Case Study

Enterprise LAN Solution

Transform Surgical Efficiency with FS Industrial Solution

FS collaborated with a pioneering robotic surgery company, transforming surgical efficiency with FS industrial solution, achieving a remarkable 30-second boot time, eliminating post-surgery delays and enabling 25% faster OR turnover.

Case Study

Enterprise LAN

FS D7000 Series Built Efficient Mixed-Rate Data Center Solution

Country

France

Industry

Healthcare

Network Type

Large and Midsize Campus Network

Solutions

Enterprise LAN

Key Stats

- 30-second network start-up time eliminated post-surgery delays, accelerating OR turnover by 25%.
- 10G speed provided seamless, lag-free, and lossless transmission of surgical data, with zero data corruption incidents across 1,500+ surgeries.
- Industrial compact design enabled easy integration into sterile surgical carts, optimizing space without extra costs.

Highlights

- Using IES5100-16TS ensures swift recovery with a quick start-up time of 30 seconds to 1 minute, meeting the stringent demands of frequent power cycling in operating rooms.
- Leveraging L3 routing and 10G speed ensures seamless, lag-free, and lossless transmission of medical imaging and robotic data.
- Robust security protocols like SSH and ACL ensure secure remote management and data privacy, effectively limiting network access to authorized devices only.
- Supports stacking, facilitating device-level redundancy management and providing backup in case of unexpected failures, ensuring uninterrupted surgical operations.

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Overview

In modern healthcare, precision and minimally invasive surgeries have become trends, with increasing levels of intelligence and automation in operating room equipment. However, surgical robots, high-definition imaging systems, and the interaction of medical data all rely on efficient network support. Our client, a global leader in surgical robot technology, focuses on integrating 2D/3D imaging, real-time navigation, and robotics to provide more effective surgical solutions for orthopedic and neurosurgeons. They aim to optimize the network environment in the operating room to ensure efficient and stable connections for all devices during surgeries, reducing waiting times caused by equipment restarts and improving the efficiency of doctors' operations.

Challenges

Our client faced significant hurdles in the high-stakes environment of surgical robotics, where even brief delays could jeopardize patient outcomes. Traditional switches required 5–7 minutes to reboot, causing idle wait times for surgeons between procedures. The systems engineer emphasized the need for a rapid boot solution to maintain workflow efficiency.

The compact nature of sterile environments necessitated switches that could fit within surgical carts (270mm*135mm*155mm). Additionally, power systems in operating rooms varied from 12V–48VDC, and voltage fluctuations caused unexpected reboots. “We couldn’t afford even a single network interruption during live robotic procedures,” the engineer noted, making support for 12/24/48VDC input essential for seamless integration with existing systems.

Furthermore, the client struggled to ensure seamless transmission of medical imaging and robotic data, experiencing data loss and latency issues that raised reliability concerns. Security was another critical issue, as the existing network lacked adequate protection, leading to unauthorized access attempts. In one instance, an unauthorized device was detected, prompting urgent security reviews and highlighting the need for switches that restrict access to authorized personnel.

Solutions

To address these challenges, FS deployed the IES5100-16TS industrial Ethernet switch, specifically designed for mission-critical environments. This switch features ultra-fast boot optimization, with cold boot times under 30 seconds to 1 minute, meeting the demands of frequent power cycling in operating rooms.

Its compact design (170x140x100mm) is significantly smaller than the client's maximum space requirement, facilitating easy integration into surgical equipment racks. With flexible port configurations, including 4 SFP+ 10Gb optical ports and 16 Gigabit Ethernet ports, the switch accommodates diverse networking needs while ensuring compatibility with 48VDC power inputs for seamless integration with existing medical power systems.

To meet the client's requirement for secure and efficient data handling, the switch supports full Layer 3 capabilities, enabling static and dynamic routing as well as VLAN inter-routing. These features ensure secure communication between devices, which is essential for protecting sensitive medical information.

Management is straightforward, with comprehensive CLI, Web GUI, and SNMP (v1, v2, v3) support, enhanced by SSH encryption. This allows for precise configuration of IP addresses, subnetting, and QoS. Robust security

features, including IEEE802.1X RADIUS authentication, IPv4/IPv6 ACLs, DHCP snooping, and ARP inspection, further safeguard sensitive medical data. Additionally, this industrial switch supports stacking which can facilitate device-level management and provide backup in case of unexpected failures, ensuring uninterrupted surgical operations.

Results

The deployment of FS IES5100-16TS industrial switches transformed the client's surgical workflows, achieving 30 second start-up time—eliminating post-surgery delays and enabling 25% faster OR turnover. With zero data corruption incidents in 1,500+ surgeries, the industrial solution enhanced seamless 3D imaging and robotic control, while its compact design saved valuable space in crowded surgical carts. Industrial-grade reliability further reduced operational risks, allowing the client to avoid costly equipment redesigns and rescheduling fees. These improvements not only enhanced surgical efficiency but also laid the foundation for scaling the industrial solution.

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