

SD-WAN and Healthcare: CIOs Guide to Mission-Critical Transformation



White paper
By Dustin Leek
CIO, Healthcare Practice, CBTS

Consult Build Transform Support

The healthcare industry is undergoing an unprecedented transformation these days, both in terms of the new technologies and services it provides and the way it provides them in an increasingly digitized economy.

But while this represents a tremendous opportunity to cut costs and improve the quality of care, particularly in the most under served areas of the globe, it nevertheless presents healthcare providers with a number of significant challenges. Like any business, healthcare exists in a highly dynamic commercial and regulatory environment, which means individual players must be proactive in order to capitalize on emerging opportunities to avoid being overtaken by more progressive healthcare institutions.

At the same time, however, healthcare is highly data dependent and must, therefore, employ cutting-edge infrastructure in order to deliver successful patient outcomes. Traditionally, however, this infrastructure has been mired in fixed hardware–software architectures that are not only expensive and difficult to manage but highly resistant to change: the exact opposite of what a modern digital business needs to survive.

The pain of integration

The pain points in this type of environment are numerous. For one thing, mergers and acquisitions are exceedingly difficult when legacy infrastructure cannot be integrated properly. This isn't just a matter of making sure e-mails get through or that the phones work. Modern healthcare organizations exchange data in a wide variety of ways, from voice and video conferencing to medical imaging and telemedicine applications, which means the network must be adaptable to a wide variety of protocols, file formats, and packet sizes.

Establishing basic connectivity among disparate environments is difficult enough, but the challenge becomes even more acute when the need for end-to-end visibility is taken into account. Even among broadly integrated legacy environments, the tendency over the years has been to establish point solutions for the various piecemeal resource configurations that are brought online over time. Not only does this produce a level of complexity in the management stack that is highly expensive to maintain, it ultimately hampers the ability to optimize data flows because no single monitoring solution can provide a complete picture of the data environment or drill down to the source of most bottlenecks: the poor exchange of data from one system to another. This is how many IT departments get caught off guard when performance wanes even though each individual monitoring system is in the green.

In the very near future, of course, this need for end-to-end visibility and control will not only encompass the data center and the cloud but must extend all the way to the IoT edge. Healthcare is already one of the most device-centric industries on the planet, and this will only accelerate as billions of devices start streaming health-related data around the clock from hospitals, homes, and even our bodies.

Not all of this data will be funneled to centralized resources, however. A large portion will end at processing centers on the edge where they can more quickly act on it in emergency and even many non-emergency situations. But the load making it back to the cloud and data centers for more in-depth analysis is still expected to be quite large, which means the network must not only be flexible but also highly intelligent to the point of making autonomous decisions as to what data goes where and what is the best way to transport it.

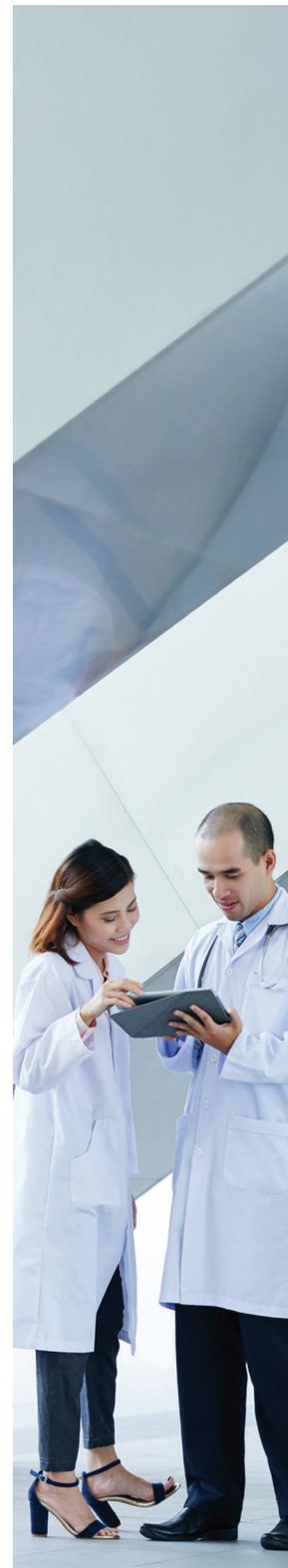
All the while, this new healthcare wide area network must set new records for availability, reliability, and performance. When lives are at stake, any downtime is life-threatening, and yet, like any technology, network systems fail from time to time. In the traditional data environments, the aim was to guard against outages at all costs, but in this new environment in which failure is recognized as inevitable, the focus must shift toward rapid recovery and minimization of data loss, which can only be achieved by a highly flexible and largely autonomous network infrastructure built on broadly federated abstract resources.

Using SD-WAN decreases hospital costs

This is why many healthcare companies are rapidly transitioning to the Software Defined Wide Area Network (SD-WAN). SD-WAN supports the ability to bring in multiple, carrier-agnostic Internet links without increasing costs. Many healthcare providers utilize Multiprotocol Label Switching (MPLS) or dedicated Internet links, which are high-dollar and low bandwidth. These solutions also don't provide the scalability and flexibility required for the high-quality image-intensive technology of the future.

If these links go down, it often takes hours to get them back up again, and in healthcare, mere seconds of downtime can be critical in life or death situations. However, in the SD-WAN world, by leveraging multiple transport modes, whether it is MPLS, dedicated Internet, broadband, or another connection when one link goes down, the network chooses another path without interrupting service.

