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INTERNATIONAL STANDARD

ISO/IEC/ IEEE 8802-1AS

First edition
2013-02-15

Information technology — Telecommunications and information exchange between systems — Local and metropolitan area networks —

Part 1AS: Timing and synchronization for time-sensitive applications in bridged local area networks

Technologies de l'information — Télécommunications et échange d'information entre systèmes — Réseaux locaux et métropolitains —

Partie 1AS

Reference number
ISO/IEC/IEEE 8802-1AS:2014(E)

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Institute of Electrical and Electronics Engineers, Inc.
3 Park Avenue, New York
NY 10016-5997, USA
E-mail stds.ipr@ieee.org
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Published in Switzerland

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— *Part 11: Wireless LAN medium access control (MAC) and physical layer (PHY) specifications*

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IEEE Std 802.1AS™-2011

IEEE Standard for
Local and metropolitan area networks—

Timing and Synchronization for Time-Sensitive Applications in Bridged Local Area Networks

Sponsor

LAN/MAN Standards Committee

of the

IEEE Computer Society

Approved 10 February 2011

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Abstract: This standard defines a protocol and procedures for the transport of timing over bridged and virtual bridged local area networks. It includes the transport of synchronized time, the selection of the timing source (i.e., best master), and the indication of the occurrence and magnitude of timing impairments (i.e., phase and frequency discontinuities).
Keywords: best master, frequency offset, grandmaster, IEEE 802.1AS, phase offset, synchronization, syntonization, time-aware system

The Institute of Electrical and Electronics Engineers, Inc.
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PDF: ISBN 978-0-7381-6536-3 STD97070
Print: ISBN 978-0-7381-6537-0 STDPD97070

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Introduction

This introduction is not part of IEEE Std 802.1AS-2011, IEEE Standard for Local and metropolitan area networks—Timing and Synchronization for Time-Sensitive Applications in Bridged Local Area Networks.

This standard specifies the protocol and procedures used to ensure that the synchronization requirements are met for time-sensitive applications, such as audio and video, across bridged and virtual bridged local area networks consisting of LAN media where the transmission delays are fixed and symmetrical; for example, IEEE 802.3™ full-duplex links. This includes the maintenance of synchronized time during normal operation and following addition, removal, or failure of network components and network reconfiguration. It specifies the use of IEEE 1588™ specifications where applicable in the context of IEEE Std 802.1D™-2004 and IEEE Std 802.1Q™-2005.[a] Synchronization to an externally provided timing signal (e.g., a recognized timing standard such as UTC or TAI) is not part of this standard but is not precluded.

This is the first edition of IEEE Std 802.1AS.

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IEEE Standard for Local and metropolitan area networks—

Timing and Synchronization for Time-Sensitive Applications in Bridged Local Area Networks

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1. Overview

1.1 Scope

This standard specifies the protocol and procedures used to ensure that the synchronization requirements are met for time-sensitive applications, such as audio and video, across bridged and virtual bridged local area networks consisting of local area network (LAN) media where the transmission delays are fixed and symmetrical; for example, IEEE 802.3™ full-duplex links. This includes the maintenance of synchronized time during normal operation and following addition, removal, or failure of network components and network reconfiguration. It specifies the use of IEEE 1588™ specifications where applicable in the context of IEEE Std 802.1D™-2004 and IEEE Std 802.1Q™-2005.[1] Synchronization to an externally provided timing signal (e.g., a recognized timing standard such as UTC or TAI) is not part of this standard but is not precluded.

1.2 Purpose

This standard enables stations attached to bridged LANs to meet the respective jitter, wander, and time synchronization requirements for time-sensitive applications. This includes applications that involve

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multiple streams delivered to multiple endpoints. To facilitate the widespread use of bridged LANs for these applications, synchronization information is one of the components needed at each network element where time-sensitive application data are mapped or demapped or a time-sensitive function is performed. This standard leverages the work of the IEEE 1588 Working Group by developing the additional specifications needed to address these requirements.

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IEEE P802.11v™ (D15.0, September 2010), Draft Standard for Information technology—Telecommunications and information exchange between systems—Local and metropolitan area networks—Specific requirements, Part 11: Wireless LAN Medium Access Control (MAC) and Physical Layer (PHY) Specifications—Amendment 8: IEEE 802.11™ Wireless Network Management.[2]

IEEE Std 802.1D™-2004, IEEE Standard for Local and metropolitan area networks—Media Access Control (MAC) Bridges.[3, 4]

IEEE Std 802.1Q™- 2005, IEEE Standard for Local and metropolitan area networks—Virtual Bridged Local Area Networks.

IEEE Std 802.1ag™-2007, IEEE Standard for Local and metropolitan area networks—Virtual Bridged Local Area Networks—Amendment 5: Connectivity Fault Management.

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[2]IEEE P802.11v/D16 (November 2010) was approved by the IEEE-SA Standards Board on 2 February 2011. It was published as IEEE Std 802.11v-2011 on 9 February 2011 and is available from the Institute of Electrical and Electronics Engineers, 445 Hoes Lane, Piscataway, NJ 08854, USA (http://standards.ieee.org).

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[5]IETF RFCs are available from the Internet Engineering Task Force Web site at http://www.ietf.org/rfc.html.

[6]ITU-T publications are available from the International Telecommunications Union, Place des Nations, CH-1211, Geneva 20, Switzerland/Suisse (http://www.itu.int/).

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