



Wireless Network Healthcare Solutions

System-Wide High-Speed Connectivity

Wireless Networks Deliver Cost-Effective and High-Speed Bandwidth to Power eHealth Initiatives

Broadband connectivity and communications are revolutionising the healthcare industry. High-speed networks are helping hospitals, clinics and healthcare IT systems address and overcome some of their most serious challenges. These include escalating costs, an overflow of patients, shortages of doctors, nurses, and other healthcare professionals, troubling increases in medical error, growing records management requirements, and many others.

As more and more healthcare providers turn to technology to improve their care and service, one broadband solution is emerging as the most powerful, most viable, and most cost-efficient solution: wireless.

WIRELESS NETWORK TECHNOLOGY IN HEALTHCARE

As one of the world leaders in powerful and innovative wireless broadband solutions, Motorola designs and deploys indoor and outdoor high-speed wireless networks, providing healthcare professionals with solutions that help save lives. Electronically-enhanced healthcare (eHealth) applications embrace a wealth of products, systems and services designed to reduce costs, improve quality and efficiencies, such as:

- Video teleconferencing, which enables long-distance collaboration between specialists, and delivery of telemedicine services to patients.
- System-wide broadband network coverage for instant access to information and communications.
- Electronic and remote video monitoring supports cost-efficient presence management strategies.
- Mobile communications allow paramedics and ambulance crews to transmit vital patient data to A&E (accident & emergency) before they arrive.
- High-speed data capabilities comply with increasingly stringent data protection and patient privacy regulation, whilst providing fast access to health records.
- Real-time bedside communications which can help to prevent errors in medication and blood transfusions.

WIRELESS NETWORKS IN REMOTE & MOBILE EHEALTH APPLICATIONS

Wireless networks provide more reliable and secure high-speed connectivity for transmission of data-intensive information such as CAT scans and MRIs.



Capture patient details on the scene



Send data for diagnosis and treatment



Doctors have rapid access to information

WIRELESS NETWORK SOLUTIONS FOR RURAL HEALTHCARE

Sparsely populated rural areas around the world are struggling with a lack of sufficient healthcare services, facilities, doctors, nurses and other healthcare professionals. Wireless broadband networks offer rural healthcare providers – even in the most remote locations – the ability to connect in real-time with up-to-date information, patient records, specialists for collaborative medicine, remote monitoring, and more. Motorola wireless broadband networks are helping rural healthcare providers improve their quality of patient care, safety and satisfaction, at the same time reducing the potential for error and delivering substantial operational savings.

HIGH-SPEED VOICE, VIDEO AND DATA COMMUNICATIONS

Wireless broadband networks bring healthcare environments an exceptional combination of instant high-speed voice, video and data communications, plus freedom to communicate to and from anywhere and everywhere – inside, outside, or on the move. With its long-term industry leadership in wireless systems, Motorola provides high-speed connectivity solutions supporting many of today's most important healthcare initiatives:

- **Remote Patient Monitoring (Telecare).**

Electronic and video monitoring is employed by many hospitals as part of cost-efficient presence management strategies. Faced with aging populations, budgetary and staff resourcing pressures, healthcare providers are implementing high-speed Motorola wireless networks to enable remote monitoring and sensing of a patient's vital signs. This helps to reduce the number of scheduled appointments and in-home nurse visits to chronic and post-treatment patients. Significant cost savings are also possible. According to the EU's eHealth Impact¹ project, the benefits gained from implementing eHealth systems can be more than two times greater than the additional cost of implementing them.

- **Ubiquitous Information Access.** According to a 2008 Report to Congress² in the US, thousands of patients die in hospitals every year as a result of medical errors. However, the report also found that connecting doctors with networked electronic ordering systems could reduce the incidence of serious medication errors by 86 percent. Motorola wireless broadband networks are helping to maximise the benefits delivered via this technology and healthcare partnerships, and are powering integrated healthcare knowledge sharing ecosystems that allow organisations of all sizes to store, organise and access patient,

administrative and operational data. At the same time, Motorola's solutions incorporate multiple levels of security, ensuring that organisations are in compliance with regulatory requirements.

