

Technical Disclosure Commons

Defensive Publications Series

November 24, 2016

Trace The Security And/Or Lossless Component In Data Center Lossless Ethernet Network Using CFM (IEEE802.1ag)

ALE USA Inc.

Follow this and additional works at: http://www.tdcommons.org/dpubs_series

Recommended Citation

ALE USA Inc., "Trace The Security And/Or Lossless Component In Data Center Lossless Ethernet Network Using CFM (IEEE802.1ag)", Technical Disclosure Commons, (November 24, 2016)
http://www.tdcommons.org/dpubs_series/322



This work is licensed under a [Creative Commons Attribution 4.0 License](https://creativecommons.org/licenses/by/4.0/).

This Article is brought to you for free and open access by Technical Disclosure Commons. It has been accepted for inclusion in Defensive Publications Series by an authorized administrator of Technical Disclosure Commons.

Trace The Security And/Or Lossless Component In Data Center Lossless Ethernet Network Using CFM (IEEE802.1ag)

Authors: VEERARAGHAVAN, Muthu Krishnan - CHARYA, Sudhindra (PA0044284)

Copyright owner: ALE USA Inc.

Data Centre Ethernet Networks have been enhanced to provide lossless and secure paths to carry Fibre Channel traffic with appropriate configuration for loss-less and secure Ethernet such as priority flow control, quantized congestion notification, enhanced transmission selection, FIP snooping and NPIV Proxy. Native Fibre Channel Networks were point-to-point; with the introduction of loss-less Ethernet, multiple switches could be in the path of the traffic and each switch could potentially cater to multiple e-nodes and servers. In such a network, it is difficult for the administrator to verify if a path from an e-node to server and vice-versa is completely loss-less or not.

As per the 802.1ag standard, optional TLV's are carried as part of IEEE 802.1ag packet. Basically LTM/LTR packets are meant to trace the path from source end point to destination end point. The idea is to enhance LTM/LTR packet to carry additional TLVs for a specified priority and VLAN, and to check for loss-less and/or security or not. The intermediate switches need to trap LTM packet and parse these TLVs and check if the specified VLAN and priority are configured for loss-less from databases maintained for PFC, ETS, QCN etc. for the ingress and egress ports or not. Along with the Loss-Less component, each intermediate DUT will parse the TLV to check if any secure component is requested, and if so query from FIP Snooping, NPIV proxy databases etc for ingress and egress ports. This loss-less and/or secure information for ingress egress ports will be replied back as part of additional TLV in the LTR packet. This process continues till LTM reaches the destination end point. Once LTM process is completed, source end point will be having information of the loss less configuration of all the intermediate end points and the destination end point. This way the administrator would know if the path to a particular MAC-address is loss-less and/or secure. These additional TLVs are in the form of OUI TLVs.

In **Figure 1** below, it is assumed that all the Ethernet devices are in the same VLAN. UP MEP will be configured on port 1/1 of Ethernet switch 1. Similarly down MEP will be configured on port 1/1 of FCF. Remaining ports in Ethernet world are configured as MIP. With the help of CCM message MEP's in the same domain and VLAN will learn about the existence of each other, i.e MEP 1 will be learned in FCF and MEP 2 will be learned in switch 1. At any point, LTM can be triggered by User from MEP 1 to MEP 2 and vice-versa. When LTM is triggered from MEP 1 to MEP 2, it will carry additional TLV as part of LTM as shown in **Figure 2 and 3** to gather information about Lossless and secure component in the path. When LTM is received on switch 2, it will send LTR back to switch 1 with additional TLV as shown in Figure 2 and 3, these additional TLVs will have Lossless and secure component information about ingress port (1/1) and egress port (1/2). After this, switch 2 will forward LTM to FCF because LTM target MAC is not switch 2. This process continues till original LTM reaches to destination say MEP 2. In this case FCF is the target MEP and will send back LTR with additional TLV thereby terminating the path.

