io by HFCL

Case Study

AIIMS – Delhi (Medicine & Healthcare)

Every Second Matters!

How HFCL is Transforming One of India’s Largest Hospitals and Savings Lives with Revolutionary Wireless Solutions

Background

All India Institute of Medical Sciences (AIIMS), New Delhi, stands as a pinnacle of healthcare excellence. Established in 1956 by an Act of Parliament, this renowned public medical research university and hospital embodies the principles of delivering exceptional biomedical science education and practice. With a prestigious 710-bed facility, AIIMS is one of the country's largest and most esteemed healthcare institutions, catering to over 2 million patients annually.

Embracing its role as a national beacon of excellence, AIIMS has become a pioneering force in medical education, biomedical research, quality-driven treatment, patient care, Evidence-Based Medical Practice (EBMP), Faculty Development Program (FDP), and the cutting-edge field of telemedicine.

AIIMS, with its steadfast dedication to pushing the boundaries of medical knowledge, has firmly established itself as a premier biomedical research center and a symbol of excellence in education. With its relentless commitment to delivering exceptional healthcare standards, AIIMS continuously shapes the future of healthcare by setting new benchmarks and elevating the standards of medical practices.

- 45% initial failure rate in wireless connection contributes to a 2-sec increase in wait time, subsequently causing delays in providing critical health care to patients.[1]

- The Wireless Healthcare Market is set to experience significant growth, with an anticipated rise from USD 137.05 billion in 2023 to USD 340.32 billion by 2028, with a CAGR of 19.95%.[2]

The reliability of a hospital network is of utmost importance as it directly impacts decisions of life and death. Working closely with the hospital's IT / Network team, we planned the Wi-Fi network keeping in view critical factors such as digital and physical obstacles, the potential influx of patients leading to a surge in data demands, flexibility to set priority for different types of network traffic and a highly secure Wi-Fi environment. Our customized Wi-Fi network solution ensures uninterrupted connectivity enabling healthcare professionals and patients to access vital information and collaborate seamlessly.

Bhuvnesh Sachdeva
Senior Vice President, HFCL

Overview

Advanced Wi-Fi solution for medical institutions is no longer a want but a necessity, as wirelessly enabled medical devices facilitate convenient, untethered, and agile healthcare delivery to patients. With doctors, nursing, and administrative staff always on the move, a reliable and all-time connected network becomes imperative for them to deliver the best patient care. In a hospital environment, high device density, bandwidth-intensive applications, and mission-critical operations put tremendous pressure on the network, as a lag of a few seconds can have serious consequences in critical healthcare situations. Medical institutions worldwide are quick to recognize the growing importance of the role played by advanced wireless networks in supporting patient care and seamless communication between doctors and staff, enabling the deployment of advanced medical technologies.

In pursuit of the Quadruple Aim strategy, hospitals are giving priority to amplifying patient experience, improving health outcomes, reducing costs, and enhancing clinical experience. As per the survey findings, more than 50% of the hospitals included in the study are boosting their investments in digital health solutions. [3]

All India Institute of Medical Science (AIIMS) a prominent institution in the medical landscape of India and renowned globally for its excellence in medical education, cutting-edge research, and exceptional patient care, decided to upgrade its existing network infrastructure with the Made-in-India Wi-Fi solutions.

The upgrade involved deploying indoor Wi-Fi 5 Access Points across all key areas of the hospital premises. With an upgraded network carefully planned to offer seamless, secure connectivity, high throughput, lowest latency, and predictable performance, Doctors and staff can now stay connected in a ubiquitous Wi-Fi environment.

This enhancement allows them to focus on delivering best-in-class patient care. Even patients can now access a seamless and secure Wi-Fi network across the premises and stay connected with their loved ones. The improved Wi-Fi network has also contributed to increasing workflow efficiency, secure data transmission, and network monitoring while ensuring compliance with medical security standards.

Approximately 92% of healthcare institutions and professionals experienced enhanced performance through the process of digital transformation.[4]

Challenge

AIIMS, a renowned medical institute with a daily inflow of more than 50,000 patients and 15-20 (average) medical devices connected in an ICU, encountered challenges due to its existing network infrastructure limitations. The network struggled to meet the increasing demands for high-speed connectivity and robust security measures for secure data transmission ensuring patient data confidentiality.

Solution

To ensure a 100% reliable and secure network, HFCL's team took the initiative to conduct a Wi-Fi network assessment and site survey. Based on their findings, they actively planned the optimal network solution and successfully deployed it within a few weeks. The project involved deploying 100 Wi-Fi 5 Access Points across key strategic locations of the hospital covering the outpatient center, in-between cluster of facilities, education wing, and other key sites.

As a part of the solution, we implemented a Single SSID (Service Set Identifier) for employees and patients to enhance the user experience. This implementation eliminated the need for navigating or switching between different networks, streamlining connectivity. Additionally, it simplified the configuration and maintenance of SSIDs, resulting in reduced complexity for better network management.

Further, the network was carefully designed to prioritize the confidentiality of patient data, enabling secure data transmission over the network. For enhanced security, we implemented user authentication using WPA2-PSK, which utilizes the AES encryption technique and supports both TKIP and AES protocols. This choice of encryption ensures compatibility with a wide range of devices while effectively limiting unauthorized access to patient's protected health information. The team implemented an automatic disconnection feature for visitors, which limited network access beyond the configured time to improve the overall user experience. We deployed a customized captive portal to enhance the efficiency, security, and compliance of the network authentication process. This tailored solution made the entire process more efficient, ensuring seamless network access while maintaining robust security measures and adhering to medical regulatory standards.

