



UZ LEUVEN

UZ LEUVEN NURSING TEAM HAS MORE TIME LEFT FOR THE PATIENT, THANKS TO CISCO'S NETWORK

«BY CONVERGING ALL THE MEDICAL DEVICES IN THE IC ROOMS VIA CISCO SWITCHES IN THE HOSPITAL NETWORK, WE CAN NOT ONLY PROVIDE MORE INFORMATION FOR OUR DOCTORS, BUT ALSO ILLUSTRATE IT BETTER GRAPHICALLY. THAT MEANS THAT THE INFO IS NOT ONLY MORE DETAILED, BUT BECAUSE IT'S IN VISUAL FORM IT SIMPLIFIES THE PROCESS OF ANALYSING IT, TOO.»

Dominiek Cotteem, project leader for information systems, UZ Leuven

EXECUTIVE SUMMARY

BACKGROUND

The Leuven University Hospitals comprise a group of different hospitals: the UZ Gasthuisberg, UZ Sint-Rafaël, UZ Sint-Pieter, UZ Pellenberg and UMC Sint-André in Lubbeek. Until recently, the Psychiatric Hospital Salve Mater was also part of this group, but today no hospital activity is being developed in that institution any more. Until 1970, all the institutions functioned more or less independently of each other and their medical care was not always coordinated as well as it could be. The split-up of the university in Leuven meant that an appropriately integrated

university hospital had to be developed for the brand-new autonomous Faculty of Medicine. A hilltop known as Gasthuisberg seemed to be the ideal place to build a completely new medical campus with hospital and teaching accommodation. Over the last few years, the UZ (University Hospital) Gasthuisberg has been extended more and more. Thus, discussions are currently under way with the government to relocate the surplus hospitalisation activities of UZ Sint-Pieter at Gasthuisberg.

CHALLENGE

The Leuven University Hospitals have been looking for a solution to converge the medical equipment connected to patients in IC into a single network. After all, the nursing staff were having to fill in the medical data manually. By automating data collection, the aim was on the one hand to cut out errors and

time-wasting and, on the other hand, to greatly simplify the analysis of patients' data. At the same time, they wanted to separate this network of critical instruments galvanically and ensure that all the network ports were isolated.

SOLUTION

UZ Leuven had already implemented a patient monitoring system previously. With the installation of Cisco switches in all the IC rooms, the hospital can now integrate the instruments in IC with the selfsame patient monitoring system. Because those critical instruments are separated galvanically, the safety of the

patient is assured at all times. UZ Leuven is in the first place improving its medical care with this installation, but the patients themselves now have a network port to surf if they want to.

RESULTS

Today, patients' data are fed through every minute to the central databank of the hospital network. This means the medical staff no longer have to write anything down and UZ Leuven can avoid human errors and writing in the same things twice. The data from the various medical devices set up in the IC rooms are compared with one another in the patient monitoring system. This far-reaching automation means that doctors can recognise patterns and take medical decisions faster.

According to a number of scientific studies, this enables nursing staff to save half an hour of administration time per eight-hour shift. The time which has been saved is then given over to patient care. The invoicing of nursing care and medication is made easier for the administration. Thanks to the switches, all the ports are moreover galvanically separated, so that nothing can happen to the patients.





Until a year ago, the doctors and nurses in the IC wing of UZ Leuven had to fill in the data for the patient files manually. They copied them down from the many medical devices installed in those rooms. That not only took up a lot of time, but there was always a real danger of human errors. Moreover, it is not so easy to keep track of developments in a patient's condition and compare old data with new in this way. This was why UZ Leuven looked for a solution to automate the work of copying data twice. That solution was finally found in iMDsoft's MetaVision patient monitoring system.

Most medical devices do in fact have a network connection. That was how the university hospital's IC department got the idea of connecting up the various devices to the hospital network. To do this, the existing network port had to be expanded in order to make extra ports available. The computer department of UZ Leuven installed a Cisco 8-port switch in each of the IC rooms. Each device in those rooms – for example, for kidney dialysis or respirators – is connected up to it. The switch itself is connected to the hospital's central network. This makes it possible to integrate the monitoring data with the patient monitoring system.

«Eight ports might seem a bit excessive at the moment, but it's difficult to predict exactly how many ports we might need in the future. Medicine is evolving along with technology. In fact, more and more hospital equipment is being fitted with a network connection. So there are ports not being used at the moment, but we expect that we'll eventually be using them,» explains Dominiek Cotteem, project leader for information systems at UZ Leuven.

RECOGNISING MEDICAL PATTERNS FASTER AND MORE EASILY

The medical equipment in IC provides an enormous amount of data about the patient. Putting all those monitoring data together offers many new possibilities. «In the first place, we can easily monitor the patient from a distance now. In addition, bringing together all those data from different sources enables us to take the right decisions faster and more easily. We can compare the incoming data in our central database and use them to make the best analyses. That in turn enables us to recognise certain medical patterns more quickly. If all the data indicate that the patient is developing a lung infection, we can act proactively and take the necessary steps in time. In the past, we were not able to compare analyses and results so well and we didn't have the information to hand so quickly and clearly as we do today,» explains Dr. Geert Meyfroidt, deputy clinic head at the ICU.





