ICMP based TRILL OAM

draft-tissa-trill-oam-00.txt

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What is the difference ?

- Holistic Approach
  - Tools, Monitoring, Network wide Reporting
- ICMP based messaging framework
  - Re-use current infrastructure and what is defined in other areas such as IP and MPLS
- Customized for TRILL to include
  - multi-pathing, multicast trees and other TRILL specific functionality
- Assortment of tools

Tools

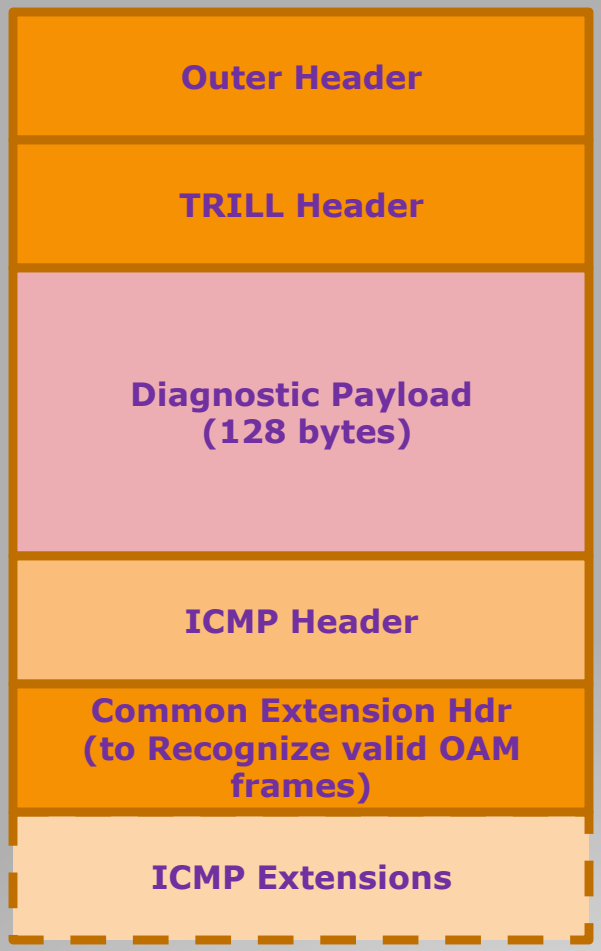
- Ping
- TracePath
- MAC Discovery
- AF Discovery
- Multicast Tree Verification
- End Point Attachment Discovery
- VM Identify discovery

Architecture

Types of TRILL OAM messages

- 3 Types of TRILL OAM messages
  - Request Messages
  - Response Messages
  - Notification Messages
- All the tools are implemented using Request and Response model
- Error indications utilize Notification messages

Encoding of Request Message

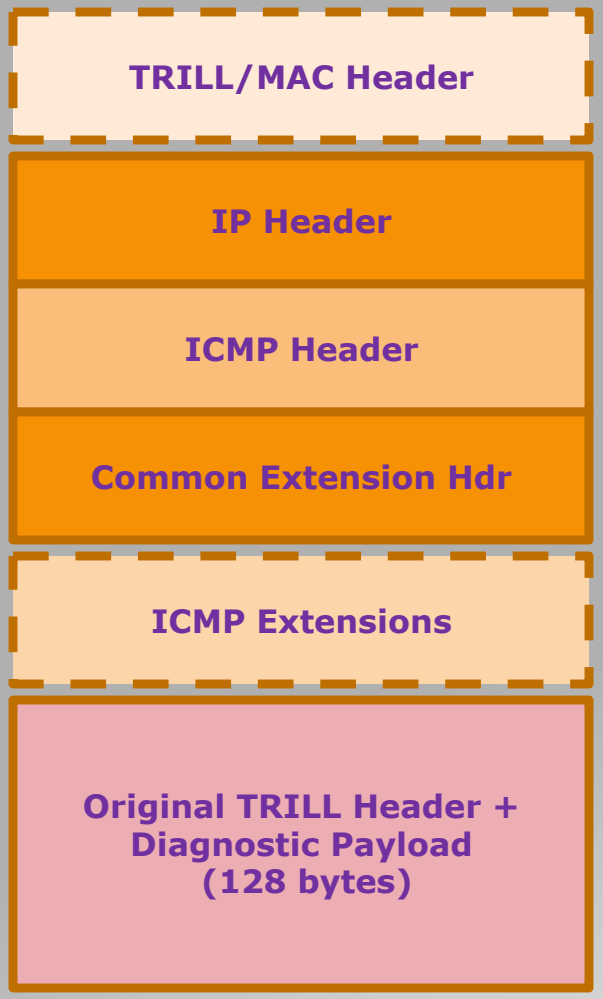


Ethernet, IP, TCP/UDP Headers + Padding to align to 128bytes of data frame to be analyzed

ICMP Echo Request is extended per *draft-shen-traceroute-ping-ext-03*

e.g. Version, Authentication, Orig VLAN etc.

