STANDARDS AND INFORMATION DOCUMENTS

AES24-1-1999
(withdrawn 2004)

STANDARDS

AES standard for sound system control - Application protocol for controlling and monitoring audio devices via digital data networks - Part 1: Principles, formats, and basic procedures (revision of AES24-1-1995)

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AES24-1-1999
(Revision of AES24-1-1995)

AES standard for sound system control — Application protocol for controlling and monitoring audio devices via digital data networks — Part 1: Principles, formats, and basic procedures

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Abstract

This standard describes the architecture of AES-24, the name assigned to an extensible application protocol for controlling and monitoring audio devices via local area networks, and, when possible in the future, devices designed for other media.

Contents

Foreword

[This foreword is not a part of *AES standard for sound system control — Application protocol for controlling and monitoring audio devices via digital data networks — Part 1: Principles, formats, and basic procedures*, AES24-1-1999.]

This document is a revision of AES24-1-1995 *AES standard for sound system control -- Application protocol for controlling and monitoring audio systems -- Part 1: Architecture.* The revision was made by the SC-10-02 Working Group on Application Protocols of the SC-10 Subcommittee on Sound System Control. At the time of finalizing the standard, SC-10-02 had 75 members from some 12 countries. This revision and the drafts of subsequent parts of the AES24 standard are based on detailed proposals prepared in late 1996 by a task group headed by J. Berryman. To enhance public participation in the development, unofficial synopses of these proposals were also prepared for the trade press by Fred Ampel.

Three additional parts of the AES24 standard are planned.

AES24-2, *AES standard for sound system control — Application protocol for controlling and monitoring audio devices via digital data networks — Part 2: Data types, constants, and class structure*.

AES24-3, *AES standard for sound system control — Application protocol for controlling and monitoring audio devices via digital data networks — Part 3: Transport requirements*.

AES24-4, *AES standard for sound system control — Application protocol for controlling and monitoring audio devices via digital data networks — Part 4: Internet protocol (IP) transport of AES-24.*

Many individuals contributed to the creation of this standard. At the time of its completion, the writing group that produced it included in its membership F. Ampel, D. Bavholm, J. Berryman (SC-10-02 chair), R. Caine, J. Combs, S. Crompton, K. Dalbjorn, B. Evans, K. Fitzke, N. Hamawi (writing group convenor), C. Hanna, B. Harshbarger, P. Ibbotson, M. Karagosian (SC-10-01 chair), D. Karlin, M. Lave (SC-10-02 vice-chair), R. Moses, R. Neely, J. Oakley, S. Potosky, T. Roseberry (SC-10 chairman emeritus), J. Shaettle, A. Singer, P. Smith, R. Spina, J. Stembel, L. Tyler (SC-10 chair), B. Van Der Werf, and D. Warman.

In particular, the chair would like to express his gratitude to the former chair of SC-10, Tom Roseberry, for his sure, calm guidance of the subcommittee from the time of its formation through late 1995.

Jeff Berryman
Chair, AESSC SC-10-02
1997-05-15

AES standard for sound system control — Application protocol for controlling and monitoring audio devices via digital data networks — Part 1: Principles, formats, and basic procedures

0 Introduction

0.1 Goals

The AES-24 protocol is conceived to meet the following goals.

1) Extensibility

AES-24 is extensible in a clean way, to support new equipment and concepts that may be developed.

2) Flexibility

AES-24 provides orderly methods for accommodating nonstandard devices in ways that maximize interoperability.

3) Compatibility

AES-24 supports three types of compatibility:

a) backward, in which new versions of AES-24 support products that use older versions, although not with the full functionality of the new versions;
b) forward, in which old versions of AES-24 support products that use newer versions of AES-24, although not with the full functionality of the devices;
c) lateral, in which products using custom enhancements to AES-24 interoperate with products using standard versions of AES-24, although not with the functionality of the custom enhancements.

0.2 Flexible data transmission requirements

AES-24 is conceived to operate over a variety of data transmission facilities, although AES-24 functionality may vary depending on the services provided by those facilities.

0. 3 Peer-to-peer operation

AES-24 is a peer-to-peer protocol, in which any device may initiate or accept control and monitoring commands.

