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**Part 1BA:
Audio video bridging (AVB) systems**

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Partie 1BA: Systèmes de pontage audio-vidéo (AVB)



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IEEE Std 802.1BA™-2021
(Revision of IEEE Std 802.1BA-2011)

**IEEE Standard for
Local and Metropolitan Area Networks—
Audio Video Bridging (AVB) Systems**

Developed by the
LAN/MAN Standards Committee
of the
IEEE Computer Society

Approved 8 December 2021
IEEE SA Standards Board

Abstract: Profiles that select features, options, configurations, defaults, protocols, and procedures of bridges, stations, and LANs that are necessary to build networks that are capable of transporting time-sensitive audio and/or video data streams are defined in this standard.

Keywords: audio video bridging, AVB, Bridged Local Area Networks, IEEE 802.1BA, LANs, local area networks, MAC Bridges, MANs, metropolitan area networks, time-sensitive data streams, time-sensitive networking, TSN, Virtual Bridged Local Area Networks, virtual LANs

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Introduction

This introduction is not part of IEEE Std 802.1BA-2021, IEEE Standard for Local and Metropolitan Area Networks—Audio Video Bridging (AVB) Systems.

This standard contains state-of-the-art material. The area covered by this standard is undergoing evolution. Revisions are anticipated within the next few years to clarify existing material, to correct possible errors, and to incorporate new related material. Information on the current revision state of this and other IEEE 802 standards may be obtained from

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IEEE Standard for Local and Metropolitan Area Networks— Audio Video Bridging (AVB) Systems

1. Overview

1.1 Scope

This standard defines profiles that select features, options, configurations, defaults, protocols, and procedures of bridges, stations, and Local Area Networks (LANs) that are necessary to build networks that are capable of transporting time-sensitive audio and/or video data streams.

1.2 Purpose

The purpose of this standard is to specify defaults and profiles that manufacturers of LAN equipment can use to develop AVB-compatible LAN components, and to enable a person not skilled in networking to build a network, using those components, that does not require configuration to provide working audio and/or video services.

1.3 Word usage

The word *shall* indicates mandatory requirements strictly to be followed in order to conform to the standard and from which no deviation is permitted (*shall* equals *is required to*).^{6,7}

The word *should* indicates that among several possibilities one is recommended as particularly suitable, without mentioning or excluding others; or that a certain course of action is preferred but not necessarily required (*should* equals *is recommended that*).

The word *may* is used to indicate a course of action permissible within the limits of the standard (*may* equals *is permitted to*).

The word *can* is used for statements of possibility and capability, whether material, physical, or causal (*can* equals *is able to*).

⁶ The use of the word *must* is deprecated and cannot be used when stating mandatory requirements; *must* is used only to describe unavoidable situations.

⁷ The use of *will* is deprecated and cannot be used when stating mandatory requirements; *will* is only used in statements of fact.

1.4 Introduction

The successful support of time-sensitive audio and/or video data streams in a Bridged LAN requires the selection of specific features and options that are specified in a number of different standards, some of which are standards developed in IEEE 802[®], and others (in particular, those that relate to functionality in OSI layer 3 and above in ISO/IEC 7498-1:1994 [B7]) that are developed by other bodies. In this standard, it is the selection of features and options that support OSI layer 1 and 2 LAN functionality that is of interest, in order to specify the requirements for LAN support in Bridges and the end stations that attach to them.

The standards from which features and options are selected by this standard are as follows:

- a) The VLAN Bridge specification in IEEE Std 802.1Q.
- b) The time-synchronization standard, IEEE Std 802.1AS.
- c) The MAC and PHY standards specified for the various LAN MAC/PHY technologies, such as IEEE Std 802.3, IEEE Std 802.11, ITU-T G.9960 & ITU-T G.9961 (Powerline), and MoCA.

These features and options are selected by means of the profiles described in Clause 7. These profiles support specific functions within an AVB network, such as the Bridges and LAN technologies used to carry the AV streams, and the end stations that attach to the LAN and that provide the source(s) and the destination(s) of the stream data.

In some cases, there are functions that are needed in order to construct a usable AVB network, but that are not described in any other standard. In those cases, the technical specification is included in Clause 6 of this standard, along with a statement of the conformance requirements associated with the function, so that the function can be referenced by a profile in the same way as functions defined in any other standard.

Clause 5 introduces the architecture for AVB systems and AVB networks, and some of the terminology used in describing them.

1.5 Objectives

The architecture described in Clause 5, the AVB functions specified in Clause 6, and the profiles specified in Clause 7, are intended to meet the following objectives:

- a) Describe the components that can be combined to form an AVB network (i.e., a network whose components cooperate and interoperate to allow the transmission of AV streams) and how those components can be combined.
- b) Describe some of the consequences and limitations for AVB streaming that result from the incorporation of non-AV capable devices in an AVB network.
- c) Define additional functions that are required for AVB operation that are not otherwise documented in contributing standards.
- d) Provide guidance in terms of meeting the end-to-end latency requirements for successful AVB operation.
- e) Define conformance requirements for AVB systems, in terms of the standards to which conformance is required for the various system components and the optional features of those standards that are required to be implemented. These conformance requirements address the guaranteed delivery, end-to-end latency, and time-synchronization requirements for successful AVB operation.

2. Normative references

The following referenced documents are indispensable for the application of this document (i.e., they must be understood and used, so each referenced document is cited in the text and its relationship to this document is explained). For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments or corrigenda) applies.

IEEE Std 802[®], IEEE Standard for Local and Metropolitan Area Networks: Overview and Architecture.^{8, 9}

IEEE Std 802.1AS[™], IEEE Standard for Local and Metropolitan Area Networks—Timing and Synchronization for Time-Sensitive Applications.

IEEE Std 802.1Q[™], IEEE Standard for Local and Metropolitan Area Networks—Bridges and Bridged Networks.

IEEE Std 802.1Qcc[™], IEEE Standard for Local and Metropolitan Area Networks—Bridges and Bridged Networks—Amendment 31: Stream Reservation Protocol (SRP) Enhancements and Performance Improvements.

IEEE Std 802.3[™], IEEE Standard for Ethernet.

IEEE Std 802.11[™], IEEE 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.

ITU-T Recommendation G.9960 (11/2018), Unified high-speed wireline-based home networking transceivers—System architecture and physical layer specification.¹⁰

ITU-T Recommendation G.9961 (11/2018), Unified high-speed wireline-based home networking transceivers—Data link layer specification.

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