P802.1Qdw

Type of Project: Amendment to IEEE Standard 802.1Q-2018
Project Request Type: Initiation / Amendment
PAR Request Date:
PAR Approval Date:
PAR Expiration Date:
PAR Status: Draft
Root Project: 802.1Q-2018

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

2.1 Project Title: IEEE Standard for Local and Metropolitan Area Networks--Bridges and Bridged Networks
Amendment: Source Flow Control

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:
Dec 2025
4.3 Projected Completion Date for Submittal to RevCom: Jul 2026

5.1 Approximate number of people expected to be actively involved in the development of this project: 20
5.2.a Scope of the complete standard: This standard specifies Bridges that interconnect individual LANs, each supporting the IEEE 802 MAC Service using a different or identical media access control method, to provide Bridged Networks and VLANs.
5.2.b Scope of the project: This amendment specifies procedures and managed objects for the signaling and remote invocation of flow control at the source of transmission in a data center network. This amendment specifies enhancements to the Data Center Bridging Capability (DCBX) protocol to advertise the new capability. This amendment specifies the optional use of existing stream filters to allow bridges at the edge of the network to intercept and convert signaling messages to existing PFC frames. This amendment also addresses errors of existing IEEE Std 802.1Q functionality.

5.3 Is the completion of this standard contingent upon the completion of another standard? No
5.4 Purpose: Bridges, as specified by this standard, allow the compatible interconnection of information technology equipment attached to separate individual LANs.
5.5 Need for the Project: Congestion, in particular incast congestion, is detrimental to network performance in the data center and most acutely affects the widely used Remote Direct Memory Access (RDMA) protocols, such as RDMA over Converged Ethernet (RoCE), in High-Performance Computing (HPC) and Artificial Intelligence (AI) data center networks. PFC is used to avoid packet loss from to congestion, however, PFC applies flow control to a locally attached link resulting in problematic side effects at scale such

as congestion spreading and head-of-line blocking. Higher layer end-to-end congestion control typically takes too long adjusting the source transmission rate to avoid buffer exhaustion, especially during incast congestion. Source Flow Control (SFC) is needed to apply flow control directly to the source as quickly as possible, mitigating packet loss and the sides effects of existing PFC at scale. Enabling an edge bridge at the source to intercept signaling messages and convert them to existing PFC supports early adoption and eases end-user migration while also allowing SFC implementations directly on server network adapters.

5.6 Stakeholders for the Standard: Developers and users of networking for data center environments including integrated circuit developers, bridge and end station vendors, network operators and users.

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?
Yes

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

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:
PFC and DCBX are specified in IEEE Std 802.1Q: IEEE Standard for Local and Metropolitan Area Networks—Bridges and Bridged Networks

#5.5:
RoCE is specified by the Infiniband Trade Association. Supplement to Infiniband Architecture Specification Volume 1 Release 1.2.1 Annex A17: RoCEv2. September 2014: pages 1-23

#6.1.2:
While 'YANG' (developed by the Internet Engineering Task Force) appears to be an acronym its expansion 'Yet Another Next Generation' is not meaningful. YANG is a widely-used standard that is relevant to the Registration Authority.
IEEE Std 802 IEEE Standard for Local and Metropolitan Area Networks: Overview and Architecture
IEEE Std 802d IEEE Standard for Local and Metropolitan Area Networks: Overview and Architecture Amendment 1: Allocation of Uniform Resource Name (URN) Values in IEEE 802 Standards
RA URN tutorial: http://standards.ieee.org/develop/regauth/tut/ieeeurn.pdf
RA - Registration Authority
URN - Uniform Resource Name