



‘Generation Data’ - shaping the future of healthcare IT

Introduction

‘Generation Data’ is shaping the future of healthcare IT – are you ready?

Leading healthcare organizations are transforming the industry with new digital tools such as wearable sensors, AV systems, telemedicine and mobile apps. And they’re using them to create lower-cost services that are smarter and more patient-centric.

Now is the time for healthcare providers to prepare for ‘Generation Data’ – the emerging data-centric, data-driven world – so they don’t need to ‘rip and replace’ their infrastructure later on.

The answer is to consider your current IT infrastructure, and act now to get the right wired and wireless networking technology and communications in place. At Panduit, we can help ensure you’re ready for Generation Data, with an infrastructure backbone that’s robust enough to support today’s peaks in demand, whilst preparing you for the future.

As part of that journey, it’s worth looking closely at two big industry trends: security and data centralization, both of which can improve your patient care.



1 Security: protecting patient and clinical data

Modern healthcare organizations operate in a highly connected and wireless world, making data security a major issue. And with the volume and diversity of platforms running on connected endpoint devices, security is becoming a significant technical and logistical challenge.

Healthcare IT teams are used to applying software-based cybersecurity measures, such as data encryption, antivirus and firewalls. However, while these are important to implement, it's the physical security systems that provide a first line of defense in the battle against information theft.

Physical security

Physical security can be easy to overlook when healthcare IT departments consider their information security strategies. However, the sensitivity of patient medical records and potential disruption to care make physical security of paramount importance.

“Physical security is the first line of defense against network and equipment threats,” says Marisa Mrozinski, Product Manager at Panduit¹. The following areas are therefore worth considering as part of an overall physical security strategy.

Port security

Securing hardware is important because it presents a physical block to somebody who is trying to take control of the equipment or access the network. So, by physically limiting access to network hardware, you can effectively prevent unauthorized alteration to network devices or the theft of data.

One of the easiest ways for a hacker to get access to hardware is via the USB port. These are ubiquitous, and it just takes a few minutes for a flash drive to be plugged in and used to launch network access software.

However, physical security can be as simple as installing port security solutions, such as USB block-out devices, which can only be removed with a key.

1. <http://panduitblog.com/2019/05/07/security/physical-security-is-first-line-of-defense-against-network-and-equipment-threats/>

A former student was recently in the news for destroying 59 university computers using a 'USB Killer' device – a weaponized thumb drive that discharges electrical current, also damaging seven computer monitors and computer-enhanced podiums that had open USB slots². "Fortunately, it is easy, and inexpensive, to prevent these types of activities," Marisa comments.

Along with port security, hospitals, surgery centers and clinics should also consider the full range of physical security: tamper-resistant faceplates, equipment locks and computer cages, all of which play a part in protecting your physical and digital estate.

Cameras and access control

Security cameras can operate as cost-effective devices attached to the computer network, delivering coverage across the healthcare facility, including the server room. Together with door and area access control hardware such as room access keypads and key cards, they can provide a powerful security solution.

The combination can help to secure everything from car parking facilities to pharmaceutical storerooms, pediatric wards, and emergency rooms.

