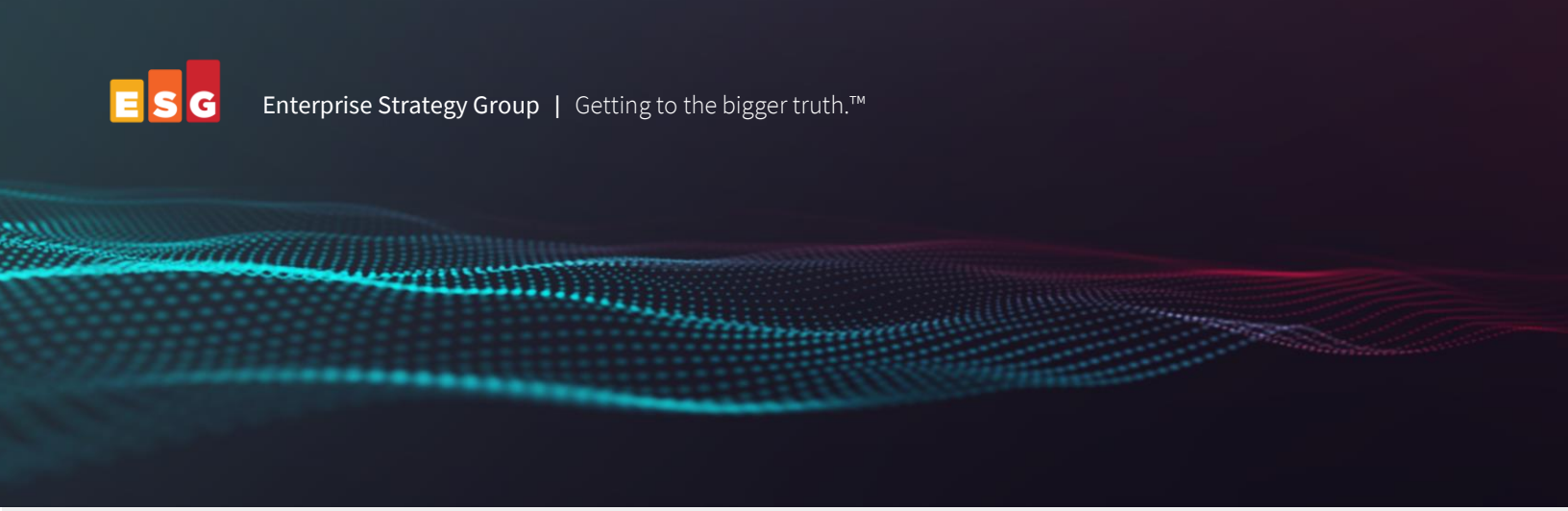


ESG WHITE PAPER

# Healthcare's New Normal: A Highly Connected and Optimized Network Environment

## Placing Greater Reliance on Enhanced Network Security, Visibility, and Analytics

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September 2020

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## Introduction: The New Normal for Healthcare

Rising numbers of organizations are traveling down the digital transformation path, and this especially holds true for the healthcare industry. Healthcare organizations are increasingly embracing digital transformation to provide the proper policies, processes, workflows, and IT environments to deliver an enhanced experience to their customers and become more operationally efficient.

In fact, ESG research shows that 23% of healthcare organizations report having mature digital transformation initiatives, up from just 7% two years ago, while 55% report they are in process with these initiatives.[1] In addition, the two top goals for healthcare organizations' digital transformation efforts are delivering a differentiated customer experience (58%) and becoming more operationally efficient (58%), while operational efficiency is the most often cited goal for respondents across all surveyed industries (55%).


Digital transformation is driving greater reliance on the network. As IT environments are becoming highly distributed, growing numbers of services, applications, and devices (beyond tablets, laptops, and mobile phones) are being deployed at the edge. ESG research shows that 40% of healthcare organizations have IoT initiatives underway, with another 40% planning to deploy IoT initiatives within 12-24 months.[2] This includes connected medical and IoT devices; IP cameras (for authorized, continuous real-time patient monitoring); retrospective data collection and analysis (for review of medical errors, patient safety events, and methodologies focused on nonroutine care); workstations; VoIP phones; networked TVs or digital signage to provide general information and entertainment; telemetry; and human exposure risk (HER) assessments.