- **System-wide Coverage.** Motorola networks deliver indoor, outdoor and mobile coverage within the hospital, across the campus, and to other system locations such as acute care facilities, outpatient centres, laboratories, clinics, local GP surgeries, and more. Virtual Private Networks (VPNs) can also be established, helping to facilitate doctor and patient email communications, and online consultations. In addition, healthcare providers can use their broadband connectivity to help bring high-quality healthcare to rural or other underserved areas.
- **Stronger Safety and Security.** Motorola wireless broadband networks help increase the personal safety of patients, visitors and care workers in virtually any kind of healthcare environment. Video surveillance solutions deliver real-time images that monitor access to sensitive locations such as ICUs, nurseries and pharmacies, send real-time images of transient traffic at facility entrances and public waiting areas, and real-time monitoring of remote areas such as car parks situated around campus.
- **Contingency and Continuity.** Every healthcare provider faces the possibility of disaster – from man-made incidents to natural disasters like hurricanes, tornadoes and earthquakes – and many healthcare providers are re-examining their contingency plans and continuity strategies. Motorola's wireless broadband networks can be deployed quickly and cost effectively in the event of a disaster, providing redundant networks that ensure continuous healthcare services for the community, and preventing data interruptions in the case of power failures.

¹ Study on Economic Impact of e-Health, European Commission Information Society and Media DG, 2006.

² Joint Advisory Committee on Communications Capabilities of Emergency Medicine and Public Healthcare Facilities – Report to Congress February, 2008.

MOTOROLA KNOWS HEALTHCARE WIRELESS NETWORK SOLUTIONS INSIDE AND OUT

Wireless broadband and healthcare is a perfect match. From administering medication at the bedside, or transmitting a patient's vital signs from a speeding ambulance, to collaborating with prominent specialists via video teleconferencing, high-speed wireless networks are helping healthcare providers of all sizes improve care and save lives. Motorola's portfolio of broadband solutions is globally proven to deliver the speed, access, reliability and security that help bring some of the best possible care to every patient.

Point-to-Point (PTP). Motorola's Fixed PTP solutions provide the ideal technology for backhauling data and video files between two locations. Proven to deliver 99.999 percent availability and data rates up to 300 megabits per second (Mbps), our PTP networks provide carrier-grade reliability for transmitting large volumes of information – such as MRI data or video – in both licensed and unlicensed frequencies. In addition, our PTP Ethernet bridges offer exceptional interference tolerance and can provide coverage across long distances, over water and around obstacles.

Point-to-Multipoint (PMP). Fixed PMP networks use licensed and unlicensed spectrum to deliver and support high-speed applications and connectivity. Healthcare providers use PMP networks to connect multiple locations – on a medical campus or over a more geographically dispersed area – with the main site. This high-speed connectivity enables collaborative telemedicine and communications crucial to restoring health and saving lives.



Wireless Local Area Network (WLAN).

Motorola's Enterprise WLAN solutions provide healthcare organisations with seamless indoor mobility and communications. Wireless broadband communications enable leading-edge applications such as barcode scanning of medications and blood transfusions at the bedside, enabling faster and more accurate communications between doctors, nurses and pharmacists, and mobilising hardware so that equipment can move more easily between patient locations, improving care and increasing efficiency.

Mesh Networks. Motorola Mesh networks use WiFi and Public Safety purpose-built technology to provide fixed and mobile IP-based communications solutions over a wide area. Mesh networks are ideal for establishing ad hoc networks that give first responders instant access to real-time information and the ability to communicate emergency medical data to a hospital, even while treating a patient en route. With a mesh network, clinics, labs and community-based clinics can create 'hot zones' to transmit medical information exactly when and where it is needed.

RFID Solutions:

Radio Frequency Identifier (RFID). Motorola RFID solutions provide a method of tracking assets reliably without the need for human intervention. An RFID tag is a small flat antenna that broadcasts a unique identifying number when an electrical current is passed through it. There are essentially two types of RFID technology:

Active – uses an RFID antenna housed alongside a battery in order to broadcast or transmit the ID number of the tag. This signal can be monitored by a wireless infrastructure, enabling the tracking of assets, staff, and patients, as well as the raising of alarms and alerts.

MORE MOTOROLA WIRELESS NETWORK OPTIONS

The Motorola wireless broadband portfolio is one of the most comprehensive and flexible technology systems in the industry. Besides the solutions described in detail, we also offer WiMAX, a standards-based solution that delivers high-speed connectivity in fixed, portable and mobile healthcare environments.

Passive – consists of a single antenna with no internal power supply. It will generate a small electrical current and a short-range signal if the antenna is brought into a magnetic field. The latter is generated by receivers with inbuilt RFID readers typically fitted at set locations around a building, e.g. at bottlenecks such as doorways. As the tag passes through the doorway, it picks up the magnetic field and transmits the identifier back to the receiver.

