

Bell Canada reaches Consumer Mass Market with Triple-Play Services

Lucent DSL Solutions at work at Bell Canada

IPTV Success Story

"We built a true partnership with Lucent, in which Lucent was just as dedicated to a successful service roll-out as we were. The two teams worked together to meet our extremely aggressive deployment targets. I am convinced that if we had not been able to take a truly transparent approach with Lucent, we would not have been successful."

Jean Huppé, Director of Access Network Technology Development for Bell Canada

Executive Overview

Challenge:

Deploy triple-play services using IPTV that:

- Interoperate with Bell Canada's existing satellite TV service
- Scale to support IP video without the expense of a pure fiber network.

Solution:

Hybrid Fiber to the Node (FTTN) and VDSL/ADSL2+ solution

Benefits:

Pilot participants were better equipped to perform daily job functions with:

- Rapid installation and activation-Minimal onsite configuration requires very few tools and no laptop
- Reduced costs-Innovative FTTN design distributes power to the neighborhood nodes
- Seamless integration-Solution integrates with existing hardware, satellite TV service, multivendor networking environment, and Operational Support System software
- Simplified operations-Highly reliable and scalable design features standards-based management interfaces

Outcome:

Bell Canada signed its first customer after only nine months of working with Lucent and expects to deliver triple-play services to 1 million customers by the end of 2005.

The challenge: Rapidly deploy triple-play services to combat encroaching competition from cable

Headquartered in Montreal and listed on stock exchanges in Canada, the United States, and Europe, Bell Canada is Canada's largest communications company and boasts one of the broadest communication portfolios in North America. As of December 2004, Bell Canada offered local and long distance voice services, wireless and wireline data, high-speed Internet access, IP broadband services, e-business solutions, and direct-to-home satellite and Very High Density Digital Subscriber Line (VDSL) television services to more than 27 million residential and business customers across Canada.

The innovative service defense

Competitive pressures on Bell Canada intensified over the past year, as one cable company after another announced plans to add voice to their high-speed data and video service bundles in 2005. To protect its customer base, Bell Canada needed to develop its own triple-play service offering—and fast. Bell Canada already offered satellite TV services to consumers in rural areas and bundled voice and high-speed data services over Asymmetric DSL (ADSL) to consumers in Toronto and Montreal. The solution seemed obvious: extend the existing satellite TV service into Toronto and Montreal and use it to create integrated triple-play services.

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Extending triple-play services to urban customers

But there were complications. Building owners objected to the number of rooftop dishes that would be required in densely populated neighborhoods—limiting how far Bell Canada could extend its satellite TV services into Canada’s urban centers. Bell Canada could leverage its satellite TV content to offer triple-play services over VDSL to customers in multi-family apartment and condominium buildings but had nothing to offer urban dwellers in single-family homes.

In addition, although Bell Canada’s ADSL network could easily support its voice and high-speed data services, it could not scale to provide the minimum 5 Mbps of bandwidth per household that it needed to add IP video services. A pure fiber network would provide ample bandwidth, but replacing their existing copper access network with a fiber to the home (FTTH) solution would be prohibitively expensive. Instead, Bell Canada wanted a hybrid fiber to the node (FTTN) architecture that uses high-speed fiber lines to bring bundled voice, video, and data services closer to the consumer and leverages the existing copper access network to transport those services through the last kilometer using either VDSL or ADSL2+, a next-generation ADSL standard that provides much higher data rates to support broadband video services.

Working with Lucent to implement the solution

Bell Canada wanted one partner who could provide both the equipment and the networking expertise to address all of the hardware development, network engineering, and service design issues the FTTN deployment would pose. Lucent was the only provider who offered Bell Canada the complete picture:

- Consultation and design support to develop a FTTN network architecture capable of supporting triple-play services
- A cost-effective method for distributing power from a centralized location to the field units in the neighborhood nodes
- A compact, high-density ADSL2+ capable switch that could be mounted on Bell Canada’s existing poles, Jumper Wire Interfaces (JWI)/Outside Plant Interfaces (OPI), and pedestals
- Customized installation procedures and training to speed deployment of the new Lucent Stinger® Compact Remote (CR) switches
- Quality assurance testing and integration expertise to ensure that the new equipment interoperated seamlessly with Bell Canada’s existing hardware, multi-vendor networking environment, and Operational Support System (OSS) software

Bell Canada and Lucent implemented the new FTTN network in two stages. In Phase 1, the pair worked to rapidly expand the existing ADSL network into an FTTN architecture that Bell Canada could use to offer ubiquitous voice and high-speed data services throughout the Montreal and Toronto metropolitan areas. In Phase 2, the partners integrated the new technologies required to add support for IPTV services.