Additionally, the healthcare industry is dealing with an unprecedented global pandemic. As a result, many healthcare organizations are accelerating their digital transformation efforts to both accommodate on-premises needs and enable a surge in remote workers. Plus, many healthcare organizations have had to support pop-up testing centers, field hospitals, or telemedicine sites for virtual care.

While a number of industries reported IT budgets will be negatively impacted for the rest of 2020, according to ESG research, 25% of healthcare respondents believe their organizations will increase their IT budgets, citing the increased spend is due to a COVID-19-related need for services.[3]

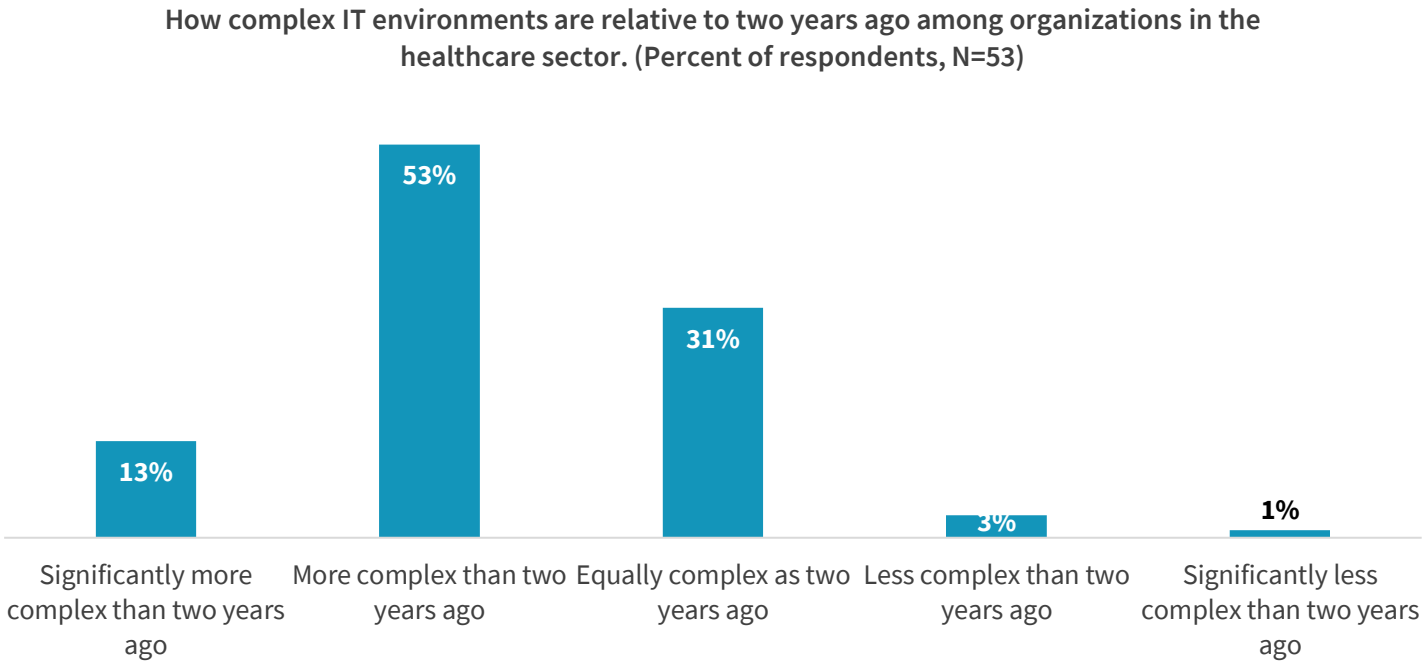
However, as these organizations accelerate digital transformation efforts to support a distributed healthcare environment, they are also tasked with supporting temporary locations and remote workers, which bring greater levels of complexity.

[1] Source: ESG Master Survey Results, *2020 Technology Spending Intentions Survey*, January 2020.
[2] ibid.
[3] Source: ESG Research Report, *The Impact of the COVID-19 Pandemic on Remote Work, 2020 IT Spending, and Future Tech Strategies*, June 2020 .