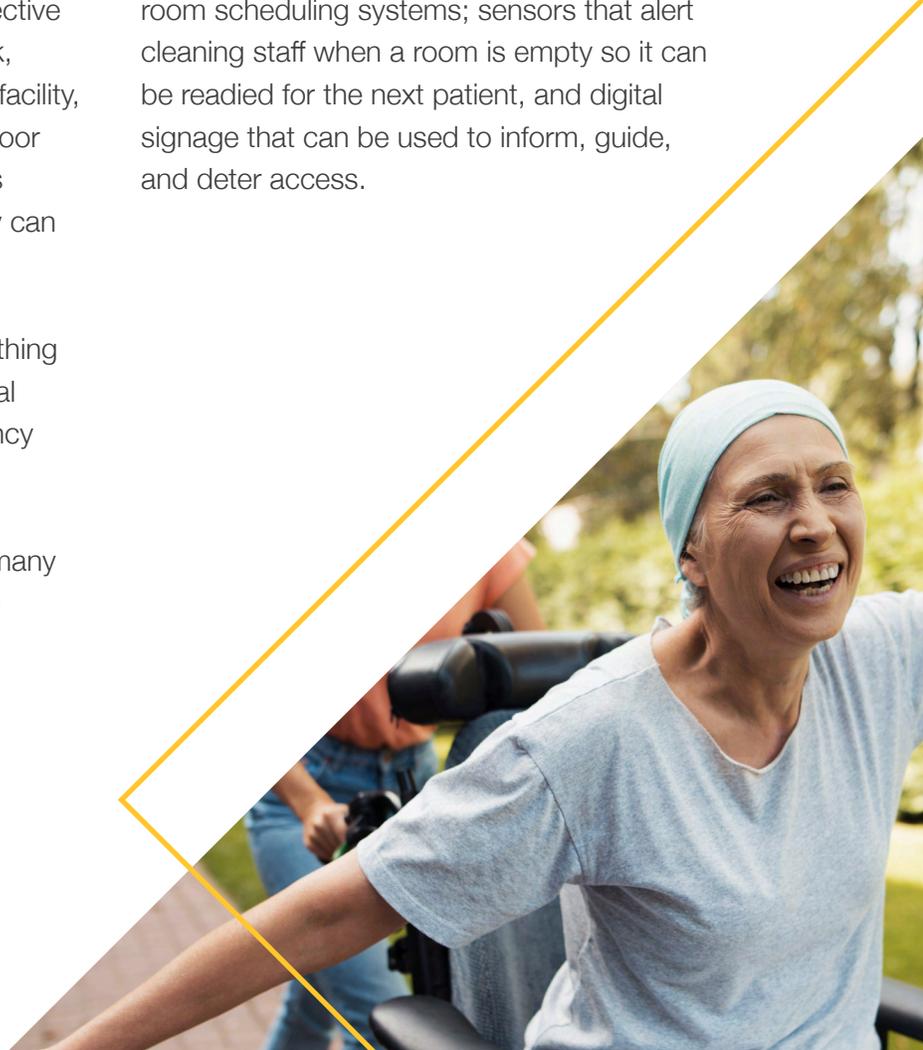
Today's network-attached cameras have many advantages over previous solutions. Video surveillance systems are now lightweight, inexpensive and integrate easily into the network.

They also provide high quality digital video and store it on hard drives rather than tape media, making it much easier to store, search and archive, as well as access from anywhere in the network – including the Internet. And they can also be set to record continuously, at particular times, only when they detect movement, or when a door is opened, further improving security across the facility.

When it comes to considering access control solutions, many options are available using key cards, tokens or biometrics to ensure only the right people have access to particular rooms or areas. An electronic access system can track each individual user, and create a log that shows who requested access or entered a particular location, and at what time.

Other features that can ensure day-to-day operations are safe and smooth running are: room scheduling systems; sensors that alert cleaning staff when a room is empty so it can be readied for the next patient, and digital signage that can be used to inform, guide, and deter access.

2. <https://www.zdnet.com/article/former-student-destroys-59-university-computers-using-usb-killer-device/>



2 Centralizing patient data: the future of healthcare

As healthcare firms come to rely more on patient and systems data, using it to improve patient care and outcomes, data centralization is becoming a vital aspect of future healthcare services. To support data centralization, strong pathways and networks are required, enabling organizations to centralize their data and store, analyze, share and disperse it more easily across their infrastructure – easily, quickly and securely.

Panduit has experience supplying such networks, and has developed a comprehensive solution based on high-bandwidth copper cabling, optical fiber and wireless technologies to deliver high data throughput with low latency. By making a network like this the backbone of your healthcare infrastructure, you can confidently deliver the full spectrum of services, from mobile apps to networked hospital equipment.

Healthcare service providers across the board are already experiencing the benefits of data centralization, accessing information through mobile and remote connectivity. The following examples indicate what's possible now, and highlight some exciting initiatives that are just around the corner.

Mobile healthcare

The first area with huge growth potential is: mobile access to healthcare services - for patients, doctors and clinical workers alike. According to a survey from Spyglass Consulting Group, 90% of hospitals are making significant enterprise-wide investments in smart phones and secure mobile platforms³. They aim to address the mission-and patient-critical communications requirements of clinical and non-clinical mobile workers within and outside the hospital.

The study found that the most common communications challenges that clinical workers face include communications overload. Clinicians also suffered from a lack of standardized processes, which can introduce medical errors into care processes. And they expressed a dissatisfaction with existing communications tools provided by hospital IT.

