Performance Measurement Using STAMP for Segment Routing Networks

draft-gandhi-spring-stamp-srpm-00

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Agenda

- Requirements and Scope
- History of the Draft
- Updates Since IETF-106
- Summary
- Next Steps

Requirements and Scope

Requirements:

- Delay and Loss Performance Measurement (PM)
  - ✓ Links and End-to-end P2P/P2MP SR Policies
  - ✓ Applicable to SR-MPLS/SRv6 data planes
- No need to bootstrap PM session (e.g. to negotiate UDP port) - spirit of SR
  - ✓ Stateless on egress node - spirit of SR
- Handle ECMP for SR Policies
- Support stand-alone direct-mode loss measurement

Scope:

- STAMP [RFC 8762]
- STAMP TLVs [draft-ietf-ippm-stamp-option-tlv]

History of the Draft

- Feb 2019
  - Draft was published - *draft-gandhi-spring-twamp-srpm-00*
- May 2019
  - Added STAMP TLV for Return Path
- Mar 2019
  - Presented revision-00 at IETF 104 Prague in SPRING WG
- July 2019
  - Presented revision-01 at IETF 105 Montreal in IPPM WG
    - Slide 9 Titled - Applicability of STAMP – STAMP is supported
- Aug 2019
  - Revision-02 updates included a section on stand-alone LM messages
- Nov 2019
  - **SPRING Chairs announced in the meeting the agreement with IPPM chairs to progress the draft in SPRING WG**
  - Presented revision-04 at IETF 106 Singapore in SPRING WG
- Mar 2020
  - Moved STAMP support to – *draft-gandhi--spring-stamp-srpm-00*

Updates Since IETF-106 (Revision-04)

Updates:

1. Defined Control Code for “In-band Response Requested” for STAMP
   - ✓ Updated Two-way mode procedure using the Control Code
2. Defined Destination Address in STAMP Node Address TLV to identify the intended Destination node
3. Added Return Address Sub-TLV in the STAMP Return Path TLV to send response to a specific node
4. Various editorial changes

Open Items:

- Identify TLV as Mandatory or Optional
- Update IANA registry action

STAMP Control Code Field

For a Query: Sender Control Code

0x0: Out-of-band Response Requested.
This is also the default behavior.

0x1: In-band Response Requested.
Indicates that this query has been sent over a bidirectional path and the probe response is required over the same path in the reverse direction.
The bidirectional path does not have to be an SR path.

For a Response: Reflector Control Code

0x1: Error - Invalid Message.
Indicates that the operation failed because the received query message could not be processed.
0xN: Additional Error will be defined in future