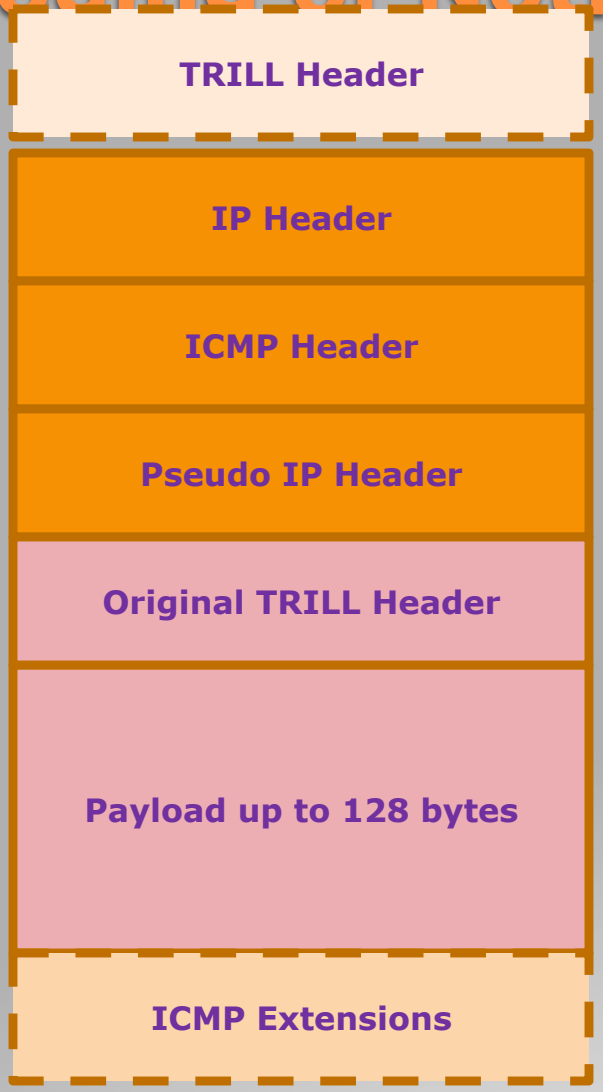
Encoding of Response Message



Can be sent in-band or out-of-band. Just like MPLS Ping RFC 4379

ICMP Echo Response is extended per *draft-shen-traceroute-ping-ext-03*

Encoding of Notification Message



Pseudo IP Header is required per RFC 792 and RFC 1122 for ICMP to multiplex unsolicited notification messages to appropriate applications

Use 127.<nickname>.100 pseudo IP address. Similar to RFC 4379 MPLS Ping.

UDP Well-known Destination port address multiplex to TRILL OAM

Current status

- Will be publishing draft -01, incorporating comments received so far.

Comments and Actions

Comments	Actions
Fills gaps of current TRILL WG OAM draft	Thanks
ICMP Error Notifications need IP header in the user Data (RFC 792 and RFC 1122)	Updated to include the pseudo IP header
ICMP Echo Request/Response is not extensible per RFC 4884	Follow methods proposed in draft-shen-trace-ping-ext-03
How to define flooding scope for reporting	Follow methods proposed in ISIS MI draft
How to define Alert (i.e. Copy to CPU along the path)	Use RBridge Channel Alert Flag draft-ietf-trill-rbridge-extensions-00

Question to the WG: Next steps ?

Q&A

Advantages compared to current TRILL WG OAM proposal

- Allows to include custom payloads to drive ECMP choices along the path.
- Include Monitoring, Reporting and Network Health distribution framework to facilitate easy troubleshooting
- Include assortment of tools beyond basic Ping and traceroute
- Utilize ICMP protocol stack for messaging

OAM Regions

- Network is administratively partitioned in to sections such that
  - Maximize fault coverage
  - Define boundaries for distribution of detail Network Health information
- Summary Data are distributed throughout the network
- Detail data are distributed within the applicable region

