THE FUTURE OF HEALTHCARE: MAKING A CONNECTION

A Unite Private Networks E-Book

ABOUT
UNITE PRIVATE NETWORKS

Since 1998, Unite Private Networks (UPN) has provided next generation high-bandwidth, fiber-based solutions across over 300 cities within 21 states. Enterprises, governments, schools, carriers, data centers, and hospitals leverage UPN's services including dark and lit fiber, private line, optical Ethernet, Internet access, data center services, and a vast array of customized solutions to ensure success. UPN is headquarted in Kansas City, MO and maintains a network footprint that encompasses over 8,500 metro fiber route miles with over 6,000 on-net buildings.

UPN maintains a special focus on the healthcare vertical, designing secure custom network solutions that guarantee the seamless and secure delivery of patient data across complex medical ecosystems while protecting confidentiality and ensuring compliance.

IN THIS E-BOOK

DIGITALIZATION
OF HEALTHCARE

Over the past two decades, a wave of digitization has advanced the healthcare industry, which brought forth vast improvements in doctors' ability to serve patients. Some say Information Communications Technology (ICT) development in the medical field is in its infancy, with few facilities having the infrastructure and technology utilization (buy in) to be considered a true "smart hospital." Still, patients visiting the typical healthcare facility today experience several benefits from ICT.

For example, take primary care–general physicians, who leverage technology on a routine basis to prescribe medications, access disease registries, and reference electronic medical records. Patients, outside of doctor visits, regularly take advantage of consumer health IT applications to easily share information with their doctors and receive rapid, around-the-clock treatment.

Collectively, this ecosystem of applications helps doctors provide diagnosis and treatment more quickly, minimizing errors, and offering safer care at a reduced cost.

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In more complex environments, such as hospitals, heavy machinery and massive databases are increasingly networked to provide seamless and comprehensive advanced care. Akin to voice and data networks converging across office environments over the years, biomedical devices are converging in hospitals. Some new medical disciplines are even fully predicated on ICT, such as biomedical engineering. In fact, some hospitals consider biomedical engineering to be part of their information service department rather than a medical department – even though its ultimate goal is to treat patients like any other care unit.

Now that heavy medical machinery is reliant on a hospital's network infrastructure, and not just clerical systems, reliability, speed and uptime are even more mission critical in healthcare environments.

Lags and downtime can severely hurt the quality of care and even result in loss of life. It doesn't get any more mission critical than that.

THE QUEST
FOR INTEROPERABILITY

The American Hospital Association (AHA) estimates hospitals spent $47 billion annually on ICT between 2010 and 2013. Much of this investment was driven by facilities striving to meet the mandate set forth by the Medicare Access and CHIP Reauthorization Act of 2015 (MACRA). The legislation declared a national objective to establish comprehensive exchange of health information through interoperable certified electronic health record (EHR) technology by December 31, 2018. Interoperability is the ability to electronically send, receive, find, and integrate or use key clinical information between disparate medical organizations.

Considering that the average patient sees multiple doctors from different types of facilities as part of a comprehensive treatment plan, having a unified platform that allows for simple transference of data would be a major boon to the industry and all around continuity of care. and needs.

Interoperability will not only link hospitals, but also allow pharmacies, retail clinics and imaging centers to all have real-time access to the same important information, so they can further specialize the care they provide each patient according to his or her specific circumstance

The **consequences** of inadequate interoperability plagues hospitals on a daily basis. Examples include specialist reports coming through illegible when transferred from one hospital to another, data points appearing in wrong sections, and critical fields missing in care summaries. These errors can lead to devastating mistakes and have been a major speed bump in collaborative care.

Sadly, as of 2015, only half of hospitals were able to receive critical patient information when needed from providers outside of their own network ecosystem. As of 2017, less than 30% of health systems EHRs were fully interoperable and less than 20% actually used data transferred from an outside source. The primary pain point in achieving interoperability is the inability to receive information from outside sources. In order to be interoperable, a hospital must have a secure network that meets HIPPA compliance (not an easy task) and is robust enough to rapidly send and receive massive data sets. It's important to note that there is a much more significant cost in the absence of interoperability – **not to mention its impact on every hospital, consumer, and tax payer.**

> Investment in the right network infrastructure brings major gains to the quality and efficiency of care.

CLOSING THE CARE GAP
WITH TELEMEDICINE

In the United States, the all-cause mortality rate in 2014 in urban areas was 704.3 per 100,000 population, compared with 830.5 per 100,000 in rural areas. In remote areas, patients don't have the plethora of specialists as in major metropolitan areas. Even though approximately 20% of the nation's population lives in a rural area, only about 10% of the nation's physicians are located in these often-isolated locations. On a bright note, telemedicine, the practice of using ICT to provide clinic health care from a distance (remotely) is working to bridge the gap in quality and breadth of care between urban and rural environments.

