

innovations: the manufacturer's view

# Interconnection, the New-Fashioned Way

## FOCUSRITE'S REDNET PRO AUDIO NETWORKING SYSTEM

BY PHIL WAGNER

Focusrite recently introduced the latest in studio networking technology—RedNet, our professional audio networking system. RedNet's core is based on Audinate's Dante system, providing wide-scale networking of audio signals using off-the-shelf gigabit Ethernet architecture.

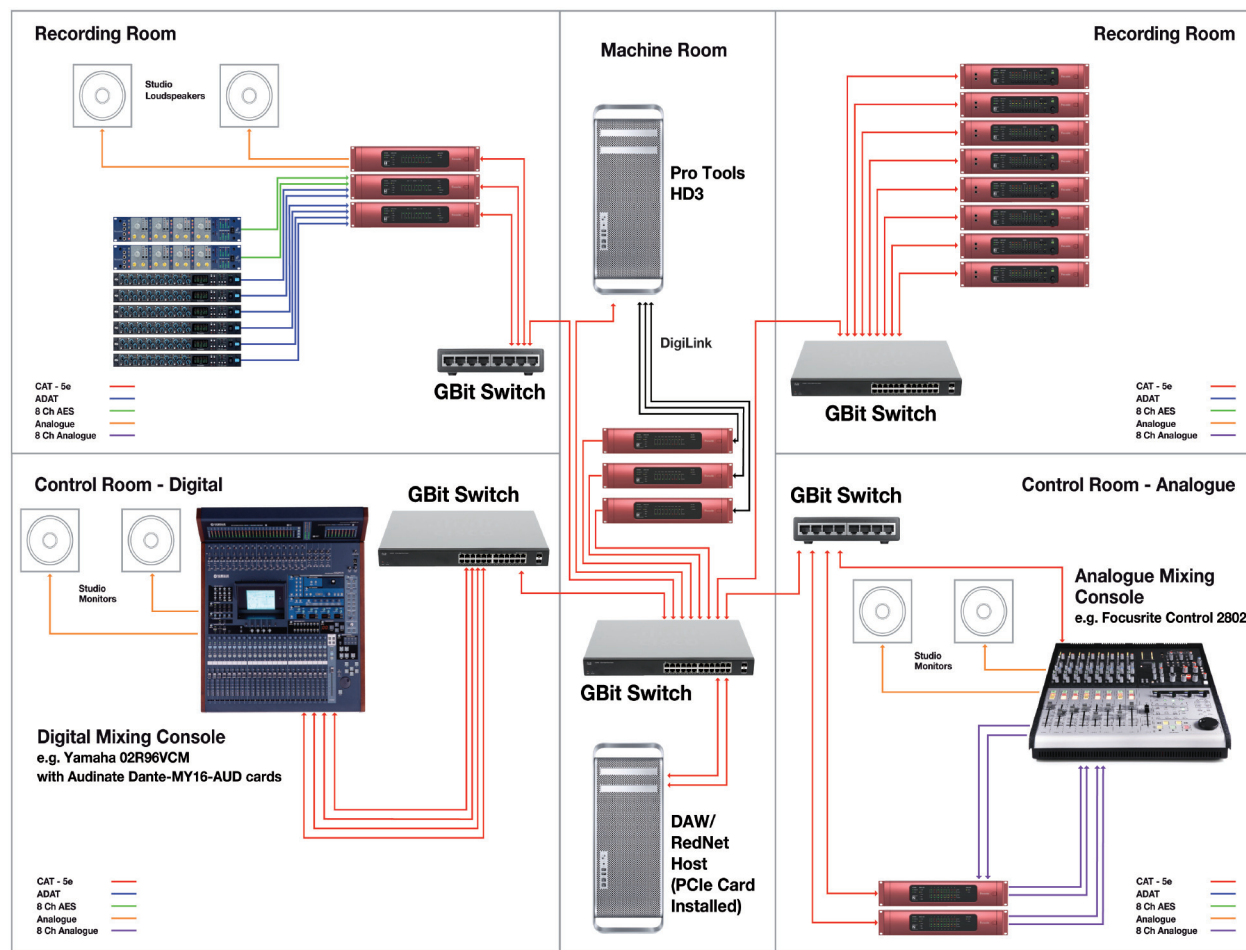
Dante is presently employed by Allen & Heath, DiGiCo, Midas, Stag-etc and Yamaha, among others. U.K. sound company, Britannia Row, has also been using Dante successfully for some time. Focusrite is the only company to offer this robust and reliable core technology for studio applications—RedNet. Focusrite's direction with RedNet harnesses information technology/internet protocol advances for studio connectivity, providing ease of use and flexibility.

