, Prot:0) Downstream Detailed Mapping



Nodes 9 advertises

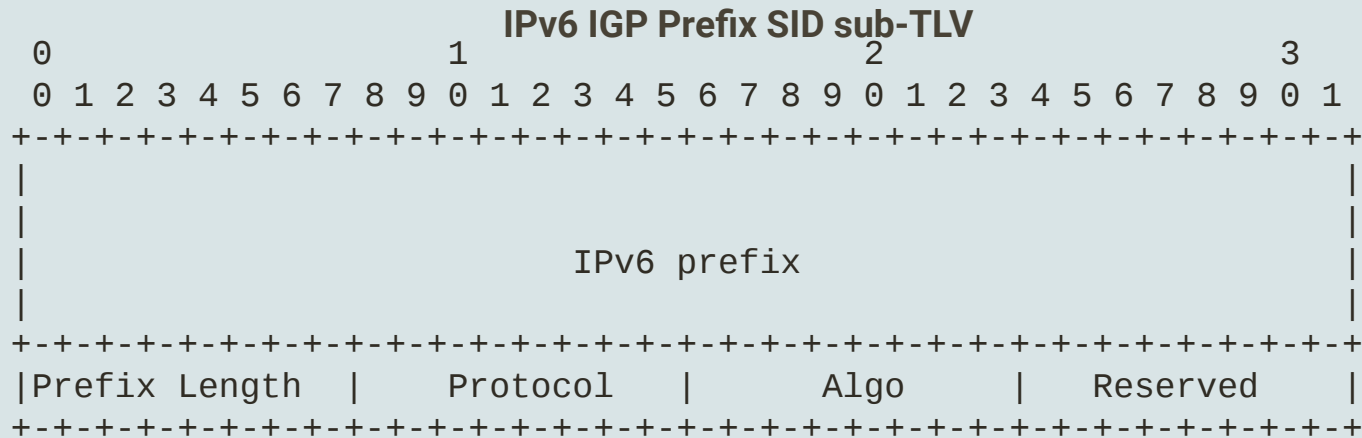
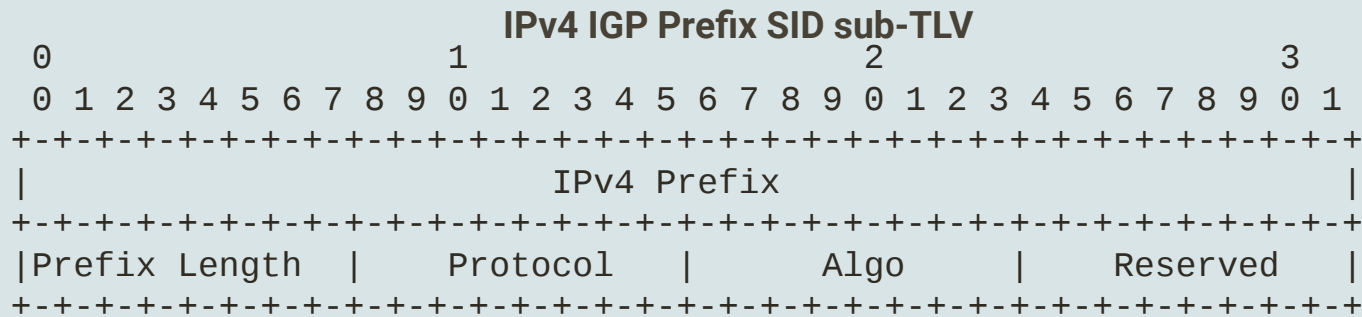
- Prefix SID 16009 for ALG00
- Prefix SID 16809 for Algo 128
- Prefix SID 16909 for Algo 129



- MPLS Ping and Traceroute tools may return false positives or false negatives in presence of Flexible Algorithms.
- RFC-8287 requires extension to tackle above challenges.

Proposed Solution – Add Algo ID

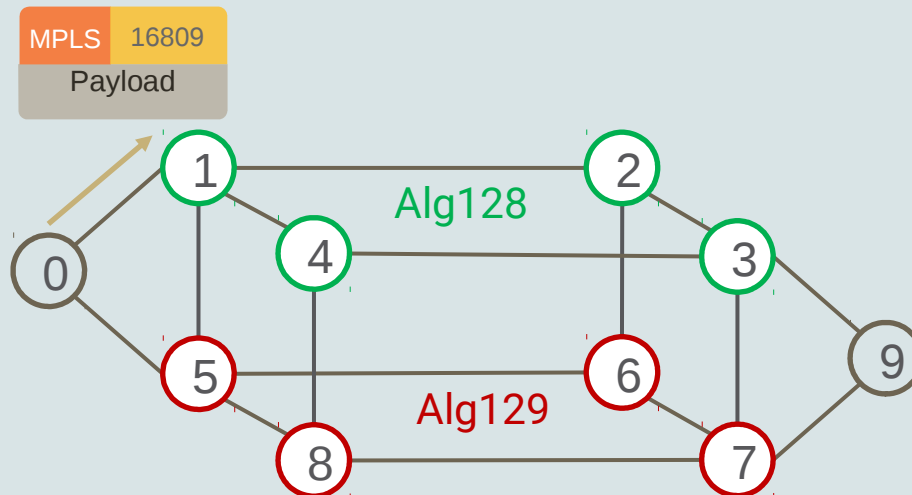
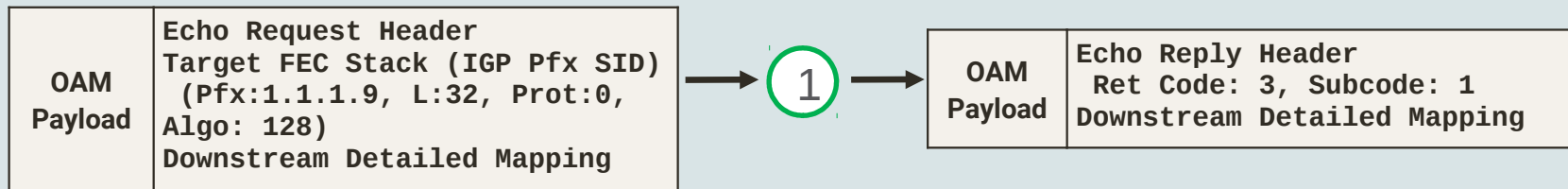
- Extend IGP Prefix SIDs TFS sub-TLVs defined in RFC-8287 to also carry algorithm identification.



- Change is backwards compatible.
 - Default algo is 0 so existing algo-unaware implementations will not need any updates to TLV processing.

Example with Proposed Solution

- Initiator includes algo id in the FEC for IGP Prefix SID sub-TLV echo request.
- Responder (Node 1) processes the echo packet, parses IGP Prefix SID including algo id, and correctly validates it against incoming label.
- Responder (Node 1) returns the result of validation (RC 3 : Node will label switch) back to initiator.



I-D Status

- New draft that identifies a gap and proposes a solution to extend RFC-8287.
- Maintain backwards compatibility with existing algo-unaware implementations.
- I-D is being presented to both MPLS and SPRING WG.
- Next Steps:
 - Seeking
 - WG feedback;
 - **WG Adoption**
- Thank you!