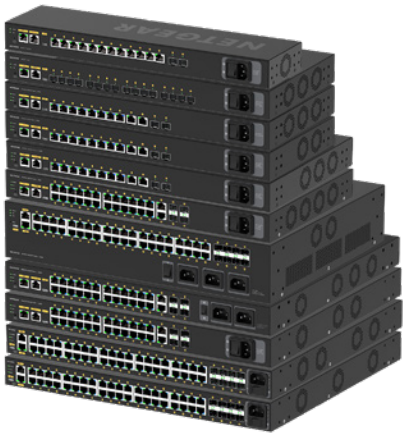
Cardiff University School of **Healthcare Medical Simulation Facility**

NETGEAR® AV

At Cardiff University's School of Healthcare at Heath Park West, NETGEAR AV switches provide the robust network foundation for the AV solution incorporated into a sophisticated £2.5 million medical simulation facility where future doctors and nurses train using lifelike patient simulators and smart monitoring systems. By seamlessly transmitting patient data from hospital beds and interactive mannequins to a central control room over the network, Cardiff University has created an immersive learning environment that mirrors real-world healthcare settings. The result is flawless operation with zero network-related downtime.

Background

Cardiff University is a leading public research university founded in 1883 and recognized for academic excellence and innovation. The University serves over 33,000 students from more than 130 countries, offering programs across arts and humanities, social sciences, physical sciences, engineering, medicine, and biosciences. As part of the University's most significant campus upgrade in a generation, Cardiff invested £646 million in new facilities designed to foster collaboration and introduce innovative teaching methods across various disciplines.



CASE STUDY

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"We like working with NETGEAR switches. They are very plug-and-play and easily configurable. We've worked with AV over IP across many networks, and NETGEAR just makes things straightforward."

Scott Meikle, Systems Engineer, GVAV

The School of Healthcare's relocation to Heath Park West is a critical component of this transformation, with a focus on practical medical training. The facility features sophisticated patient-simulation technology with training mannequins that move, speak, and exhibit realistic physiological responses, enabling students to practice medical procedures and decision-making in a controlled environment that closely mirrors real hospital settings. Smart cameras throughout the facility capture every interaction, and video feeds are transmitted via the AV-over-IP infrastructure to a central control room where instructors can manage multiple training scenarios by controlling simulated monitoring responses to the displays, voicing patient responses, and controlling mannequin behavior. This approach enhances the quality of medical education while ensuring patient safety by allowing students to make mistakes and learn from them in a risk-free environment before treating real patients.

Challenge

Creating a network infrastructure for medical simulation training presented several unique challenges that extended beyond typical educational AV installations. The facility needed to support simultaneous transmission of multiple high-definition video streams for the data feeds from patient simulators that provide real-time physiological information. All of this content had to flow reliably to the central control room without latency or quality degradation, as instructors depend on these feeds to create a realistic simulation and evaluate student performance.

The physical infrastructure posed additional constraints. The facility had extremely limited space for networking and cabling, forcing most infrastructure to be installed through narrow spaces above the ceiling. This required a network solution that could distribute video and data across multiple spaces while minimizing cabling requirements. The system also needed to integrate seamlessly with Visionary's PacketAV Matrix Series AV-over-IP technology, which Cardiff had standardized across campus for its reliability and performance. This is enabled by NETGEAR's Visionary AV network profile, ensuring fully compliant networking for the installed system.

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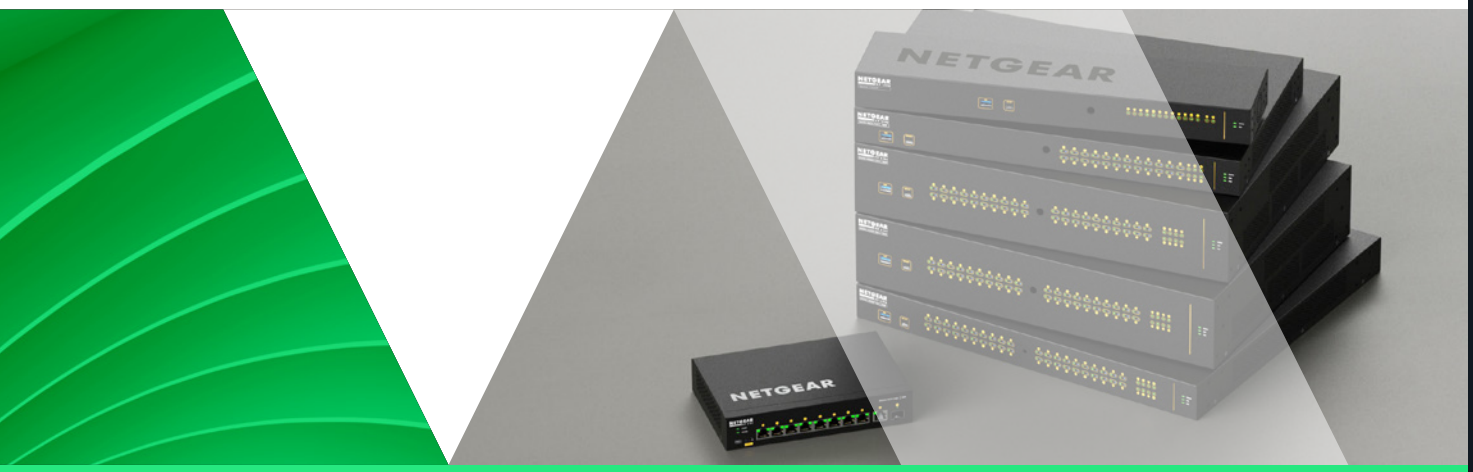

"We've sold other brands in the past, but NETGEAR is much more accessible due to their graphical approach in the managed switches. For us, the NETGEAR AV UI is a clear differentiator to ensure that commissioning and long-term support is easy, smooth and accessible for our team and end users alike, when compared with the more conventional network configuration we've used in the past."