## Network Challenges for Healthcare IT Environments

IT complexity was already an issue prior to the COVID-19 pandemic: According to ESG research, two-thirds (66%) of survey respondents from the healthcare sector already believed their IT environment is more complex or significantly more complex than it was two years ago (see Figure 1).[4]

**Figure 1. IT in Healthcare Is Still Complex**




*Source: Enterprise Strategy Group*

### IT Complexity Drivers

But what is driving this IT complexity? A number of factors, and based on ESG research, the top drivers of complexity in healthcare environments include an increase in applications leveraging new modern architectures (34%); an increase in the number and type of applications used by employees (31%); and new data security and privacy regulations (31%). In addition, 29% of respondents cited the need to incorporate emerging technologies such as advanced analytics, as well as citing the increase in remote/mobile workers, and 26% said an increase in the number and type of endpoint devices are driving increased IT complexity.[5]

Consequently, healthcare organizations face even more network complexity as they must provide secure access (while mitigating risk) for proliferating numbers of applications and connected medical devices found in numerous geographically dispersed locations, including hospitals and medical centers; remote clinics and offices; and urgent care centers—and now pop-up testing sites, field hospitals, and home offices.

[4] Source: ESG Master Survey Results, *2020 Technology Spending Intentions Survey*, January 2020.
[5] ibid.

## Work from Home (WFH) Initiatives

While essential healthcare workers had to report for work every day, a larger number of workers, especially those delivering nonessential services or involved in the payer or insurance industry, swiftly transitioned to remote work. Organizations have to ensure the availability of safe and private communications as well as services and environments, while complying with industry and government regulations, specifically for:

- Telehealth and virtual care services. Organizations have to figure out how to leverage technology to deliver telehealth and virtual care services to patients (remotely and in geographically dispersed locations). In addition, working from their home offices, medical staff must securely and efficiently deliver services to patients—keeping in mind that all communications and file transfers must meet strict HIPAA regulations.

- Insurance companies. Given the scale of the medical crisis, insurance companies have to not only ensure the safety of their personnel by having them work from home, but also ensure that they can still deliver outstanding service to their customers. Because many of these interactions may also involve payment discussions, it is critical that all relevant corporate and industry regulations (PCI) are enforced, even when working from home.

## Limitations of Legacy Network Infrastructure

Challenges abound for those healthcare organizations still relying on legacy network infrastructure, like MPLS, that are expensive, take a significant amount of time to provision, and in some areas have limited availability. Yet, many healthcare providers still rely on these connections for their remote locations to connect to their data centers. While this is a dedicated link and delivers good performance, it is not feasible to use for remote workers or temporary sites. Even for fixed locations, the cost becomes prohibitive when deploying bandwidth-intensive applications, thus limiting innovation and stifling agility.

## Inadequate Network Security

The shift to working from home also significantly increased the attack surface for healthcare organizations. As result, many struggle to implement the zero-trust network access environment required to ensure secure connectivity to healthcare applications and PHI data. This will be especially important for emerging work-from-home environments and telemedicine setups.

## Lack of Network Visibility

As healthcare organizations continue to support highly distributed locations, remote workers, and an ever-increasing number of devices connecting to the network, the lack of visibility into the network can become problematic. If IT is unable to see potential issues in real time, risk increases, and network performance can be impacted. If users are unable to easily access the applications or information they require to perform their jobs, productivity decreases, and more importantly, customer experience suffers.

In these environments, trying to manually monitor the network and hoping to address issues before they become real problems (i.e., swivel chair management) is not sustainable. Operations teams must inventory, locate, and identify massive numbers of network-connected user and medical devices (regardless of location), detecting anomalous activity before it can negatively affect the entire organization (think data breach, impact to performance and user experience, and the inability to meet compliance). Additionally, during this pandemic, operators must securely manage on-premises equipment while working remotely.

## Balancing Innovation and Operational Budget

Another key area is shifting enough budget from existing operational initiatives to driving new network innovations. With the primary concern being the physical safety of its employees, IT needs to be more creative to find ways to increase the portion of its network budget for innovation and not just to keep the lights on. This will require solutions with near-term ROIs and greater security and operational efficiency.

A number of challenges are impacting healthcare networks, but they are not insurmountable. Innovative technologies can empower operations teams and deliver the secure, performant, and agile connectivity required for healthcare organizations in the new normal.

