

CASE STUDY

NETHERLANDS CANCER INSTITUTE TRANSFORMS NETWORK TO EMPOWER WORLD-CLASS RESEARCH AND DYNAMIC TREATMENT



The Netherlands Cancer Institute (NKI) was founded in 1913. It is the only dedicated cancer centre in the Netherlands and maintains an important role as an international centre of scientific and clinical expertise, development, and training.

Based in Amsterdam, it provides the country's best cancer treatment, and has been responsible for a number of scientific breakthroughs.

"Two of our recent successes have been around immunotherapy - training the body's cells to recognise and fight cancer cells, and targeted therapies to block a cancer based on the patient's DNA," says Bram van den Broek, Advanced Microscopy Specialist and Bio Image Analyst at NKI. "This is built on decades of research and collaboration."



A SINGLE NETWORK TO SUPPORT RESEARCH AND PATIENT CARE

This is increasingly digital and data-hungry work. To be more effective in the way it treats cancer, NKI decided to modernise its campus and data centre network architecture. This would not only empower applied and theoretical research but allow staff to adapt to new trends around mobility in the workplace.

"Both parts of the organisation require data and they need that data to be kept secure," says Roel Sijstermans, Head of IT at NKI. "But they use different systems and applications and have different rules."

Sijstermans' challenge is to provide a single and simple network infrastructure that can support both, and yet be highly secure and segmented, while easy to manage.

REQUIREMENTS

- Enable seamless mobility for clinicians to improve productivity
- Strengthen information security as data grows exponentially
- Create high-performance software-defined network to support world-leading cancer research

SOLUTION

- 802.11ac Indoor & Outdoor APs
- Mobility Controllers
- Mobility Master Controller
- Aruba Campus Core, Distribution and Edge switches
- ClearPass Policy Manager and Access Control
- AirWave network management

OUTCOMES

- Simplified the secure transfer of data and collaboration between research teams
- Improved productivity for specialist medical teams, with faster access to critical information, whenever and wherever
- Paved the way for continued digital innovation, including use of healthcare IoT

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ROEL SIJSTERMANS
HEAD OF IT, NKI

Creating a modern, digital workplace

NKI consists of two sites. The Netherlands Cancer Institute is the research wing. It accommodates approximately 650 scientists and scientific support personnel, conducting applied and theoretical research. The Antoni van Leeuwenhoek Hospital has 185 medical specialists, 180 beds, an out-patients clinic with around 106,000 visitors, 12 operating theatres and 11 irradiation units for radiotherapy.

The goal is to create a modern workplace, enabling seamless connectivity throughout the site. This would have a range of benefits: employee mobility, data at the bedside, connectivity for a range of modern healthcare devices, electronic patient records. It would also create the optimum environment for world-class research, helping to attract and retain top research talent.

"We wanted to create an environment where clinicians and researchers can do their best work," says Sijstermans.

Detailed planning over nine months

The solution involves a complete overhaul of NKI's approach to networking in its data centre and campus environments. Working with Deltics, a long-time IT service provider to NKI and Aruba partner, Sijstermans and team went through six rounds of detailed technical planning over nine months before agreeing the architecture.

Prior to this, NKI had already adopted Aruba ClearPass. Network insight gained from ClearPass proved to be crucial in planning the new approach.

"We wanted an infrastructure that was easy to control, simple to manage," says Sijstermans. "A software-defined infrastructure and network architecture was at the heart of this."

The Aruba Edge and Mobile First Architecture underpins the entire wired and wireless infrastructure. At the heart of the campus network, two Aruba 8400 Campus Core switches provide the capacity, performance and high-availability required. A combination of six Aruba 8320 Campus Distribution switches in three redundant pairs, provide the distribution layer for the two sites. The campus edge connectivity is provided by over 50 Aruba 3810M, 5412R and 5406R Campus Edge switches.

Pervasive Wi-Fi connectivity and seamless mobile roaming are assured throughout the sites by the use of over 1,000 Aruba AP-300 series access points, including AP-303H Unified APs for patient rooms. The Wi-Fi environment is controlled by Aruba 7210 and 7240 Mobility Controllers and overseen by a Mobility Master. Aruba AirWave network management provides the IT team full visibility and proactive management over the entire infrastructure.

It produces a network that is flexible and scalable yet managed from a single point.

