

Swedish Hospital Speeds Diagnosis, Treatment

When Sweden’s leading hospital – Karolinska University Hospital – deployed a Cisco Systems Medical-Grade Network and Connected Imaging solution it improved the delivery of healthcare services by helping hospital doctors and home-based medical specialists access, view and share patient information quickly and securely, improving the efficiency and speed of diagnosis and treatment.



Networking 17th Century buildings

Karolinska University Hospital in Stockholm is the leading hospital in Sweden and an international pioneer in cancer treatment. It was the first hospital in the world to use X-ray gun technology to treat small, deep-seated tumours and the associated Karolinska Institutet was appointed in 1901 to award the Nobel Prize in Physiology or Medicine. Karolinska Hospital treats 1.3 million patients a year, performs around seven operations every hour and uses hundreds of thousands of digital images annually to support patient care.

Through a recent merger, Karolinska now has 1800 beds and 15,000 employees and comprises two main locations in Stockholm – Huddinge and Solna. These sites are 30 kilometres apart and have several satellite locations.

The Karolinska environment presents many challenges to effective information sharing and communications because of the high number of locations and building construction. Many locations, built in the 17th century, limit cable installation and there were independent local area networks or sites networked together with a series of hubs. The imaging systems were segmented off on separate networks preventing sharing digital images beyond a single site.

EXECUTIVE SUMMARY

CUSTOMER NAME

- Karolinska University Hospital, Sweden

INDUSTRY

- Healthcare

BUSINESS SIZE

- Enterprise

BUSINESS CHALLENGE

- Improve healthcare delivery and save costs
- Improve healthcare information sharing around the hospital
- Manage multiple locations spread across Stockholm

NETWORK SOLUTION

- Cisco Medical-Grade Network
- Cisco Connected Imaging
- Cisco Data Centre Network Architecture

CISCO TECHNOLOGY DEPLOYED

- Cisco Catalyst 6500 Series Switches
- Cisco 7200 Series Routers
- Cisco Catalyst 3560 Series Switches
- Cisco MDS 9500 Series Multilayer Directors
- Cisco Aironet
- Cisco Wireless Service Module (WISM)
- Cisco Catalyst 6500 series Firewall Services Modules
- Cisco PIX 500 Series Security appliances
- Cisco Location Appliance 2700 Series

BUSINESS VALUE

- Improves delivery of healthcare services to patients and reduces costs by several thousand dollars per patient
- Patient time in hospital can be reduced
- Improves speed of treatment delivered to patients by reducing digital image interpretation and results reporting time
- Supplying digital X-ray images to doctors faster
- Ability handle and improve sharing of increasing data volumes from radiology departments with same number of staff
- Improves the hospital relationships with specialists
- Enables medical expertise to be shared more efficiently within the hospital and internationally

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Karolinska's technology infrastructure could not support clinical requirements to improve the delivery and cost effectiveness of healthcare provision. Karolinska needed to share information – such as patient records and images – efficiently across multiple sites. It faced specific network performance issues for sharing digital image files as these grew in volumes and file size. For example, Karolinska's two radiology departments generate as much as 1000Gigabytes (GB) of data every week. A single patient CAT scan requires around 1500 separate 'slice' images amounting to 800Megabytes (MB). These images must be acquired, transported, interpreted, stored and viewed across a secure, reliable and responsive infrastructure capable of supporting radiologists and enabling collaboration with doctors. The infrastructure must work in concert with the Picture Archival and Communications (PACS) and medical record applications to support the demands of modern patient care.

Cisco – top of the line technology

Anders Eriksson, network operations manager, Karolinska University Hospital, was charged with finding a solution. "Modern healthcare relies heavily on the ability to share information anytime, anywhere and to deliver medical applications directly to the point of need. Yesterday, computer networks were expected to support one or two applications. Today, they must support a multitude of high-bandwidth applications such as PACS and patient records, and be able to deliver them securely and instantly."

Karolinska turned to Cisco Systems and its Medical-Grade Network (MGN) and Connected Imaging solutions for the answer. "We know that the communications infrastructure is vital to Karolinska and its ability to provide leading-edge healthcare services now and for the next ten years. We wanted top of the line advanced technologies, and so we chose Cisco. The Cisco brand stands for quality and we wanted the same level of reliability and robustness for Karolinska's communications infrastructure," says Eriksson.

Karolinska has deployed a Cisco MGN around all its locations in Stockholm linking up 14,000 users. Based upon worldwide deployment, Cisco's MGN enables 24/7 operation and rapid access to critical medical information, integrates a variety of applications onto a converged network and supports seamless communication so that clinicians can improve healthcare at the point of need. Karolinska has used Cisco's Connected Imaging reference design to ensure its digital imaging environment is responsive, reliable and secure. Cisco wireless technology provides access to 2000 users where granite construction of older buildings restricted cabling installation.