Modern mobile devices can help solve these issues, as long as hospitals build a strong foundation for healthcare mobility, says Siddharth Shah, an analyst for Frost & Sullivan⁴. He says, “My main advice for other hospitals is, don't underestimate the physical components. You can't just hand people an iPad and hope it's all going to work. Providing enough Wi-Fi coverage, Bluetooth Low Energy and cellular connectivity in all areas of the hospital is important. And cybersecurity is the biggest challenge by far. There's no fool proof solution but implementing the right controls can help.”

3. http://www.spyglass-consulting.com/press_releases/SpyglassPR_CLINICAL_COMM_2018.v1.0.pdf

4. <https://healthtechmagazine.net/article/2019/01/mobile-devices-help-providers-transform-patient-experience>

Many hospitals and clinics are already using iPads and mobile tablets for daily tasks, from patient registration to the doctor's daily rounds⁵.

Not only does it replace the traditional clipboard, it also gives healthcare professionals on-demand access to patient details, wherever they are in the system. And it means that specialists, therapists, pharmacists, lab clinicians and others all have access to up-to-date information so they can provide the care that is needed.

Mobile devices are also being used in hospitals for entertainment, food ordering, education and communication. And Virtual Reality (VR) and Augmented Reality (AR) are expected to improve the user experience and functionality of medical and non-medical apps in the future.

AV in healthcare

AV (audio-visual) systems in hospitals is another emerging trend that relies on having a robust network that supports data centralization.

Working with Atlona, a Panduit company, The Anaesthesia Associates of Massachusetts implemented an IP-based AV as a Service (AVaaS) conferencing solution⁶. The service is scalable, with high levels of uptime, and centralized management, and enables hospitals to bring remotely-located medical experts together in a conference room to share expertise and monitor individual operations via video.

Another healthcare business, Illinois, US-based Blessing-Rieman College of Nursing & Health Sciences, introduced AV at its dedicated education center for teaching and training⁷. The college, which is situated near Blessing Hospital, uses Atlona's OmniStream AV-over-IP platform at its Simulation Center. It features a complete hospital unit with nine patient rooms and five control stations, where students are offered specialized instruction and a sophisticated learning environment to master clinical skills.

As well as conferencing and training, AV is also being used for messaging in waiting rooms, and dynamic and tailored digital signage throughout the hospital. Among its advantages are that it's engaging, timely, and offers the human touch, while assisting the flow of movement around buildings.

5. <https://www.bosstab.com/au/blog/2019/six-ways-ipads-and-mobile-tablets-are-used-in-hospitals/>

6. <https://atlona.com/resources/case-studies/aam-greenpages/>

7. <https://atlona.com/resources/case-studies/blessing-hospital/>



Online consultations

An additional growth area for AV is online medical consultations. These are on the rise, with US startups like Doctor on Demand starting to gain traction⁸. The company's CEO, Hill Ferguson, says Doctor on Demand can handle 90% of the consultations that happen every day in urgent-care facilities, at a far lower cost. It employs its own doctors and video consultation services are staffed around the clock, seven days a week.

And in the UK, online video consultations are already being used routinely, with Push Doctor, [pushdoctor.co.uk] a business based in Manchester, UK, working with over 7,000 registered General Practitioners. The service connects patients to doctors using secure online videoconferencing, and can be used with a PC, mobile or tablet app.

8. <https://techcrunch.com/2018/04/25/video-consultation-service-doctor-on-demand-raised-74-million-so-everyone-can-see-a-doctor-anytime/>



Telemedicine

Healthcare network transformation is giving rise to sophisticated Remote Patient Management (RPM) or Telemedicine, and patient monitoring services. These use cloud-based technologies, vital monitors and big data analytics to improve decision-making and enable cost-efficient virtual care across remote locations, including patients' homes.

And as sensor equipment becomes more sophisticated, it will be possible to collect more accurate and granular vital data, including blood pressure readings, heart rate, breathing, glucose levels, weight, and even brain and other vital organ activity, in order to further improve patient care⁹.

By the end of 2023, the RPM market is expected to be worth more than \$31.3 billion, increasing 97% in value from 2017¹⁰.

The advantages of RPM include: eliminating unnecessary visits in person; optimizing time spent with patients; lowering nursing and hospital costs and improving communication.

