> "It developed the first endoscopy site in the UK – and to the best of our knowledge on the planet – utilising uncompressed 4K video (SDVoE) over a 10GB Ethernet network using fibre interconnectivity."
>
> Andrew Chapple, Communications Manager, Quadram Institute

Company name:
Quadram Institute

Company size:
400+

Industry:
Medical

Company website:
quadram.ac.uk

Social:
facebook.com/
QuadramInstitute

Geographic region:
Norwich, England

NETGEAR's M4300 helps implement a system with zero-latency and pixel-perfect uncompressed 4K video quality.

BACKGROUND

The Quadram Institute in Norwich, England, is a groundbreaking medical centre focusing on food science and health. The new £84 million facility brings together more than 100 clinicians and 300 researchers from several founding partner organisations.

It also includes one of the UK's largest endoscopic and bowel cancer screening suites capable of handling more than 40,000 procedures a year, making it one of the largest in Europe.

To support its crucial diagnostic, teaching and research mandates, the Quadram Institute needed an AV system to elevate the level of collaboration between clinicians, students and researchers conducting and monitoring the procedures performed on site.

In addition to meeting rigorous health codes, the system would need to provide video imaging of the highest quality as well as video switching with near zero latency to facilitate real-time viewing and interaction among medical and clinical staff.

PROBLEM/OBJECTIVE

Snelling Business Systems, the UK-based global AV systems integrator, was selected to handle the comprehensive and critical AV requirements—creating the first endoscopy site in the UK utilising SDVoE technology to distribute uncompressed 4K video over a NETGEAR 10GB Ethernet network.

For reasons of bandwidth as well as electrical isolation, the system infrastructure was specified for 100% optical fibre connectivity, another first for a medical imaging facility.

"There was no doubt the integration of cutting-edge video and networking technology would be critical to achieving our vision of a world-class, forward-thinking institute," said Andrew Chapple, Communications Manager, Quadram Institute.

"Snelling Business Systems has proven its merit as a technology partner who helped us realise our vision with zero compromise."

SOLUTION

Two-Way Audio & Uncompressed 4K: For performing endoscopies that could be monitored by medical staff, students and researchers onsite and in remote locations. Using NETGEAR's M4300 switches afford us 10G connectivity which is considerable bandwidth for the required two-way audio and uncompressed 4K video with near zero latency from four sources simultaneously.

"We used NETGEAR switches as we needed a modular switch that would allow us to provide maximum flexibility and expandability in the future. The nice thing about this NETGEAR solution is that it is basically pre-configured to work with ZeeVee's encoders/decoders. Multicast configuration can be tricky; using NETGEAR switches was very simple." – Kevin Madeja – Snelling Business System

This multi-view platform enables live visual and voice interaction between clinicians performing procedures in the four interconnected endoscopy suites and those viewing from other locations in the facility and beyond its walls.

All specifications of the system meet stringent government and industry requirements for medical applications.

For example, the equipment in the endoscopy suites that is directly connected to the endoscopic medical equipment have medical grade power supplies, galvanized isolation and anti-bacterial coating.

Innovative Uncompressed 4K AVoIP Solution: "As the leading facility for endoscopies in the country, it is important that the AV system does all it can to support those performing the procedures, as well as those being trained to perform them," said Kevin Medeja, Group Technical Officer, Snelling Business Solutions.

"The level of performance and sophistication we were able to achieve would not have been possible using an HDBaseT or compressed SDVoE AVoIP (AV over IP solution). "

To capture and stream AV sources for this ground-breaking system, Snelling selected ZeeVee ZyPer4K SDVoE encoders for fiber Ethernet, which deliver uncompressed 4K 4:4:4 video over a 10G NETGEAR optical IP network.

Outputs from the high-resolution endoscopy camera, as well as the suite's PTZ cameras, were connected to the encoders. ZeeVee's technology enables streams from multiple sources to be seen in multi-view format on a single display, all in real-time.

IP Switch Choice: To support the required 10G Ethernet infrastructure, NETGEAR M4300 switches were selected. NETGEAR are also an SDVoE Alliance co-founding member.

"This ambitious project underscores how the demands of today's AV applications in the medical arena, including the requirements for the highest video quality and low latency, can be met and exceeded in healthcare environments," said Richard Jonker, VP SMB Product Line Management, NETGEAR.

"The convergence between AV and IT is here and it's supporting new ways for practitioners to deliver better outcomes.

RESULTS

ZeeVee ZyPer4K, NETGEAR M4300 switches and SDVoE technology combined to provide the following benefits to Quadram Institute's endoscopy suite, seminar rooms and remote medical community:

Multiview was Critical: Multiview processing built into the decoder reduced the complexity of the installation by removing additional image processing hardware.

Image Quality: The 10G system provided pixel-perfect resolution, clarity, and color reproduction. A 1G compressed SDVoE AVoIP solution had the potential to introduce compression artifacts and reduced quality, which is unacceptable for medical applications.

Latency: The system's two-way communication required near zero latency, and SDVoE technology provides sub-100 microseconds of latency.

Galvanic Isolation: Stray currents that compromise visual acuity are unacceptable in a facility performing endoscopic procedures on patients. The 100% fibre infrastructure eliminated this threat.

Worry-free Deployment and Configuration: ZeeVee products are auto-discovered by the ZyPer Management Platform and NETGEAR switches are pre-configured for AV over IP distribution.

Future-proofing: Built-in 10-Bit HDR support allows Quadram Institute to expand its application with the latest technology at any point in the future without having to replace any of the core infrastructure.

www.netgear.co.uk

quadram.ac.uk