Within the Cisco MGN and Connected Imaging architecture and design, Karolinska has incorporated Cisco's Data Centre Network Architecture to consolidate four data centres into two sites. This approach has provided Karolinska with an environment that supports the key demands of patient data and digital imaging access and collaboration. It also ensures redundancy and performance with the two sites providing primary and secondary resources for business continuity purposes.

The complete Cisco solution includes Cisco Storage Area Network (SAN) technology to optimise management and availability for huge volumes of patient data in a fully redundant and cost-effective solution. The Cisco SAN technology improves data sharing and access more cost effectively across the enterprise infrastructure.

The Cisco Connected Imaging virtual SAN (VSAN) solution enables Karolinska to create separate, virtual networks within the single infrastructure. It utilises VSAN and Connected Imaging design to prioritise the delivery and access of critical or highly sensitive data based on patient need. Karolinska has all the benefits of separate infrastructures – such as security, reliability and prioritisation – without the extra cost of building and supporting multiple environments. IT staff have remote server management capabilities for reboots and can deploy customised PC profiles to every PC on the network.

The Cisco technology at Karolinska has been implemented by Dimension Data, a Cisco Gold Certified Partner and Cisco Registered Partners EMC and Dell.

"Using Cisco technology to get patient information to specialists quickly is saving Karolinska thousands of dollars for each patient. Keeping patients in the hospital is expensive, so the faster we can treat them, the better it is for the patient and more cost effective for the hospital."

Anders Eriksson
Network Operations Manager
Karolinska University Hospital

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Cisco helps improve patient care and saves thousands of dollars

The Cisco MGN and Connected Imaging directly contribute to Karolinska improving its healthcare services in multiple ways. The radiology department can store its huge volumes of data on its VSAN rather than archiving it on expensive tape storage devices after just a week. With Connected Imaging, Karolinska reduces the difficulties and time required to access image data to improve radiologist and staff productivity, and medical doctor satisfaction with faster and easier access to patient digital images.

Connected Imaging also improves the productivity of specialist consultants and experts who work at sites other than the hospital. They can access patient data and images through the Cisco MGN to provide more timely and accurate diagnosis. By using Cisco technology to improve access to information like digital images, Karolinska can reduce the time patients spend in hospital and radiologists can now supply images to doctors much faster.

Eriksson says, “Using Cisco technology to get patient information to specialists quickly is saving Karolinska thousands of dollars for each patient. Keeping patients in the hospital is expensive, so the faster we can treat them, the better it is for the patient and more cost effective for the hospital.”

Prior to deploying the Cisco MGN and Connected Imaging, Karolinska had a patchwork of different technologies and suppliers for its network, but as Eriksson says, “We have been using different types of equipment before and usually there would be some sort of problem, but with the Cisco kit everything works – nothing has worked as well as the Cisco technology”.

The quality and reliability of Cisco’s network security is very important. Eriksson says, “Sweden has strict laws regarding the safety and confidentiality of patient information, but we couldn’t find a supplier that could provide a single enterprise-wide security solution. Cisco, however, has everything we need for securing both the active and passive network and that’s a real advantage for us.”

The Cisco MGN also supports multimedia applications which are helping to improve collaboration of medical expertise within the hospital and globally. In addition to improving the utilisation of medical expertise across a broader geographic environment, these collaboration tools will improve medical education and improve the speed and timeliness that specialists can provide expert consultancy and advice. Karolinska’s MGN collaboration capabilities will expand the range of its medical care and of its current video conferencing with hospitals in Russia, Estonia and France.

Karolinska is developing a special operating theatre with IP Television so that unique or pioneering operations can be viewed in real-time by student doctors and clinicians at Karolinska or even globally. The Cisco MGN supports the hospital’s plan to provide audio interaction so viewers can talk to and question surgeons during operations. The Cisco MGN enables pathology laboratories to show and discuss results with doctors in real-time instead of the doctors having to wait for results to be sent to them.

The Cisco MGN and Connected Imaging solutions provide the framework and structure to support Karolinska’s continual desire to improve patient care with advanced communications and collaboration tools. Karolinska is planning other applications that will help doctors to be more efficient. PDAs will replace pagers for immediate communications rather than requiring doctors to find a public phone and return a call. The PDAs and the Cisco MGN provide doctors with information on their way to the patient, and even enable them to access additional information and contact other doctors if specialist knowledge is needed.



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