Phase 1: Expand the network to provide ubiquitous ADSL coverage

Although Bell Canada offered ADSL service to most of Toronto and Montreal, there were still neighborhoods where broadband voice and data services were not yet available. The partners' first job, therefore, was to design and deploy a FTTN network that would plug those gaps by bringing DSL services within 1 to 1.5 km of every customer in the Montreal and Toronto metro areas. To do this, Bell Canada required three things:

- A compact, high-density switch that could be mounted onto existing neighborhood copper cross-connect cabinets to support DSL
- A cost-effective means to power the equipment in those nodes
- A rapid installation and activation process for the new equipment

Grooming the Lucent Stinger® CR for its Bell Canada debut

Lucent worked with Bell Canada to tailor its Stinger® CR switch to meet Bell Canada's network and service requirements. The small form factor of the switch, its proposed position in the field, and Bell Canada's high-density service requirements posed some unique design challenges. To be accepted into the target neighborhoods, the field-hardened Stinger® CR switches had to be acceptable aesthetically and operate absolutely silently. Lucent also had to modify the Stinger® CR chassis slightly to enable Bell Canada to mount it using brackets that were compatible with the cabinets already in place. Lucent and Bell Canada tested the proposed solution in Lucent's lab to verify that the Stinger® CR would interoperate with Bell Canada's preferred DSL modem. In the end, Lucent worked with Bell Canada to equip each Stinger® CR switch to serve up to 144 customers, emit zero noise, and bolt onto the existing cross-connect cabinets in multiple physical configurations without affecting the integrity of those cabinets in any way (see Figure 1).

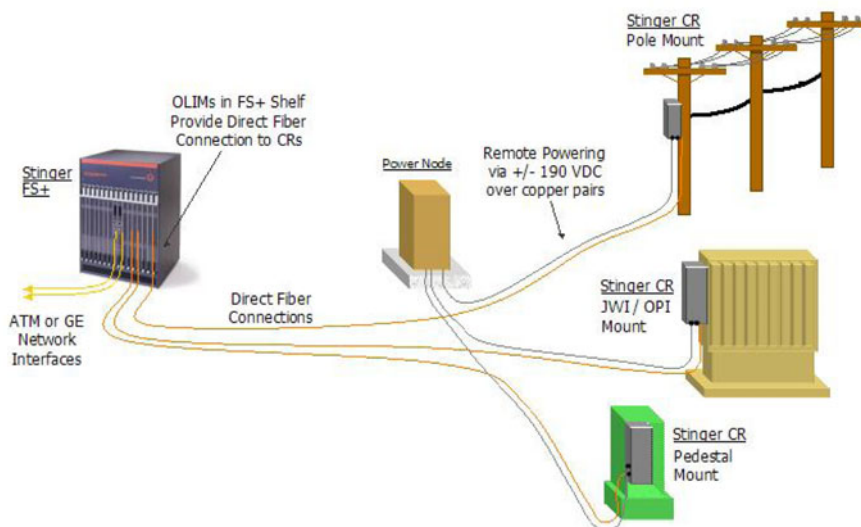


Figure 1—The Lucent Stinger® CR provides flexible mounting options to integrate more easily with the hardware already in place at Bell Canada's existing neighborhood node.

Powering the field units

Providing cost-effective power to the disparate field units in the FTTN network was another critical engineering problem. Theoretically, Bell Canada could supply each field unit with both AC power from the utilities and on-site backup batteries, but this would be very expensive. To make the FTTN network work, Bell Canada needed some way to reliably distribute DC power from a centralized location to the field units. The problem was that no one had ever done it.

