

MPLS-based Service Function Path (SFP) Consistency Verification

draft-1m-mpls-sfc-path-verification-01

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Background and Motivation

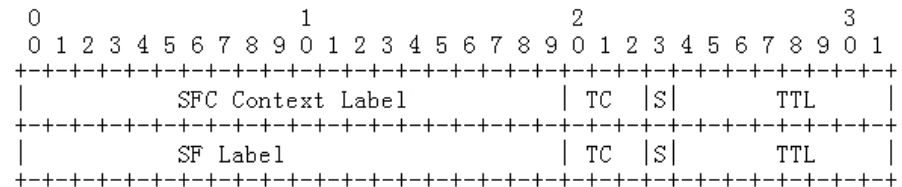
- **MPLS-based Service Function Path (SFP)**

- SR-MPLS Service Programming (SFC-SR) : each SF is associated with an MPLS label, an SFP can be encoded as a stack of MPLS labels and pushed on top of the packet. [draft-ietf-spring-sr-service-programming]

forwarding based on a single label

- MPLS-based Network Service Header (SFC-MPLS) : a basic unit of representation is used, which comprises two MPLS labels, one carries a label to provide a context within the SFC scope, and the other carries a label to show which SF is to be enacted. [RFC8595]

forwarding based on a basic unit



The Basic Unit of MPLS Label Stack for SFC

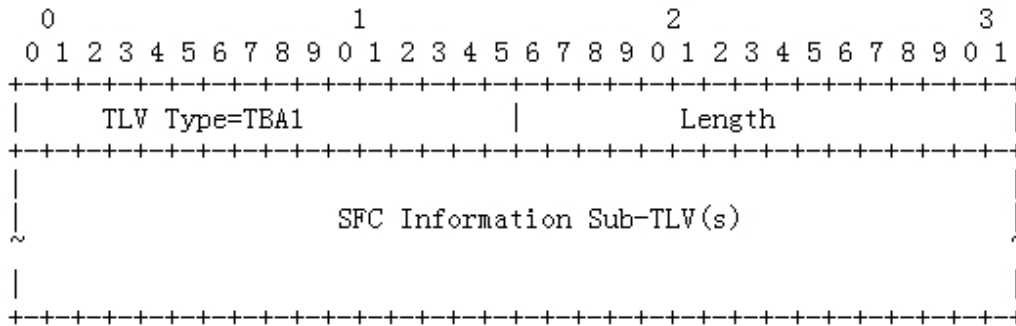
- This document defines extensions of the MPLS LSP ping to support verification between the control/management plane and the data plane state for SFC-SR and SFC-MPLS

Updates from Interim Meeting

- IANA Considerations section has been added for newly defined (sub-)TLVs.
- Acronyms section and Security Consideration section have been added.
- Introduce the use of Special-purpose label (SPL) in the active OAM mechanism for SFC-MPLS

New TLVs

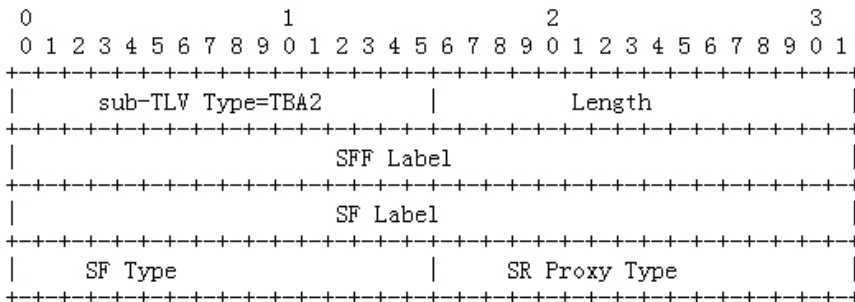
SFC Validation TLV



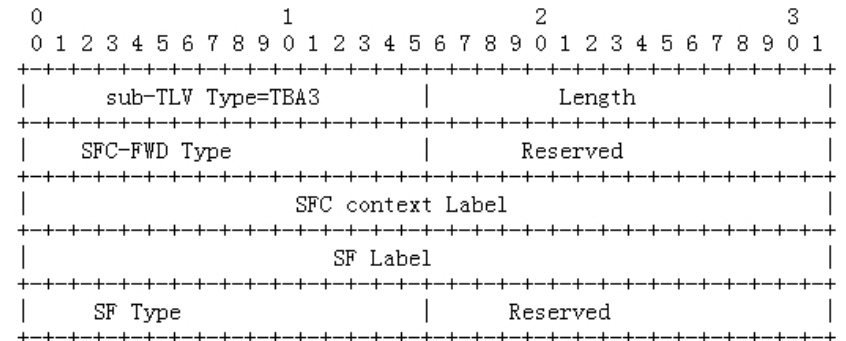
An MPLS SFC validation request/reply is an MPLS echo request/reply that includes an SFC validation TLV.

