TRILL OAM

draft-eastlake-trill-rbridge-channel-00
draft-bond-trill-rbridge-oam-01
draft-manral-trill-bfd-encaps-01

Vishwas Manral
IP Infusion
vishwas@ipinfusion.com

David Michael Bond
UNH IOL
david.bond@iol.unh.edu

Donald Eastlake 3rd
Huawei Technologies
d3e3e3@gmail.com

Contents

- TRILL OAM
  - Layer 3 and Layer 2 OAM don't work for TRILL
- An RBridge Channel
- ICMP like OAM Facilities
- TRILL BFD Support
- Proposed WG Actions

OAM Operations, Administration, & Management

- TRILL OAM needs to operate in single and multiple hops unicast and multicast between and through TRILL protocol stacks on RBridges. It needs to provide:
  - TRILL error reporting (TRILL Header hop count exhausted, egress nickname unreachable, …) and similar "ICMP-like" functions
  - Rapid RBridge/link failure detection
  - RBridge level traceroute
  - RBridge level ping

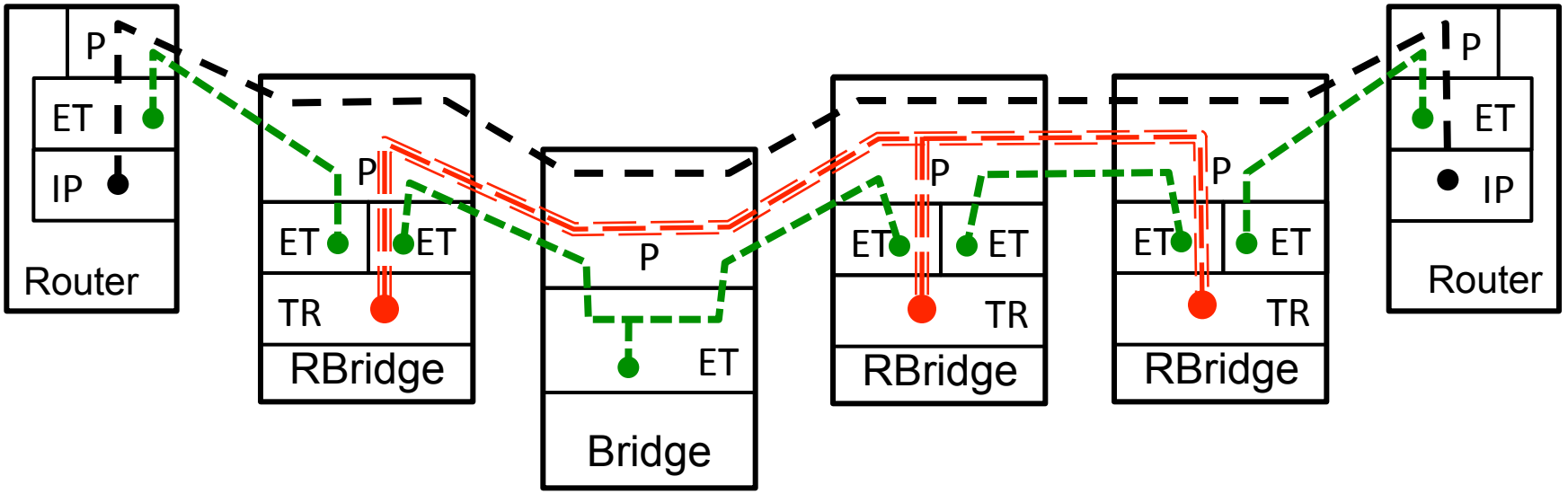
OAM Layer 3 OAM Doesn't Work for TRILL

- RBridges are not required to have IP protocol stacks or IP addresses.
- Even if all RBridges in a campus did have IP protocol stacks, those stacks would not be involved in TRILL ingress, transit, or egress processing for through traffic, even for IP native frames.

OAM Layer 2 OAM Doesn't Work for TRILL

- Layer 2 OAM would only be applicable to the Layer 2 link between neighbor RBridges.
  - It can test the links and ports but not TRILL protocol stacks
  - Layer 2 protocols, such as 802.1ag, cannot pass through RBridges in native form
- Different links in an RBridge campus can be different technologies.
  - For example, all, some, or none of the links in a campus could be PPP or 802.1 or other…