Studio wiring is typically time-consuming, complex and represents a good portion of a new studio build expense. Analog cables are susceptible to RFI/EMI emissions and grounding issues. Even the "cleanest" installations cannot avoid cable capacitance or "skin effect" associated with long cable runs that deteriorate signal performance. Analog cable issues are all but eliminated using RedNet. The only analog breakouts necessary are from each RedNet box to the connected gear.

For original or retrofit applications, multi-core analog cable placement issues arise. Opening walls, penetrating beams or floors sometimes is simply not an option and is certainly less desirable. Overall, RedNet will save time in planning, design, raw cable and installation labor expenses. The savings can add up to tens of thousands of dollars.

RedNet allows the use of common Cat-5 cabling as the basis of the studios' inter-room wiring. Bulk Ethernet cables (prices as low as five cents a foot) are less expensive than analog 24 pair multi-core cable by a factor of 100. Cat-5 networking with RedNet provides a faster, more affordable and practical studio wiring solution. Any competent IT professional can pull Cat-5 cables with installation into standard wall boxes and plates. Extra Cat-5 cables may be easily dropped for future expansion.

The range currently consists of six products: RedNet 1—8-channel A-D/D-A; RedNet 2—16-channel A-D/D-A; RedNet 3—32-channel digital I/O; RedNet 4—8-channel



Mic/Line A-D; RedNet 5—32-channel Pro Tools HD Bridge; and RedNet PCIe—256-channel PCIe card.

RedNet PCIe allows 128 channels in and 128 channels out through the host processor running Logic, Cubase/Nuendo or other native software. The PCIe card provides sub 3mS round-trip latency necessary for multitrack recording and monitoring. RedNet 4 is my favorite, with eight differentially balanced mic preamps and remote gain control. The sonic benefits of remote mic preamps are highly desirable. RedNet 5 completes the puzzle for Pro Tools HD and Native users. Additionally, RedNet I/O can be plugged directly into a laptop, providing 64 channels of connectivity to recording software. Latency when connected to a laptop is similar to that of our FireWire interfaces.

A logical RedNet application is a single or multi-room recording or post-production studio application. Multiple interfaces may be placed in one location simply using a gigabit Ethernet (GigE) switch on the end of a single Ethernet run. This provides, for example, six RedNet 4 interfaces for 48 channels of mic/line inputs. Adding a RedNet 1 adds eight more line inputs and four stereo headphone/cue mix feeds.

RedNet routing software allows I/O setup between the various RedNet de-

vices, and to store and recall system setup parameters. For standalone applications, routes may be created between RedNet devices and left connected without a host after initial setup. Interoperability between RedNet and other Dante supported devices is possible.

For a touring, fixed install or house of worship venue where a recording branch is required, RedNet would allow direct connection to any Dante-equipped live mixing console. An Allen & Heath M-Dante or Yamaha's MY-16 Dante card interfaced to a RedNet 5 Pro Tools Bridge is an obvious way to connect one's recording system to a live console. Ethernet can be tapped in a "green room" for listening to mixes and/or "remote" recording. With minimal cable expense, the old concept of "cut and run" after the show is easier than spooling multi-core cable, even if new Ethernet cables are necessary.

The RedNet system provides 120 dB signal-to-noise ratio A-D and D-A conversion. The system will operate at 44.1, 48, 88.2, 96 and 192 kHz sample frequencies, is self-clocking and can run multiple sample frequencies simultaneously. Red Net 3 and 5 digital I/O can lock to incoming digital audio or word clock and loop sync (RedNet 5).

In the equipment room, the entire facility's multichannel connections go through an off-the-shelf GigE switch.

Cat-5 Ethernet runs are stable to 100m or 328 feet. Multiple switches can be employed for larger-scale implementation. With media conversion to fiber-optic cabling, multichannel audio signals can be extended to go miles. GigE switches with fiber are now common.

As you can hopefully see, the possibilities to route analog or digital signals around any sized studio are countless. GigE switches provide bandwidth for over 600 channels of uncompressed audio channels. A very interesting aspect of the RedNet system is that the RedNet audio streams can be combined with normal data/phone traffic in studio, office or home environments and may even be combined with other professional audio and/or video traffic. Focusrite specifies "managed" GigE switches with Quality of Service (QoS) features. QoS prioritizes clock sync and audio/video traffic over other network data.

Dante and Focusrite's RedNet system is Audio Video Bridging (AVB)-compliant. AVB, the newly ratified IEEE standard, is supported by the AVnu Alliance and its large contingent of manufacturers. RedNet is ready for the highly anticipated AVB future (see illustration on page 33 for an example system diagram). RedNet products will be available from January 2012.

Phil Wagner is president of Focusrite Novation. Focusrite, focusrite.com