healthcare innovation
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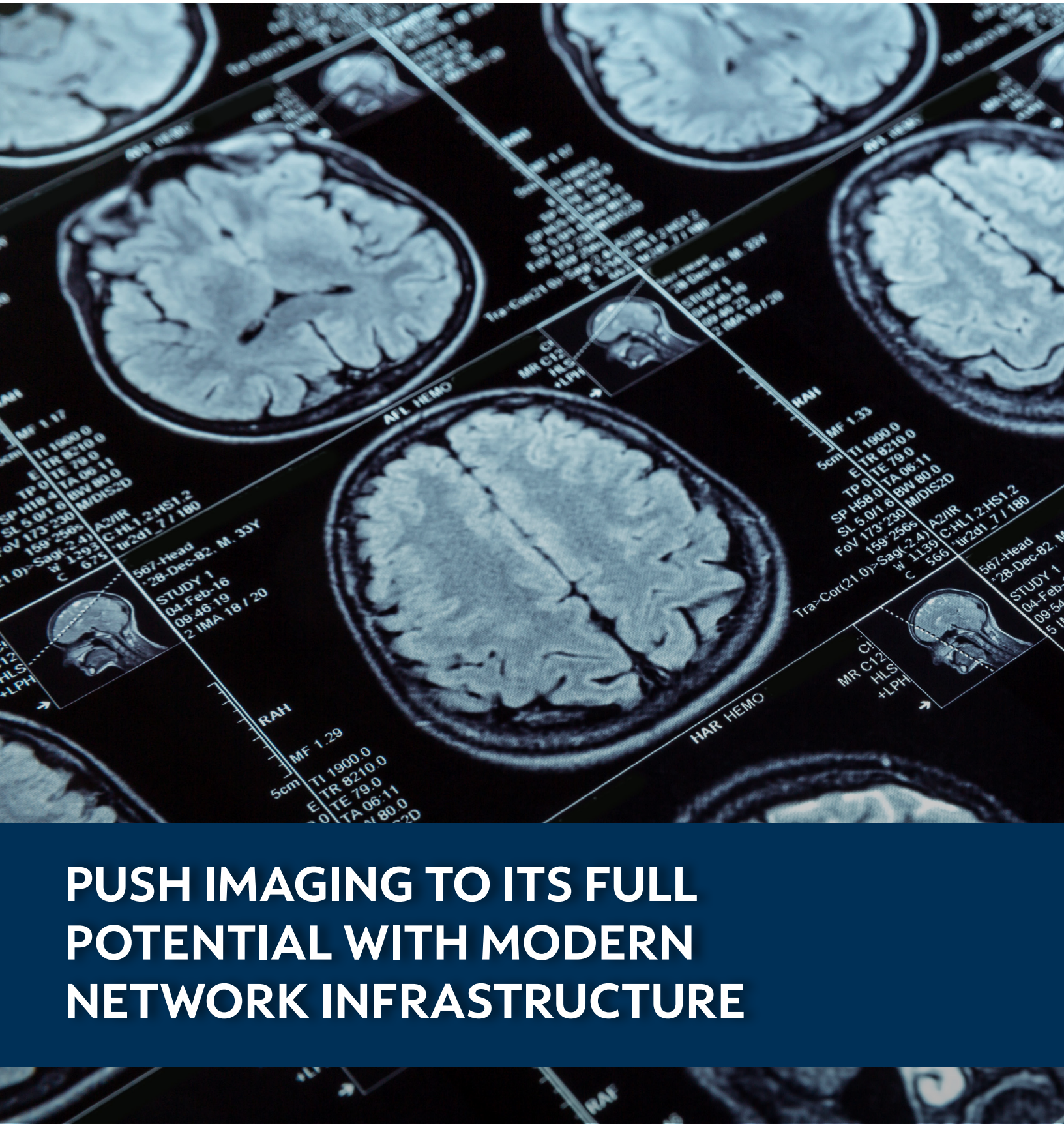

PUSH IMAGING TO ITS FULL POTENTIAL WITH MODERN NETWORK INFRASTRUCTURE

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Advances in imaging technology, real-time analysis and collaboration have enabled medical images to become dynamic documents valuable at the point of care and as part of a patient's longitudinal record. Taking advantage of these capabilities requires network infrastructure that can support fast, secure downloads and connections whether clinical staff are part of a main hospital network or based in a distant satellite office.