This practice uses robust networks to connect remote clinics with major hospitals affording rural patients the ability to "virtually" take advantage of more specialized health services available in more densely populated areas. There are currently about 200 telemedicine networks, with 3,500 service sites

ALL-CAUSE MORTALITY RATE

Urban Areas

704.3

per 100,000 population

Rural Areas

830.5

per 100,000 population

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in the United States. As telemedicine matures, the specializations available to remote patients begin to mirror those found in major urban medical centers. Telepharmacy, telerehabilitation, and telecardiology are just some of the specialized telemedicine services available today. In addition to facilitating remote interactions with doctors, one of the major tenants of telemedicine is remote patient monitoring sites. **As an example, nearly 1 million Americans are currently using remote cardiac monitors.**

A requisite for telemedicine is real-time, two-way interactive communication between the patient and the physician or practitioner at a distant site. At a minimum, uninterrupted audio and video is required, but more effective telemedicine operations include asynchronous or "store and forward" transfer of data collected from monitoring devices and cameras.

Telemedicine has brought major healthcare improvements to rural Americans, but the global impact is far larger, with millions of patients using telemedicine to monitor vital signs, remain healthy and out of hospitals and emergency facilities. ■■■

"SMART HOSPITALS"
THE FUTURE

Healthcare technology and underlying network infrastructure has come a long way over the past two decades, but there's still tremendous room for advancement. Ultimately, healthcare facilities must weave ICT into their patient-facing operations to the point they are considered "smart hospitals". Analyst firm, Frost & Sullivan considers, "smart hospitals [to] optimize, redesign, or build new clinical processes, management systems and potentially infrastructure, enabled by underlying digitized networking of interconnected assets, to provide a valuable service or insight, which was not possible or available earlier, to achieve better patient care, experience, and operational efficiency."

Essentially, smart hospitals create new health services that were not possible before the implementation of networked ICT. Biomedical engineering, as aforementioned, is a prime example of a new medical field born out of ICT advancements. Frost & Sullivan believes that hospitals will spend more than $5 billion on cloud computing, data analytics, and remote patient monitoring by 2025 in those areas. In the same period, the analyst firm also projects the industry will spend approximately $12 billion on hygiene management, pharmacy automation, patient flow solutions, secure communications, mobile asset tracking and smart rooms.

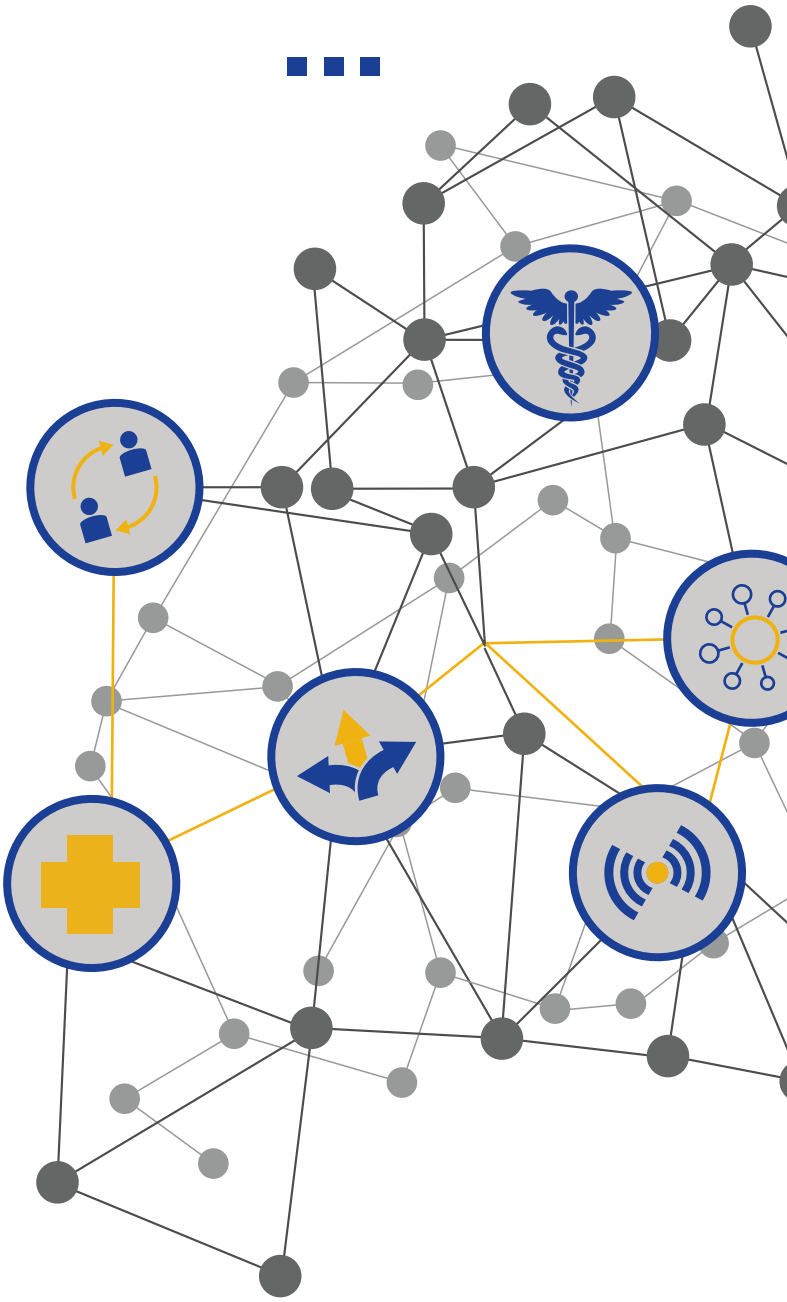
For patients, smart hospitals translate to better quality of care, more personalized services, and far fewer errors in the delivery of care. In order to achieve "smart hospital" status, facilities need not only focus on augmenting their own technological capabilities, but ensure full interoperability, so they may receive, synthesize, and collect sensitive medical data with facilities outside of their own brick and mortar network networks, network infrastructure and technology ecosystem. ■ ■ ■