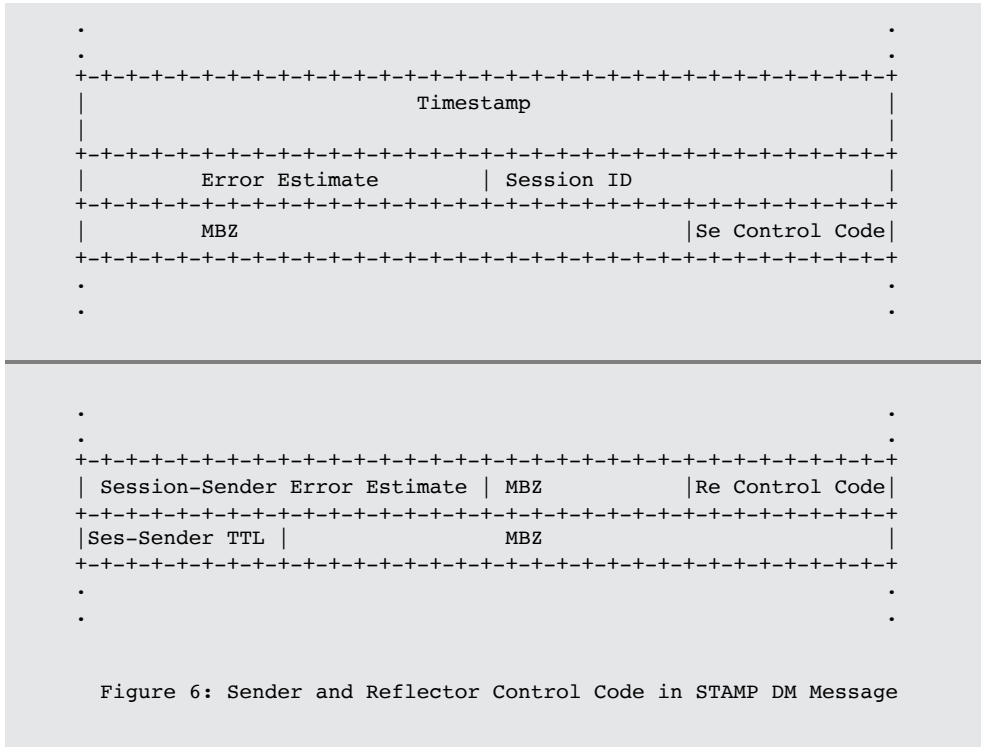


Figure 6: Sender and Reflector Control Code in STAMP DM Message

Performance Measurement Modes

- One-way Measurement Mode
  - Reply sent “out of band” on IP/UDP path by default
- Two-way Measurement Mode
  - Reply sent “in-band” on reverse SR path
    - Based on Control Code from the probe query message
  - Use Return Path TLV for STAMP from the probe query message
- Loopback Measurement Mode
  - Probe message carries the return path in the header of the packet

Destination Address in STAMP Node Address TLV

Destination Node Address (value TBA1):

- Indicates the address of the intended recipient node of the query message.
- The reflector node SHOULD NOT send response if it is not the intended destination node of the query.
- Useful when query is sent with 127/8 destination address.

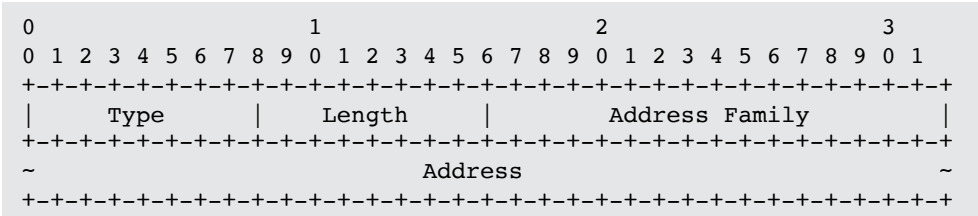


Figure: Node Address TLV Format

Return Address in STAMP Return Path TLV

Return Path (value TBA2):

Sub-TLVs:

1. Type (value 0): Return Address. Target node address of the response different than the Source Address in the query
2. Type (value 1): SR-MPLS Label Stack of the Reverse SR Path
3. Type (value 2): SR-MPLS Binding SID [draft-ietf-pce-binding-label-sid] of the Reverse SR Policy
4. Type (value 3): SRv6 Segment List of the Reverse SR Path
5. Type (value 4): SRv6 Binding SID [draft-ietf-pce-binding-label-sid] of the Reverse SR Policy

