> DELIVERING THE FIRST-EVER CONVERGED OLYMPIC AND PARALYMPIC GAMES NETWORK: IT'S ALL ABOUT TEAMWORK

Case Study

Vancouver Organizing Committee for the 2010 Olympic and Paralympic Winter Games (VANOC)

Nortel has teamed with the Vancouver Organizing Committee for the 2010 Olympic and Paralympic Winter Games (VANOC) and Bell Canada to help deliver a flawless Games experience for the XXI Olympic and Paralympic Winter Games.

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2010 Winter Games

Nortel has been chosen by VANOC as their Official Converged Network Equipment Supplier for the 2010 Olympic and Paralympic Winter Games. Nortel will supply network communications equipment both directly to VANOC and to Bell Canada, the exclusive Telecommunications Provider for the 2010 Winter Games, as they build the first all-IP converged network at an Olympic Games.

Challenge

To work together to deliver a single, highly secure, highly reliable converged network infrastructure across 15 geographically dispersed Vancouver and Whistler Games venues, as well as numerous support venues, meeting the voice, video and data communications needs of as many as 90,000 individuals (media, athletes, officials, Olympic and Paralympic family, workforce and volunteers) and a million plus spectators. Being a truly Hyperconnected event, the network must have the flexibility to accommodate the huge number of devices that need to be connected and provide simple and secure access to its subscribed services. This network must also deliver anytime, anywhere access to information; and be able to accommodate sudden peaks of traffic.

2010 Winter Games — A truly Hyperconnected event

The infrastructure supporting the 2010 Winter Games will not only have to support over a million individuals — it will also have to accommodate a myriad of different devices, which is why delivering a network designed for capacity, flexibility, reliability and simplicity is of the utmost importance.

- 15,000 VoIP phone and fax lines
- 7,000 mobile phones and 2,000 push-to-talk
- 5,000 radios
- 4,000 TV drops
- 500 Wireless Access Points

Solution

To address the Hyperconnectivity demands of the Games, the end-to-end infrastructure will leverage Nortel's Ethernet Routing Switches to meet the Games' reliability and bandwidth demands. Robust VoIP services will be delivered using Nortel Call Servers and IP phones. Mobility will be enabled through Nortel's Wi-Fi technology and through an expansion of existing CDMA facilities. Most importantly, the network will offer airtight security for both wired and wireless access using best-in-breed firewalls, intrusion detection systems and encryption technologies, with Nortel's Secure Network Access technology playing a pivotal role in authenticating users and allowing them the appropriate network access.

Benefits

An always-available, high-capacity end-to-end network that will allow for seamless wired and wireless communications, with reduced cost and greater flexibility.

The scenario

On February 12, 2010, some 5,000 athletes and officials from more than 80 countries will stride into BC Place Stadium in Vancouver, British Columbia, Canada for the opening ceremonies of the XXI Olympic Winter Games.

Over the course of the next 17 days, roughly 10,000 media representatives will converge on the Olympic venues to cover seven sports and 15 disciplines. Over a million guests will arrive at nine competition venues and three billion television viewers from 160 countries will be watching.

A month later, ten days of Paralympic Games events will be held.

In all, an estimated 192,000 timing, distance and scoring events will have been measured and captured.

Provisioning a communications infrastructure for such an event is quite clearly an enormous challenge. The key to delivering seamless communications for this high-profile event? Convergence.

Says Justin Webb, Bell Canada's VP for Olympic Services: "When you look at the communications requirements of the Olympic and Paralympic Games, where you have a massive amount of activity in a very short period of time, the simplest way of doing this is over a converged IP infrastructure. So as much as possible, every service offering that Bell provides will be put over IP — hence we're calling them the 'All-IP' Winter Games."

Critical to the success of this endeavor is the selection of Nortel by VANOC as the Official Converged Network Equipment Supplier for the 2010 Olympic and Paralympic Winter Games. Nortel has been selected both by Bell Canada — the exclusive Telecommunications Provider for the 2010 Winter Games — and by VANOC to supply networking equipment for the Games. An end-to-end network will support networking within and between 15 Games venues and numerous non-competition sites, including two data centers, two media centers, two athlete villages, two ceremonial sites and the VANOC headquarters.

