The Convergence of AV and IT

by Christian Bechard

AV and ICT systems live side-by-side in the Mississauga Council Chambers.

The past decade has seen a continued convergence of audio-visual with information and communications technologies, first in fixed installations and now increasingly in mobile and touring systems.

In less than 10 years, the novelty of designing hybrid analog and digital systems has given way to the mundane reality of integrating complete IT-based solutions. Five years ago, for example, the accepted design for a major new building at a Canadian university included video-over-CAT5 cable, alongside what were then state-of-the-art analog systems. However, now that the building is nearing completion, those systems are completely digital, with an 8 MB video bandwidth. The AV control processors look like purpose-specific computers, and the control system itself resembles an IT network.

The greatest advantages of a network are the increased connectivity and capacity. It is very easy to route hundreds of inputs to hundreds of outputs without concern for traditional limitations such as impedance and termination, and over very long distances — up to 68 miles in the case of single-mode fibre optic cable. One fibre optic cable can carry a great deal of audio, video and other data that in the past would have required the installation of an enormous — and very expensive — amount of copper. An added advantage of fibre is that ground loops are all but a distant memory.

These increases in flexibility and signal quality have been accompanied by a dramatic decrease in the cost of installation, while system operation has been simplified through ordinary IT practices, such as the use of macros, through which complex routines can be executed via single key-strokes. In addition, the operational status of most equipment on a network can now be monitored remotely in real time, leading to savings in down time and maintenance costs.

While the technologies have been integrating well, the same isn't always true for the professionals responsible for them. It's helpful for AV and Broadcast designers and technicians to understand the IT point of view, learn what their needs are, and how to communicate with them.

IT professionals tend to feel ownership over their network. IT departments are usually in charge of all technology, and they are ultimately responsible if anything goes wrong. It is in their interest to know every element and ensure it all works together. AV/Broadcast is only one part of a larger whole. If you can communicate the how and why of your systems, they'll be able to make sure everything runs smoothly.

Security is a big concern. Questions they may ask include: Does this need a firewall? Does it require outside access? A virtual network? Issues specific to a given organization may arise depending on the sensitivity of other information on the network. For example, we recently designed systems for a municipal arts, theatre, and library complex. The IT network for this building is shared with the municipality, which raised security concerns because AV equipment is on the same network as records of residents' tax bills. Ideally, there wouldn't be anything else on a network purpose-designed for AV, but this is often seen as impractical, or considered an unnecessary duplication of equipment and expense.

The IT department may be unfamiliar with AV requirements, particularly in the realm of bandwidth (the fundamental requirement that there be enough space in a network path for all of your packets to get through unimpeded). Requirements can vary widely. For example, a low bandwidth (450Kbps) 20-minute videoconference call would require 54 megabytes of data, or 162Mb/hour; the same call at high bandwidth (3Mbps) would require 3.6 Gigabytes of data or 10.8Gb/hour.

Another thing that IT needs to understand is that ideally, an AV network should not exhibit any latency, particularly in monitoring live situations. It is very distracting — imagine a speaker addressing a large room, his image projected on screens overhead. If there is latency in the system, the sound of his voice will not match the

Contributor Christian Bechard draws on over 30 years' experience in the AV and entertainment industries.

movement of his lips. It is like watching an old, out of sync movie.

To increase communication and understanding, AV and Broadcast professionals should educate themselves in the area of IT, perhaps even to the point of upgrading their credentials in the field. At the very least, they should learn about Ethernet and IP addresses, and how to configure IP settings on their own computers. They should understand the difference between a hub and a router, the cable length limitations for wired Ethernet, and the surprisingly restrictive rules for hooking up cascading hubs — perhaps even learn how to fix RJ-45 connectors. (Put a little RJ-45 cable crimper in your toolkit. Get the ratcheting kind and learn how to use it — a good one costs only about $100. And while you're at it, buy a computer cable tester.)

As a worthwhile career investment, buy and read one or more of the many good introductory books on the subject of AV networks; for example, Video Systems in an IT Environment, 2nd edition; Audio Over IP; and Mobile Broadcasting With WiMAX, all available from Focal Press (http://www.focalpress.com).

When all is said and done, it's much more enjoyable going to work when you can share the concerns of your fellow workers in ancillary fields, and can communicate your own interests in language they understand. **B**

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