Residence Time Measurement

draft-mirsky-mpls-residence-time-02

Greg Mirsky gregory.mirsky@ericsson.com
John Drake jdrake@juniper.net
Stewart Bryant stbryant@cisco.com
Alexander Vainshtein Alexander.Vainshtein@ecitele.com
Stefano Ruffini stefano.ruffini@ericsson.com

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Problem Statement

- Residence Time – time it takes a packet to traverse a node
- Clock synchronization protocols, i.e. IEEE-1588v2, may use residence time
- MPLS Packet Delay Measurement RFC 6374 includes propagation delay – not useful

Update in -02

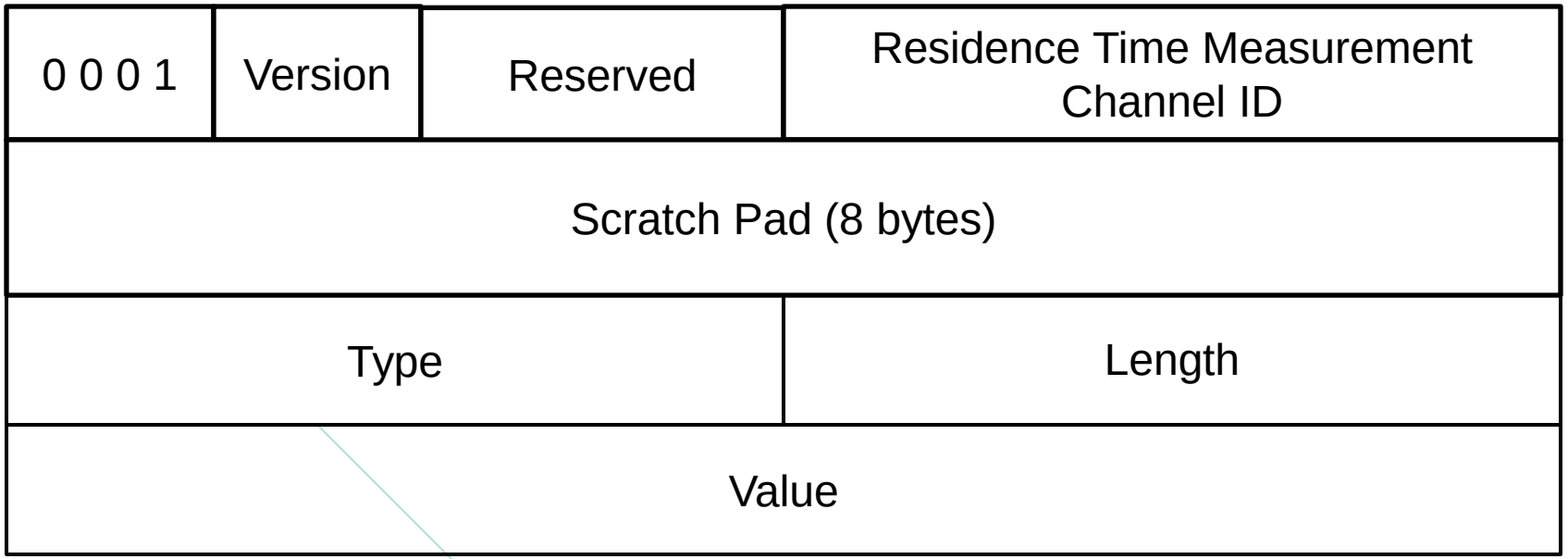
- Welcome Stefano Ruffini
- TLV to carry time synchronization protocol packet
- Use cases:
  - RTM capable homogeneous environment
    - Residence time can be measured across LSPs instantiated by LDP
  - RSVP-TE LSP signaling and TTL “distance” calculation
    - To the next RTM-capable downstream LSR

RSVP-TE Control plane

- Initialize Record Route and RTM Set Objects in Path message
- Resv message includes RRO and RTM Set Objects
- The RTM-capable transit LSR:
  - Uses the first LSR ID in the RTM Set Object and its position in the RRO to calculate TTL distance to the next downstream RTM capable LSR on the LSP
  - Inserts its ID as the first ID into the RTM Set Object before forwarding the Resv message

Data plane (updated)

- New G-ACh – Residence Time Measurement
- Scrath pad – 8 bytes (same size as Correction Field in IEEE 1588v2)
- Mandatory TLV – new
- Type indicates the payload, e.g. PTP packet unauthenticated
- Each RTM capable LSR:
  - records RTM reception time
  - sets TTL in MPLS label stack element to expire on the next RTM capable downstream LSR on this LSP
  - records RTM transmission time, calculates node residence time and adds to the Scratch Pad
- Egress LSR may use the Scratch Pad to perform time correction, e.g. update the PTP's Correction Field



Next steps

- IGP TE extensions: RTM Capability sub-TLV in Router Capabilities TLV for OSPF and IS-IS
  - Facilitates computation of RTM-capable LSPs by CSPF
  - Allows recognition of the special case when all LSRs are RTM-capable
- RSVP-TE Extensions: Define RTM Set Object in RSVP-TE
- Solicit comments & feedback from the WG