RPM is already making a difference today, with Pittsburgh, US-based UPMC Magee-Womens Hospital employing it to reduce postpartum hypertension visits by 57%, while also improving patient engagement¹¹.

Critical Care

Telemedicine and remote patient care can literally be life-changing in certain circumstances.

- They provide the ability to consult with a specialist anywhere in the world for timely advice and interventions.
- They extend the reach of healthcare providers to rural populations that don't currently have access to local ones.
- They assist aging or non-ambulatory patients who have difficulty traveling to a clinic.

Other telemedicine trends that will shape the future of the healthcare industry include the ability to automatically collect information, and run analytics on aggregated patient data in the cloud, in order to improve treatments.

Additionally, hospitals and insurance companies are starting to securely store medical records in the cloud so patients can access test results online 24/7. This reduces paper and saves time for health service providers.

9. https://www.researchandmarkets.com/research/d5b9k7/2019_report_on?w=4

10. <https://www.prnewswire.com/news-releases/global-remote-patient-monitoring-market-report-2018-2023-featuring-qualcomm-life-osi-systems-philips-healthcare-abbott-laboratories-and-ge-healthcare-300638144.html>

11. <https://www.healthcareitnews.com/news/remote-patient-monitoring-smartphone-cuts-one-week-post-partum-visits-57>

Power over Ethernet lighting

Finally, running your lighting across your cabling network using Power over Ethernet (PoE) has huge advantages in healthcare settings, enhancing patient care and comfort in particular.

Studies have found that lighting can improve patient diagnoses and recovery time, decrease anxiety in patients and their families, and increase employee productivity. When paired with other digital building systems, lighting sensors can help determine room occupancy to control heating and cooling and facilitate housekeeping; can alert staff when patients leave their beds; and can even quiet staff if noise volumes pass a threshold.

With the ability to cost-effectively illuminate large public areas, PoE lighting can enhance patient safety and improve the comfort of waiting rooms. The technology is safe and stable, dating back to 2002. PoE is now used to deliver power and bandwidth to a myriad of devices ranging from traditional VoIP phones to wireless access points, digital signage and cameras.

For hospitals and clinics, PoE LED lighting has the advantages of being cost-efficient, with a long operating life, reduced energy consumption and a color temperature that reduces eye strain, due to the wavelength the LED uses.

Panduit has tested PoE lighting and cabling infrastructures extensively, coordinating with the relevant standards bodies and their testing facilities. We also work with a vast network of PoE lighting manufacturers, all of which gives us the ability to deliver a PoE solution for today's future-ready smart buildings.



Conclusion:

The importance of a strong infrastructure

Innovations such as mobile healthcare, telemedicine and big data analytics all require a strong, future-ready network infrastructure that supports peak performance. The network must be robust enough to support critical healthcare functions such as the rapid transfer of digital imaging, the use of robotic surgery, which is on the rise, essential pharmacy inventory and management systems, and sophisticated nurse call systems.

Panduit helped to implement such a network for Illinois, US-based Elmhurst Memorial Healthcare¹². This high bandwidth copper, fiber and wireless solution has dramatically improved healthcare service levels across the organization.

Healthcare professionals at Elmhurst are able to rapidly and securely share electronic medical records, X-rays, lab results, and other test results, at the same time, from different locations.

As for patients, the computer next to their bed allows caregivers to spend more time with them and less in the doctor's office or nurse's station. Plus, patient beds are smart, with movement sensors, voice-based translation modules for more than 70 languages; and medication schedule alerts.

"The new Elmhurst Memorial Hospital is an ideal blend of the practical and the beautiful. We have carefully designed it with the future in mind so that it can accommodate changes in healthcare, ensuring it will be as functional 50 years from now as on opening day," says Leo Fronza, former CEO of Elmhurst Memorial Healthcare.

Examples like Elmhurst demonstrate how Panduit is a technology partner with a vision for the future. We work with healthcare organizations to put into place IT solutions based on future-focused patient and business needs. We do this by building a robust, reliable and secure physical infrastructure to support patient-centered care. This enables you to embrace new medical technologies, and allow for future growth with flexibility and scalability.

12. https://pages.panduit.com/Elmhurst_LP.html

Panduit is highly active in standards development and industry advancements, driven to solve customer challenges and exceed expectations with best-in-class product solutions, service and support.

Contact us to learn how our innovative network infrastructure solutions can impact your facilities.

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