

# Simple TWAMP (STAMP) Extensions for Segment Routing Networks

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# Agenda

- Requirements and Scope
- Summary of Extensions
- Next Steps

# Requirements and Scope

## Requirements:

- Support in-band Performance Measurement for links and SR paths

## Goals:

- Avoid provisioning test sessions on Session-Reflector for stateless mode
- Avoid control protocol for signaling dynamic parameters
- High scale for number of test sessions and faster detection interval
  - Support hardware implementation

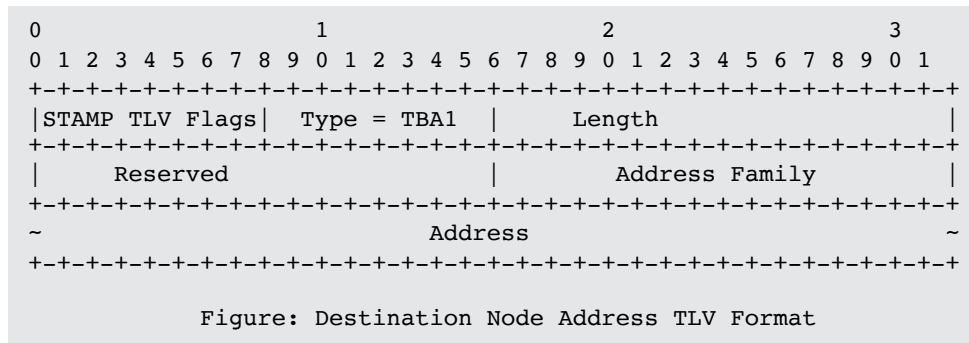
## Scope:

- STAMP [RFC 8762]
- STAMP Extensions [RFC 8972]

# STAMP Destination Node Address TLV

## Destination Node Address TLV (value TBA1):

- Indicates the address of the intended destination node of the Session-Sender test packet.
- The Session-Reflector node **MUST NOT** send reply if it is not the intended destination node of the test packet.
- Useful when test packet is sent with 127/8 destination address (e.g. sweeping ECMP paths).



# STAMP Return Path TLV

**Return Path TLV (value TBA2) to carry one Sub-TLV for return path:**

### Sub-TLVs Types:

- Type (value 1): Return Path Control Code. Reply test packet based on the control code flags.
  - 0x0: No Reply Requested.
  - 0x1: In-band Reply Requested.
- Type (value 2): Return Address. Destination node address for the reply; different than the Source Address in the test packet
- Type (value 3): SR-MPLS Label Stack of the Return SR Path
- Type (value 4): SR-MPLS Binding SID [draft-ietf-pce-binding-label-sid] of the Return SR Policy
- Type (value 5): SRv6 Segment List of the Return SR Path
- Type (value 6): SRv6 Binding SID [draft-ietf-pce-binding-label-sid] of the Return SR Policy

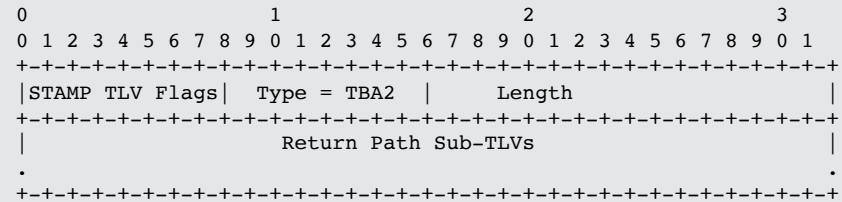


Figure: Return Path TLV

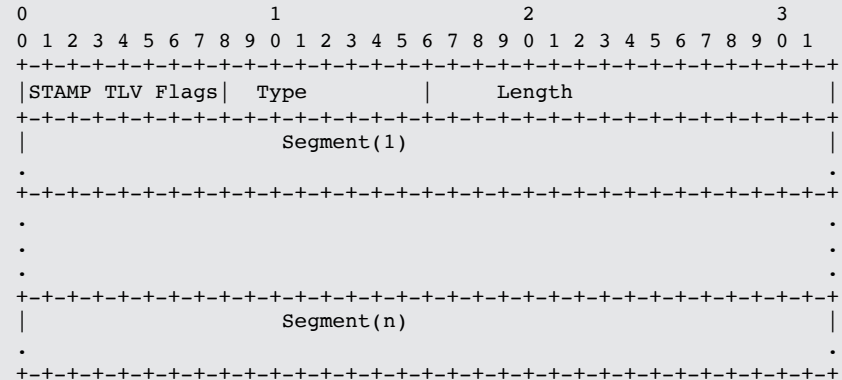


Figure: Segment List Sub-TLV in Return Path TLV

# Return Path Control Code Sub-TLV - Usage

- In-band Reply:
  - For link delay measurement
    - Session-Reflector sends reply on the same incoming link in the reverse direction
    - Link can be Virtual, LAG or LAG member
  - Avoid provisioning each test session (session id, source-address) on Session-Reflector (can have an order of 1K links)
    - Stateless mode of STAMP Session-Reflector as defined in RFC 8762
- No Reply:
  - The Session-Reflector does not transmit reply test packet back to the Session-Sender and terminates the test session
  - The Session-Reflector sends performance metrics via streaming telemetry using the information from the received test packet

# Return Address Sub-TLV - Usage

- The STAMP reply test packet may be transmitted to a different node than the Session-Sender
  - e.g. to a controller for telemetry use-cases.
- For this, the Session-Sender can specify in the test packet the receiving destination node address for the Session-Reflector reply test packet.

# Return Path Segment List Sub-TLVs - Usage

- For SR path, reply test packet may need to be sent on a specific return SR path
- Bidirectional SR path (forward and reverse) dynamically computed using CSPF by the head-end node
  - Path can change often based on topology change, link/node failure in the network, etc.
- No signaling in SR (PCE can be used)
- Avoid signaling and maintaining dynamic state on Session-Reflector to store return paths for each test session (each session-id, source-address)
  - Order of 10K SR Policy (that can have active and standby candidate-path and each can have multiple segment-lists)



# Next Steps

- Welcome your comments and suggestions
- Requesting WG adoption

# Thank you