SMART NETWORK
FOR SMART HOSPITALS

With the magnitude of connected devices within medical facilities increasing rapidly to fulfill interoperability and smart hospital initiatives, more robust and resilient telecommunications networks are required to power the healthcare industry. As of 2000, medical networks demanded fully redundant and parallel network topology – since not even planned downtime for maintenance is permissible.

After all, lifesaving equipment requires seamless connectivity these days and a successful procedure may rely on receiving real-time information from an external facility or institution.

In addition to resiliency, speed requirements have grown significantly as medical equipment collects increasingly larger datasets and shares them between other heavy machinery and facilities. Best practices require a 10GB network at minimum, but faster capacity would serve to help future proof intuitions for new data intensive practices made possible by evolving technologies.



UPN - ENABLING
ICT/ TELEMEDICINE

When architecting network solutions for the medical sector, UPN has both the provider and patient in mind. We design and deploy an infrastructural foundation that enhances quality of care, while controlling costs – another "mission critical" item for healthcare institutions.

We are experts in healthcare ICT and guarantee that your network meets all compliance controls and sensitive HIPPA-protected patient is safeguarded from the threats of the public Internet. Additionally, we offer several network topologies to ensure there is zero downtime. UPN, low latency, private networks, and redundant circuits allow you to stay in compliance and set your patients' minds at ease about the security of their personal information.

SINCE INCEPTION, UPN HAS NEVER SUFFERED A DATA BREACH.

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As good as the physical infrastructure is, a resilient network must be run by learned and seasoned professionals.

Our industry-leading team of engineers monitors all elements of the UPN network (24x7x365) from our centralized NOC to ensure continuous, secure and fluid operations.

We understand bandwidth hungry applications like PACS, EMRs, and telemedicine. Unite Private Networks provides state-of-the art, highly reliable data services to enhance communications system-wide. Since we own and operate our own proprietary fiber-optic network, we can respond to any issue faster than competing networks that lease significant portions of their advertised footprint. We offer multiple Layer 2 connectivity options to meet your desired level of redundancy: point-to-point, point-to-multi-point, and multi-point-to-multipoint. Customers can choose from single and dual, diverse fiber pathways from their premises to the UPN DWDM/MPLS core network. We also offer protected ring access, diverse network access ports and switches, and built-in failover/protection with the UPN network. These options ensure that connectivity within and between medical facilities maintains the resiliency mission critical operations mandate.

UPN has significant experience enabling interoperability, having streamlined data management across multiple locations and disparate institutions. We utilize top-of-the-line equipment to transport patient data, providing you peace of mind when delivering and receiving these sensitive documents. Additionally, we are experts in Telemedicine and participate in the USAC Rural Healthcare Fund.

Major medical intuitions and their remote extensions require complex, customized network solutions. As data plays an increasingly important role in the treatment of patients, where workloads must be collected anywhere and delivered across far reaching footprints, canned

network solutions do not suffice. Customized, private fiber-based solutions are essential to ensure security and performance, while providing scalability to allow for growth as new data-intensive applications come into play. UPN has the ideal solution that allows medical operators to scale their network across lit and dark fiber environments to ensure seamless network integration.

FIBER-OPTIC INFRASTRUCTURE

YEARS IN BUSINESS

CUSTOMER RETENTION RATE

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SOURCES

http://searchhealthit.techtarget.com/tip/Health-care-network-availability-can-be-a-matter-of-life-or-death

http://www.americantelemed.org/main/about/telehealth-faqs-

https://www.ahrq.gov/professionals/prevention-chronic-care/improve/health-it/index.html

https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4449960/

http://www.healthconnect-intl.org/ictforh.html

http://www.healthcareitnews.com/news/heres-where-smart-hospitals-will-make-big-tech-investments-near-future

https://dashboard.healthit.gov/evaluations/data-briefs/non-federal-acute-care-hospital-interoperability-2015.php

http://www.aha.org/advocacy-issues/hit/interoperability.shtml

https://www.fiercehealthcare.com/ehr/interoperability-usability-research-ehrs-onc-health-it-health-systems

https://www.healio.com/family-medicine/practice-management/news/online/%7B9ad-bc230-e87b-4a49-8516-fd9811b7b780%7D/trying-to-understand-and-close-the-rural-health-care-gap?page=2

https://www.medicaid.gov/medicaid/benefits/telemed/index.html