SFC Information Sub-TLV: ONLY included in the reply message.

SFC Info Sub-TLV for SFC-SR

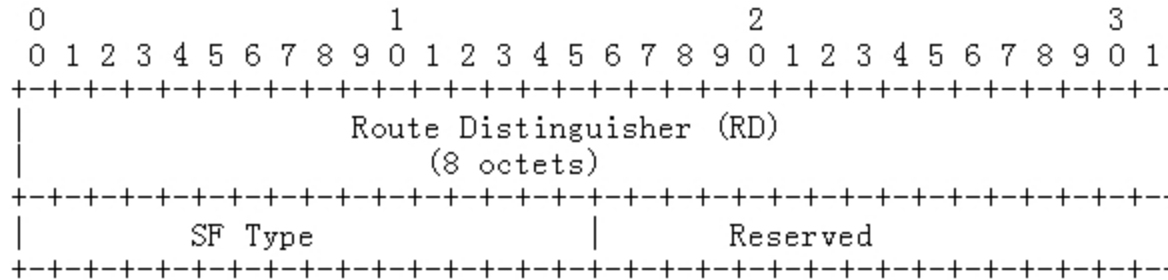


SFC Info Sub-TLV for SFC-MPLS



New TLVs

SFC Basic Unit FEC Sub-TLV



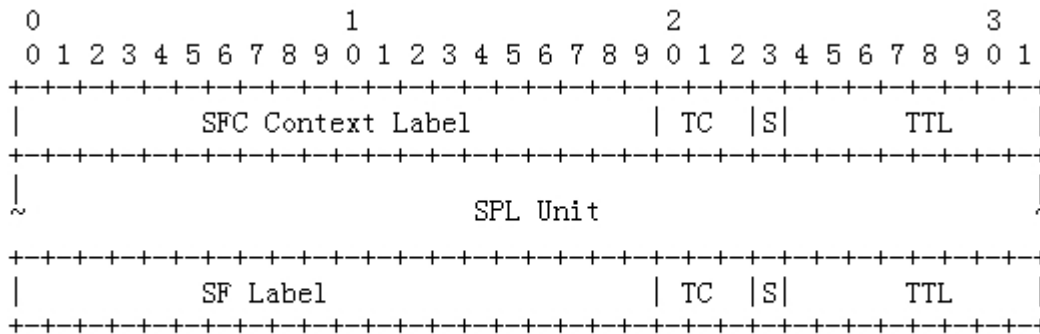
a Sub-TLV for TLV Types 1(FEC TLV), 16, and 21 defined only for SFC-MPLS

Route Distinguisher (RD): defined in SFIR Route Type specific NLRI [draft-ietf-bess-nsh-bgp-control-plane] .

SF Type: It is defined in [draft-ietf-bess-nsh-bgp-control-plane] and indicates the type of SF, such as DPI, firewall, etc.

Special-purpose Label (SPL) in SFC-MPLS

- An SFF needs to identify an OAM packet with the SFP scope because an SF may not be capable of processing the SFP OAM payload.
- Using an SPL in the basic unit allows for a closer functional match between NSH and SFC-MPLS.
- An SPL unit MAY be present in one or more basic units.



Special-purpose Label Unit with the Basic Unit of MPLS Label Stack for SFC

G-ACh over SFC-MPLS

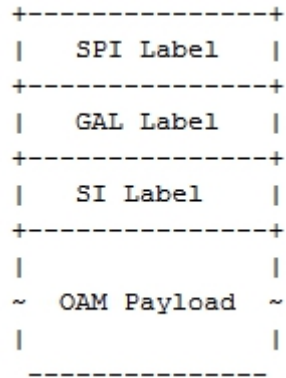
G-ACh: Generic Associated Channel, over which OAM and other control messages can be exchanged [RFC5586].

GAL: G-ACh Label. If the GAL immediately follows the SFC Context label, then the packet is recognized as an SFP OAM packet.

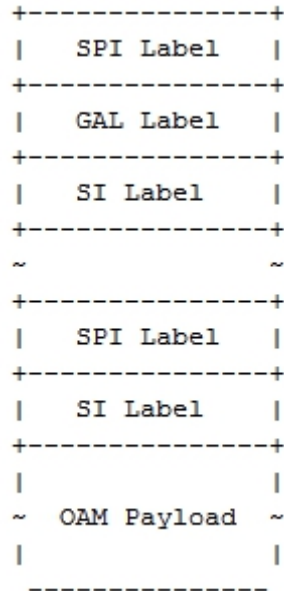
Processing Rules:

- An SFF MUST NOT pass the OAM packet to a local SFI or SFC proxy.
- The SFF MUST decrement SF Label entry's TTL value. If the resulting value equals zero, the SFF MUST pass the SFP OAM packet to the control plane for processing.
- If the TTL value is not zero, the SFP OAM packet is processed as defined in [RFC8595], according to the type of MPLS forwarding used in the SFP.

