1588 over MPLS Update

draft-ietf-tictoc-1588overMPLS-02

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Requirements

• Transport 1588 messages over MPLS network
• Support Master, Slave, Boundary Clock and Transparent Clock at LER
• Support Transparent clock at LSR
• Backward compatible with non-1588-Capable LSRs
Master Clock at LER

(A)
- LSP Label
- IP header
- UDP header
- PTP Message

(B)
- LSP Label
- PW Label
- CW
- Ethernet Header
- PTP Message
Slave Clock at LER

(A)

LSP Label
IP header
UDP header
PTP Message

(B)

LSP Label
PW Label
CW
Ethernet Header
PTP Message
Boundary Clock at LER

PTP-LSP

LER

LSR1

LSR2

LSR3

Boundary Clock
Slave Master
Clock Clock

(A) IP header
UDP header
PTP Message

(B) Ethernet Header
PTP Message

(A) LSP Label
IP header
UDP header
PTP Message

(B) LSP Label
PW Label
CW
Ethernet Header
PTP Message
Transparent Clock at LER

Measure Transit Delay

Update Correction Field

PTP-LSP

LER

LSR1

LSR2

LSR3

(A)

IP header

UDP header

PTP Message

(B)

Ethernet Header

PTP Message

(A)

LSP Label

IP header

UDP header

PTP Message

(B)

LSP Label

PW Label

CW

Ethernet Header

PTP Message
Transparent Clock (TC) at LSR

- Measure Transit Delay
- Update Correction Field

PTP-LSP

LER
LSR1
LSR2
LSR3
LER

(A) LSP Label
IP header
UDP header
PTP Message

(B) LSP Label
PW Label
CW
Ethernet Header
PTP Message

(A) LSP Label
IP header
PW Label
CW
Ethernet Header
PTP Message

(B) LSP Label
IP header
UDP header
PTP Message

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Ingress LER Must be 1588-Capable

1588-Capable LER
1588-Capable LSR
Non-1588-Capable LSR
1588-Capable LSR

1588-Capable LER
Current Solution draft-02

• Use standard Encapsulation
  – IP/MPLS or PW

• Use **Dedicated** LSPs/PWs to carry 1588
  – To detect 1588 messages without DPI

• PTP LSP/PW is signaled
  – RSVP-TE extension
  – LDP, BGP PW signaling extension (FFS)

• Routers advertise their 1588-capability
  – OSPF, IS-IS extension
Proposed Enhancements to draft-03

• Draft-03 to only describe data plane behavior

• Separate drafts needed for each of the Routing and Control Plane protocol enhancements

• Make the solution more generic solution
  – Support PTP, NTP, Special Shim, etc.

• Support Time-stamping and Correction Field update
Proposed Enhancements to draft-03

• Signal the following in OSPF, ISIS
  – 1588 capability per-port

• Signal the following via LDP, BGP, RSVP-TE
  – Offset to the Timing message
  – Timing message type (PTP, NTP, Special Timing Shim, etc)
  – Action Type (TS or CF update)
Status

• Draf-00 published Jan 2011
• Draft-02 published Oct 2012
• Draft-03 was written but not officially released
  – Plan is to release draft-03 after Vancouver meeting based on feedback from affected WGs
Next Step

• Require review and comments from:
  – TICTOC WG
  – MPLS WG
  – PWE3 WG
  – OSPF WG
  – ISIS WG

• Publish draft-03