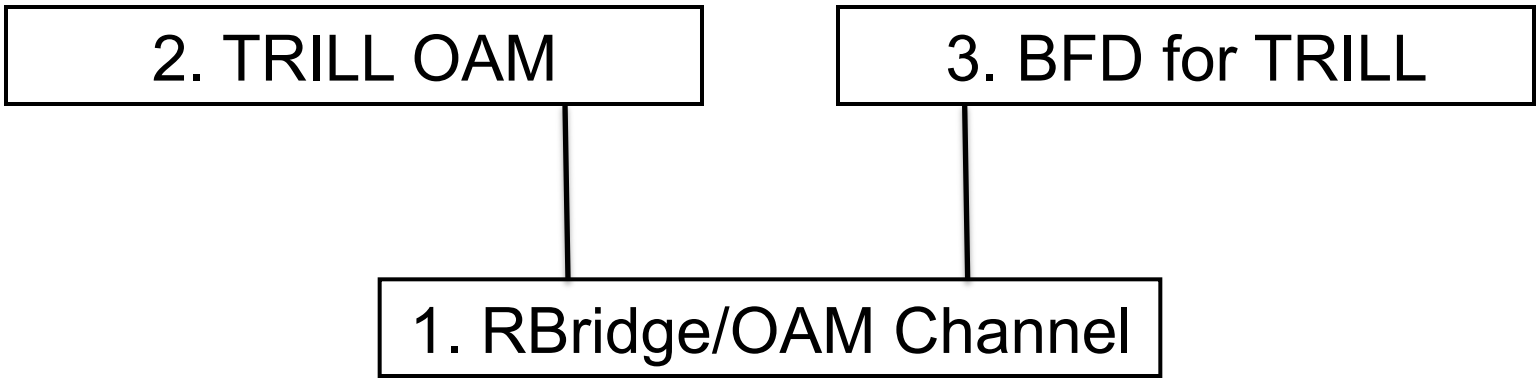
OAM Operations, Administration, & Management



P = Ports and Fast Path Logic
ET = Ethernet stack possibly with 802.1ag OAM = **Green**
TR = TRILL protocol stack including TRILL OAM = **Red**
IP = IP protocol stack including Layer 3 OAM = **Black**

Three Drafts

1. Channel Draft provides a communications path for inter-RBridge messages
2. TRILL OAM draft provides ICMP like facilities
3. BFD draft provides BFD Control and BFD Echo



Contents

- TRILL OAM
- An RBridge Channel
  - Inter-RBridge channel for OAM and other protocols
- ICMP like OAM Facilities
- TRILL BFD Support
- Proposed WG Actions

An RBridge Channel

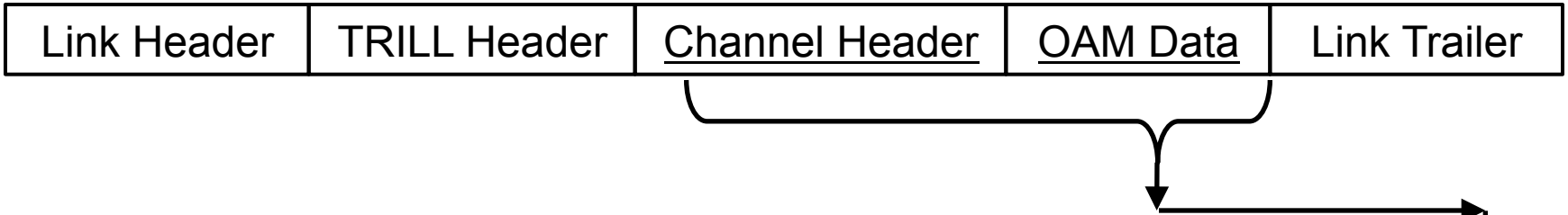
- RBridge Channel frames look like TRILL Data frames
  - If unicast they are routed to the egress nickname
    - A special nickname “Any-RBridge” is available to guarantee delivery to neighbors regardless of the state of nicknames.
  - If multi-destination, they are distributed over the tree identified by the egress nickname to all RBridges in the Inner.VLAN

An RBridge Channel

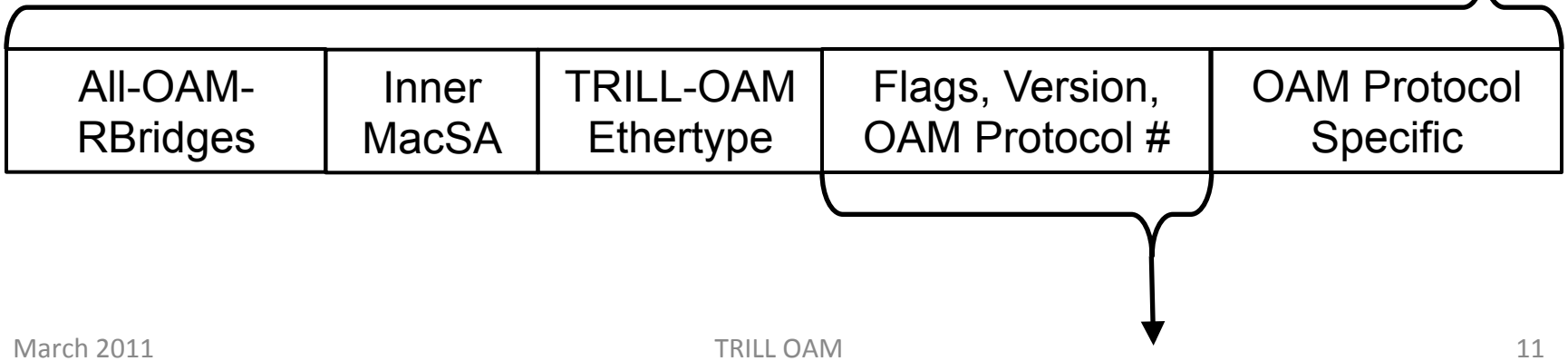
- Inter-RBridge TRILL OAM frames are detected by an OAM-aware egress RBridge based on their Inner.MacDA: All-OAM-RBridges.
- If appropriate for the OAM protocol, messages can also be sent between RBridges and end stations.
- The following Ethertype will be available:
  - TRILL-OAM

