Case Study – Newcastle NHS Trust

The Client

The Newcastle upon Tyne Hospitals NHS Trust delivers healthcare services from seven major sites including the Freeman Hospital, The Royal Victoria Infirmary (RVI) and the Newcastle General Hospital.

The Newcastle NHS trust is investing £304m in a massive programme to improve and expand their city centre hospitals. This includes a new state of the art centre for cancer care and kidney treatment at the Freeman site, and a larger development at the RVI, adding the new Victoria Wing. The Freeman development was completed in summer 2008, and services are moving into the RVI during 2009. Overall completion of the programme will be in 2012.

The Challenge

The key aim of the security systems improvement programme was to ensure that the Freeman and RVI Hospitals provided a secure environment for patients and staff. The system would need to capture any incidents which took place and provide sufficient information to ensure the appropriate action could be taken by providing high-quality evidence for identification and potential prosecution.

Both Freeman and RVI hospitals have facilities spread across a large campus. The traditional method of cabling all cameras back to one central point would, on such a large site, be impractical, time-consuming and extremely expensive. Furthermore, the trust was looking to have a central control room monitoring at the Freeman site which also covered the RVI site.

The Specification

The aim was to provide an integrated digital video recording (DVR) and management system offering very high recording performance, with centralised control and a smooth, simple yet powerful operator interface.

The specification was developed with careful consideration being given to the control room environment. The final critical factor for consideration was the integration capability of the video management system with other security systems. The basic topography of the system was designed around a number of local "nodes" with coaxial cabling to the cameras, and with fibre optic to the control room.

Between the Freeman site and the RVI site, a total of over 600 cameras were specified, being a mixture of fully functional day/night cameras static cameras and pan/tilt/zoom (PTZ) cameras. The existing Maxpro Max1000 video matrix systems were to be integrated into the new system.

Recording resolution, quality and frame rate were specified at 25fps recording rate per camera, full-frame resolution (720 x 576), with 31 days storage period. All cameras were to be instantly accessible for live viewing and replay, with multiple-channel replay essential. A complete network-based video wall system was included, capable of displaying any combination of cameras from any point on either site.

The Solution

2020VISION TECHNOLOGY

Newcastle NHS Trust engaged 2020 Vision Ltd to provide the solution. 2020 Vision were the innovators behind the node-based approach, exploiting the latest IP-based technologies. However, this was a collaborative project, 2020 Vision worked in conjunction with Veracity UK Limited.

INSTEK DIGITAL

Veracity UK Ltd. is a development partner of Instek Digital Co. Ltd., a manufacturer of high-performance hybrid digital video recording and management systems, and it was the Instek MatriVideo enterprise system which was chosen. The MatriVideo system can be fully integrated with the Maxpro video matrix, access control, fire alarms, intruder detection and automatic number plate recognition (ANPR) systems.

The digital video recorders (DVRs) were all linked over a dedicated security system network to the main control room. A video wall was installed in the control room for display of live real-time images from any group of cameras from any combination of DVRs. The operators were provided with two MatriVideo Command Centre workstations for system control. PTZ cameras are controlled through a normal CCTV keyboard and joystick which is fully integrated into the digital system.

The Results

The new surveillance system has performed beyond expectation. In particular the operators have found the "drag and drop" camera display capabilities easy to use. The interface allows total control of cameras and simple archiving of any time, date and selection of cameras.

Shortly after the system was commissioned, an unidentified bag was found near the entrance. Under bomb threat procedures, the hospital wing would have been evacuated. Due to the easy and intuitive system security staff managed to find the owner of the bag (an elderly patient who was recognised by staff) using instant fast reverse. Despite not having full training in the use of the system yet, the intuitive controls allowed them to avoid an expensive and disruptive evacuation of the wing clearly illustrating the value of the system's image quality, ease of use and playback features.

Robin Smith, Estates Consultant NHS Trust, with Peter Houlis, 2020 Vision.

Robin Smith, Estates Consultant for the Trust said,

"The replacement of the ageing and disparate equipment is long overdue. The new integrated solution will see our security and safety procedures raised to the highest level, which can only be of benefit to the hospitals and people working and passing through them. We are delighted with the results"

2020 Vision Systems has just been awarded North Tyneside Small Business of the Year 2009.

Technical Features

The client-server architecture is a crucial feature. This means that the recorders (servers) are separate machines doing nothing but recording and video serving, whilst the client machines are the workstations used by the operators. Thus the operators cannot accidentally or deliberately change settings, interfere with or switch off the recording process.

These DVRs run under the Linux operating system as this is ideal for 24/7 high-reliability server operation. Both the Linux operating system and the DVR server software are stored on solid-state memory forming a system which is highly resistant to viruses and other malware. The recorded video data is stored on up to eight disk drive units offering up to 8,000GB of disk capacity per recorder.

The MatriVideo system DVRs are capable of recording both analogue and IP cameras, although only analogue cameras have been installed so far in this project.

Up to 16 further IP cameras can be recorded by the DVR, in addition to the 16 analogue cameras. A key capability of the MatriVideo DVR is video streaming. The DVR can produce networked live video streams from all analogue and IP cameras connected to the DVR, thus negating the need for any separate IP video encoders to provide streaming from the analogue video sources.

The operator workstations, "Command Centres" in Matrivideo terminology, run under the Windows operating system, providing a fully-featured graphical user interface on either a single screen, or spread across three screens for the most powerful and comprehensive system control.

The Future

The numbers of cameras on both the Freeman Hospital and the Royal Victoria Hospital sites will expand as new buildings and facilities come on line in the future. Due to the scalability of the video management system, camera channels, recording units, display monitors and control points can be added at will without any change to the system or even interruption of normal operation.