The traditional mindset of images as static files to be captured and stored may make it difficult for healthcare organizations to justify investments in network infrastructure for the sake of imaging. For imaging to reach its full potential, organizations need a modern network. Increasingly, they are more likely to benefit from managed network services that leverage software-defined wide area network (SD-WAN) technology that alleviates the burden of implementation, management, maintenance and security — leaving their IT teams to focus their attention on how to best support patient care.

Healthcare is struggling to make the most of imaging

Imaging is increasingly foundational to patient care. At the point of care, imaging can enable real-time diagnostics in situations when every minute counts. Imaging also enables more informed treatment decisions for everything from tumors to broken bones, helping care teams provide care that meets patients' needs. Over time, images contribute to a patient record that's sharable across the continuum of care, providing a longitudinal view of a patient's health and enabling care teams to avoid duplicative or unnecessary procedures.

Unfortunately, these benefits are difficult to realize if network infrastructure is underperforming. Organizations are likely to experience "application drag," which impacts performance and means clinicians struggle to upload or even view files in real time. There's also "network drag," which leaves clinicians — and patients — waiting to establish a reliable connection with a specialist capable of conducting an imaging analysis. Finally, there's *limited scale*; as care moves to the edge, outpatient facilities, specialists and primary care physicians (PCPs) beyond the hospital network are increasingly out of the loop.

Poor network performance is not uncommon. Organizations have competing priorities for digital transformation. Regulatory mandates often drive spending to compliance requirements, leaving little in the budget for IT improvements. A prevailing point of view that imaging is largely a matter of capturing, slicing and storing information — and not necessarily a matter of sharing information — may temper interest in network upgrades for imaging's sake. If organizations seek to leverage imaging to connect care teams and improve clinical outcomes, they need to look closely at how a modern network lets them make the most of imaging.

Avoiding these data issues increases the confidence organizations have in their data, which directly impacts funding for assets and projects.

A modern network transforms the way healthcare benefits from imaging

There's an all-too-familiar scenario in community-based emergency departments across the United States. A patient arrives in the evening presenting symptoms of a stroke. The hospital has the equipment to conduct a CT scan. However, there's no one available on-site to assess the image and determine whether a patient should be administered tissue plasminogen activator, or tPA, to dissolve a possible clot.

Time is of the essence. Research from Washington University **shows** brain tissue begins to die as soon as 10 minutes after the onset of a stroke. The more time that elapses, the greater the impact on the brain. As the National Institutes of Health **indicates**, tPA administered within three hours helps restore blood flow to the brain and limit the risk of damage and functional impairment. On the other hand, treatment that's delayed six or more hours can kill all at-risk brain tissue and can lead to severe disability.

A stable, high-bandwidth connection can transform this interaction. It begins with the journey to the hospital via emergency medical services (EMS), as personnel can access the patient's medical history and also share real-time updates on how they treated the patient in the ambulance. The community hospital can quickly send a high-resolution image to a specialist on call at another facility. The ED physician can consult remotely with that specialist; together they can determine whether to administer tPA when minutes matter most. Once the patient is admitted, staff throughout the hospital will have the information they need to provide appropriate care.

The benefits extend beyond the initial interaction. Thanks to cloud-based networking and storage infrastructure, all images and accompanying analyses are part of the patient's record and accessible by the community-based PCP. Meanwhile, the PCP has the capability to consult with imaging and cardiology on a targeted care plan. At an enterprise level, imaging data can be made available for retrospective analysis that can inform treatment protocols and improve population health.

In this scenario, all stakeholders benefit.

- The community hospital can provide necessary, potentially life-saving care when acting in milliseconds can save lives. This is vital for organizations that might otherwise need to transport a patient to another facility — fracturing their relationship with that patient, losing the revenue tied to treatment, and leading to worse clinical outcomes that come with lifelong complications.

- If further EMS transport is necessary, either by ground or air, technicians can remain informed of a patient's condition and any treatments they have received so far, and they can respond accordingly while on the move. In addition, they can better communicate with both the community hospital sending the patient and the acute care receiving the patient, facilitating informed decision-making while the patient is in transit.

- The PCP is empowered to play an active role in treatment decisions. Instead of receiving a retrospective report once a patient is discharged, they can collaborate with hospital-based physicians and remote specialists — offering vital context about the patient's health and well-being that no other provider has.

