

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

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Date: January 17, 2022.

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DCN 1-22-0055-02-ICne

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 2026

4.3 Projected Completion Date for Submittal to RevCom: Dec 2027

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 IEEE 802.1 Standards, including IEEE 802.1Q, IEEE 802.1AC, IEEE 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, and extends the interfacing from IEEE 802.1AC for MAC method-specific marking and handling mechanisms for late errors for use by MAC methods that support the CTF operation.

This standard also details the usage of CTF bridges in bridged networks including networks with a mix of bridges with and without support for the 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).

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 802.1Q refers to "IEEE Std 802.1Q: IEEE Standard for Local and Metropolitan Area Networks—Bridges and Bridged Networks"
- 2) IEEE 802.1AC refers to "IEEE Std 802.1AC: IEEE Standard for Local and Metropolitan Area Networks—Media Access Control (MAC) Service Definition"
- 3) IEEE 802.1CB refers to "IEEE Std 802.1CB: IEEE Standard for Local and Metropolitan Area Networks—Frame Replication and Elimination for Reliability"
- 4) 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.
- 5) By definition, modification of IEEE 802 MAC Standards and specification of new IEEE 802 MAC Standards is beyond scope.
- 6) By definition, change existing IEEE 802.1 Standards 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>.