Indoor Wi-Fi

ion4i-Wi-Fi 5 2x2 (Qty:100)

MU-MIMO high capacity indoor Access Points

PoE Injector

HF-PoE20-AC/DC (Qty:20)

HFCL High Power Gigabit PoE+Injectors, AC/DC Input, 20W, 48V Output

Result

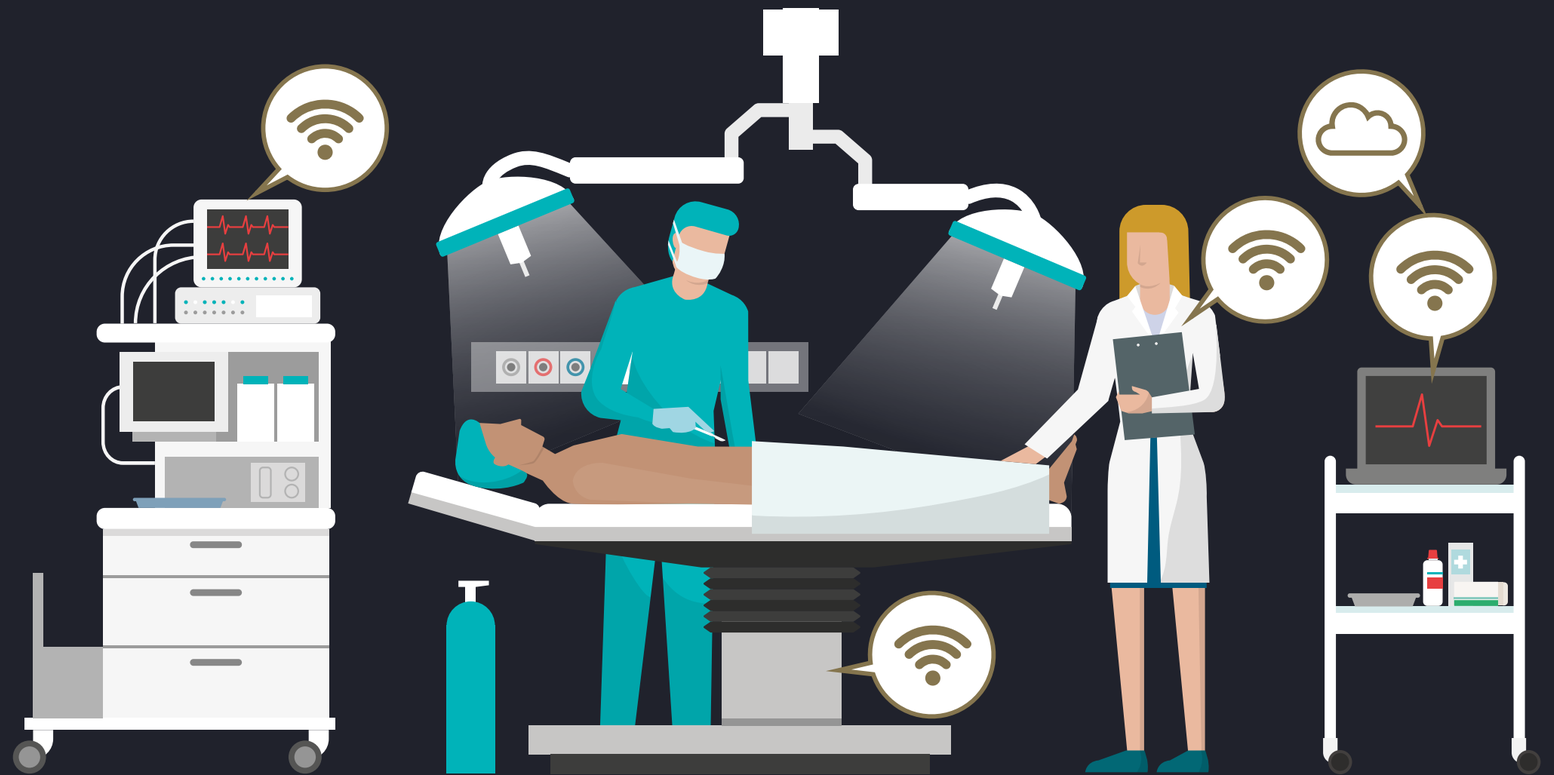
01 With the adoption of Wi-Fi 5, the number of Access Points required to cover the entire area was reduced by 3X. Traditional Wi-Fi solution requires a higher density of Access Points to ensure complete coverage. Through careful planning and the enhanced capacity of Wi-Fi 5, we successfully achieved comprehensive coverage of the entire approximately 3000 square meter area with fewer Access Points.

02 The key issue of network congestion was reduced by 2X as several features of Wi-Fi 5, such as OFDM orthogonal frequency-division multiple and MU-MIMO ensure faster and reliable data transmission over multiple connected devices simultaneously. The implementation of advanced encryption standard (AES) algorithm in WPA2 -PSK ensures robust data encryption for Wi-Fi networks, offering a powerful solution to prevent unauthorized access and protect data from interception.

03 The well-designed and efficiently executed network infrastructure resulted in a remarkable 80% reduction in investment costs. Moreover, the entire solution is highly energy efficient as devices can adjust their power usage based on the connectivity demands, bringing in significant cost savings for the institute.

Conclusion

The solution enhanced network performance, ensuring seamless connectivity and uninterrupted access for users. The faster and more reliable access to critical patient data has improved healthcare professionals' decision-making, enhancing medical delivery and patient outcomes. Overall, the entire solution has transformed the institution's network infrastructure, optimizing efficiency, security, and delivery.



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