## HealthCare Must Leverage Innovative Network Technology

It has become quite clear that the current environment has placed a greater reliance on technology to enable communication, collaboration, and continued business operations. In fact, according to ESG research, two-thirds of healthcare organizations indicated that the present COVID-19 situation will make them more reliant on information technology.[6] However, technology for the sake of technology doesn't makes sense. Any technology deployed must provide real benefits that deliver against healthcare's top digital transformation goals, which include delivering better user experiences and enabling greater operational efficiencies.

That said, for the healthcare industry to reach its goals for the "new normal," innovative network technology must offer:

- Ease of use. The network technology must be easy to use, enabling centralized operations and management; simplified control and enforcement of global policies; and the deployment of the correct processes, policies, and workflows, with the ability to quickly make modifications. Technology must support cloud-based management, enabling authorized IT teams to securely administer the system from anywhere. This will also enable a simplified, cost-efficient way to remotely implement and deploy branch, pop-up, or home offices in a timely fashion, alleviating the need to send highly trained staff to properly deploy and configure new systems in geographically dispersed locations.

- Secure access and transport. Healthcare organizations must be able to employ zero-trust network access for secure and optimal access to healthcare applications, personal healthcare information (PHI), and other confidential data, essential for work-from-home employees and clinicians providing telemedicine services.

- End-to-end network visibility, enabling administrators to easily view the entire network (think all connected applications and devices) to swiftly mitigate potential risk or issues before they can escalate. IT must also be able to inventory all connected devices in real time to ensure all connected devices are authorized.

- Optimized system performance. The network must be application-aware in order for systems to run optimally, enhance security, and deliver an improved user experience. An application-aware network can distinguish between the types of connected devices and applications (think real-time and mission-critical traffic as opposed to applications that work over best-effort networks). Additionally, the network must be able to provide proactive alerts to ensure potential issues are mitigated before they can impact performance.

[6] Source: ESG Research Report, *The Impact of the COVID-19 Pandemic on Remote Work, 2020 IT Spending, and Future Tech Strategies*, June 2020 .

- Detailed analytics and AI. Organizations must employ detailed analytics and AI across the entire network and all connected devices to effectively understand and benchmark normal, day-to-day operations as well as gain real-time business intelligence and customer insights to improve performance, security, and user satisfaction.

- Sufficient bandwidth for availability, innovation, and growth. Video and collaboration solutions are bandwidth-intensive, so it will be important to acquire sufficient bandwidth to support them. Ideally, organizations would provision multiple links for high availability. In cases where multiple fixed line connections are not available, the ability to leverage cellular connections (4G/5G) as a backup will be essential. Transitioning to fixed broadband connections (from MPLS) provides increased bandwidth rates typically for lower costs. This additional bandwidth will not only accommodate future growth but also enable new and innovative services to be delivered, such as diagnostic and imaging tools and remote surgery.

- An improved ROI. Healthcare organizations seeking new technologies to enable increased operational efficiency are also looking for technologies that can provide an improved ROI, which allows more of their budgets to be directed to innovation (maintaining a competitive edge and growing the bottom line) and not just to keeping the lights on. In fact, ESG research shows that 80% of healthcare respondents stated they will purchase or plan to purchase new technologies possessing improved ROI.[7]

## VMware SD-WAN Powered by VeloCloud: Leveraging VMware Edge Network Intelligence to Move Healthcare Forward

VMware SD-WAN network technology is already widely deploying in the healthcare market. Organizations with highly distributed environments rely on cloud-delivered collaboration services to allow staff, partners, and patients to work and communicate effectively. For both insurance companies and healthcare providers, the pandemic has solidified VMware's SD-WAN as an enabling technology, extending the benefits currently enjoyed at branch offices to home offices (think high availability, and secure, seamless access to necessary applications and services). It has recently added technology from VMware Edge Network Intelligence to take advantage of the data generated from the platform to further enhance performance and security.

### VMware SD-WAN Helps Organizations Digitally Transform

VMware SD-WAN allows organizations to digitally transform their wide area networks by providing high performance and secure connectivity from any company location to public cloud services (IaaS and SaaS), private data centers, and other locations, offering improved network agility at a lower cost.

