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Building an AoIP Network With Blades

The author installs a WheatNet audio over IP system

◗ PRODUCT EVALUATION

BY AMANDA HOPP

I can't tell you the last time we did an upgrade of our production rooms here at the Crawford broadcasting cluster in Denver. It's been that long.

For many years, we have used various Mackie production mixers and a dated AudioScience 4000-series sound card in each room. The problem was, when a computer finally died and we upgraded, the sound card no longer worked with the newer motherboards. It's no secret that IT technology marches forward and takes no prisoners; so this required us to purchase a newer sound card and a breakout box to go with it.

While the price in the end probably worked out to be close to the same, we reasoned, why not upgrade to something that uses audio over IP?

Since we had Wheatstone equipment in our control rooms, Wheatstone IP Blades and E-series control surfaces were the obvious choice for upgrading our production rooms.

BLADES

To get the ball rolling, we ordered a new Dell Precision T3060 computer to be the centerpiece server; once it was in and had all the Windows updates and antivirus software installed, I was able to install the required Wheatstone software.

WheatNet should be kept on its own

separate dedicated gigabit network. This prevents interference and conflicts between your general IT network and the WheatNet-IP audio network. Also, Wheatstone recommends you use managed gigabit Ethernet switches — specific models made by Cisco — due to compliance with Ethernet standards used by WheatNet-IP, reliability over time and ease of configuration.

I highly recommend spending the money on the switches that Wheatstone has tested and found optimal. Not all smart switches have the same menus and options, and unless you are very good at finding various menu items, it will be difficult to get them to work with the WheatNet network.

The beauty of the WheatNet-IP system is that all connections are made with RJ-45 connectors. You can either purchase premade cables from a third party (e.g., StudioHub) or make your own. We pulled out our Cat-5 cable and made some XLR cables to connect speakers and a microphone. The wiring was easy; Wheatstone provides charts of the wiring for the needed connectors in their user manual, so users can

The Blades are shown in the rack.

create their own if need be. We then loaded several songs to play through Windows Media Player. The Blade we were using for this was an Aura8IP processing Blade, which has integrated digital audio signal processing. This gave us more options to really work with the quality of the sound.

There are some helpful programs for the engineering side of things.

First is the Aura8IP Guru. This program is for use with the processing Blade. There are presets included to help with a starting place for certain processing schemes. From there you can adjust; or you can start off with a blank slate and make the changes you want to get the sound you want. We don't use much processing at our cluster, so I did not play around with this program as much as I could have.

WheatNet-IP Navigator is the heart of the Wheatstone AoIP system and the mechanism by which the system is configured and managed. This program should be kept on a separate computer on the WheatNet network, and it should be locked down for engineering use only as it sets the parameters for the entire network. IP Navigator is where you can route, lock, set visibilities and do so much more with all the individual Blades, surfaces and third-party devices on the network.

While each Blade stores its own info, along with all of the other Blades' info, IP Navigator puts it together — so you can see everything in one place. Much like the X-Point program Wheatstone uses to manage its Bridge router system, this program is a crosspoint system, and X marks the spot. It makes routing things easy. Find the source you want to route and the destination you would like it to go to and click at the intersection. When the connection is made successfully, one or more green dots will appear (two diagonal green dots for stereo to stereo, two vertically-stacked green dots for a mono source feeding a stereo destination, and a single green dot for a mono to mono connection).

Depending on the configuration ordered, Wheatstone's IP Blades have a couple of utility mixers, AES and analog capabilities and more. An advantage of this system is that a Blade can be used as a standalone unit or integrate with the WheatNet-IP Intelligent network. This allows for more flexibility as you can set up a room to run

Wheatstone E6 Control Surface and Controller Software

multiple stations or see sources from any of the other Blades on the network. Also, the Blades back each other up, so if Blade 1 fails, I can get the spare Blade out, name it Blade 1 and put it on the same IP address as the previous Blade 1. It will be able to then download its needed settings and configuration from the other Blades on the network.

What this does is allow someone to get a room back up and running quickly. You don't have to send the unit off for repair and wait for that long process until it comes back (if you don't have a spare). All you have to do is plug in and name the Blade and put in the correct IP address. It will then query the other blades and restore its settings.

CONTROL SURFACE

We used the Blades and our new WheatNet network with Wheatstone E6 control surfaces. The E6 we got is a nice, eight-channel surface that can be used for on-air or production use. In our on air rooms, we use the big G6 consoles with the bridge router. The E6 consoles have a similar look and feel, which is what we like. Each channel can be configured for any source.