Completing the jigsaw

In terms of the scope and scale of this undertaking, VANOC's vice president of technical infrastructure, Andy Platten, helps put things into perspective:

"I used to work in IT for a very large bank. The infrastructure that we're building for the Games is roughly the same complexity and size as what we had deployed there.

"But what we're doing here for the Games is like opening all the branches on the same day, with all the systems working. And it has to run perfectly. Customer transactions can't go wrong, and we have to balance every night.

"It's an interesting challenge."

Platten references some other challenges unique to the Games:

"We have some very unusual traffic peaks. We'll have a scenario at the finish of a race where a hundred photographers will be lined up, and as the athletes come across the finish line they'll have their digital cameras, and they'll hold their fingers down on those cameras, and they'll take ten pictures in a single second — each picture being 15 meg in size — and those photos will have to be transmitted back to their editing areas so that within minutes they can be up on the Internet.

"It all comes down to having the capacity on the network to deal with these sudden peaks. If you have 60 races going down a hill, you'll have 60 peaks of traffic where the network will go from zero to multiple gigabytes and back to zero. So the fact that we will be setting up a network that can deal with those fluctuations in demand is essential."

In regards to security: "We're obviously a very high-profile event. We worry about two primary areas. One is disruption: someone trying to stop the Games or make a statement. And the other is someone trying to get access to information that they shouldn't have, and that could include changing event results or gaining access to privacy-related information."

One source for all

And what will this end-to-end network provide?

As the Games approach, approximately 90,000 individuals — comprising the Olympic family, the media, athletes, officials and volunteers — will arrive prepared to go to work. Each will be provided with what Platten calls "a pick list" of services.

"When they turn up, they've got one sole source of supply for commercially priced services that they're going to need."

Voice service — including VoIP and cellular services with push to talk — will be provided to roughly 15,000 users across the Games venues. Networking services will include Wi-Fi and fixed-line access to the Internet and Wi-Fi and fixed-line access to specific services that can be purchased.

"We can sell an Ethernet Virtual LAN service," says Platten, "so the Reuter's staff, for example, could say, 'We need a 10-Mg Ethernet service between our office in the main press center and these venues, and these are the characteristics it needs' — and we'll deliver it to them off our converged infrastructure."

VANOC will also offer what effectively is an internal Internet with which journalists can receive very game-specific services — for example, a commentary-information system that will provide split times on events.

Platten is enthusiastic about the level of automation provided by using Nortel's Secure Network Access (NSNA) technology, which allows "individuals to plug into any port on the network and, based on the credentials of the device, be assigned the appropriate network resources. In previous Games, you had to have a port for every LAN type, and control which device could connect to that port, which increased cost and complexity."

Behind the Bell "All IP" Games

The Vancouver 2010 Olympic and Paralympic Winter Games will be the first Games run on an "all-IP" converged network. Previous Games have featured at least four purpose-built networks for voice, data, video and broadcast services.

Why IP?

- **Increased flexibility:** Throughout such a dynamic event, the network needs to be able to quickly adapt to changes.
- **Increased customer satisfaction:** Customers will receive a single phone number that will work seamlessly across traditional handsets and their computers/laptops.
- **Increased cost-effectiveness:** Delivering a flawless Games experience is the baseline. Doing it more cost effectively? **Even better.**

Finding a trusted vendor

For both VANOC and Bell Canada, preparing to deliver this array of services has of course entailed extremely meticulous preparation, beginning with the selection of their partners.

"We ran a highly competitive process," says Webb, "but what we did that was different was that we went to the market for a *partner*. We needed a partner because we don't yet have final requirements. We know the essence of what we're going to deliver, but we don't know exactly, to the last detail, what the final requirements will be.

"It was a very rigorous process. And quite frankly, Nortel came forward and was *significantly* more committed to partnership, more committed to the spirit of the Games and more committed to being flexible in delivering the solution, even though we haven't yet settled on the final details."