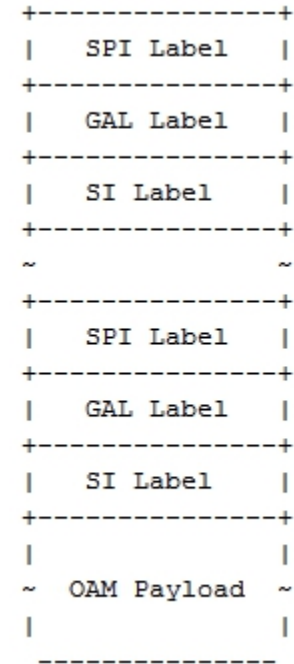
GAL in SFC-MPLS Packet



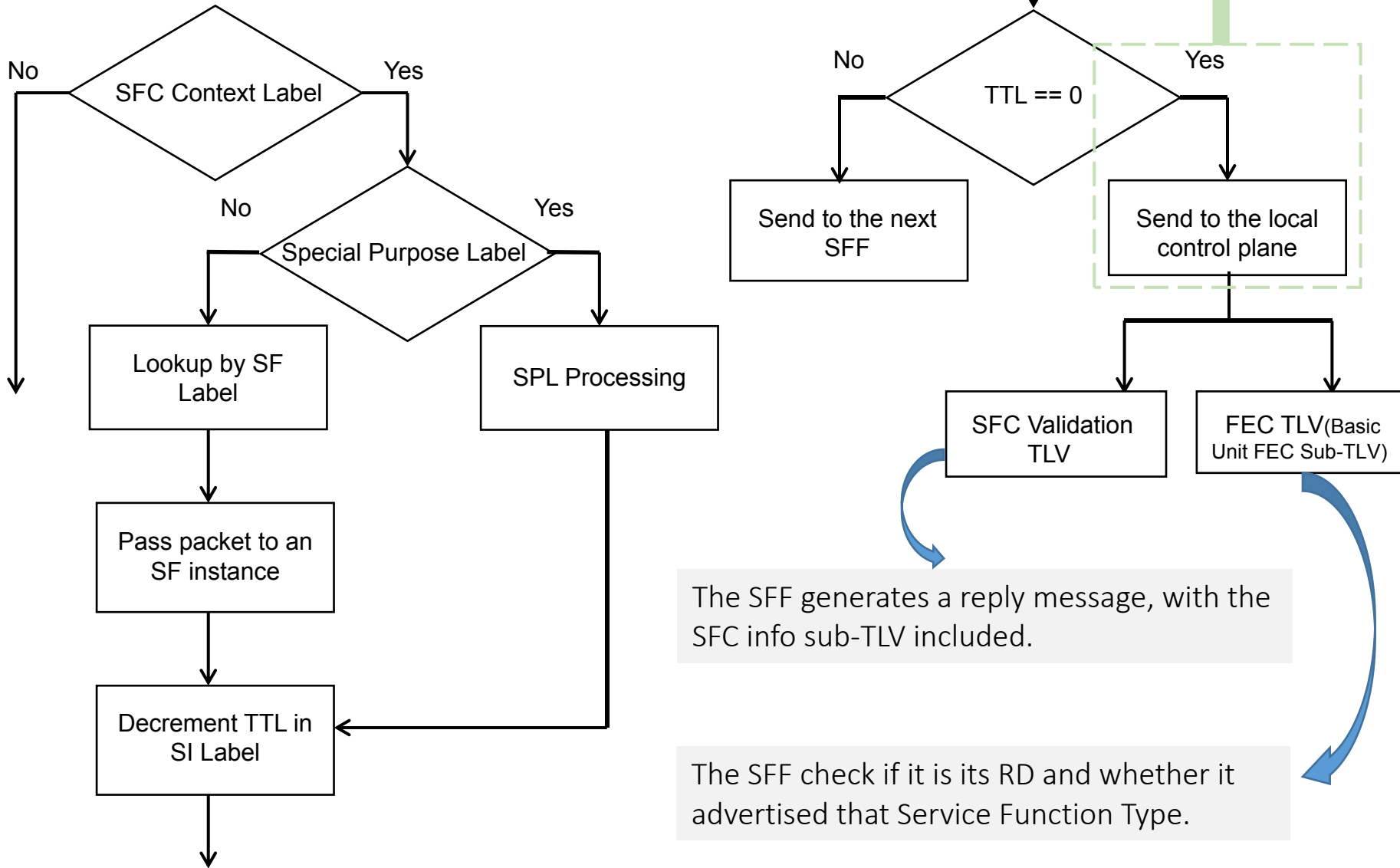
GAL in Label Swapping Mode



GAL in Label Stacking Mode or Mix Mode



Theory of Operation for SFC-MPLS



Next Steps

- Your feedback and comments are welcome and much appreciated

Thank You !