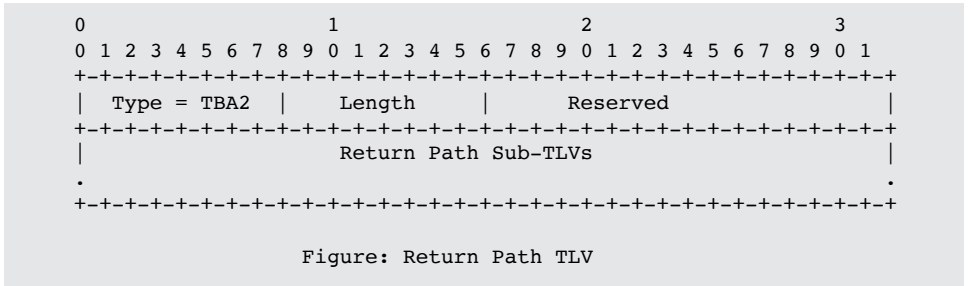


Figure: Return Path TLV

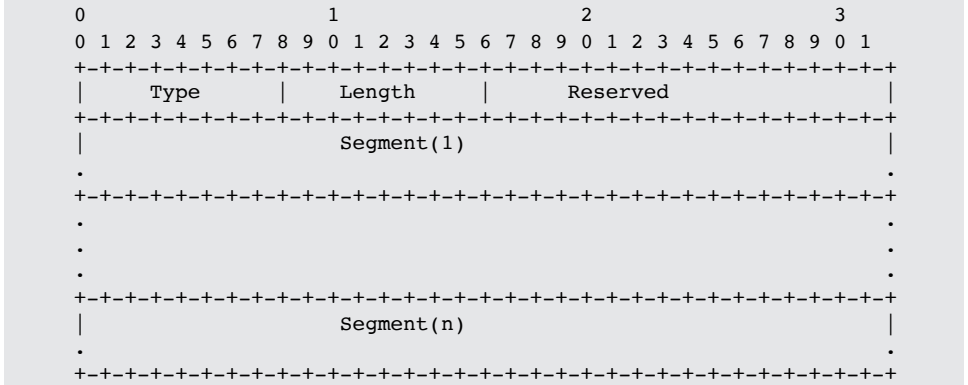
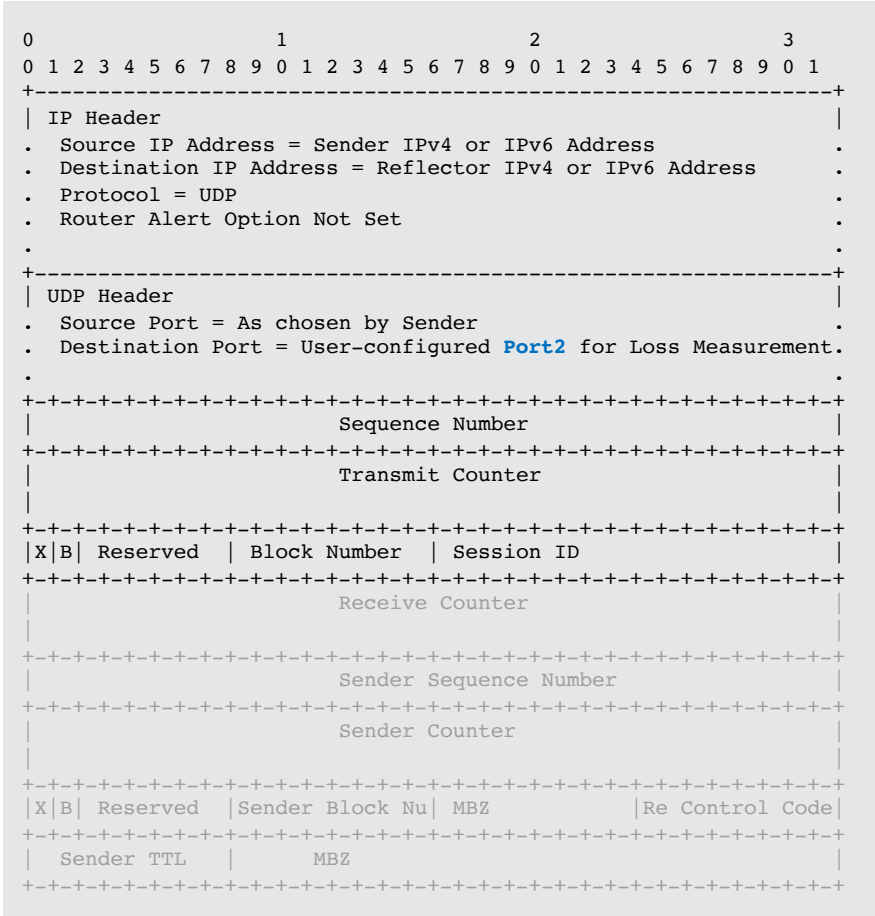


Figure: Segment List Sub-TLV in Return Path TLV

Stand-alone LM Message Format for STAMP

- Loss Measurement (LM) message defined
  - Hardware efficient counter-stamping
    - Well-known locations for transmit and receive traffic counters
  - Stand-alone LM message, not tied to DM
- LM message format is also defined for authenticated mode
- User-configured destination UDP **Port2** is used for identifying LM probe packets
- **Does not modify existing STAMP (which is for DM) procedure as different UDP destination Port2 is used for LM.**



Next Steps

- Welcome your comments and suggestions
- Implementation exists
- In WG adoption (SPRING WG) queue
- Keep IPPM WG in the loop about the milestones