- The remote specialist similarly elevates their profile from an offsite individual providing a one-off analysis of an image to a core, trusted member of the community hospital's care team.

- The patient is more likely to survive the stroke, receive the treatment they need in the hospital, and recover from the comfort of their own home under the guidance of their PCP.

Build a high-capacity network to support imaging's potential

If organizations hope to transition images from static files to be captured, sliced and stored to dynamic enablers of real-time, collaborative decision-making, then a modern, high-capacity network must be an IT investment priority. Simply put, a network that brings together high performance, low latency and embedded security is necessary to enable imaging to meet its potential to transform care.

Managed SD-WAN at the core

The core of this infrastructure is the managed software-defined wide area network. SD-WAN is a virtualized wide area network that can adapt to differing workloads, leverage multiple connectivity and transport types, and incorporate security layers such as firewalls and unified threat management. Managed SD-WAN takes this a step further by offering infrastructure, access and security as an end-to-end solution, removing the complexity all too often found in multi-vendor legacy networks. What's more, as a managed service, it relieves organizations of the burden of managing a network at a time when recruiting qualified IT staff can pose a challenge.

Managed SD-WAN supports mission-critical infrastructure in three important ways.

- It covers multiple locations. Critically, this includes medical facilities on the edge — the PCPs, specialists and other ancillary providers who traditionally haven't benefitted from high-speed networks or extensive Wi-Fi coverage on a health system's main campus.

- It enables access to multiple cloud service providers. This helps organizations avoid the types of expensive rip-and-replace implementations that often make network infrastructure projects a difficult sell for executive leadership.

- It provides the throughput to transfer large files quickly. This supports current use cases — such as remote consultation for stroke care, as described above — as well as cutting-edge use cases like digital breast tomosynthesis, a more accurate means of potentially detecting breast cancer that generates files as large as 3 GB.

Tailored to healthcare's unique needs

SD-WAN, as a managed service, is especially well suited to meet the unique needs of hospitals and health systems looking to better leverage imaging resources.

- Organizations can establish higher-capacity connections when they need them. For example, they may allocate high capacity on a 24/7 basis to imaging centers, emergency departments and facilities participating in peer-to-peer consultations, and they may opt to make high capacity flexible to other sites as necessary — such as a PCP reviewing CT scans for a patient admitted to the emergency department.

- Leading managed SD-WAN partners can support hybrid implementation options. Organizations can retain their investments in existing, mission-critical networks while transitioning to SD-WAN where and when it makes sense. This is particularly beneficial as hospital networks expand into new geographic areas or otherwise expand.

- Organizations can transition to edge networking and away from traditional hub-and-spoke patterns of routing traffic. Adding access points helps medical facilities away from the main health system get on the network and use the applications and information they need to provide high-quality care — all without the need to dedicate onsite IT resources to the complexity of network management.

- Administrators can easily gain greater visibility into network performance. This allows for preventive maintenance and other proactive actions that have the downstream benefit of reducing IT costs and preventing network outages that inhibit information-sharing and put patients' lives at risk. Additionally, performance data can help organizations make informed decisions about where future infrastructure improvements may be necessary. It is important to note that modern tools make this possible using cloud-based portals; that means monitoring can occur anywhere — and organizations with limited resources need not take on the cost of employing an onsite network administrator.

- Cybersecurity tools can be integrated across the network. Small practices can now benefit from features such as threat detection, intrusion prevention, data encryption and application controls that they may have previously lacked the resources to implement. Likewise, pushing automated updates across the network removes vulnerabilities that otherwise may go undetected and allow attackers to gain easy access to a network.

Conclusion

Healthcare has made many technology investments over the last four years to support care delivery, manage operating expenses and automate time-consuming administrative processes. One aspect of digital transformation that many organizations have overlooked is imaging. State-of-the-art equipment and high-resolution files are, unfortunately, of little use to clinical care teams if legacy network infrastructure doesn't support fast and secure information.

Now is a critical time for organizations to ensure their networks can support imaging to its full potential. Hospitals and health systems looking to use imaging data for real-time care, retrospective analysis and enterprise-level population health improvement would benefit from leveraging managed SD-WAN to put in place the modern network infrastructure they need.

Spectrum Business® is positioned to partner in implementing and managing SD-WAN, letting hospital IT teams apply their expertise to the unique needs of their organization. **Contact us** to learn more about the scalable communications, networking and security solutions we provide for the healthcare industry.

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