Simple Two-way Active Measurement Protocol (STAMP) Extensions for Rate and Multicast Measurements
draft-mirsky-ippm-asymmetrical-pkts

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IETF-118, November 2023
Reflected Test Packet Control TLV

<table>
<thead>
<tr>
<th>STAMP TLV Flags</th>
<th>Type</th>
<th>Length</th>
</tr>
</thead>
<tbody>
<tr>
<td>Length of the Reflected Packet</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of the Reflected Packets</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Interval Between the Reflected Packets</td>
<td></td>
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<tr>
<td>~ Sub-TLVs ~</td>
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</tbody>
</table>

Length of the Reflected Packet – in octets
Number of the Reflected Packets – unsigned integer. (Do we need to set an upper limit?)
Interval Between the Reflected Packets – in nanoseconds
One-way STAMP

- Reflected Test Packet Control TLV can make STAMP into one-way measurement
  - STAMP Session-Sender sets the value of the Number of the Reflected Packets to zero
  - Processing of the received STAMP test packet at the STAMP Session-Reflector according to the local policy
Reflected Test Packet Control TLV in Combination with Return Path TLV

- Return Path TLV [I-D. ietf-ippm-stamp-srpm], when used in combination with Return Address Sub-TLV allows a Session-Sender to control the destination of the reflected test packet.
- Reflected Test Packet Control TLV can be combined with Return Path TLV to direct reflected packets, particularly when in the multicast network, to a collector of measurement data (see RFC 7594 A Framework for Large-Scale Measurement of Broadband Performance) for further processing and network analytics.
Rate Measurement with Reflected Test Packet TLV

- RFC 7497 Rate Measurement Test Protocol Problem Statement and Requirements lists requirements for the rate measurement in access networks:
  - Ability to control asymmetric packet rate
  - Ability to control asymmetric packet size

- Reflected Test Packet Control TLV conforms to the requirements set forth in RFC 7497:
  - Packet rate control using Number of the Reflected Test Packets and Interval Between the Reflected Packets
  - Packet size control using Length of the Reflected Test Packets
Enhance Security Considerations

• Spoofed STAMP test packets with Reflected Test Packet Control TLV may be used as an attack vector.

• To mitigate the threat of an attack, an implementation MUST use the identity protection mechanism. That could be:
  – Verification of the source of the test packet against a list of allowed nodes, e.g., ACL.
  – STAMP Authentication mode.
  – HMAC TLV.

• Considering the potential number of reflected packets that can be generated by a single test packet sent to a Multicast address, when sending such messages, a Session-Sender SHOULD sign packets using the HMAC TLV.
Next steps

• Welcome your questions, comments, and cooperation
• Please kindly consider WG adoption

Thank You!