

innovations: the manufacturer's view

The State Of Modern Networking Solutions

FOCUSRITE REDNET: A CASE IN POINT

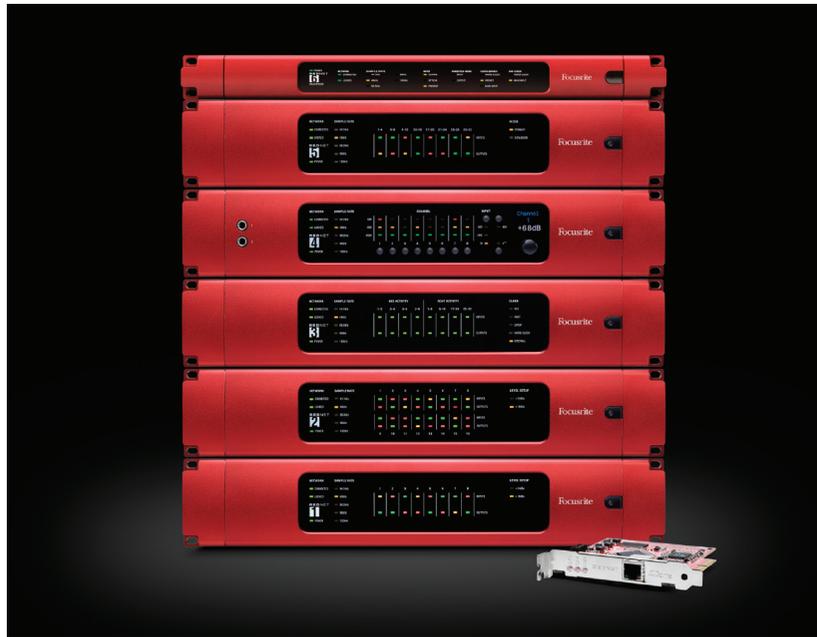
BY PHIL WAGNER

For decades, studio facility and live venue audio wiring were based on multicore cable. With digital technology permeating most workflow scenarios, facilities are implementing audio networking for multi-channel audio transport. Several professional networking protocols exist in various stages of commercial availability. Manufacturers use either 'audio over IP' Layer 3 networking transport or Layer 2 Ethernet transport. Legacy technologies, like CobraNet and Ethersound, were based on proprietary Layer 2 Ethernet.

Dante, Livewire/Ravenna and Q-SYS, pass audio using Layer 3 IP-based transport and therefore are routable. Q-Sys is a proprietary audio over IP solution used by QSC Audio. Ravenna is under development by mixing console supplier Lawo and has partnered with Livewire from Telos/Axia. Audinate, developers of Dante, is a professional media networking company.

Dante has become the de facto AV networking solution, with more than 100 OEM companies onboard, and new partners regularly announcing Dante support. Dante networking offers a highly functional interconnection approach between many popular professional audio manufacturers. Dante utilizes the more advanced 'network' Layer 3 IP protocol, with all devices having unique MAC and IP addresses. This optimizes network traffic and provides for maximum security. IT professionals seem to prefer Layer 3 when implementing professional audio traffic in a mixed-use network.

Dante's 'audio over IP' Ethernet solution utilizes standard network cabling and commonly available/inexpensive network switches. Focusrite adopted Dante several years ago based on its robust design and its ability to offer high quality (uncompressed 24-bit/192 kHz), high channel count and low latency. Dante offers plug-and-play network configuration. The wide-scale adoption of Dante provides a high level of interoperability. This opens up new possibilities for AV systems that cannot be otherwise achieved. Signals



Focusrite's RedNet range of Dante-enabled products

are routed via the Dante Controller software running on a PC or Mac. Dante Controller easily routes signals from either one source to one destination or one source to many destinations.

Focusrite's RedNet is a range of Dante-enabled products, available since early 2013, including a 128-channel, low-latency PCIe card, 8- or 16-channel AD/DA, 32-channel digital I/O, 8-channel Mic Pre Amps, 32-channel HD Bridge for Pro Tools HD and the latest 64-channel MADI Bridge.

All products utilizing Dante appear on and may be routed using the same Dante Controller. For example, Yamaha MY-16 AUD cards provide 16 signals in and out of their consoles and I/O boxes and onto the Dante network; several cards may be used at once. Newer Yamaha CL Series as well as Allen & Heath and Soundcraft consoles offer 64 channels of Dante I/O.