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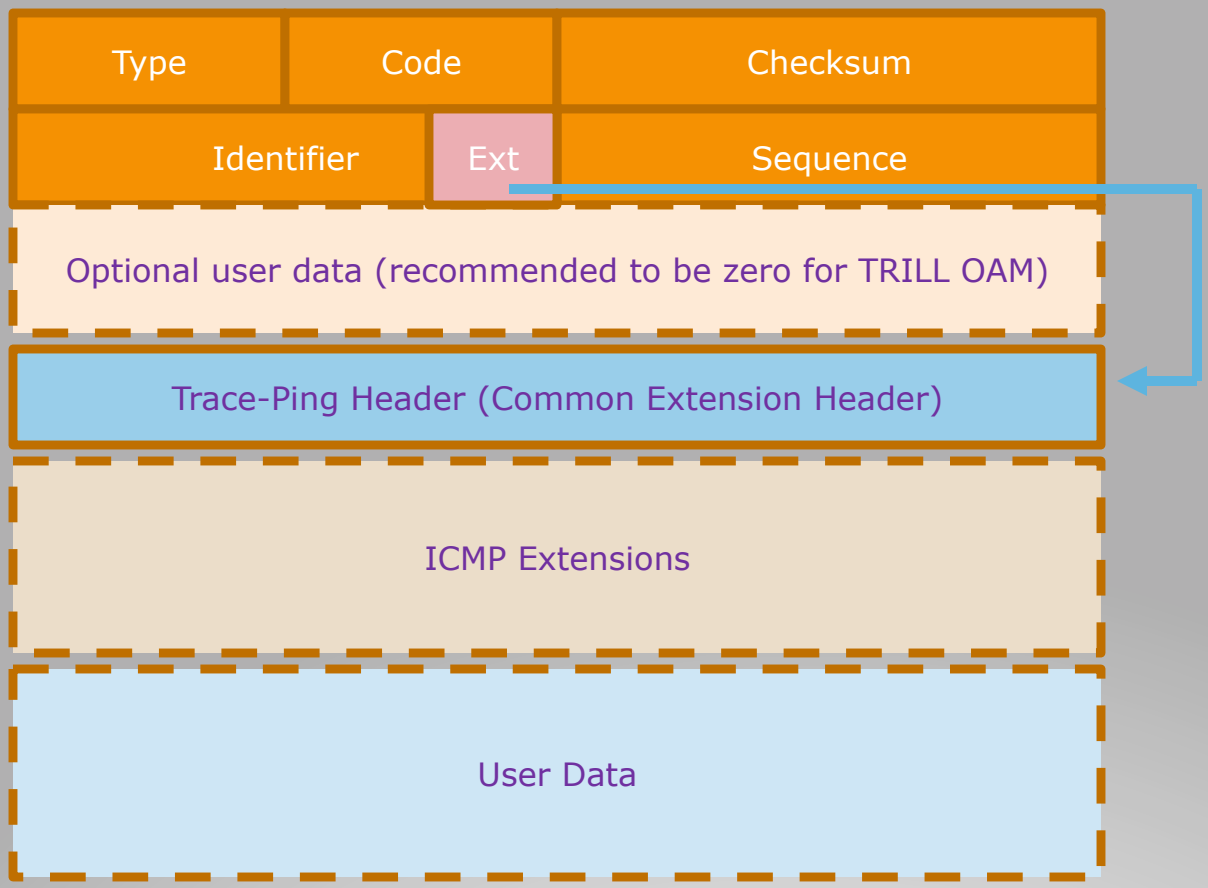
Backup Slides

ICMP Echo Request/Response extension



Channel Draft Inner MAC requirement

- SRC MAC need to be All-Egress-RBridge
- Ether Type need to be Channel EtherType
- Reference Sections: 2 and 2.1.2 of *draft-ietf-trill-rbridge-channel-03*
- *draft-ietf-trill-rbridge-oam-01* use the channel draft, lack of flexibility to define DA prevents including real payloads to drive proper multipathing.
- *draft-ietf-trill-rbridge-channel-03, section 2.1.2 specifies Inner.SRC MAC MUST be a MAC owned by originating Rbridge*
  - *This further restrict using channel draft for OAM purpose.*

Identifying OAM payloads

- Layer 2 Unicast Flows
  - Use a special EthType
- IP Flows
  - Use a well-known SRC MAC

  OR
  - Use a well-known unicast MAC DA

  OR
  - Use TRILL Hop-Count Method
    - Discover number of Hops to egress from ingress
    - Generate OAM frame with Hop-count -1, thus forcing egress RBRidge to receive TRILL Hop count zero packet.
    - Per TRILL Base Protocol specification RFC 6325, Hop-Count zero packet can not be forwarded. Hence generating an Exception to the CPU
- Multicast
  - Tree Verification – *Use a Well-known L2 Multicast MAC address*
  - L2 Multicast Flows – *Use Special EthType*
  - IP Multicast Flows – *Use Well-known SRC MAC address*

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Feedback Received and Actions:

- Comment: Fills gaps of current TRILL WG OAM draft
- Comment: ICMP Error Notifications need IP header in the user Data (RFC 792 and RFC 1122)
  - Action: Updated to include the pseudo IP header
- ICMP Echo Request/Response is not extensible per RFC 4884
  - Follow methods proposed in draft-shen-trace-ping-ext-03.
  - Updated the text of our draft to include the methods specified in draf-shen..
- How to define flooding scope for reporting.
  - Follow methods proposed in ISIS MI draft
  - Updated section 10 of the draft to reflect the required changes
- How to define Alert (i.e. Copy to CPU along the path)
  - Use *RBridge Channel Alert Flag*
  - *draft-ietf-trill-rbridge-extensions-00*