TWO SITES, ONE SMART HEALTHCARE FACILITY

The result is a platform on which NKI can deliver continued, digital innovation. Sijstermans says discussions have already taken place around asset tracking, wayfinding, and the integration of healthcare-focused IoT devices, from smart bands to connected refrigerators. In due course, integrating IoT devices and solutions which utilise ZigBee onto the network, and monitoring, managing and securing their access will be facilitated by the integrated ZigBee interface in Aruba access points. Solutions such as Dynamic Segmentation and the ClearPass Device will automate the connection, authentication and security policy enforcement for such devices and extend wireless services to the IoT segment.

All of this will connect to the network, all will feed back more data to better inform the running of the hospital.

"Today, 30% of the connections are to the wireless networks, and growing. We expect the future to be increasingly wireless," he says.

Productive, effective, high-specialised healthcare

In terms of the Antoni van Leeuwenhoek Hospital, Sijstermans says the network already supports a range of functionality. It is easier for clinicians to share and access medical data, when they need it, where they need it. Visitors and patients have open access to the network; there is role-based access for staff.

Outpatients have 10-minute appointment slots; clinicians can access the full range of diagnostic evidence, from HD images to detailed medical records sent from the patient's local doctor. Medical teams are more productive; patient engagement is more effective. With more data points, and the ability to collect new patient data on the go, digital records are more accurate and more up-to-date.

"We're not a typical hospital. Patients come from throughout the Netherlands for specialist treatment, often involving a pathologist, a radiologist, an oncologist, and a surgeon working as a team," Sijstermans explains. "It is crucial these teams are ready to act, when needed. The network ensures they have access to the data they need."

Dynamic, collaborative research

For researchers, working in teams of 5-20, the network simplifies the task end experience of seamless sharing of large data sets. It enables research teams to collaborate on critical projects.

"The aim was to create data lakes, not data swamps," says Sijstermans.

"Data sets are growing exponentially. The bottleneck is not the acquisition of data, but the processing and analysis. We now have a network that can support dynamic research."

The plan is to expand the use of VDI, first for the medical staff but then to researchers, allowing secure, remote working.

"We're looking at Aruba Dynamic Segmentation, and the ability to give certain rights to certain users, and to control the data sent between segments," says Sijstermans. "One of the main parts of our research is applied research – working with doctors. We need to be able to move data between different environments, securely and simply."

Dynamic Segmentation will significantly simplify the network, reducing the need for many VLANs and automates device or user connectivity policies. This software-defined network will also enable the IT team to spin up a secure, dedicated and temporary network for any new project, while benefiting from all the necessary services, security policies and performance specifications which the users are accustomed to and would expect to have.

This makes the IT team far more flexible and responsive, and able to meet the needs of the staff and the ever-evolving workplace.

A secure and versatile network experience

The NKI data centre is entirely made up of HPE FlexFabric 5940 switches, building the core, aggregation and access layers. It is then connected to the Campus networks and provides access for NKI applications, including the planned expansion of VDI environment.

At present, NKI runs as many as 2,000 virtual desktops for clinical and research users. Physicians and nurses can initiate a virtual desktop session in one part of the hospital, then easily move to another area and get right back into their session with a swipe of their badge. It saves time and provides clinicians with much greater flexibility to move from patient to patient.

The data centre is a combination of two separate locations on-tie and a third instance in a second location. The DC network is comprised of HPE FlexFabric 5900 series switches which constitute the core, aggregation and access layers. The VMware® VDI platform running on an HPE Hybrid IT platform provides the secure and versatile work environment for clinical and research staff.

Getting the most out of the network

NKI now has a network foundation on which to add new functionality and services. "We have the connectivity, the reliability, and the performance we wanted. We have a network that is open to patients, visitors and researchers, but one that gives us visibility and control," says Sijstermans.

Indeed, NKI can alter bandwidth based on user roles and profiles and the next step is to roll out Mobile Device Management allowing greater use of mobile devices and BYOD services. The integration of the new VMware AirWatch MDM platform with ClearPass will enable Sijstermans' team to monitor device security postures and compliance with security policies. ClearPass can then isolate any truant device.

Sijstermans says the next challenge is not so much technical as cultural. He wants his IT team to adopt a more service-led approach:

"We have the infrastructure. I want our guys to work with clinicians or researchers to help them get the most out of the infrastructure. That is the real change."