IEEE Standard for Layer 2 Transport Protocol for Time-Sensitive Applications in Bridged Local Area Networks

Microprocessor Standards Committee

of the

IEEE Computer Society

Approved 10 February 2011

IEEE-SA Standards Board

Abstract: The protocol, data encapsulations, and presentation time procedures used to ensure interoperability between audio- and video-based end stations that use standard networking services provided by all IEEE 802 networks meeting quality-of-service requirements for time-sensitive applications by leveraging concepts of IEC 61883 are specified in this standard.

Keywords: bridged LAN, IEC 61883, IEEE 802.1 AVB protocols, IEEE 802.1AS, IEEE 802.1BA, IEEE 802.1Qat, IEEE 802.1Qav, IEEE 1722, local area network (LAN), quality of service, time-sensitive media streaming, time synchronization

The Institute of Electrical and Electronics Engineers, Inc.
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PDF: ISBN 978-0-7381-6549-3 STD97076
Print: ISBN 978-0-7381-6550-9 STDPD97076

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Introduction

This introduction is not part of IEEE Std 1722-2011, IEEE Standard for Layer 2 Transport Protocol for Time-Sensitive Applications in Bridged Local Area Networks.

Increasingly, entertainment media are digitally transported. Streaming audio/video and interactive applications over local area networks is becoming more common.

This standard builds on the work done by the IEEE 802.1 AVB task group by providing a common audio/video transport protocol capable of supporting the needs of both consumer and professional audio/video applications.

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1. Overview

Increasingly, entertainment media are digitally transported. Streaming audio/video and interactive applications over bridged local area networks (LANs) need to have comparable real-time performance with legacy analog distribution. There is significant end-user and vendor interest in defining a simple yet common method for handling real-time audio/video suitable for consumer electronics, professional audio/video applications, etc. Technologies such as IEEE Std 1394™-2008, Bluetooth®, and USB exist today, but each has their own encapsulation, protocols, timing control, etc., such that building interworking functions is difficult. The use of a common audio/video transport over multiple IEEE 802® network types will realize operational and equipment cost benefits. By ensuring that all IEEE 802 wired and wireless devices share a common set of transport mechanisms for time-sensitive audio/video streams, we lessen the effort of producing interworking units between IEEE 802 and other digital networks.

1.1 Scope

This standard specifies the protocol, data encapsulations, and presentation time procedures used to ensure interoperability between audio- and video-based end stations that use standard networking services provided by all IEEE 802 networks meeting quality-of-service requirements for time-sensitive applications by leveraging the concepts of IEC 61883.

1.2 Purpose

This standard will facilitate interoperability between stations that stream time-sensitive audio and/or video across LANs providing time synchronization and latency/bandwidth services by defining the packet format protocols and synchronization mechanisms.

2. Normative references

The following referenced documents and URLs are indispensable for the application of this document (i.e., they must be understood and used, so each referenced document is cited in 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.

IEC 61883-1:2003, Consumer Audio/Video Equipment— Digital Interface—Part 1: General.[1]

IEC 61883-2:2004, Consumer Audio/Video Equipment—Digital Interface—Part 2: SD-DVCR Data Transmission.

IEC 61883-4:2004, Consumer Audio/Video Equipment—Digital Interface—Part 4: MPEG2-TS Data Transmission.

IEC 61883-6:2005, Consumer Audio/Video Equipment—Digital Interface—Part 6: Audio and Music Data Transmission Protocol.

IEC 61883-7:2003, Consumer Audio/Video Equipment—Digital Interface—Part 7: Transmission of ITU-R BO.1294 System B.

IEC 61883-8:2008, Consumer Audio/Video Equipment—Digital Interface—Part 8: Transmission of ITU-R Bt.601 Style Digital Video Data.

IEEE P802.1AS™/D7.2 (Mar. 2010), Draft Standard for Local and Metropolitan Area Networks: Timing and Synchronization for Time-Sensitive Applications in Bridged Local Area Networks.[2,3,4]

IEEE Std 1394™-2008, IEEE Standard for High-Performance Serial Bus.

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

IEEE Std 802.1Qat™, IEEE Standard for Local and Metropolitan Area Networks: Virtual Bridged Local Area Networks—Amendment 14: Stream Reservation Protocol.

IEEE Std 802.1Qav™, IEEE Standard for Local and Metropolitan Area Networks: Virtual Bridged Local Area Networks—Amendment 11: Forwarding and Queuing for Time-Sensitive Streams.

[1] IEC publications are available from the Sales Department of the International Electrotechnical Commission, Case Postale 131, 3 rue de Varembé, CH-1211, Genève 20, Switzerland/Suisse (http://www.iec.ch/). IEC publications are also available in the United States from the Sales Department, American National Standards Institute, 11 West 42nd Street, 13th Floor, New York, NY 10036, USA.
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