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: Standard for Local and Metropolitan Area Networks—Tag-on-Frame Telemetry for IEEE 802 Networks

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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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 proposed standard: This standard specifies protocols, procedures, service interfaces, and managed objects to support forward signaling of telemetry within tags on data frames in IEEE 802 networks (see IEEE Std 802). This standard supports telemetry for MAC, C-VLAN and S-VLAN bridges and for end stations specified by IEEE Std 802.1Q. 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 management objects and a YANG data model that can initiate telemetry at the data link layer and record telemetry.

5.3 Is the completion of this standard contingent upon the completion of another standard? Yes
Explanation: This standard will reference the Congestion Signaling (CSIG) tag format specified in the Ultra Ethernet Consortium standard for Ultra Ethernet, which is currently in draft and expected to be published in the 3rd quarter of 2026.
5.4 Purpose: This standard provides a simple, high-performance method for collecting and updating telemetry information in-band on data frames via data link layer tags. This Tag-on-Frame Telemetry provides forward signaling of the telemetry over the data link layer. The Tag-on-Frame Telemetry feature provides information about the congestion state of the bottleneck hop along a path as data frames travel forward within a flow. The telemetry information gathered can provide fine-grained information about the bottleneck along the frame’ s forward path through the LAN. Since the telemetry collected at the data link can also be important for higher-layer protocols, as well as data link layers, service interfaces are provided allowing higher layers to make requests for telemetry

information and receive indications of the collected telemetry information associated with each data frame where it can be reflected to the sender.

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 causes slowdowns in distributed computations used in datacenters for 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 artificial intelligence accelerator network operators, network equipment manufacturers, network silicon suppliers, LAN network operators, telecom providers, cloud providers, and large businesses.

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 references and text fragments quoted from the Congestion Signaling (CSIG) wire format specification in the Ultra Ethernet Consortium Standard for Ultra Ethernet. 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

Explanation: This standard is expected to require assignment of two new EtherTypes by the IEEE Registration Authority Committee (RAC) to identify two telemetry tags.

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

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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"