FINAL DRAFT
Amendment

ISO/IEC/IEEE 8802-1Q:2020/ FDAM 35

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Telecommunications and exchange between information technology systems — Requirements for local and metropolitan area networks —

Part 1Q:
Bridges and bridged networks

AMENDMENT 35: Congestion isolation

Télécommunications et échange entre systèmes informatiques — Exigences pour les réseaux locaux et métropolitains —

Partie 1Q: Ponts et réseaux pontés

AMENDEMENT 35

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AMENDMENT 35

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The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of document should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives or www.iec.ch/members_experts/refdocs).

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ISO/IEC/IEEE 8802-1Q:2020/Amd 35 was prepared by the LAN/MAN of the IEEE Computer Society (as IEEE Std 802.1Qcz-2023) and drafted in accordance with its editorial rules. It was adopted, under the “fast-track procedure” defined in the Partner Standards Development Organization cooperation agreement between ISO and IEEE, by Joint Technical Committee ISO/IEC JTC 1, *Information technology*, Subcommittee SC 6, *Telecommunications and information exchange between systems*.

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Any feedback or questions on this document should be directed to the user’s national standards body. A complete listing of these bodies can be found at www.iso.org/members.html and www.iec.ch/national-committees.

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Figures

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IEEE Standard for
Local and Metropolitan Area Networks—

Bridges and Bridged Networks

Amendment 35: Congestion Isolation

(This amendment is based on IEEE Std 802.1Q™-2022.)

NOTE—The editing instructions contained in this amendment define how to merge the material contained therein into the existing base standard and its amendments to form the comprehensive standard.

The editing instructions are shown in ***bold italics***. Four editing instructions are used: change, delete, insert, and replace. ***Change*** is used to make corrections in existing text or tables. The editing instruction specifies the location of the change and describes what is being changed by using ~~strikethrough~~ (to remove old material) and underscore (to add new material). ***Delete*** removes existing material. ***Insert*** adds new material without disturbing the existing material. Deletions and insertions may require renumbering. If so, renumbering instructions are given in the editing instruction. ***Replace*** is used to make changes in figures or equations by removing the existing figure or equation and replacing it with a new one. Editing instructions, change markings, and this note will not be carried over into future editions because the changes will be incorporated into the base standard. [6]

[6] Notes in text, tables, and figures are given for information only and do not contain requirements needed to implement the standard.

1. Overview

1.3 Introduction

Insert new text at the end of 1.3 as follows:

This standard specifies protocols, procedures, and managed objects that support the isolation of congesting data flows within data center environments. This is achieved by enabling systems to individually identify flows creating congestion, isolate those flows to the congesting queue, and signal to neighbors. This mechanism reduces head-of-line blocking for non-congesting flows sharing the same traffic class. Congestion Isolation is used with higher layer protocols that utilize end-to-end congestion control in order to reduce packet loss and latency. To this end, it:

ct) Defines a means for VLAN-aware Bridges that support congestion isolation to identify flows that are creating congestion.

cu) Defines a means for adjusting transmission selection for frames of congesting flows.

cv) Provides a means for discovering peer VLAN-aware Bridges and stations that support congestion isolation.

cw) Defines a means for signaling congestion isolation to supporting peer Bridges and stations.

cx) Defines a means for recognizing a system’s level and port orientation within the topology relative to the edge.

2. Normative references

Insert the following references into Clause 2 in alphanumeric order:

IEEE Std 802.1CS™, IEEE Standard for Local and Metropolitan Area Networks—Link-local Registration Protocol.[7, 8]

IETF RFC 768 (STD0006), User Datagram Protocol, August 1980.[9]

IETF RFC 791 (STD0005), Internet Protocol—DARPA Internet Program Protocol Specification, September 1981.

IETF RFC 3168, The Addition of Explicit Congestion Notification (ECN) to IP, September 2001.

IETF RFC 3232, Assigned Numbers: RFC 1700 is Replaced by an On-line Database, January 2002.

IETF RFC 6335, Internet Assigned Numbers Authority (IANA) Procedures for the Management of the Service Name and Transport Protocol Port Number Registry, August 2011.

IETF RFC 8200 (STD0086), Internet Protocol, Version 6 (IPv6) Specification, July 2017.

[7] The IEEE standards or products referred to in Clause 2 are trademarks owned by The Institute of Electrical and Electronics Engineers, Incorporated.
[8] IEEE publications are available from The Institute of Electrical and Electronics Engineers (https://standards.ieee.org/).
[9] IETF RFCs are available from the Internet Engineering Task Force (https://www.ietf.org/).

3. Definitions

Insert the following definitions in the appropriate collating sequence, renumbering accordingly:

3.1 congesting flow: A sequence of frames the end-to-end congestion controlled higher layer protocol treats as belonging to a single flow that is experiencing congestion within a congestion isolation aware system.

3.2 congestion isolation aware system: A Bridge component conforming to the congestion isolation provisions of this standard.

3.3 Congestion Isolation Message (CIM): A message transmitted by a congestion isolation aware system, conveying congesting flow information used by the upstream peer congestion isolation aware system.

3.4 Congestion Isolation Point (CIP): A Virtual Local Area Network (VLAN) Bridge or end station Port function that monitors a set of queues for congesting flows, isolates congesting flows to a congesting queue, and can generate Congestion Isolation Messages.

4. Abbreviations

Insert the following abbreviations into Clause 4, in the appropriate collating sequence:

CI	Congestion Isolation
CIM	Congestion Isolation Message
CIP	Congestion Isolation Point

5. Conformance

5.4 VLAN Bridge component requirements

5.4.1 VLAN Bridge component options

Insert new list item ag) at the end of the lettered list in 5.4.1 as follows:

ag) Support for Congestion Isolation (CI) operation (5.4.7).

5.4.1.6 ETS Bridge requirements

Insert new list item a) at the beginning of the lettered list in 5.4.1.6 as follows, renumbering all subsequent items:

a) Support the ETS algorithm (8.6.8.3).

Insert 5.4.7 after 5.4.6 as follows:

5.4.7 VLAN Bridge requirements for congestion isolation (optional)

A VLAN-aware Bridge implementation that conforms to the provisions of this standard for congestion isolation in Clause 49 shall:

a) Support, on one or more Ports, the creation of at least one Congestion Isolation Point (49.3.1).
b) Support Explicit Congestion Notification (ECN) as defined by IETF RFC 3168 and associated updates along with Active Queue Management (AQM) as described in 49.2.1.
c) Support per-stream classification and metering for CI as specified in 8.6.5.2.3.
d) Support, at each Congestion Isolation Point, the variables and procedures of the Congestion Isolation Protocol (49.4).
e) Support the ability to configure the variables controlling the operation of Congestion Isolation (12.33.1), the CI Peer Table (12.33.2), the CI Stream Table (12.33.3), and each CIP (12.33.4).
f) Conform to the required capabilities of IEEE Std 802.1AB.
g) Support the use of the Congestion Isolation TLV in LLDP (D.2.15).

A VLAN Bridge implementation that conforms to the provisions of this standard for congestion isolation may:

h) Support the monitoring of more than one queue on a Bridge Port (49.4.1.2.5).
i) Support transmission selection algorithms other than strict priority.
j) Support the de-isolation of congesting flows by means other than the empty status of a congesting queue (49.2.6).
k) Support the Congestion Isolation YANG model (48.3.8).
l) Support Topology Recognition (49.5).