STAMP Extension for DSCP and ECN Traversal Measurement

draft-white-ippm-stamp-ecn

IPPM – IETF122

Greg White

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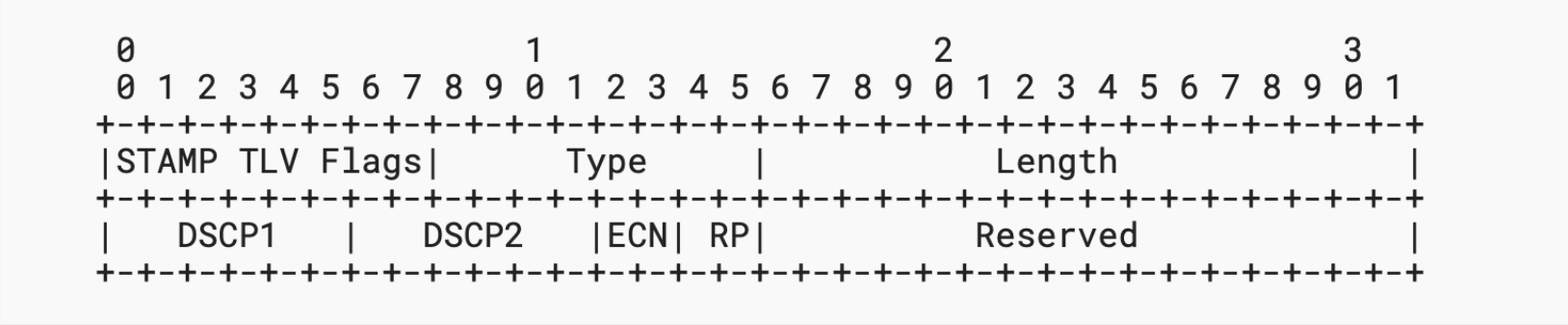
Purpose

- Define a STAMP Extension (TLV) to enable bi-directional measurements of ECN traversal
  - Detect ECN field manipulation in each direction
    - Bleaching
    - Congestion marking
  - Perform differential measurements of path latency based on ECN value

- Existing Class of Service TLV enables bi-directional DSCP measurement, but only reliably enables one-way ECN measurement

Existing Class of Service TLV

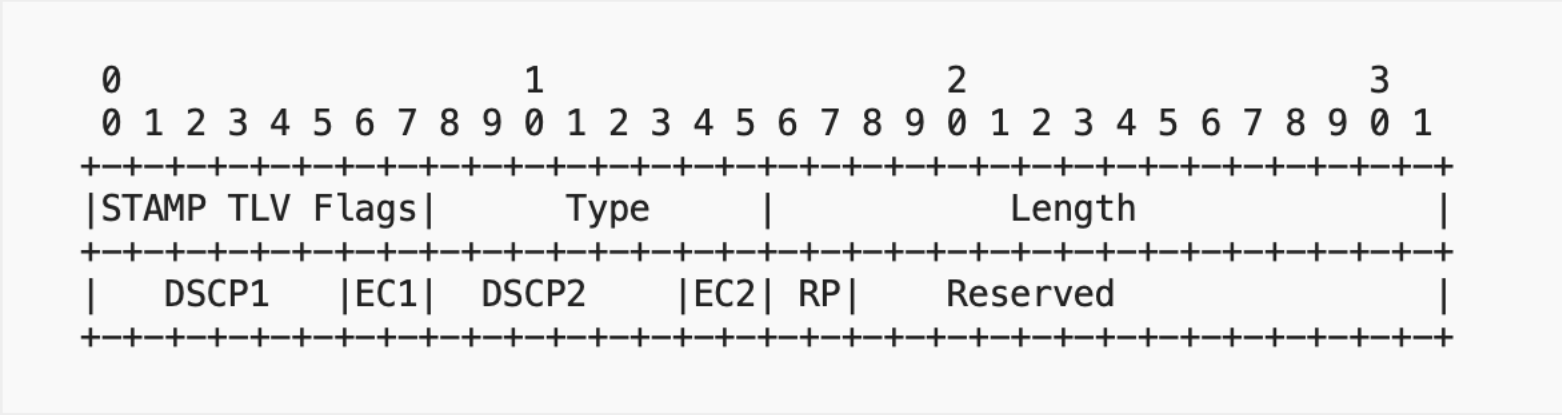


- DSCP1: DSCP value intended by the session-sender to be used as the DSCP value of the reflected test packet¶
- DSCP2: received value in the DSCP field at the ingress of the session-reflector¶
- ECN: received value in the ECN field at the ingress of the session-reflector¶
- RP (reverse path): a session-sender **MUST** set the value of the RP field to 0 on transmission¶

Using Class of Service TLV for ECN measurement

- Population of ECN field on reflected packet is not defined in RFC8762 or RFC8972
  - It is implied that the SR copies ECN from the received packet
- Lack of control of reverse path ECN value
  - Forward path bleaching prevents:
    - Detection of reverse path bleaching
    - Measurement of latency differential on reverse path
  - Forward path congestion indication (CE) prevents
    - Detection of reverse path congestion indication

Proposed DSCP and ECN TLV



- DSCP1: DSCP value intended by the session-sender to be used as the DSCP value of the reflected test packet¶
- EC1: ECN value intended by the session-sender to be used as the ECN value of the reflected test packet¶
- DSCP2: received value in the DSCP field at the ingress of the session-reflector¶
- EC2: received value in the ECN field at the ingress of the session-reflector¶
- RP (reverse path): two-bit field indicating whether the session-reflector used DSCP1 or DSCP2 as the DSCP value of the reflected test packet; a session-sender **MUST** set the value of the RP field to 0 on transmission¶

Open question

- How to handle both TLVs (CoS & DSCP/ECN) in a STAMP message
- Options:
  1. Declare it invalid, Session Reflector behavior is undefined
  2. Both can be present, DSCP/ECN takes precedence
     - “Older” Session Reflector will ignore DSCP/ECN and use CoS
     - “Newer” Session Reflector will ignore CoS and use DSCP/ECN
     - Allows Session Sender to run tests against an SR without a priori knowledge whether it supports DSCP/ECN
- Option 2 introduces slightly more complex requirement on SR, but seems to have value.

Implementation Status

- Two interoperable implementations:
  - One (public) by Will Hawkins:
    - https://github.com/cerfcast/teaparty
  - One (not public yet) by CableLabs

TLV Registration

- Draft proposes Sub-TLV type 179
  - In the “First Come First Served” range
  - Current implementations use this value

- If the draft is adopted by IETF, could move to the “IETF Review” range

WG feedback?

- Is this interesting for IPPM?
- Consider adoption?