

TMC'S TELECOM ADVISOR

Consultant Casebook - Tel-Ed 98

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In this, the first of a new series of articles presenting projects managed by TMC, we look at a major technology conference hosted by the Victoria Conference Centre. The conference, aimed at the education market, was unusual in a number of ways. It required access to a large number of off-site computer systems and it was linked real-time with a similar conference in the USA. TMC was asked to help plan and project manage the data network. In this article, we review the conference and the data network design. This is an intriguing insight into the future of education, conferencing and advanced data networking.



The Aims of Tel-Ed

This conference was planned as a technology showcase for software and hardware suppliers to exhibit their latest products to educators, both teachers and administrators. Whilst many exhibits were basically conventional boxed software, there were many exhibitors who wanted live access to their web sites to illustrate how the power of the Internet could be harnessed by educators.

There was one major hardware and software demonstration, which was planned to show how the barriers of distance could be eliminated by modern communications technology in an affordable way. It involved collaboration between hardware suppliers, including an advanced motion compression system for desktop PCs; and software suppliers, including PC conferencing and multi-media demonstration software. The vision of this collaboration became the cornerstone of the network development for the conference – a shared session between children in Canada and the USA in a live conference theatre.

The Shared Session

The advanced new hardware is designed to move real-time multi-media conferencing into the realm of mass use. The software suite harnesses the power of the new hardware and the result is the ability to use a simple IP link, such as the Internet, to join two computers over any distance. What is done with one computer workstation will be duplicated on the other.

Modules of software include audio and video communication – users wear headsets at both

workstations and small video cameras, working via the video compression hardware, convey their head and shoulder images between sites.

The other conference element is an Internet Browser. This allows the two conferees to jointly browse any web site and to discuss what they find in the process – shared research, with audio and video, over any distance.

The compression hardware is able to function with a variety of data rates on the inter-site link. It is possible to work over a link at speeds as low as 64kbit/s, however the images are rather low in detail and motion rendering is poor. Convincing images, with smooth refresh and adequate detail, can be achieved with a communications link of the order of 400kbit/s for each direction. This is somewhat beyond the capability of a dial-up modem, but easily provided by cable modems or other high speed access technology.

The User Perspective

How does all this fit into education?

The students of Sir James Douglas School in Victoria and the Calcasieu and Orleans Parish School Systems of Louisiana were given a short time to create a web site, using powerful graphical tools to replace traditional scissors and glue. The Victoria students researched the life and times of Emily Carr, using CD-ROM reference libraries, Internet web sites and digital photography. The result was shared with the New Orleans students, who reciprocated with a project of their own.

Planning the Network

Back at the Victoria Conference Centre, the data communications network design took shape over several weeks before the conference start date. Conventionally, over 100 phone lines and dial-up modems would have been required – the shared sessions alone required the equivalent of twelve ISDN B channels.

TMC was able to design a pilot of the new communications network currently being planned for the Victoria Conference Centre, and to use this pilot as a live prototype for evaluation.

The aim was to move most of the data traffic away from inefficient circuit switched data onto a high speed Local Area Network. The topology of the LAN was not earth-shattering – just basic 10baseT hubs and routers. The implementation, however, was quite another story.

In the final week of planning, a chance discovery showed **TMC**'s designers that three of the conference rooms were not actually in the Victoria Conference Centre at all, but rather were in the adjacent Empress Hotel. It would have been easier to let these rooms fall back to dial-up modems – but that would have missed the point of the technology demonstrator aspect of the project. Instead, a new 12-strand optical fibre cable was rapidly installed by the Victoria Conference Centre to make the Empress Hotel a part of the new LAN.

As late as the day before the conference start, new Category 5 cabling was being pulled into conduits, during one of the limited timetable breaks, in the main exhibition hall. To the horror of the planners, the cable came through wet – there was a water leak into the conduit run! A rapid last-minute technology switch saw deployment of fibre links joining the hubs in the exhibition hall to the main communications room and the last obstacle to the LAN completion was overcome.

The design of the off-site data links called for two high-speed pathways. One would be used to channel exhibitor data traffic to the Internet and the other would provide a predictable “Internet emulation” link directly with the New Orleans site. Although the PC conferencing system was designed to use the public Internet, **TMC** recommended using dedicated bandwidth for the demonstration. Bearing in mind that the computer displays would be relayed onto massive projection screens, any erratic delay introduced by the network would have been magnified out of all proportion on the large screen display. The aim was to show the *use of the technology* not the technology itself – hence the

focus had to be on the image, not the communications induced artefacts, which would likely be quite acceptable in real life on a 15” screen.

BCTel, who were one of the main event sponsors, were called on to help. Their planners and engineers came up with a T1 (1.5Mbit/s) circuit routed from Victoria to Vancouver and onwards to New Orleans over the UUNET network – the same network used to carry much of the Internet itself.

The government’s Information Technology Systems Division (ITSD), were also called on to help with the LAN support and the main Internet access via a 10Mbit/s fibre link. With their help, over 100 computers were connected to the LAN and assigned Internet IP addresses in a complex planning exercise managed on behalf of the Victoria Conference Centre by **TMC**.

The Event Itself

All the planning came to an end as the two-day conference went live. It is a tribute to all concerned that the complex technology infrastructure did its job perfectly – and was visible to nobody.

The reward was seeing the students and parents in the Lecture Theatre discussing their Emily Carr project live with their counterparts in New Orleans. This was a major step in education – yet it achieved little by way of recognition in the media because the achievement was never really seen for what it truly was.

This was not just Internet in the classroom. This was participatory education involving kids in their early school years sharing experiences with new friends half a world away - in real time. This is “pen friend technology” for the next millennium, yet the kids involved do not see the technology. It is merely a natural tool to them, in the same way that pencils, scissors and glue were to older generations.

The final credit must go to the kids - who, after all, were both the focal point and the purpose behind the entire exercise. It is a pleasure to be a part of creating their New World.

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