Previously, doctors used to analyse the medical data of their patients on paper. The information accumulated used to be set down in tables and was pretty limited. Nowadays, doctors can not only have more information at their fingertips, but they can also visualise it better graphically. That means the information is not only more detailed, but it also makes analysing easier because it is visual.

«Our doctors can now access the desired information in all possible ways. Each doctor has his own graphical preferences for this. With the curves and graphs we draw on the basis of the available data, we can make the patient's information exceptionally clear. That's more powerful than a simple table on paper. The technology makes collecting and interpreting this mass of data much easier. Streamlining all the data about a patient makes the life of the doctor, kinaesthetist or nurse a bit easier, too,» explains Dominiek Cottem.

PATIENT FILES ALWAYS ACCURATE

Above all, the doctors and nurses at UZ Leuven don't have to copy things down any more. The nursing staff confirm every hour the figures that are automatically being fed through. In this way, all the data in the electronic patient file are accurate and the quality of medical care is optimised. «So the patients also benefit from this automation. Cisco's switches were a great help in this,» Cottem continues.

The integration of patients' data also facilitates monitoring by doctors. Patients' data are updated every minute in the patient monitoring system. In the past, doctors were only given that info once a day. Now they can access a patient's calorie balance, for example, with a simple click of the mouse. They can use it to calculate automatically the quantity of food a patient will need over the following days. In the burns unit, doctors can automatically calculate the quantity of fluid a patient must be given. «Our doctors can therefore closely follow the status of their patients. And it is precisely for this reason that if they don't have access to the medical data for even a couple of hours when there are planned system stops, we get some complaints. They just can't do without it any more,» says Dr. Meyfroidt.

SECONDARY ALARM SYSTEMS

There is an alarm system on virtually all our medical devices. That gives a warning when a particular limit has been exceeded. To interpret the alarms it is often important to know the data coming from another source. There was no umbrella system for the computerising and integration of data, and the various devices didn't work in concert.

«Now that we have put all the data on to a single network we can create our own, secondary alarm systems. When various limits have been reached together, we know about it immediately and we can react a bit faster than we used to. Mind you, the system works purely as a backup: the doctor is still in full control,» explains Dr. Meyfroidt.

«For a large number of conditions in intensive care – for example, toxic shock after a serious infection – the speed with which appropriate treatment is given is literally a matter of life and death. So, for those conditions we want to create





special 'clever' alerts. The integrated data not only support our patient care, but also the scientific research in our department. For a university centre like ours this second function is also very important. For example, if we have a patient with the ideal background for a particular clinical study in our department, the patient monitoring system tells us about it – and we can inform the interested party or responsible research departments accordingly.»

GALVANIC SEPARATION

The Leuven University Hospitals have installed the Cisco switches not just to simplify medical monitoring. In IC the patients are in fact connected up to a number of devices linked to the lighting circuit via galvanic separation. When those devices are connected to the hospital network, the network must be separated galvanically too. In the room, the uplink of the installed switch is connected to a galvanically separated outlet, and thus we ensure that all the network ports on the switch are also isolated. So we can be sure that nothing happens to the patients.

«We also chose Cisco switches for hygiene reasons. In contrast to most other switches, which are cooled by means of a fan, the Cisco switches are cooled passively, so they don't stir up any dust. A hospital, and certainly the operating theatres and the IC rooms, must be scrupulously clean. The Cisco switches contribute greatly to this. And one other advantage: because there's no fan built in, the switches are practically silent, too. In IC that's certainly not a needless luxury,» concludes Dominiek Cottem.

Each room in IC is equipped with a PC, which is of course connected to the network via the switches. Doctors can access and input data from those rooms. If they want to investigate the epileptic activity of a patient, they can send an EEG directly to the neurological lab where it can quickly be assessed by specialists. Echograph images of the heart can also be sent via the switches. At the same time, life is made a bit more convenient for the patients: thanks to those extra network ports, they can actually surf the Internet from their rooms.

DOUBLING THE NUMBER OF SWITCHES

The UZ Leuven initially installed a total of 80 switches. Now, they are looking into what departments they will eventually equip with the patient monitoring system. The hospital is thinking first about the neonatal department and the various operating theatres. In the future, the UZ Leuven plan to increase the total number of switches installed to at least 170.

To sum up: there are three elements that determine the return on investment for this project. In the first place, the nursing staff of UZ Leuven have half an hour's more time for their patients in each shift, thanks to the automation. «In the health care sector, the ROI is always measured qualitatively too, and not purely from a financial and economic point of view. Greater availability of the nursing staff is of vital importance to our seriously ill patients,» concludes Dr. Meyfroidt. Automation also optimises patient care. The software generates clever alarms, among other things, and standardises medical care through specific protocols. Finally, the data being collected can be used as a source for scientific studies, as well as support for managing the department and continuously monitoring the quality of patient care.