

Axia Essentials: Understanding the AES67 AoIP Interoperability Standard



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Now that the AES67 interoperability standard has been approved, you've probably been thinking of all kinds of questions about how it will impact you and your operation. We have, too! Here, we've collected some of the best questions we've received regarding AES67, networked audio for broadcast, and the future of networked audio technology. We hope you find it helpful.

Maybe reading this will inspire questions of your own! If so, we welcome them - just write Inquiry@AxiaAudio.com.

What's going on with AES X192, the IP-Audio interoperability project?

Good news! The X192 project committee completed their work in April 2013, and submitted their findings to the AES. The work of the AES subcommittee for an AES standard on audio network, (called X192) was given an official AES number, AES67, and was ratified by the AES67.

Does this mean that AES67 is the standard now?

Yes. As of 11 September, 2013, AES67 is a published standard.

What does the AES67 standard contain?

According to Mark Yonge, AES Standards Manager:

"This standard defines an interoperability mode for transport of high-performance audio over networks based on the Internet Protocol. For the purposes of the standard, high-performance audio refers to audio with full bandwidth and low noise. These requirements imply linear PCM coding with a sampling frequency of 44,1 kHz and higher and resolution of 16 bits and higher. High performance also implies a low-latency capability compatible with live sound applications. The standard considers latency performance

of 10 milliseconds or less. This standard provides comprehensive interoperability recommendations in the areas of synchronization, media clock identification, network transport, encoding and streaming, session description and connection management.”

(Reference:<http://www.aes.org/standards/blog/2013/9/aes67-2013-audio-over-ip-130911>)

Won't AES67 make Livewire, RAVENNA, and other AoIP systems obsolete? Don't we already have enough audio networking protocols and standards?

To quote Kevin Gross, inventor of CobraNet and chairman of the X192 committee: “Yes we do; Too many in fact. The purpose of [an AES standard] is to create a place where several existing protocols can be tied together.”

We'd like to point out (modestly, of course), that the AES67 specification is a subset of the many functions that Livewire performs. The Livewire “ecosystem” of controls, GPIO, metering and discovery, provides more total functionality than does AES67 alone. This means that Livewire systems will not be obsolete – rather, there will be Livewire systems in the future that also use AES67 stream modes.

How does Axia feel about all this?

Axia is a huge proponent of interoperation! After all, that's what IP-Audio is all about. When Steve Church unveiled IP-Audio at NAB 2002, he told everyone his vision: all broadcast equipment speaking a common language of networked control and audio, to finally do away with soldered, single-destination audio circuits and the stupefying array of connectors that accompanied them. Steve's vision – and ours – is that all broadcast gear should interoperate; easily, seamlessly and without drama.

So it's probably no surprise that Axia and the rest of the Telos Alliance has been involved with X192/AES67 since the project's inception. And in fact, our third-generation audio interfaces (xNodes) were specifically designed with the capability to accommodate the new standard.

Speaking of RAVENNA – how do they fit into all of this?

ALCNetworX, RAVENNA's parent company, was also a member of the X192 committee, and they have stated that they plan on fully embracing the AES67 standard. We expect that RAVENNA devices will have a protocol which supports AES67 interoperation. Axia

and RAVENNA are already partners, of course, and between us already have 80+ companies whose products interwork using the RAVENNA standard.

Axia and RAVENNA were a big part of the X192 project.

Isn't AES67 just a synthesis of those two systems?

Not at all. The X192 Task Group consisted of over 100 members from a wide variety of equipment manufacturers – including some who are direct competitors of Axia and RAVENNA. It's not a "rubber-stamp" project! AES67 is the result of 3 years of collaboration by these many contributors, ensuring use of the best ideas, no matter where they originated.

Now that AES67 is ratified, how long will it be before all networked gear works together?

That's a tough question. Ultimately, it's up to individual manufacturers to write and release software updates; the speed with which they do so depends upon the demand their clients place on them, and the resources available.

You say that Axia introduced AoIP to broadcast in 2002, and you've got over 4,000 studios on-air. So why is AES67 even needed?

When Steve Church and his team were developing Livewire, they had to invent tech that didn't exist before. One critical piece of tech was network clock sync. Problem was, the Ethernet standard in place at the time had no criteria for high-precision time-synched audio.

Why is this so critical? As Telos Alliance Chief Science Officer Greg Shay explained in his excellent paper "Taking the 'Sting' Out of Evolving Digital Audio Networks" (presented at NAB 2013 and downloadable from AxiaAudio.com/tech/): "Accurate timebase recovery is directly related to, and essential for, low latency (low delay) of the audio going over the network."

In other words, if you want networked, realtime, broadcast quality audio without jitter and delay, you've got to have all network devices synchronized to a network master clock. So we invented the first distributed high-precision clocking system for Ethernet, and debuted it in Livewire.

Although Axia has always been happy to share our tech with software and hardware manufacturers, other, open methods of Ethernet clock sync emerged, one of which became the IEEE-1588 synchronization standard – which is an integral part of AES67.

I need new studios. Should I wait to purchase equipment until all the manufacturers adopt AES67?

Not unless you're prepared to wait quite a while. Implementing a new standard always takes time, as manufacturers adapt existing products, design new ones, and release software updates. New Ethernet switches with IEEE-1588 time handling capability will also need to be designed and brought to market.

In the meantime, Livewire, with over 4,500 studios on-the-air worldwide, is working today, and has a roadmap for future compatibility of existing hardware. This assurance means that the Livewire- or RAVENNA-based studio you put in place today will be compatible with AES67 in the future – your studio gear won't become obsolete.

What changes, if any, will be required for my existing Livewire network to support AES67?

At this moment, our engineering team is reviewing the final specification to determine just that.

In many cases, a software update might be all that's needed. Applying software updates to Axia products is generally a painless process – simply download the update packages and apply them using a standard Web browser and PC, or use Axia iProbe software to “push” the update to your devices *en masse*.

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