

Better patient and business outcomes begin with a better network



How converged fiber PON/DAS networks are transforming hospitals for digital-age care and efficiency

Highlights:

Hospitals are under increasing pressure to improve the quality and efficiency of patient care while reducing costs. Converged fiber networks are helping answer these challenges, replacing legacy copper-based LANs with a far more scalable, cost-efficient alternative.

Benefits include:

- High-capacity bandwidth with a reduced carbon footprint
 - Maximum reliability and safety, essential for critical care systems
 - Better security and compliance
 - Flexible, future-proof platform
 - 30–50 percent lower network costs¹
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Hospitals and other healthcare facilities are at an important crossroads. While new medical devices and electronic health records have paved the way for better patient care, the underlying network infrastructure they rely on has been at a virtual standstill. Hospital networks haven't evolved to address increasing requirements for capacity, speed and security. Moreover, they are inhibiting hospitals from fully capitalizing on advancing mobile, social and analytic technologies to raise the quality of care and lower costs.

Converged fiber networks with passive optical network (PON) and distributed antenna system (DAS) technologies provide a solution. By enabling network services to converge on a single ultra-fast fiber optic backbone, they significantly reduce the size and cost of the infrastructure and create a highly efficient, sustainable platform for the delivery of patient care.

Rising connectivity demands

Technology is transforming the practice and business of healthcare. Telemedicine and remote patient monitoring are removing distance and knowledge barriers and allowing medical information to be disseminated wherever it is needed. Increasingly, wireless medical devices are being used in patient care, opening up new worlds of medical discovery and intervention. Mobile and collaborative technologies are facilitating consultation and information sharing, accelerating diagnosis and treatment, and extending care to remote areas. By leveraging new data sources and analytic innovations, hospitals are gaining deeper insight into individual patient needs, but also clinical and business operations, enabling efficiency improvements in patient flow, safety and resource utilization. These insights can facilitate cross-agency collaboration, case management, and program access and delivery.



Hospital networks are the backbone for all of these activities. Mission-critical services and care delivery depend on pervasive high-speed bandwidth. It is essential for capturing, analyzing and sharing patient and clinical information in real time. But bandwidth is also needed for the billing, security and administrative systems that sustain daily hospital operations. The network must be capable of supporting a full-service hospital campus, from admitting areas and operating rooms to nursing stations and patient beds. It has to meet current demands and have the agility to adapt as those demands change.

A network for the future of healthcare

Historically, healthcare facilities have relied on multiple networks to connect people and medical technologies. These infrastructures are often massive, relying on miles of copper cabling and layered Ethernet switches. This construction makes them inherently limited and unable to deliver the bandwidth, range or reliability to meet current requirements. Additionally, they are costly to operate, necessitating considerable space, power and personnel to deploy and maintain.

Passive optical networks that use a converged fiber infrastructure with DAS overcome these limitations by replacing the labyrinth of copper cabling and switching equipment with space- and energy-saving optical fiber and by integrating multiple networks and services on a single network infrastructure. The result is a simplified network that can deliver the highly scalable, reliable bandwidth required by today's hospitals. Fiber optimizes network performance and agility while significantly lowering cost and complexity.

Converged fiber networks can be deployed and operated at one-third less than the cost of traditional networks.² This is achieved through service integration and a smaller equipment footprint, which speed installation and reduce power, cooling and space requirements. Quality of service is centrally monitored through a single management console that provides consolidated access to virtually all network

devices and ports, simplifying administration and enabling performance issues to be remedied immediately. Furthermore, fiber enables data to move at higher speeds and greater distances without the electromagnetic interference that can disrupt sensitive radiologic devices. Since fiber is also non-corrosive and hard to tap, it is safer and more secure in hospital settings, easing compliance with Health Insurance Portability and Accountability Act (HIPAA) and Payment Card Industry (PCI) regulations.

With the ability to integrate massive amounts of data from various sources, a converged fiber network can take advantage of sophisticated analytics for improving hospital security and building efficiency. Intelligent video analytics can be deployed to identify and investigate threats and unauthorized activities. Building analytics can be used to identify and diagnose maintenance, comfort and energy issues. Hospital administrators can use these insights to improve both safety and the bottom line.

One network for all

Converged fiber networks allow the full range of IT, building and healthcare services to operate over the same shared infrastructure. That means one network for all hospital operations, from wired and wireless voice, video and data communications to telemedicine and nurse call systems to building systems like security surveillance and lighting. The cost benefits of this convergence cannot be overstated, especially in an industry facing an uncertain revenue stream and a barrage of regulatory requirements.

DAS enables wireless carriers to broadcast their signals over the same fiber infrastructure. It enables hospitals to provide pervasive, high-speed wireless coverage across their own campus facilities, but also to physician offices and affiliated clinics in the surrounding area. Advanced features like capacity steering and location services enable an enhanced experience for patients by helping doctors respond more quickly and directing them to emergencies.

Opportunities to advance care and lower costs

As healthcare reform continues to take hold, the focus on hospital efficiency and patient outcomes will intensify. More and more hospitals will rely on telemedicine to treat patients. Consumers will initiate medical interactions through their mobile devices. To help manage chronic conditions, they will turn to wearable devices, remote health monitoring and virtual care. These digital health measures will increase the demand for analytics and highly resilient clinical systems. Cost-conscious providers will look to the cloud to capture, aggregate, analyze and back up the data.

The healthcare industry's ability to leverage cloud, analytics and mobile technologies to streamline costs, enhance efficiency and deliver managed care in new, innovative ways will depend on the underlying network. Converged fiber networks provide a far better platform for accomplishing these objectives.

IBM builds next-generation networks

At IBM, we've made it our business to understand our clients' needs and objectives. We provide network solutions in the context of those requirements. We design, deploy and manage networks that drive business growth and innovation.

Today our network solutions are helping transform healthcare, reinventing service delivery and cost for the digital age. IBM NextGen Campus Networks leverage PON and DAS technologies to meet increasing demand for fast, reliable bandwidth while dramatically lowering operating costs, energy consumption and management complexity. By increasing access to patient records, facilitating physician collaboration and driving innovative care options, these converged fiber networks enable you to deliver better patient and business outcomes. They can be easily configured for the user and bandwidth density of your hospital campus, and they are modularly structured so you can deploy advanced features as needed.

Our ability to bring together all of the software, applications and technologies required for effective networking today—from LAN, wireless and WiFi to cloud, mobility, analytics and security—enables you create a highly efficient, sustainable platform for the delivery of healthcare services now and in the future.

For more information

To learn more about PON, DAS and IBM NextGen Campus Networks and assess the potential for your organization, contact your IBM representative or IBM Business Partner, or visit:

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^{1,2} In IBM client engagements, PON has been shown to reduce capital costs by 30–55 percent and ongoing operational costs by 30–70 percent. Individual results may vary.



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