An RBridge Channel

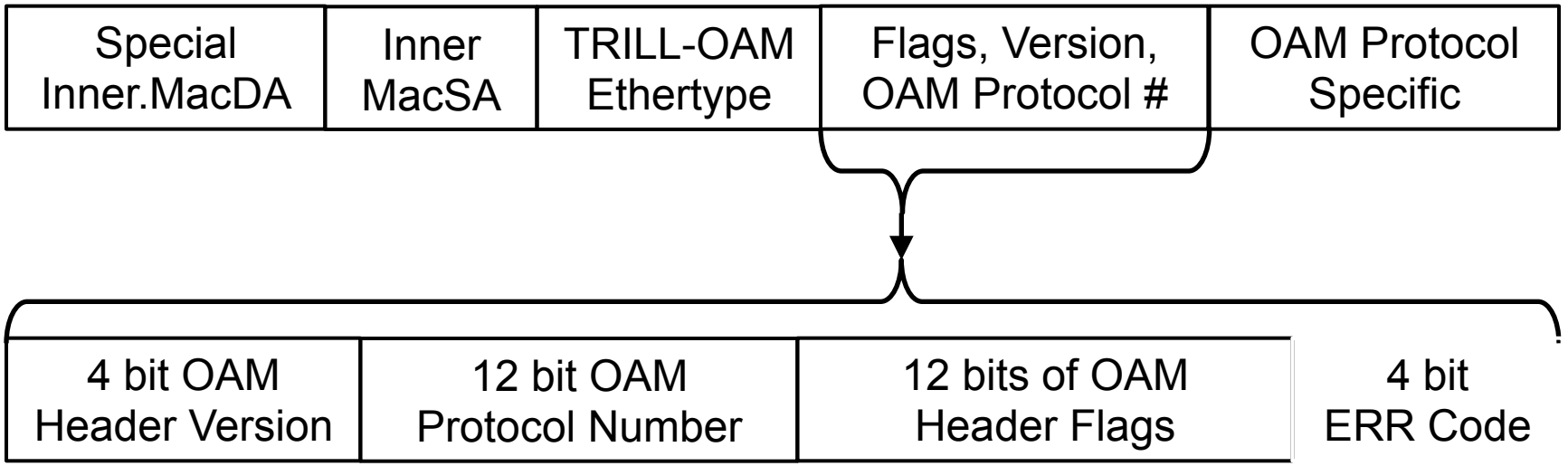
- TRILL OAM Frames are TRILL Data Frames:



- The TRILL OAM Message Header and Payload:



An RBridge Channel



- 1 = Rbridge Channel Err
- 2 = TRILL OAM
- 3, 4 = BFD Control, Echo
- 5 – 4,094 available

- 0 = Silent
- 1 = Multi-Hop
- 2 - 11 available

Contents

- TRILL OAM
- An RBridge Channel
- ICMP like OAM Facilities
- TRILL BFD Support
- Proposed WG Actions

draft-bond-trill-rbridge-oam-01

- TRILL Traceroute
  - Based on hop count, similar to IP traceroute
- TRILL Ping
  - Similar to ICMP
- Error reporting functionality

draft-bond-trill-rbridge-oam-01

- Differences between 00 and 01
  - Reworked the document to use the OAM Channel rather than an OAM option
  - Changed the frame formats to work within the OAM Channel
  - Numerous minor typo corrections and wording clarifications
  - Removed the route-respond traceroute
  - Combined all the error notifications into one OAM Channel

Contents

- TRILL OAM
- Problem and Motivation
- Architecture
- ICMP like OAM Facilities
- TRILL BFD Support
- Proposed WG Actions

TRILL BFD Support

overhead continuity testing messages. Because of this low overhead, they can be sent frequently and thus rapidly detect failures.

- For RBridge OAM, BFD Control is sent via the RBridge Channel.

TRILL BFD Support

BFD Control, BFD Echo can be used to send a frame to a neighbor RBridge that is addressed back to yourself. That is, the ingress and egress nicknames in the TRILL Header are equal.

- See RFC 5880 and 5882 for general BFD information, RFC 5881 for BFD over IP.

Contents

- An RBridge Channel
- ICMP like OAM Facilities
- TRILL BFD Support
- Proposed WG Actions

Proposed WG Actions

group drafts, retaining the three draft structure

Manral

IP Infusion

vishwas@ipinfusion.com

UNH IOL

david.bond@iol.unh.edu

Huawei Technologies

d3e3e3@gmail.com