Thank you

Backup

STAMP DM Message with Direct Measurement TLV (DM+LM Combined Probe Message)

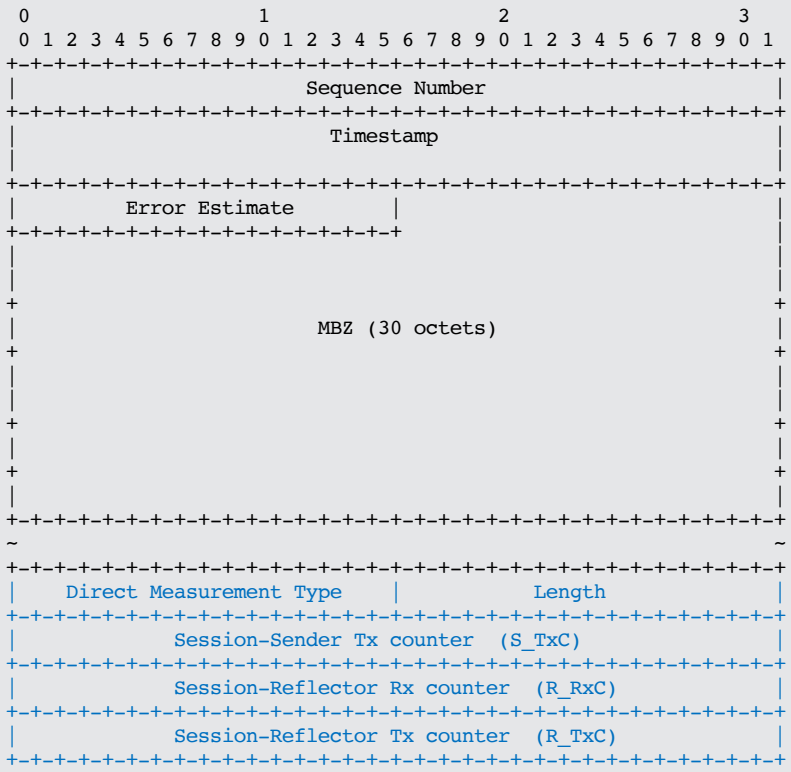


Figure: Sender Message Format

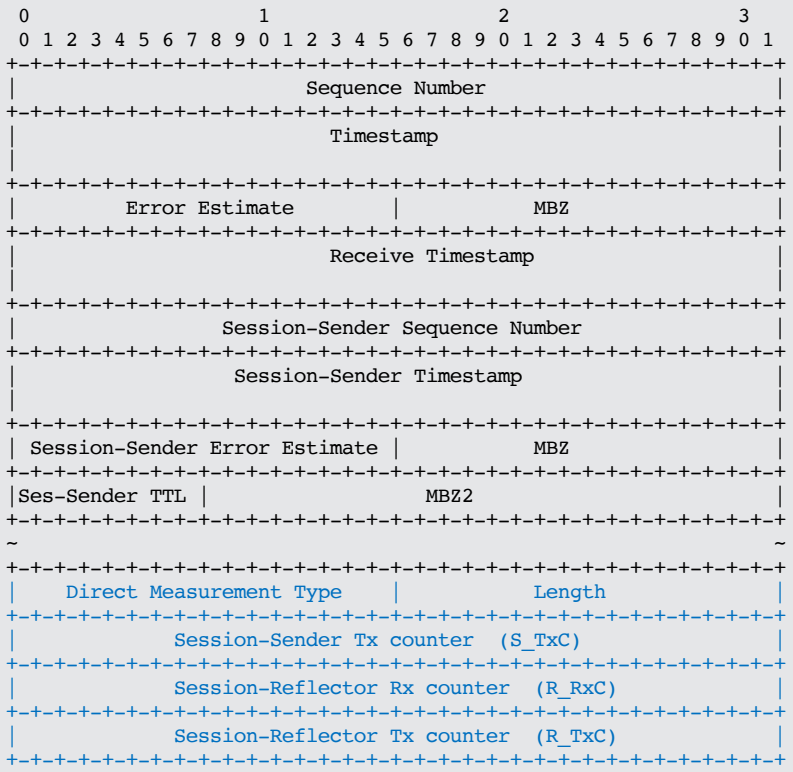


Figure: Reflector Message Format

Thank you