

AES-R12
Standards project report -
AES67 Interoperability PlugFest -
Munich 2014

Abstract

This report summarizes the AES67 interoperability test event ("plugfest") held at the Institut für Rundfunktechnik (IRT), Munich, Germany on 27 to 30 October 2014. Ten companies tested 16 products against each other to confirm interoperability. The results are presented, together with the results of a range of tests of optional operational modes described in the standard.

An AES standards project report implies a consensus of those directly and materially affected by its provisions who have approved it as representing the views of their AESSC subcommittee but not of the AES as a whole. It is intended as a guide to aid the manufacturer, the consumer, and the general public. The existence of an AES report does not in any respect preclude anyone, whether or not he or she has approved the document, from manufacturing, marketing, purchasing, or using products, processes, or procedures not in agreement with the report. Publication does not assume any liability to any patent owner, nor does it assume any obligation whatever to parties using the report. This document is subject to periodic review and users are cautioned to obtain the latest edition.

Audio Engineering Society Inc. 60 East 42nd Street, New York, NY., US.
www.aes.org/standards standards@aes.org

Document preview:
for full document, go to
www.aes.org/publications/standards

Contents

0 Introduction	4
0.1 Purpose.....	4
0.2 Approach.....	4
0.3 Participation	4
1 References	4
2 Test environment	5
2.1 Equipment setup.....	5
2.2 IP address assignment	6
3 Primary interoperability tests	6
3.1 General	6
3.2 Synchronization to a common clock	6
3.3 Multicast streaming: 1 transmitter, many receivers.....	7
3.3.1 General.....	7
3.3.2 Transmitters	7
3.3.3 Receivers	7
3.3.4 Results	7
3.4 Multicast streaming: many transmitters, many receivers.....	8
4 Interoperability options	9
4.1 General	9
4.2 Stream format options.....	9
4.3 Session Initiation Protocol (SIP) and unicast mode	11
4.3.1 General.....	11
4.3.2 Unicast only.....	11
4.3.3 Unicast and SIP.....	11
5 Network setup	12
5.1 General	12
5.2 Switch PTP modes	12
5.3 Disconnecting PTP	12
5.4 Quality of Service (QoS)	12
6 Conclusions	12
7 Recommendations and future work	13
Annex A: Photographs	14

Foreword

The inter-operability tests described here were discussed and formulated by AES standards task group SC-02-12-M under the leadership of Kevin Gross.

The members of the task group that produced these results are: Loic Andrieu, Roberto Barbieri, Stephan Flock, Johannes Freyberger, Kevin Gross, Eric Heurtel, Andreas Hildebrand, Frank Hoyer, Henry Jesuiter, Gilbert Passador, Vincenz Riffeser, Matthias Schuchert, Nicolas Sturmel, Maciej Szlapka, Bertrand van Kempen, and Mark Yonge.

We would like to express our appreciation to Sonja Langhans of the IRT for valuable help with organising this event, and to her colleagues Franz Baumann and Andreas Metz who assisted the tests. Fredrik Bergholtz and Johan Boqvist of Swedish Radio, and Peter Stevens of the BBC, all contributing on behalf of the EBU, also provided material help, especially in data analysis.

Richard Foss
Chair, SC-02-12 Working Group on Audio Applications of Networks

Standards project report - AES67 Interoperability PlugFest, Munich 2014

0 Introduction

0.1 Purpose

The purpose of this interoperability test was to demonstrate functional compatibility - interoperability - between a number of different implementations of the standard AES67-2013, "AES standard for audio applications of networks - High-performance streaming audio-over-IP interoperability"

0.2 Approach

An interoperability test is not the same as a product shoot-out. The purpose is to allow engineers from different companies to meet in a commercially-neutral context to connect their equipment with equipment from other developers and to confirm, through testing, that signals are transmitted and received correctly according to the standard. The spirit is of technical enquiry, not point-scoring, and this is in the practical interests of all participants.

For this reason, this report has been prepared under the Chatham House Rule, which states: "When a meeting, or part thereof, is held under the Chatham House Rule, participants are free to use the information received, but neither the identity nor the affiliation of the speaker(s), nor that of any other participant, may be revealed."

0.3 Participation

The following manufacturers participated in this plugfest.

ALC NetworX GmbH
Archwave AG
Axia Audio
Digigram SA
DirectOut GmbH
Georg Neumann GmbH
Lawo AG
Merging Technologies S.A.
SOUND4
Telos Systems Inc.

A total of 16 separate products implementing AES67 were tested. Implementations varied from software implementations on a PC to hardware-based FPGA solutions. All products were based on existing networked-audio products with AES67-specific extensions.

1 References

This plugfest was to confirm the interoperability of various products according to the standard AES67-2013. This report should be read together with the standard that, in addition to the specification, provides many normative references and also lists many of the terms and abbreviations used here.

AES67 requires interoperability with linear PCM audio coding, a sampling frequency of 48 kHz, 16 or 24 bits-per-sample, 1 to 8 audio channels (2-channel stereo presumed to dominate), and a packet time of 1 ms. This is

Document preview:
for full document, go to
www.aes.org/publications/standards

2014-11-24 printing