VMware SD-WAN by VeloCloud offers:

- Cloud management. Administrators can access a simple, cloud-based user interface to manage the complete end-to-end SD-WAN environment from work or home. This accelerates provisioning and policy creation while ensuring employees can be productive even when working remotely.

- Zero-touch provisioning (ZTP). To accelerate remote deployments, once operations teams have established the appropriate performance and security policies, new locations can be brought online with little interaction. Simply plug in and connect the SD-WAN device, and the software will configure and optimize the device in accordance with corporate guidelines. Thus, IT staff never needs to travel to remote sites to deploy, configure, or test equipment. This

[7] ibid.

centralized and automated provisioning can deliver significant operational efficiencies when turning up hundreds or thousands of new sites.

- Dynamic multipath optimization (DMPO). DMPO ensures that healthcare organizations can effectively give priority to the most important applications over less important ones. For example, mission-critical telehealth applications that require performance-sensitive audio and video capabilities would be high priority, as would access to patient files and credit card information, which are fully segmented and prioritized. Conversely, a guest network for any type of social media channels or video streaming channels would be deprioritized. Additionally, if multiple links are connecting high priority applications, DMPO ensures an automatic and seamless switch to another link if one has issues.

- Rapid deployment at any location. When time is of the essence, it is essential to quickly deploy a new network with secure access, especially in healthcare. Utilizing zero-touch provisioning and centralized policies, VMWare SD-WAN's automation and policy-based automation capabilities allow healthcare payer and provider organizations to swiftly deploy new networks virtually anywhere. With the advent of the pandemic, many employees working at call centers, hospitals, and clinics have found themselves working away from their offices. For example:

    - A well-known insurance company was able to rapidly deploy over ten thousand VMware SD-WAN by VeloCloud solutions to its call center workers' homes in under two weeks. This enabled employees to safely work from home and still deliver the same high-quality experience to their customers while ensuring that all corporate and industry security policies were enforced.

    - Radiologists at a well-known cancer facility were unable to receive and view large medical imaging files at their remote offices (due to intolerance to delay, jitter, and latency), which were sent from temporary imaging facilities located in trailers. One glitch meant the entire file needed to be retransmitted. SD-WAN by VeloCloud was able to clean up the link, making it more stable, as well as providing higher performance. Physicians were able to increase the number of scans read per day, enabling them to deliver results to their patients more quickly, thus enhancing the patient experience as well as enabling faster time to billing.

## VMware Edge Network Intelligence Enhances VMware SD-WAN by VeloCloud

VMware SD-WAN by VeloCloud now extends its value to the healthcare market with the integration of VMware Edge Network Intelligence. With its AI and machine learning (ML) capabilities, VMware Edge Network Intelligence will enable VMware to offer additional analytics and insights to healthcare environments. This would include providing even more optimized performance, proactive alerting, benchmarking, and anomaly detection. In addition, it will provide healthcare organizations with an accurate, real-time medical device inventory (IoT) and health status.

As a cloud-based AIOps platform, VMware Edge Network Intelligence takes advantage of all the data generated by the SD-WAN device, providing valuable network performance analytics incorporating actionable data on network traffic and application performance between the cloud, data centers, branches, and remote locations through its ability to consume and analyze data (including packet analysis and metrics by means of APIs across multi-vendor wired and wireless LAN environments).

The AI/ML capabilities of VMware Edge Network Intelligence combined with VMware's analytics, visibility, and remediation capabilities provide organizations with a simple means to securely view, manage, and troubleshoot highly distributed networks.

## The Bigger Truth

Over the past few years, growing numbers of healthcare organizations have been embarking on and maturing digital transformation initiatives. Today, the pandemic is serving to accelerate that transformation. As a result, it will be imperative for healthcare organizations to make better use of innovative technology. SD-WAN solutions that provide deep visibility into the network as well as analytics and AIOps (AI for IT operations) will enable these organizations to gain increased operational efficiencies and deliver better customer experiences.

The combination of VMware SD-WAN by VeloCloud and VMware Edge Network Intelligence technologies extends the value for healthcare at a more granular level by means of enabling more consistent and robust work-from-home experiences, offering medical device-level visibility, securing and optimizing connectivity, and providing seamless operations of telehealth services and connected medical devices.

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