An emerging technology, Audio Video Bridging (AVB) is based on a set of core IEEE standards. AVB is presently being developed as a Layer 2 protocol. AVB will offer an IP-based Layer 3 transport in the coming years, but the initial deployments are non-IP based. Several audio manufacturers have announced AVB products. As a 'closed' system, they can only talk to themselves and are not necessarily interoperable with others. AVB does require specialized AVB support in switches.

The AVnu Alliance was developed to provide AVB interoperability certification. Initially, AVB switches will be tested for interoperability followed by AVB endpoints. In the next year, it is expected we will begin to see AVnu certified products announced. Audinate has already demonstrated its ability to incorporate the AVB transport in Dante and will offer multiple transport protocols in its solution suite.

The AES-X192 standards task group was formed to study audio interoperability over high-performance IP networks. Standard and proprietary media networks use common Internet Protocol (IP); however, they do not interoperate. AES-X192 endeavors to seek commonality among these offerings to see that the technology develops towards the center of interoperability. The AES standard has just been published as AES67, which will be discussed along with a host of networking issues at this month's AES convention.

Networked audio is prevalent in the commercial installation market. Sound reinforcement venues (from club to stadium), house of worship and theme parks benefit from networked audio efficiency. Other markets are now employing networked audio based on increased product availability. RedNet devices are able to augment existing Dante networks.

Academic institutions with large-scale campus networks are rapidly adopting networked audio. Audio

networking provides many benefits: enhanced productivity is achieved by linking performance, rehearsal, recital, studios, control rooms and labs within existing network infrastructure. Of course, it pays to involve the campus IT department early in the planning process. Once the audio network is provisioned, implementation is relatively simple. Benefits also include remote control of Mic Pre signals, as in our RedNet 4, providing conversion at the audio source with the Mic Pre control embedded in the Dante stream. This may span miles on fiber optic cable-based networks.

Recording environments can augment their preferred workstation I/Os with the benefits of networked audio workflow. Focusrite's RedNet 5 HD Bridge connects directly to Pro Tools HD/HDX/Native cards and latency is on par with existing solutions. Multi-room music or post facilities are able to achieve efficiency and cost savings.

Music production users implementing RedNet receive the benefits of lower latency than FireWire, higher channel counts, simplified wiring and greater flexibility.

Those upgrading their computers with the RedNet PCIe card get up to 128 channels I/O at 96 kHz with 3 ms latency. RedNet 3 digital I/O units are being connected to existing mic pre amps and audio interfaces' digital ports.

Composers have numerous sources from keyboards rigs, sample library computers and DAWs. Signals are seamlessly routed between the studios, control and machine rooms. Composers recording with Pro Tools often prefer to compose in Logic Pro. Employing a low-latency RedNet network allows for more channels to move between these workstations.

Broadcast production is now beginning to integrate audio networking. Entertainment shows traditionally set up multiple audio positions with FOH, monitor, recording and production feeds. Variety shows can now implement Dante networking connecting PA consoles to stage racks for the house and guest bands. One Ethernet cable carries a 128-channel Pro Tools record feed

(continued on page 40)

Innovations

(continued from page 36)

from the stage racks to four RedNet 5 HD Bridges.

Worship environments are a perfect fit for audio networking. Larger installs combine the entertainment model with existing band, FOH and monitor setups. Now worship facilities may easily and affordably add Dante enabled equipment for recording and broadcast. Virtual sound check capability is accommodated

High performance audio networking provides great flexibility...Scale is only limited by customers' requirements, imaginative design and proper system integration.

on a PC fitted with a RedNet PCIe card connected to a Dante equipped console.

MADI is ever present in music, post, broadcast and live applications. MADI consoles and routers can now be expanded to the networked environment. RedNet 6 MADI Bridge

provides 64 channels of I/O with asynchronous sample rate conversion. Live consoles with MADI can now sit on a Dante network. Studios utilizing Dolby Atmos monitoring can have a MADI console feeding the Atmos processor via a RedNet 6 MADI Bridge and BSS Soundweb London

devices.

High performance audio networking provides great flexibility and is now being implemented to a greater degree. Scale is only limited by customers' requirements, imaginative design and proper system integration.

Focusrite

focusrite.com

Phil Wagner is the president of Focusrite Audio Engineering's US subsidiary, Focusrite Novation. He has an extensive background with major facility installations, and can be reached at philwagner@focusrite.com