P802.1EH

Type of Project: New IEEE Standard
Project Request Type: Initiation / New
PAR Request Date:
PAR Approval Date:
PAR Expiration Date:
PAR Status: Draft

1.1 Project Number: P802.1EH
1.2 Type of Document: Standard
1.3 Life Cycle: Full Use

2.1 Project Title: IEEE Standard for Local and Metropolitan Area Networks—Telemetry Tagging of Data Frames

3.1 Working Group: Higher Layer LAN Protocols Working Group (C/LAN/MAN/802.1 WG)
3.1.1 Contact Information for Working Group Chair:
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3.2.1 Contact Information for Standards Committee Chair:
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4.1 Type of Ballot: Individual
4.2 Expected Date of submission of draft to the IEEE SA for Initial Standards Committee Ballot: Jul 2028
4.3 Projected Completion Date for Submittal to RevCom: Jul 2029

5.1 Approximate number of people expected to be actively involved in the development of this project: 20.

5.2 Scope of the proposed standard: This standard specifies protocols, procedures, and managed objects to support forward signaling of telemetry in dedicated tags added to data frames. This standard supports Medium Access Control (MAC), Customer Virtual Local Area Network (C-VLAN) and Service Virtual Local Area Network (S-VLAN) bridges and end stations. Telemetry in conjunction with IEEE Std 802.1AE MAC Security is also supported. This standard specifies a service interface to enable higher layer protocols to initiate and retrieve telemetry from the data link layer. This standard supports managed objects and a YANG data model for initiating and recording telemetry.

5.3 Is the completion of this standard contingent upon the completion of another standard? No

5.4 Will this document contain a Purpose clause? Yes
Purpose: This standard provides a simple, high-performance method to provide information about the congestion state of the bottleneck hop along a data frame's path within a flow. The collection of fine-grained bottleneck information can be important for network protocols and network performance analysis.

5.5 Need for the project: Today's high-performance networks need fine-grained, low- and fixed-overhead, in-band telemetry to monitor network load and congestion and identify hot spots. Additionally, higher layer protocols need fine-grained bandwidth, delay, and congestion signals gathered from a path's bottleneck to avoid packet loss from congestion and permit fast and accurate reactions to network load changes and network

congestion events. Higher layer protocols also need fine-grained network load information to reduce the tails of flows' completion times, which cause slowdowns in distributed computations used in datacenters for artificial intelligence (AI) training and inference. Existing higher layer telemetry systems fall short of meeting these requirements because their variable-length headers overly burden network devices with complex operations and produce large frame expansions that in turn can cause packet fragmentation.

5.6 Stakeholders for the standard: Data center and AI accelerator network operators and users, network equipment manufacturers, network silicon suppliers, LAN network operators and users, telecom providers, cloud providers.

6.1 Intellectual Property

6.1.1 Is the Standards Committee aware of any copyright permissions needed for this project? Yes

Explanation: The standard is expected to include material from the Congestion Signaling (CSIG) portion of the Ultra Ethernet Specification of the Ultra Ethernet Consortium. Copyright permission will be sought from the Ultra Ethernet Consortium if needed.

6.1.2 Is the Standards Committee aware of possible registration activity related to this project? Yes,

This standard is expected to require assignment of new EtherTypes by the IEEE Registration Authority Committee for the telemetry tagging.

The YANG Data Model will be assigned a Uniform Resource Name (URN) based on the RA URN tutorial and IEEE Std 802.

7.1 Are there other standards or projects with a similar scope? No

7.2 Is it the intent to develop this document jointly with another organization? Undecided

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8.1 Additional Explanatory Notes:

#5.2: Telemetry examples include Available Bandwidth, Delay, and Queue Depth measures.

#5.2: IEEE Std 802.1Q, IEEE Standard for Local and metropolitan area networks—Bridges and Bridged Networks

#5.2: IEEE Std 802.1AE, IEEE Standard for Local and metropolitan area network—Media Access Control (MAC) Security

#5.2: IEEE Std 802, IEEE Standard for Local and Metropolitan Area Networks: Overview and Architecture

#5.2: While 'YANG' (developed by the Internet Engineering Task Force) appears to be an acronym, its expansion is not meaningful. YANG is a data modeling language for the definition of data sent over network management protocols specified by IETF Request For Comments (RFC) 7950, The YANG 1.1 Data Modeling Language.

#6.1.2: IEEE Std 802 IEEE Standard for Local and Metropolitan Area Networks: Overview and Architecture

#6.1.2: IEEE RA URN tutorial: http://standards.ieee.org/develop/regauth/tut/ieeeurn.pdf