

# Curing the High-Def Headache

*The Skills You Need For a Smooth High-Definition Transition to Digital Video.*

by Don Kreski

**"The good old days where you could just run a wire to some kind of matrix switcher are long gone. Digital, high-definition video is here and is pushing all of us into modern times."**

That's Alvaro Yurrita, a project engineer at Adtech Systems of Sudbury, MA, talking about the advantages and frustrations of digital video. "There's so much more you can do than was ever possible before, but some of the aspects of the HDMI standard can put a damper on things."

## WHAT CAN GO WRONG WITH DIGITAL VIDEO?

James Fife, a designer at Toronto-based AV consulting firm Engineering Harmonics, tells a story of how a contractor working on one of his projects installed conduit for fiber but failed to stick to the 8-inch minimum radius required on all of the bends. "The fiber fit and the basic tests were OK, at least with the tester the installer used. The drywall contractor came through and covered all of the conduits. But one of the corners was too tight and we got an intermittent signal at 1080p."

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Terry Dahl, president of Video Services, Inc. of Mankato, MN, says in digital the entire system may go dark, leaving little clue of the cause. "Troubleshooting is definitely different than analog," he says.

Yurrita suggests that there's no avoiding these kinds of problems—what's needed is a way to diagnose and manage them. There are a number of areas where a systems designer or facilities manager can run into trouble.

Glenn Pernick, director of technical support at Crestron, says the company tracks its support calls carefully, and they have identified three areas where a digital video installation is most likely to fail:

1. Terminations and cabling. "90% of the calls we've received have involved termination or cable issues," Pernick explains. "Most of our integrators can make great analog cables in seconds, but now they're building fiber optics and that's a little trickier."



2. EDID problems. "EDID can be confusing and it plays a part in roughly half of the support calls that come in," Pernick says.

3. Network issues. "About 45% of the digital video support calls we field include network issues," he says, "although that's dropping month by month."

The designers and integrators I spoke to emphasized networking problems, suggesting that anyone making the move into digital video should learn as much as possible about network installation.

For example, Fife reports that "the hardest thing for us in many projects is where to put the end points. You can't just run cable from point A to point B. Now you need a transmitter and a receiver, and most floor boxes are not large enough to accommodate them."



A multi-screen, dual-codec distance learning system at the Dalhousie University Medical Center, Halifax campus. James Fife and Russ Noble of Engineering Harmonics designed the system, which features an all-digital signal path using Crestron DigitalMedia components. This photo, by Alan Dorey for Engineering Harmonics, shows the lecture hall in use.

That question has had a lot more impact than I would have thought."

Russ Noble, also a designer at Engineering Harmonics, explains that the AV network, whether analog or digital, was traditionally separate from the computer network. "Nowadays, however, we want to reside on the enterprise network where IT can most easily maintain it."

### IT WOES

A big issue for most IT departments is IP address assignment. "One thing we learned," says Shawn Hansson, president of Logic Integration, Inc. of Lone Tree, CO, "is that a digital video switch does not need one IP address, but one for each card plus the mainframe, and you want to assign them consecutively."

Pernick says Crestron has addressed this issue with their latest version of DigitalMedia™ 8G+, where the main switcher plus all of its cards, transmitters, wall plates and receivers now only require one IP address. Still, ancillary equipment such as sources, displays and interfaces still require their own IP addresses, and as a result, you may be adding large numbers of devices to the network. AV integrators and IT depart-

ments need to work together from the beginning of any digital video project.

### EDID AND TERMINATION ISSUES

As Pernick notes, digital video installers often have trouble with EDID, or electronic display identification data, which allows a video source to send the best possible signal to a given display. "EDID becomes a problem when you have multiple displays," he explains. For example, you may have a 3D-capable Blu-ray player sending video to a mixture of 720p and 1080p monitors, only one of which can show 3D. "You need to understand that the source will output only one type of signal, and under EDID, it will generally be what the lowest-quality display can handle. In





PHOTO: ALAN DOREY FOR ENGINEERING HARMONICS

With the large number of displays in the system, Engineering Harmonics' Russ Noble says he expected HDCP licenses to be a problem, but that didn't prove to be the case.

this situation, you may decide to include a scaler that will accept the 3D 1080p signal, but then flatten or downsize it as needed."

"We've run into cases where a display is capable of 1080p, but its EDID response table comes back and says it can do only 1080i or 720p," adds Fife. "The problem is in the firmware, and the solution may be a simple firmware upgrade, but unless you understand what's going on you're going to be very confused by this issue."

Seemingly mundane skills can trip you up. "BNC is just two conductors," says Yurrita. "Ethernet is eight plus shielding, and if you make the smallest mistake the signal does not go through."

Fife says it's a good idea to follow BICSI network standards for hanging cable rather than traditional AV standards. "We've seen where network cable has sagged because the contractor used plastic ties rather than velcro straps. That stretched the connectors and, with 1080p video, resulted in an intermittent signal."

#### KNOWLEDGE IS CRUCIAL

In response to all of these issues, Crestron created certification classes for its DigitalMedia products. These range from a free one-day class teaching the

fundamental differences between analog and digital systems to a three-day paid class that covers every aspect of digital system installation and commissioning, including system design, setup, cable termination, testing and reporting. "We pretty much teach everything soup to nuts," Pernick says.

Crestron and other manufacturers of digital video products offer online videos, online help and 24/7 telephone support. "If the customer still needs help, we will do whatever it takes to support them even if it means getting on a plane to meet them onsite," Pernick adds.

Yurrita says his first large digital video project was extremely complex, a room-combining system with three 32x32 matrix switchers and 17 displays. "I was already skilled in network design, but I spent a lot of time reading manuals and watching videos." He says the most confusing part, for this job, was putting together an IP address table. Beyond that, "I always try to have a full understanding of a given technology before I implement it. Once I had the concepts down, designing the system was straightforward."

During the installation, Yurrita had no problems with EDID, HDCP, or other HDMI-driven issues. He used Crestron product and he says their DM Tools

software helped him set up and manage all of these aspects of the system.

Surprisingly, Pernick did not list HDCP copy protection as a major support issue. Like the others interviewed for this article, Noble said that "we expected HDCP to be a big problem, but that hasn't proven to be the case." Part of the answer is that most commercial Blu-ray players have a lot of license keys, and part of it is that DigitalMedia handles the issue smoothly. Noble says that he recently finished a project with a total of 21 displays showing output from computers, Blu-ray and other sources. "We kept adding displays expecting the system to fail, but that never happened."

The ability to create a high-level solution like this takes training. "New technology always comes with its own issues," Noble explains. "Our industry has grown fast, very fast in a very short period of time, so I'm not surprised that training has become a focus."

Dahl adds that "our first big digital video project was challenging, but with experience we've learned the tricks and the traps. We have a great comfort level with it now."

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