0.4 Security

AES-24 supports features for implementing appropriate levels of security in control networks. Details on security are considered in AES24-2.

0.5 Conceptual model

AES-24 is based upon a conceptual model in which each piece of equipment is treated as a set of discrete functional elements. Some of these functional elements deal directly with the audio signal, while others provide management and support services.

In addition to audio processing equipment, an AES-24 internetwork should include one or more other components (often called system controllers) that provide control and monitoring functions. In the same way as for audio equipment, AES-24 models system controllers as sets of discrete functional elements.

Although it is convenient to speak of system controllers as specific components, AES-24 does not accord them any special distinction. Every product attached to an AES-24 internetwork is viewed simply as a box containing assorted functional elements. It is perfectly acceptable for a single product to perform both audio processing and system control functions.

In line with modern software engineering practice, AES-24 names the discrete functional elements of a product objects.

0.6 Architecture

The architecture of this standard is basically a four-level hierarchy. The levels are, from lowest to highest in the hierarchy:

a) the objects inside the equipment, organized into groups called devices;
b) the devices;
c) the subnetwork;
d) the internetwork.

0.7 Abstraction

This standard's object-based view of audio systems is an abstraction for control purposes and not a physical description of the systems themselves. It is appropriate to think of a product's set of standard objects as the external interface it presents to a standard internetwork, rather than its internal design. This interface represents the set of control and monitoring functions that the product's designers have chosen to make accessible via the application protocol. This set may include all of the product's functions, or only a subset of them.

0.8 Transport networks

This standard specifies the formats, rules, and meanings of audio control and monitoring commands, but makes few assumptions about the manner in which these commands will physically be transported from one object to another. The medium by which AES-24 commands move between objects is called a transport network.
With appropriate software, AES-24 commands are capable of being carried by most modern transport networks.

1 Scope

This standard is intended to make it possible to control and monitor, via a digital data network, different audio devices from disparate manufacturers using a unified command set within a standard format.

This standard specifies an extensible application protocol for controlling and monitoring audio devices via digital data networks. AES-24 is the name assigned by this standard to the protocol described herein. The AES-24 protocol provides a relatively complete set of commands and responses for common audio devices, and is designed to be extensible in an orderly fashion to accommodate new commands and responses as required to suit new audio devices that are invented.

As an application protocol, AES-24 is not directly concerned with the mechanics of data transmission. The AES-24 protocol specifies the formats, rules, and meanings of audio control and monitoring commands, but makes only rudimentary assumptions about how these commands are physically transported from one device to another. Thus, AES-24 is able to operate over a variety of modern data communication facilities.

AES-24 does not specify methods for transmitting audio signals in any form.

2 Normative references

Normative references contain provisions that, through reference in this text, constitute provisions of this document. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this document are encouraged to investigate the possibility of applying the most recent editions of the indicated standards.

There are no normative references for this standard. References to subsequent parts of the AES24 standard that are now in draft stage are under consideration. These include AES24-2, *AES standard for sound system control — Application protocol for controlling and monitoring audio devices via digital data networks — Part 2: Data types, constants, and class structure*; AES24-3, *AES standard for sound system control — Application protocol for controlling and monitoring audio devices via digital data networks — Part 3: Transport requirements*; and AES24-4, *AES standard for sound system control — Application protocol for controlling and monitoring audio devices via digital data networks — Part 4: Internet protocol (IP) transport of AES-24.*

3 Definitions

3.1 Networks

3.1.1

digital data network
network (where the context is clear)
set of entities that communicate by digital means, using facilities and methods that allow any entity to exchange information with any other (subject to access controls), and where the number of entities that may participate is reasonably open-ended

3.1.2

network node
addressable hardware location in a digital data network, such as a network card

3.1.3

transport network
data communications facility that can transmit arbitrary data elements (bit strings) from one entity to another with reliable error detection, and under the control of an orderly addressing scheme

3.1.4

transport node
node (where the context is clear)
addressable logical source or destination in a transport network, where there may be multiple transport nodes per network node

3.1.5

transport address
bit string that uniquely identifies a transport node within its transport network