

Draft PAR Proposal for an IEEE 802.1 standard on Cut-Through Forwarding (CTF)

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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: P802.1DU
1.2 Type of Document: Standard
1.3 Life Cycle:

2.1 Project Title: Standard for Cut-Through Forwarding Bridges and Bridged Networks

3.1 Working Group: Higher Layer LAN Protocols Working Group (C/LM/802.1 WG)

3.1.1 Contact Information for Working Group Chair:

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3.2 Society and Committee: IEEE Computer Society/LAN/MAN Standards Committee(C/LM)

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:
Nov 2025

4.3 Projected Completion Date for Submittal to RevCom: Dec 2026

5.1 Approximate number of people expected to be actively involved in the development of this project: 30

5.2 Scope of proposed standard: This standard specifies Cut-Through Forwarding (CTF) Bridges based on the IEEE 802.1Q Bridge architecture. CTF Bridges interconnect individual IEEE 802 Local Area Networks (LANs) via different or identical Media Access Control (MAC) methods, including interconnection of MAC methods with support for the CTF operation, and interconnection of MAC methods with support for the CTF operation with MAC methods without support for the CTF operation.

For bridges that support the CTF operation, this standard specifies additions to the procedures in published IEEE 802.1 Standards, including 802.1Q, 802.1AC, 802.1CB, for processing frames that are subject the CTF operation.

These additions include additional management parameters for CTF (including YANG), methodology for marking and handling erroneous frames (~~late errors~~), and extends the service interface from 802.1AC by MAC method-specific marking and handling mechanisms for late errors for use by MAC methods that support the CTF operation ~~and support MAC-specific marking mechanisms.~~

This standard also details the usage of CTF Bbridges in bridged networks including mixed networks of bridges with and without support for the IEEE 802.1Q bridged networks ~~CTF operation.~~

5.3 Is the completion of this standard contingent upon the completion of another standard?

No

5.4 Purpose: This standard enables communication delays lower than achievable by bridges and bridged networks solely supporting store-and-forward operations. The standard allows interoperable interconnection of information technology equipment, with and without support for CTF, attached to separate individual LANs.

5.5 Need for the Project: Standardizing CTF is needed to enable communication delays lower than those achievable by store-and-forward, and it is needed to enable interoperability between different products, including (but not limited to) products from different vendors. Support for CTF is already found in existing products and in existing installations that require the lower communication delays enabled by CTF, but

~~interoperability across such products is insufficient (e.g., no common management, insufficient definition of the bridge-internal processing behavior). CTF is not standardized by IEEE 802.1. Such products are used in existing installations that require the lower communication delays enabled by CTF. Standardizing CTF is needed to enable interoperability between different products, including (but not limited to) products from different vendors.~~

5.6 Stakeholders for the Standard: Manufacturers, distributors, vendors, developers, providers and users of bridging equipment for industrial automation, professional audio-video, data centers and other systems requiring communication delays lower than achievable by store-and-forward bridging operations.

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

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:

- 1) IEEE 802.1 Q refers to "IEEE Std 802.1Q: IEEE Standard for Local and Metropolitan Area Networks— Bridges and Bridged Networks"
- 2) See slide 9 of <https://mentor.ieee.org/802.1/dcn/21/1-21-0037-00-ICne-ieee-802-tutorial-cut-through-forwarding-ctf-among-ethernet-networks.pdf> for the basic operation of a CTF Bridge.
- 3) Modification of existing MAC methods, definition of new MAC methods and decisions on whether or not particular MAC methods support the CTF operation is beyond scope.

#5.4:

Quantitative delay considerations are provided on slides 9-15 and the associated annex of <https://mentor.ieee.org/802.1/dcn/21/1-21-0037-00-ICne-ieee-802-tutorial-cut-through-forwarding-ctf-among-ethernet-networks.pdf>.