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Consultant's Connection: Ethernet AVB, Promise Fulfilled

It's been a long time coming. Today's Ethernet AVB standard for digital AV networks resembles some of those long-ago platforms that didn't quite pan out.

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Hey Dave, I guess you get your wish. I was at InfoComm 09 this year, enjoying the company of friends, some finger foods and liquid refreshment, and various product demonstrations (which, when I met Dave, included demos of loudspeakers and audio DSP gear). Dave asked if I found anything of interest at the show so far. I'd mostly been to classes and meetings, so I didn't have much to report.

But something I had found interesting, I told him, were the discussions with Peavey, Meyer Sound, JBL/Harman, and Audinate about Ethernet AVB, the future of audio/video/control integration, and the use of networks to achieve it all (and keep the IT department happy). In other words, the search once again for the single-wire solution. I'm not giddy about it, but it seems we may finally stand a chance of getting there.

Quick background: Ethernet AVB is an IEEE standard for distributing AV over an Ethernet network. At InfoComm 09, a couple of companies, including Harman Pro, showed some of the first products based on the new standard. (For more information, see proavmagazine.com/AVB).

Dave and I chatted about all this for a few minutes, discussing the relative merits of the existing audio network topologies (CobraNet, EtherSound, etc.). Then Dave turned to me and said, "You know Thom, I really miss Lone Wolf."

Lone What?

I recall attending a special conference put on by the Audio Engineering Society roughly 20 years ago in Nashville, Tenn. The subject happened to be creating a standard for the remote control and monitoring of audio systems, an idea that had its roots in solution provider Innovative Electronic Designs and its control of audio at the Charlotte Douglas International Airport in Charlotte, N.C., in 1982. It gained momentum when MIDI came out, followed by work from Richmond Sound Design



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and Crown in 1987. Lone Wolf showed something called MediaLink in 1989; then there were Crest Audio's NexSys system and Intelix MindNet in 1990. There was a lot going on.

The purpose of the Nashville meeting was to bring together these various players to discuss the state of the industry and start in on a standard for remote monitoring and control. It was generally understood that the standard would be limited to amplifiers, which would still be useful. In large installations such as convention centers and airports, it would provide far greater freedom in systems design and installation.

In 1991, AES came out with the AES-15-1991 (PA-422) standard. The PA-422 standard allowed amplifier racks to be placed up to 4,000 feet from the system's core. Audio signals could run over shielded twisted pairs, but control and monitoring was a problem because RS-232 supported only short distances. Just 11 years later, PA-422 was withdrawn because rapid advances of technology had made it obsolete. It was replaced by AES-24-1-1999 and AES-24-2-tu, which were based on using digital data networks to control and monitor audio systems. Both were quickly withdrawn in 2004.

In the midst of AES's efforts, the excitement generated at the Nashville conference was tempered somewhat when Peak Audio released CobraNet in 1996. The proprietary technology allowed control, monitoring, and multiple channels of digital audio over standard network cabling. It would go on to become as accepted an audio networking protocol as our industry could muster.

But Lone Wolf? When Dave mentioned it, I was flummoxed for a few seconds. Then I remembered. Originally released in 1989 and updated over the next five or six years, Lone Wolf's technology aspired to the lofty goal of becoming the consumer local-area network, carrying everything from home control to video and audio signals over a single fiber. The company went through a lot of money and couldn't bring a successful product to market in a timely manner, which was disappointing to those of us waiting to deploy such a network in the commercial arena. In fact, it was the first (and only) audio network my company considered for the sound systems at Benaroya Hall in Seattle. We reverted to analog systems.

At the time, the promise of a single cable carrying everything set Lone Wolf apart from the competition. True, it offered limited bandwidth (even for fiber), but its potential gave many audio engineers the vapors.

Ethernet AVB promises to have the same effect on audio system designers. However, it turns things upside down for our friends in the IT world. IT managers have been notoriously harsh about allowing digital audio and video on their networks; the bandwidth issues, to them, were too daunting. So why not build network gear that can support multiple audio and video channels, carry control and data, provide high quality of service, and still reserve space for the traffic that a network normally sees? It is, after all, a great way to push the tech envelope and get the IT people to upgrade their switching fabrics, add hardware, and turn a profit.

The AVB formula reserves 25 percent of a 1-Gbps pipe for "normal" network traffic, leaving the other 75 percent to carry the audio, video, and control signals. IT departments might be a little upset over this turn of events, but in the end might have to accept it as inevitable, especially considering Cisco, Broadcom, Xilinx, Intel, and Samsung are founding members of the AVnu Alliance, created to promote the new standard.

Despite the gravitas of this group, a 1-Gbps pipe is barely large enough to fit more than a few compressed H.264 video signals and the necessary audio channels. Fortunately, technology to support much higher bit rates is just around the corner.

So here we are, 20 years later, and it looks as though Lone Wolf was ahead of its time. Even though AVB doesn't look a great deal like Lone Wolf's MediaLink, it should be counted as a direct descendant of that seminal technology. Thus Dave gets his wish. Congratulations, my friend. In your patience you possessed your soul.

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