P802.1DGei

Type of Project: Amendment to IEEE Standard 802.1DG-2025
Project Request Type: Initiation / Amendment
PAR Request Date:
PAR Approval Date:
PAR Expiration Date:
PAR Status: Draft
Root Project: 802.1DG-2025

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

2.1 Project Title: IEEE Standard for Local and Metropolitan Area Networks — TSN Profile for Automotive In-Vehicle Ethernet Communications - Amendment: Time Synchronization Profile

3.1 Working Group: Higher Layer LAN Protocols Working Group (C/LAN/MAN/802.1 WG)
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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 2029
4.3 Projected Completion Date for Submittal to RevCom: Jul 2030

5.1 Approximate number of people expected to be actively involved in the development of this project: 25
5.2.a Scope of the complete standard: This standard specifies a Time-Sensitive Networking (TSN) profile for automotive in-vehicle networks, including requirements for communication, synchronization, and system behavior to support deterministic applications.
5.2.b Scope of the project:

This amendment refines the specification of time synchronization in IEEE Std 802.1DG networks.
The amendment defines configuration constraints and conformance requirements to ensure consistent implementation across multi-vendor systems.

5.3 Is the completion of this standard contingent upon the completion of another standard? No
Explanation:
5.4 Purpose:

The current specification allows multiple time synchronization mechanisms, leaving the selection to system integrators. While this flexibility supported early deployments, it introduces interoperability risks, increases system integration complexity for automotive use, and may lead to inconsistent implementations across vendors.
This amendment improves interoperability and consistency for automotive use by establishing a common baseline for time synchronization profile based on IEEE Std 802.1AS and clarifying its use in IEEE Std 802.1DG networks.

5.5 Need for the Project:

IEEE Std 802.1DG currently allows multiple time synchronization mechanisms,
including IEEE Std 802.1AS, IEEE Std 1588 profiles, and other domain-specific solutions.
While this flexibility supported early deployments, it introduces risks to interoperability
and consistent system behavior in multi-vendor automotive networks.

Systems using different synchronization mechanisms, or different interpretations
of those mechanisms, may not achieve consistent time alignment,
leading to increased integration and validation effort in time-sensitive applications.

Automotive networks require deterministic and reliable time synchronization
across complex systems with long product lifecycles.
In such environments, the absence of a clearly defined common baseline
increases validation effort, complicates system integration,
and may lead to vendor-specific or non-interoperable solutions.

Establishing a common baseline based on IEEE Std 802.1AS is needed to:
- Ensure interoperable implementations across vendors
- Provide consistent, deterministic time synchronization behavior
- Reduce integration and validation complexity
- Avoid fragmentation of synchronization approaches
- Support long-term stability of the automotive Ethernet ecosystem.

5.6 Stakeholders for the Standard: Manufacturers, suppliers, and users of automotive Ethernet equipment and components, including:
- Automotive OEMs
- Tier-1 suppliers
- Semiconductor vendors
- Network equipment vendors
- Tool and test vendors

6.1 Intellectual Property

6.1.1 Is the Standards Committee aware of any copyright permissions needed for this project?
No

6.1.2 Is the Standards Committee aware of possible registration activity related to this project?
No

Explanation: An amendment may use IEEE 802.1 Organizationally Unique Identifiers (OUIs) or Company Identifiers (CIDs) to define code points for managed objects and protocol parameters. If management models are specified, identifiers may be assigned in accordance with IEEE Registration Authority procedures.

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?
No

8.1 Additional Explanatory Notes:
#5.2.b IEEE Std 802.1AS IEEE Standard for Local and Metropolitan Area Networks--Timing and Synchronization for Time-Sensitive Applications