A study by the EC³ concluded that the most promising RFID applications address four areas: tracking medical staff and tools for better supply chain management and operational workflow; improved identification and authentication for staff access to locations and medical equipment; automatic processes in critical areas such as medication processing; and sensing for compliance monitoring and data collection.

³ RFID in Health Care – EC study on the requirements and options for actions in RFID in healthcare, 2009.

WITH MOTOROLA WIRELESS TECHNOLOGY, YOU CAN DEPLOY YOUR BROADBAND NETWORK STAT!

The challenges facing the healthcare industry are immediate. And because they need to be addressed sooner rather than later, wireless broadband networks offer even more value over cable, DSL and fibre installations, including:

- **Rapid deployment.** Because there is no digging or demolition necessary, Motorola wireless broadband networks can be deployed in days, rather than the weeks, months and years it can take to install a wired network.
- **Cost efficiency.** Many healthcare organisations use wireless broadband to remove the recurring costs of expensive T1/E1 leased lines and leased PBX systems. Motorola makes broadband connectivity with multiple indoor and outdoor locations extremely cost-effective. The platforms' exceptionally low acquisition, installation, operation and maintenance costs result in substantially lower total cost of ownership (TCO).
- **Equal access.** High-speed wireless also allows patients in rural or medically underserved areas where wired service is unavailable to have rapid access to up-to-date healthcare records and high-quality care.

- **Reliability.** The unparalleled knowledge gained from Motorola's nearly 80 years of wireless innovation and leadership makes our networks among the most available in the world. Our wireless networks are currently proving their reliability day-in and day-out in more than 3,000 networks in 120 countries worldwide.

- **Security.** Motorola solutions provide multiple layers of robust security across the entire network, helping assure patient privacy and regulatory compliance. Security tiers include Motorola's own proprietary data scrambling, powerful network intrusion protection, plus the highest levels of over-the-air (OTA) encryption with DES and AES.

- **Scalability.** Motorola's wireless broadband solutions allow healthcare organisations to quickly adapt to changing requirements, more innovative health and well-being applications, wider geographical areas, larger populations and higher traffic volumes.

WORLD LEADERSHIP IN DESIGN AND DEPLOYMENT

As a leader in wireless and RF technologies, Motorola offers exceptional expertise in designing and deploying wireless broadband networks across a wide variety of eHealth environments. We offer each of our customers a robust set of management tools and support services that help them meet and master the evolving and formidable challenges of today's and tomorrow's healthcare marketplace.



Motorola Interior and Exterior Wireless Broadband for Healthcare

MOTOROLA'S HIGH-SPEED HEALTHCARE SOLUTIONS MAXIMISE THE BENEFITS OF EHEALTH

From dense urban environments to remote rural locations, Motorola wireless broadband solutions are helping healthcare providers around the world maximise the power and benefits of high-speed eHealth applications and initiatives.

Improving Security of Staff and Patients in the UK

St Andrew's is the United Kingdom's largest charitable provider of secure mental health care. Some 3500 staff are employed at the main site in Northampton, and at regional units in Essex, Birmingham, and Nottinghamshire. With security of staff and patients a primary concern, St Andrew's replaced its legacy infra-red technology with Motorola's RFS7000 Wireless Next Generation (Wi-NG) architecture and AirDefense intrusion prevention system. This next-generation wireless LAN platform provides a robust and secure infrastructure delivering reliable voice and data services, and ensures staff and patient safety via 24/7 security and patient monitoring. It also supports drug management by providing nurses with accurate data capture at the point of care via a handheld device, whilst the platform is scalable to accommodate applications such as integrated door security and video surveillance technologies.

Enhancing Patient Care using Wireless Connectivity in Austria

With a strong commitment to patient welfare and renowned for pioneering new technology, the KAGes Group had a vision of providing patients and staff with internet and network connectivity across its state hospital and university clinic in Graz, plus a further 19 hospitals in the Graz and Styria regions of Austria. With wired systems prohibitively expensive, KAGes installed a highly secure and reliable wireless LAN platform from Motorola. The solution delivers internet access to patients, enables medical teams to access and update patient records and is able to support new services such as VoIP to reduce call costs between sites, and RFID to track key equipment, mobile devices and vulnerable patients.



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