In the end, Bell Canada and Lucent devised a completely new solution that ran +/- 190 VDC currents from power sources in Bell Canada's central offices to the remote Stinger® CR units over passive copper pairs. The benefits for Bell Canada were two-fold. First, the approach significantly reduced costs by avoiding the need to run AC power directly from the utilities to each neighborhood node and by allowing Bell Canada to store its backup power generators in their central office, rather than in the field. Second, it gave new life to the network of copper cables that Bell Canada had already decommissioned, but not yet uprooted from the ground. The success of this remote powering scheme has sparked new interest in FTTN applications.

Phase 2: Integrate new technologies to support video services

Next, Bell Canada and Lucent evolved the FTTN implementation to support video services. The IPTV service pulls its video content from Bell Canada's existing satellite TV network and transmits it through a fiber optic core to the Lucent Stinger® FS+ DSL Access Multiplexers (DSLAMs) in Bell Canada's central offices. The Stinger® FS+ then transmits the video content over direct fiber connections to the smaller Stinger® CR switches at the neighborhood cross-connect cabinets for delivery to individual consumers using ADSL2+. To maintain a consistent look and feel across their entire video portfolio—regardless of the mechanism used to deliver those services into the home—Bell Canada needed a standards-based IPTV solution that integrated seamlessly with its existing satellite TV service and multi-vendor networking environment. The Lucent Stinger® CR switch offered the standards-based IP, ATM, and Ethernet support Bell Canada required, including:

- Internet Group Management Protocol multicast support to optimize bandwidth utilization for broadcast video channels
- Virtual LAN and Quality of Service (QoS)/Class of Service support to maintain QoS and provide full connectivity
- Access control lists and other security features to restrict unauthorized users from accessing video content
- Support for Gigabit Ethernet as well as ATM transport rates between DS1 Inverse Multiplexing over ATM and OC-12c to support video transmissions

Streamlining the installation and activation process

To meet its service targets, Bell Canada had to install 400 Stinger® CR units in just six months in Phase 1 and more than 2000 units over the course of 12 months in Phase 2. These aggressive goals made it essential for Lucent to minimize the number of truck rolls and configuration time required to install each Stinger® CR field unit. In the end, Bell Canada technicians could complete the physical installation of each new Stinger® CR switch in one day using very few tools—and without a laptop.

Lucent also worked with CGI, Bell Canada's OSS software developer, to integrate the *NavisAccess*[™] DSL Element Management System with Bell Canada's existing OSS. Specifically, the team worked to integrate *NavisAccess*[™] with Nortel Networks Access Care, which Bell Canada uses for loop testing, and the Spirent MetaSolv Flowthrough Test Request Gateway, which Bell Canada uses to test its fault and provisioning management systems. Today, Bell Canada's network operations center personnel can remotely activate new units within a few hours of the physical installation.

The bottom line

More traditional approaches to deploying triple-play services would have required Bell Canada to install a concrete base, batteries, and a bigger cabinet at each neighborhood node. By devising a new remote powering scheme and the Stinger[®] CR switch that can be mounted onto existing cabinets, Lucent cut Bell Canada's deployment costs in half. In addition, Lucent offers Bell Canada:

- An element management system, which integrated into Bell Canada's existing multi-vendor OSS to streamline service provisioning and reduce operating costs
- The ability to leverage their existing outside plant technology for a new application
- Highly reliable DSLAMs with the highest port densities in the industry—supporting up to 72 ports per LIM card and providing 48-port low power cards for remote applications
- The ability to upgrade the cards on those DSLAMs to deploy next-generation technologies, such as VDSL2, fiber to the premise, and passive optical networking

Bell Canada signed its first customer in June 2004—after only nine months of working with Lucent. By December 2004, Bell Canada had 400 Stinger[®] CR switches delivering services to more than 160,000 homes. Bell Canada expects that it will be able to deliver triple-play services to more than 1 million customers by the end of 2005.

To learn more about our comprehensive portfolio, please contact your Lucent Technologies Sales Representative, Lucent Business Partner or visit our web site at <http://www.lucent.com/sp/>.

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