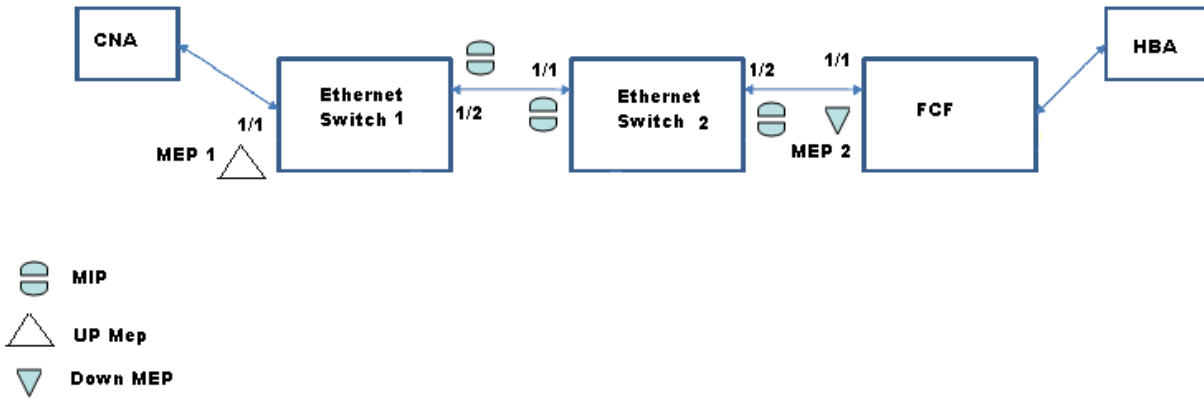


Figure 1

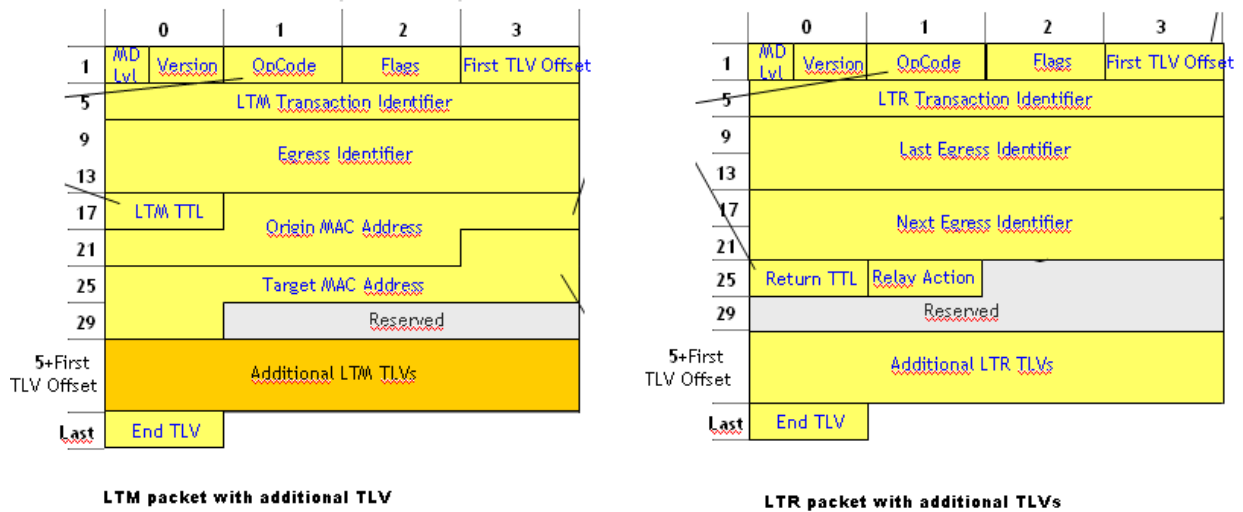


Figure 2

Type = 127	Length	VALUE = OUI Mac (3 octet) = OUI, subtype(1 octet) = (query), vlan (2 octet) = VLANID priority(1 oct) = cos value
-------------------	---------------	---

Proposed additional OUI TLV carried as part of LTM

Type = 127	Length	VALUE = OUI MAC = 3 octet Subtype = Response Vlan = VLAN ID Priority = COS value Ingress Port = PORT ID PFC configured = BOOL value ETS configured = BOOL value QCN Configured = BOOL Value FIP Proxy configured = Bool Value NPIV Proxy configured = Bool Value Egress Port = PORT ID PFC configured = BOOL value ETS configured = BOOL value QCN Configured = BOOL Value FIP Proxy configured = Bool Value NPIV Proxy configured = Bool Value
-------------------	---------------	--

Proposed Additional TLV carried as part of LTR

Figure 3