



# reliability

and application-aware networking

## Solution Brief

### High-performance networking

## Industry challenge(s)

Healthcare institutions of all sizes are targeting to re-engineer healthcare delivery by developing and integrating a range of applications (e.g., patient flow, physician order entry, billing and claims processing, and other clinical, operational, and financial systems) centered around computerized patient records, including PACS. They are uniformly targeting IP-based client, networking, content distribution, switching, and application-enabling technologies. This re-engineering is intended to make patient, clinical, pharmaceutical, and corporate data readily available to all users and applications that need them. This creates a non-negotiable need for network scalability, reliability, and performance.

## Industry requirements

Network convergence—supporting voice, data, video, and images on a single high-performance network—is being pursued to make optimal use of precious capital investments and to lower operating costs. At the same time, network convergence is driving the need for networks that consistently, securely, and reliably meet the connectivity, bandwidth, and delay requirements of mission-critical healthcare applications.

## Nortel Networks contribution

Advanced business connectivity is about highly reliable, application-aware, adaptive networking to meet the data, image, voice, and video needs of healthcare workers, medical office buildings, clinics, and major hospital campuses.

Nortel Networks high-performance networking solutions are comprised of three complementary solutions: high-performance Layer 2-7 campus networks including access to servers, optical MANs, and Virtual Private Networks (VPNs) for non-optical sites.

Nortel Networks **campus network** solutions, based on Passport\*, BayStack\*, and Alteon\* portfolios, are optimized for a two-tier architecture consisting of QoS-enabled stackable and chassis-based switches in wiring closets and very high capacity, fully redundant, Layer 2-7 campus core switches. Interconnection between these elements is provided via multi-homed Multi-Link Trunking with sub-second recovery from failures. This provides a highly reliable, highly scalable networking infrastructure for hospitals and healthcare research institutions. Virtualization and content segregation across a healthcare institution's servers drives the need for application switching in the core, providing intelligent routing (at Layer 4 and above) of user requests to the correct content locations. These advanced capabilities enhance application and server performance through load balancing, content routing, and caching.

**High-performance optical networks**, based on the industry-leading OPTera\* Metro portfolio, connect hospitals, clinics, and other medical buildings within the city and between metropolitan areas. They eliminate bandwidth bottlenecks between the in-building and metropolitan networks, and open the door for remote clinical systems that exhibit the performance of being local. They are fast, highly scalable, and ultra-reliable with optical

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technologies that automatically and instantly recover from failures. Huge PACS files can be received in seconds, even across the state, eliminating wasted time and lost files. Another major benefit of optical networking is that IT resources (such as servers, network attached storage, and firewalls) can be centralized, better utilized, and more easily operated, accessed, and secured. This helps healthcare providers standardize procedures and reduce duplication of IT resources between medical facilities.

**Virtual Private Networks** serve non-optically connected clinics and medical office buildings, as well as remote or mobile medical staff and clinicians. Nortel Networks site-to-site solutions are based on IPsec encryption and authentication and Secure Routing Technologies, a unique capability which allows dynamic routing over secure tunnels. For remote users, both IPsec and SSL VPN solutions are provided to support network and application-based security respectively, both in client-based and clientless modes. Nortel Networks solutions are based on Contivity\* and Alteon.

## Customer examples

**Catholic Healthcare West** provides healthcare service in California, Arizona, and Nevada via 42 acute care hospitals. They were faced with a key challenge to provide flexible, cost-effective, secure remote and inter-site access across 48 facilities and 9,000 staff members. They wanted to support continuous service availability, while maintaining security and privacy through strong encryption and authentication and flexible authorization policies. They chose a Nortel Networks Contivity Secure IP Service Gateway VPN solution, providing secure remote access, routing, firewall, bandwidth management, encryption, authentication, and data integrity—all in a single device. Centralized configuration and customization of devices and clients simplifies set-up and installation for sites, and for remote access users. Back-up and automatic fail-over of client to secondary and tertiary devices provided the required high level of availability.

**Cambridge Health Alliance (CHA)**, one of the ten largest healthcare systems in New England, is a consortium of three hospitals and 30+ outpatient clinics. Over the past two years, CHA has built a truly “unified” LAN, campus, MAN, and WAN network based on Nortel Networks BayStack and Passport switches. For voice, they have IP Telephony-enabled their existing PBXs, complemented with CallPilot\* unified messaging. This infrastructure allows CHA to evolve their converged network to improve collaboration among staff, to lower total cost of ownership, and to free up resources to develop enhanced healthcare services and applications.

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**[www.nortelnetworks.com](http://www.nortelnetworks.com)**

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**Erlanger Health System** is another leading healthcare provider that has partnered with Nortel Networks. Erlanger is affiliated with the University of Tennessee School of Medicine, and has an extensive network of facilities served by over 900 physicians. Their Nortel Networks integrated LAN/WAN and voice/data/image infrastructure includes an optical network for scalability and reliability, IP Telephony with unified messaging, converged clinical solutions based on the Business Communications Manager and Contivity remote access VPN solutions. Their data center environment also makes extensive use of Nortel Networks Alteon application switching and firewall technologies. They are now looking to deploy a wireless LAN solution including IP Telephony for their mobile medical workstation.

## Nortel Networks advantage

Nortel Networks understands the challenges faced by healthcare institutions, and the critical role of IT in serving business objectives. As the new healthcare realities sink in, it will be increasingly recognized by all stakeholders that healthcare has to embrace IT as integral to healthcare delivery. The nature of healthcare IT will change from being back-office support and archiving to having front-line mission-critical contributions to make. In this expanded role, healthcare IT will rely on ubiquitous, high reliability, high quality, high integrity secure networks with advanced authentication and context-aware authorization—available all the way from the billing office to the point of care. This is the kind of network that Nortel Networks has been delivering to its healthcare customers for many years.