Of VANOC's decision to partner with Nortel, Platten says, "What drew us to Nortel was the level of commitment they were prepared to make in terms of how engaged they would be as an organization and the caliber of the people they were bringing in.

"In putting on the Games," says Platten, "only five percent of the staff comes from VANOC — 95 percent comes from partners and volunteers who need to come together to form one team. We needed a vendor we could put our faith into to be a true partner."

"We also liked the fact that they gave us the opportunity to have one end-to-end network. Bell Canada had already selected them as a partner for wide area networking and voice. And the jigsaw wasn't complete until we selected the supplier for the LAN equipment. Having Nortel be the partner in that piece of the jigsaw gave us our total solution. It helps us with interoperability and it gives us accountability: one team to go to to resolve any issues."

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> Andy Platten, VP of technical infrastructure, VANOC

A big win

At the heart of the 2010 Winter Games network will be the Ethernet Routing Switch 8600 and the Optical Multiservice Edge 6500 for a resilient, high-bandwidth core network that connects all venues and supporting sites. The Ethernet Routing Switch 5500 Series with Power over Ethernet will converge wired and wireless communications across all locations.

Says Justin Webb, "We were very impressed with the carrier-grade attributes of Nortel's Ethernet Routing Switches, and the capacities and densities they offer will save us money by allowing us to deploy fewer boxes."

Mobility is another key aspect of providing customer service for the Games. Says Webb: "How fast you can get access to information is important for the customers we'll be serving at the Games. When a journalist is on the bus traveling from an event in Whistler to one in Vancouver, he's going to want network access to be able to upload his articles."

To meet this requirement within each Games venue, a Nortel Wi-Fi network will provide anytime, anywhere access to information. In addition, CDMA cellular facilities will be expanded to deal with the surge in customer traffic expected for the 2010 Games.

Bell Canada will also be offering network-based VoIP within all Games sites with the Nortel Communication Server 2000 – Compact and Nortel IP Phone 1100 Series sets. In fact, the Vancouver 2010 Olympic and Paralympic Winter Games will be the first Games to exclusively use voice over IP for all event locations, providing increased customer service through the ability to provide a single phone number that can be used seamlessly across traditional handsets and computers/laptops.

As Platten mentioned, securing the network end-to-end is another strong requirement for an event with such a high profile. Using the Nortel Secure Network Access product in conjunction with Nortel Switched Firewalls, Intrusion Detection Systems and VPN concentrators ensures the network is not only protected from *intentional* threats from the outside but also *unintentional* threats from inside. It ensures that devices that are being brought from all over the world by athletes, officials and the media are rigorously checked to ensure they are free from malware and comply with the rigid security policies defined for the 2010 Winter Games.

'... and then we put the Games on'

"In terms of our deployment cycle," says Platten, "we've got two distinctly different projects that we're running. The first is to run VANOC as an enterprise. So it's running a company that's growing at about 30 people a month. We're building an infrastructure where users can be self-sufficient, so wherever they go they just log in and work without too much IT involvement: IT needs to concentrate on putting the Games on."

Which brings us to the second project: putting on the Games.

"With Nortel now on board," Platten continues, "we're entering our network design and architectural phase, and, in parallel with that, our operational model for who's going to manage what and who's going to do what."

Next will come an integration lab: a 5,500-square-foot data center and lab where the team will build the infrastructure upon which the Games will run. Then, in late 2008 or early 2009, comes the test-event period, in which the network will be tested in real sporting events, many of them qualifying events for the 2010 Winter Games.

"Then the rest of '09," says Platten, "is the finalization of logistics — how many switches in which venues, how are we going to deploy, how are we going to operate, and really teeing it up for the deployment phase, which starts in earnest probably in October or November of 2009. And then we put the Games on."

"We were looking for a partner who will be here and who will help us plan," says Platten in summation. "The fact that Nortel will bring their expertise to the table and their commitment to deliver, on time, whatever we design — and do whatever it needs to make sure it works seamlessly — is a big relief to us."

"Nortel came forward and was significantly more committed to partnership, more committed to the spirit of the Games and more committed to being flexible in delivering the solution...."

> Justin Webb, VP of Olympic Services, Bell Canada

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