"So, for sending large files like X-ray images, CT scans, etcetera, SD-WAN will optimize the network performance," said Jon Lloyd, Director of Cloud Networking at CBTS. "SD-WAN enables you to bring in multiple connections to ensure you are always-on as opposed to relying on a single link or some manual failover process."





A standardized network is integral in health system consolidation

When it comes to integrating disparate legacy networks, the key benefit of using an SD-WAN architecture is its ability to incorporate a wide variety of network architectures without the cost and complexity (and potential disruption to service) of a major overhaul.

"SD-WAN creates an overlay where it doesn't matter what the transport is," Lloyd said. "I can now acquire a practice that's got MPLS or DIA from one provider, broadband from a second provider, and LTE from a third provider that is not transport dependent and bring them into my sites without having to redesign the network."

With so many sites within a healthcare system, administrators also need a way to prioritize traffic. Some providers install two MPLS lines at each site, which is extremely expensive. With SD-WAN, at major facilities such as emergency rooms, these providers may keep one MPLS line but reduce the other line to dedicated Internet.

However, outpatient or mobile facilities within the system may have one dedicated Internet line and one broadband line. These facilities are often open only one or two days a week, so their needs are less rigid than that of a 24x7x365 facility.

"Hospitals are no longer a physical brick-and-mortar building," Lloyd said. "They are an entire ecosystem of healthcare. SD-WAN allows them to build the network for each of those business units uniquely without having to sacrifice uniformity for standardization across the board."

Whether it's with Microsoft 365, Cisco Webex, Zoom, or another collaborative technology, healthcare professionals need conferencing tools, and many of these are cloud-based. Healthcare systems no longer keep their media servers on premises, and many technology providers don't even offer or support this technology anymore. So healthcare is being driven to the cloud by the enterprise applications they rely on.

Many healthcare organizations also participate in private clouds with their electronic medical record systems. Bigger hospitals sometimes buy the licensing for the software, and smaller practices pay a fee for access. SD-WAN ensures these practices have the same network benefits as the host hospital.



SD-WAN transforms voice technology

Voice technology is critical for healthcare systems. While clinicians share much of their data via the Internet, they also need to confer with each other and with their patients via phone. However, with mergers and acquisitions, systems often find themselves faced with phone numbers, extensions, and dial plans that don't map to their existing system. With SD-WAN, hospitals can move their voice to the cloud, so it is all part of the network. Like with Internet traffic, by using multiple modes of transport, if one voice line fails, there is another connection that can pick up the traffic. SD-WAN makes dynamic decisions on which available Wide Area Network path to use for voice and video traffic, and performs dynamic path changes in real time without breaking the connection and with as little degradation of quality as possible. This is critical functionality to maintain quality voice and video service in healthcare.

SD-WAN also ensures hospitals maintain voice communication even if they lose power, and it's a significant cost savings compared to traditional physical lines and hardware.

With CBTS solutions, healthcare facilities receive an IT partner

Whether a healthcare system has an IT staff that is small or large, it can benefit from a partnership with CBTS.

"By partnering with us, they're adding a team of expert engineers, kind of like that pocket resource, to monitor the network and make any changes. Plus, we are able to give our client's IT staff their nights and weekends back as our expert engineers monitor, manage, and support their networks 24x7x365," Lloyd said.

CBTS has a standardized implementation process in which a trained team of professionals creates a complete network design, orders the equipment on behalf of the customer, and rolls it out quickly and efficiently through cloud provisioning. If there is an issue during or after implementation, CBTS is ready to troubleshoot and remediate it remotely. If there is an issue during or after implementation, CBTS has an Enterprise Network Operations Center staffed 24x7x365 to find and remediate the cause while optimizing the network going forward to remove risk.

Through a virtual dashboard, healthcare systems can also view their network data and make adjustments. For example, administrators can identify high-bandwidth users—such as patients in the waiting room using their mobile devices to video chat or browse YouTube—and scale back their bandwidth allowance so the network runs smoothly for everyone. The ability to prioritize the transmission of certain application specific data over other less-service impacting applications with SD-WAN enables healthcare providers to access the information they need when they need it to improve the quality of care for their patients without impacting the waiting room experience.

Healthcare systems can also ensure they have the bandwidth needed to prioritize medical equipment such as a heart-monitoring device over something as simple as an administrative e-mail. They can also set security policies from the central dashboard, so all locations have the same security protections as the central hospital or clinic. This eliminates the time and man-hours of visiting each site to make a change.

Prescriptive solutions

CBTS is committed to delivering prescriptive solutions to our clients. Because we understand the healthcare space and its needs, we can identify the right solution for an individual system. With an impressive and extensive list of certifications across best-in-class vendor partners, CBTS confidently delivers exceptional cloud migration strategies and implementation capabilities to support and future-proof even the most complex healthcare systems.

“We understand your business outcomes, and we’re building an ecosystem that we could consider a kind of black label or a black box,” Lloyd said. “You don’t necessarily care what’s underneath it. This is how you want it to work, and you want to call one number for support. So, we have the flexibility to still give you that same operational ease. We support it to a standardized point, and we bill it to a standardized point, while customizing where needed, but we’re choosing best of breed to meet your specific needs.”

To learn how SD-WAN as a managed service from CBTS can provide reliable, future-forward networking solutions for your healthcare system, contact us at www.cbts.com or **866.587.2287**.