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AES project report - PTP parameters for AES67 and SMPTE ST 2059-2 interoperability

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AUDIO ENGINEERING SOCIETY, INC.
132 East 43rd St, Suite 405, New York, NY 10017, US.



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AES Standards Report - PTP parameters for AES67 and SMPTE ST 2059-2 interoperability

Abstract

Three profiles for Precision Time Protocol (PTP) might potentially be used in the professional media environment: the Peer-to-Peer Default PTP Profile of IEEE Std 1588-2008, the Media Profile of AES67 and the SMPTE Profile of SMPTE ST 2059-2. This report compares the profiles and identifies features and parameter ranges that should enable interoperability among equipment conforming to the different profiles.

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Audio Engineering Society Inc. 132 East 43rd St, Suite 405, New York, NY 10017, US.
www.aes.org/standards standards@aes.org

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Foreword

This foreword is not part of the *AES-X226 AES Standards Report - PTP parameters for AES67 and SMPTE ST 2059-2 interoperability*.

This document was developed in project AES-X226 in the SC-02-12-M task group on AES67 development under the leadership of Kevin Gross.

The members of the writing group that developed this document in draft are: John Fletcher, Kevin Gross, Eric Heurtel, Andreas Hildebrand, Nikolaus Kerö, Jim Meyer, Mike Overton, Greg Shay, and Maciej Szlapka.

This document was edited by John Fletcher.

Richard Foss

Chair, working group SC-02-12

Forward to the second edition, 2021

This revision adopts new terminology for the relationship between clocks: Leaders are the source of time information and followers use time information from leaders to synchronize their clocks. The revision also appreciates the publication of SMPTE ST 2059-2:2021 which contains an update to the default logAnnounceInterval used by the SMPTE profile. This change does not affect the original recommendations of the report.

This revision was edited by Kevin Gross with help from John Fletcher and other SC-02-12-M task group members.

AES Standards Report - PTP parameters for AES67 and SMPTE ST 2059-2 interoperability

1 Introduction

AES and SMPTE have both specified profiles for IEEE 1588-2008 Precision Time Protocol (PTP) for use in professional media applications; the respective standards being AES67 and SMPTE ST 2059-2. The design goals were somewhat different: the AES standard was aimed at interoperability of some existing networked audio systems and the SMPTE standard at meeting requirements of the EBU/SMPTE Task Force on Timing and Synchronization. Nevertheless, it is clear that there is significant overlap in the application space and that some users will want to use equipment conforming to AES and SMPTE specifications on the same network and in the same PTP domain.

Each standard defines a profile in terms of ranges and recommended default settings for parameters. The requirements of the two standards are not mutually exclusive and this report explores suitable parameter choices for interoperation. The overlapping operating conditions identified in this document are not intended to replace any profile, but rather to identify a common set of parameters and options that satisfy multiple applications.

This document is based on a reading of the two standards and the knowledge that interoperation was a stated development goal for both AES and SMPTE. Further experience with interoperation of these profiles may lead to revisions of this document or one or both of the involved standards.

In this report, a Courier typeface may be used to identify computer code expressions to distinguish them from regular text.

2 Interoperability use-case

The interoperability use-case addressed in this document is as follows:

A user has some equipment that conforms with the IEEE 1588 default profile (as required by AES67), some equipment that conforms with the AES67 Media profile, and some equipment that conforms with the SMPTE ST 2059-2 profile. The user wants to use this equipment in a single PTP domain. What parameter choices will ensure that all the equipment operates correctly?

Equipment that conforms with a particular profile is assumed to implement all required (“shall”) provisions of the profile and to support the full range of attribute values allowed by the profile.

3 Relevant PTP profiles

AES67 specifies that devices shall support IEEE 1588-2008 Default Profiles and should use AES67 Media Profile “PTP profile for media applications” in certain circumstances. SMPTE ST 2059-2 specifies the “SMPTE profile for synchronization in a professional broadcast environment”.