With the E6 surfaces, we are able to route numerous sources and the operator

can call up the source needed. A/B inputs allow for one channel to switch between two sources with the push of a single button. If you don't want to have to scroll through the many sources you can push an A/B button to select the source you want.

This is good in scenarios where you may need to use a mic for one source but also need to use the same channel for the voice effects processor. You can set it up to route the mic through the processor and have the effects come through.

The surface has a monitor output (VGA), and it uses an external monitor (user supplied) to display metering, menus and other information. There is no meter bridge on the surface, so you will need to be sure you have extra computer monitors if your current system has metering on the console.

You can also set up events, which is a helpful feature. How often have you been called in to a room because there is no audio? When you start digging into it, you realize it's just a simple button that got pushed. I know it has happened to me numerous times over the years, and this event feature makes it so easy. I can set the surface up in a default way that works with 90 percent of what we do. If someone comes in and starts pressing all the wrong buttons, we can set the preset event to fire
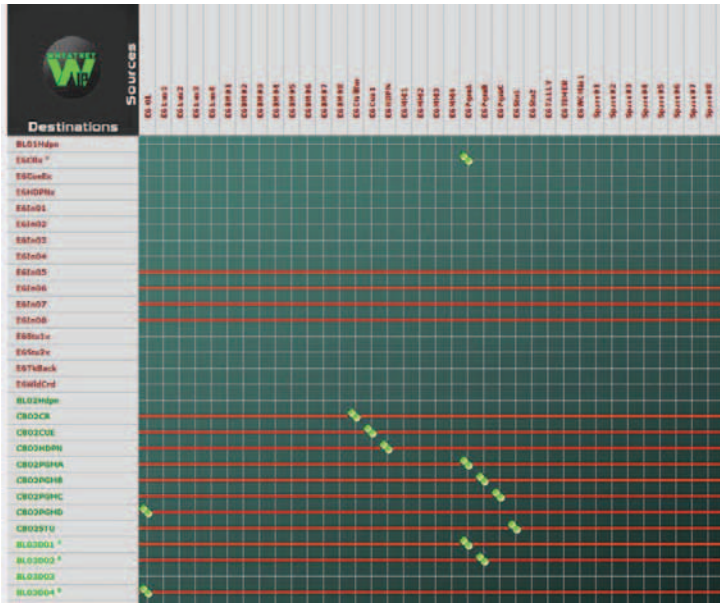
WheatNet-IP Navigator Software

Software Version of Vorsis Processor

from a programmable button and there you go, everything's reset back to normal and working again.

This feature can be used with many settings, depending on the programming you have and how you like things to be done. We can have one setting for morning drive, another for production, etc., selectable with the push of a button. This surface also allows for EQ settings, as well as compression/expansion for each channel to help you get the sound you want, without needing a processing Blade.

This surface does so much it's hard to write about it all without making this article all about the E6. You name it, and the E6 probably does it. I think I may have seen a brew coffee button as well, but you'll just have to get your own unit to see for sure.

After having things up and running for a few weeks, we have been rather amazed with how well it all worked. There are only a couple of issues I have observed and am working with Wheatstone on these.

OPERATION

First, every once in a while I will get a message saying the driver licenses cannot be found and will be shut down in 24 hours. Then a few seconds later, after clicking "OK" on the previous message, another message comes up that says they have been found. Thankfully, this has not interrupted anything we are working on.

On the audio computer we use with the new system, I have the USB ports set to never shut down, as well as the NICs to never shut down or go to sleep. However, sometimes after rebooting the computer (because we all know computers need a kick in the butt sometimes) when it comes back up, it may take a few minutes for the Wheatstone drivers to come up and start working. This normally isn't a problem, because it only affects the one audio source where the driver lives — all the Blades and

the network still keep running — except in the world of fast technology, we expect things to come right up within seconds, not minutes.

We have enjoyed the simplicity of the setup and installation of the Blades. Since the initial testing, we have purchased and installed four additional Blades, and we have 11 now operating in our facility. Each one took an hour or two to get set up, and, in the case of the production rooms, that included getting the old wiring out of the room from the Mackie board. Also, while these units do so much and may seem complicated, once you get the courage to jump in, you realize how easy it all is.

Amanda Hopp, CBRE, is chief engineer for Crawford Broadcasting, Denver. She has written here about her experiences with the Burk ARC Plus with Plus-X IP-8 Adapter, as well as with the GatesAir/Harris Intraplex IP Link 200. See radioworld.com, *keyword Hopp.*