

The Evolution and Migration of Audio Systems to the IT Network

As AV systems have migrated to IT networks for connectivity, we now see much deeper levels of integration control and configuration. How is this affecting AV management and use? And, what issues are being raised?

New audio devices and networking

Newer audio products and devices now offer networking options for audio transport and configuration. In some earlier implementations, it was common to see separate network connections for control and audio connectivity. However, this is no longer necessary in most situations.

Manufacturers today offer a range of audio networking options, often with all transport and configuration functions performed over a single network connection. This makes installation simple and efficient, although some products still retain separate connections for each.

Separate audio and control connections are usually unnecessary, as IP networks are designed to accommodate a nearly infinite variety of data types simultaneously. In modern computer networks, thousands of transactions between hundreds of devices are handled every second. These could be very different things—from software updates to video streams or text messages to cat pictures—and yet they are delivered without fear of corruption or signal loss. AV networks carry audio, video and control data in the same way, with many different transactions handled quickly and efficiently over a common set of cables and ports. Networked AV products are evolving into computing devices that employ IP technology as a common basis for all communications.

Getting legacy devices onto next-generation networks

There is plenty of perfectly good legacy audio equipment that is "network unaware" but still holds value, including both analog and digital devices, as older digital connectivity solutions such as MADI or AES3 are purely point-to-point and not capable of network connectivity. There are also products that use early implementations of "audio over Ethernet," such as Ethersound or CobraNet, that are not compatible with general purpose networks.

A wide array of convertor products is available to address this gap, migrating both analog and digital signals to audio networks. Over 250 I/O products are available for Dante, covering nearly every type of format or channel count.

While I/O convertors are incredibly useful in extending the useful life of legacy audio gear, it must be noted that they cannot provide any type of internal control for the products to which they are connected, therefore limiting the management capabilities of the system. Legacy products must still be managed using non-networked connectivity.

Dante AVIO

Recognizing the need to preserve the value of investments in legacy equipment, Audinate has recently released a family of cost-effective, low-channel-count adapters for use with non-networked mixers, DI boxes, amplifiers, powered speakers and more. Dante AVIO adapters are available in 1- or 2-channel analog input, 1- or 2-channel analog output, bidirectional 2-channel AES3 and bidirectional 2-channel USB versions. The Dante AVIO family allows users to continue using their favorite legacy equipment in modern networking environments.

Networks: more than media transport

The multi-purpose nature of IP networks lends itself naturally to combined functionality. Rather than requiring separate systems, cables and connectors to handle control or transport media, AV networks consolidate all of this into a single platform using common physical infrastructure. This consolidation brings great flexibility and power, and also some new risks.

System configuration

The very same connection that transports content from device to device can easily handle configuration data, as well. This can include adjusting channel gain on a mixer, creating sub mixes or engaging different effects presets on a DSP. IP technology allows all of these things to be performed using software from anywhere on a network, without the need to physically contact equipment that may be difficult to reach.

Subnets and expansion

Initially, real-time IP AV transport networks were bound by practical limitations that restricted systems to a single "segment" of an IP network, also called a subnet. While this is fine for live sound and touring systems, this restriction prevented widespread ease of use in larger, already established networks. As AV network technologies, such as Dante, mature, barriers are diminished, allowing larger, more complex systems to be designed and implemented.

Security

Prior to IP networking, AV systems offered very little protection against tampering. This made sense in closed, point-to-point systems, like analog. But, with networking comes the need to manage and protect devices that can be accessed by many people. Administrators are realizing that AV networks require robust access protection, just like any other IP network. Fortunately, IT has a long history of solving these problems, and AV-centric management and security products are starting to appear.

Legacy AV systems generally offered very little protection against tampering, as the closed point-to-point architecture was not broadly accessible to others or connected to other systems. IP networks are a different matter, as any IT manager will tell you, and AV networks may require access protection like any general-purpose computer network. Fortunately, these problems are well understood by the IT community, and AV-centric management and security products are beginning to appear on the market.

Dante Domain Manager

Dante Domain Manager is the first user management system designed for AV network systems. Dante Domain Manager gives administrators of Dante audio networks the ability to determine who can access selected sections of the system, using a familiar system of user authentication that can be tied to existing management infrastructure, such as Active Directory. It allows administrators to organize the AV system into zones, called “domains,” that each have individual access requirements, requiring logins by each user. A complete audit log allows problems to be tracked and solved quickly.

Subnet Expansion

Dante Domain Manager enables the use of multiple subnets for an AV system, allowing Dante to be used across networks of nearly any complexity or size. No special configuration is required, as DDM automates the steps necessary to make this work transparently.

Conclusion: What AV can learn from IT

The intrinsic flexibility, scalability and easy management made possible by networks are bringing the days of point-to-point connections to a close. With this change comes the need for education about networking and an increased focus upon areas that were previously outside the scope of AV, such as security and control. Fortunately, the IT community has a head start in this area with years of deep experience, and is bringing this level of thinking into AV with products such as Dante Domain Manager. The IT/AV convergence is here and is as much about people learning from others as it is new products and technologies coming our way.

About the Author:

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