Daniel Victory, Group Technical Director, GVAV

Unlike conventional educational environments where brief interruptions might be inconvenient, due to its real-time nature, any network failure in the medical simulation facility would disrupt active training sessions and potentially compromise the learning experience. The facility operates continuously throughout academic terms, with multiple training scenarios running simultaneously. The network had to support this demanding schedule with near-zero downtime, requiring equipment that delivers consistent performance without frequent maintenance or troubleshooting.

The installation also needed to accommodate the specific requirements of medical training environments. Hospital beds and patient simulators must be repositioned frequently to replicate different clinical scenarios, and the network needed to support this flexibility while maintaining reliable connectivity. Additionally, the system had to provide sufficient bandwidth to support simultaneous capture of full-resolution video from multiple sources.

The team had initially discussed connecting the system to the university's existing network infrastructure, but faced significant infrastructure challenges in running the 60-plus network points required across the building's constrained spaces. These factors necessitated a dedicated network solution specifically designed for the facility's unique requirements, one that could reliably support AV-over-IP distribution while remaining straightforward to manage and maintain.

"The relationship we have with NETGEAR is great. That level of support and partnership makes a real difference when you're deploying critical infrastructure, whether it's for an isolated in-room AVoIP or fully integrated LAN joining multiple solutions and rooms together."

Daniel Victory, Group Technical Director, GVAV

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“After installing the NETGEAR infrastructure, we have not needed to return to the site for network-related service calls. The solution continues performing exactly as designed after deployment.”

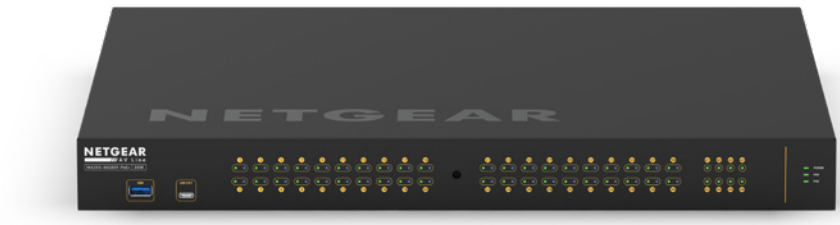
Daniel Victory, Group Technical Director, GVAV

Solution

GVAV, a leading European audiovisual integration firm, selected NETGEAR AV switches as the backbone for this critical infrastructure, providing the reliability, performance, and ease of management essential for uninterrupted medical training operations. They designed a dedicated network infrastructure using NETGEAR M4250 series AV switches optimized to support Visionary’s PacketAV Matrix Series AV-over-IP system. The solution provides reliable, high-bandwidth connectivity for the 55 Visionary encoders and decoders deployed across the training environment, including units dedicated to hospital bed simulators, patient mannequins, and the central control room. The NETGEAR switches were configured using pre-built profiles optimized for Visionary equipment, significantly simplifying deployment and ensuring optimal performance from day one.

Network topology was carefully planned to address the facility’s physical constraints. With limited under-floor space for cabling, GVAV leveraged the NETGEAR switches’ flexibility to create an efficient distribution architecture that minimized cable runs while maintaining the necessary connectivity for all training spaces. The implementation created a completely separate network dedicated to the medical simulation facility’s AV infrastructure, providing simplified troubleshooting, enhanced security, and the ability to optimize all network parameters specifically for AV-over-IP performance without concerns about impacting other university systems.

GVAV provided Cardiff University staff with comprehensive training on NETGEAR Engage, enabling them to independently monitor network health and perform basic diagnostics. The intuitive graphical interface allows facility managers to check port status, view bandwidth utilization, and access diagnostic logs without requiring deep networking expertise.



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“This system has radically improved our ability to offer fully immersive, student-focused simulations. We have become more self-sufficient, negating the need to call on network expertise as the system is very user friendly. The ability to not only control our manikins but to add visual aids, learning materials and any other content, from the control room, out to the Simulation spaces ensures we are providing a fully rounded, professional experience for our students.”

Joanne Owen – Senior Clinical Skills and Simulation Officer – Cardiff University

Results

Since installation, the NETGEAR network infrastructure at Cardiff University’s School of Healthcare has delivered exceptional reliability and performance. The facility has been operating without a single service call related to the network infrastructure, demonstrating the solution’s robustness and suitability for mission-critical educational applications. This zero-downtime record is particularly impressive given the facility’s continuous, intensive use throughout academic terms.

Cardiff University has achieved significant operational efficiency through the straightforward management of the NETGEAR infrastructure. Facility technical staff can independently monitor system health and address basic configuration needs without specialized networking expertise or external contractor assistance. This self-sufficiency reduces operational costs and ensures faster response times when adjustments are needed. GVAV’s ability to provide remote support through NETGEAR Engage has also proven valuable, enabling quick resolution of questions or optimization requests without scheduling on-site visits.

Why NETGEAR Was Chosen:

- NETGEAR Engage’s intuitive graphical user interface for easy remote management and troubleshooting
- Proven compatibility with Visionary PacketAV Matrix Series with pre-configured profiles
- Strong track record across multiple Cardiff University facilities
- Comprehensive training and technical support partnership
- Set-and-forget reliability for mission-critical healthcare education applications

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