2024 White Paper

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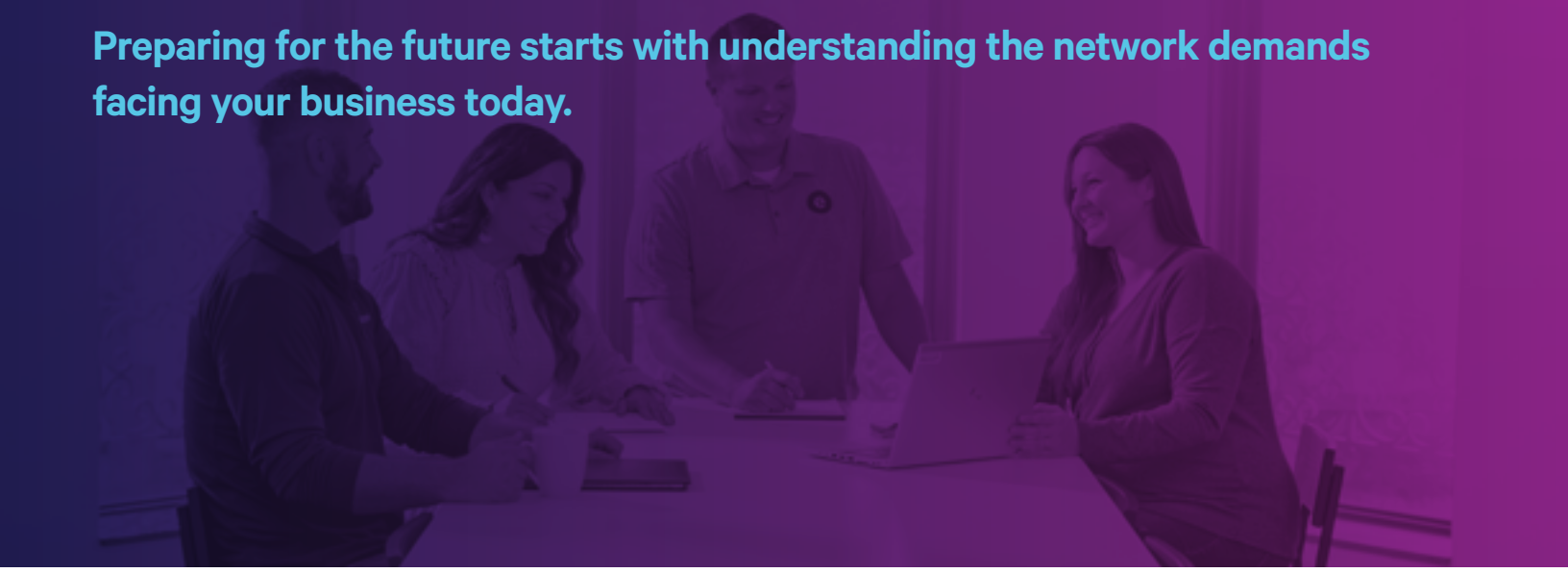
BANDWIDTH PRESSURES OF TODAY AND TOMORROW

Preparing for the future starts with understanding the network demands facing your business today.



EXECUTIVE SUMMARY

Enterprise and midsize businesses alike want and demand access to information when they need it and wherever they're located. No delays. No excuses.

When bandwidth constraints slow down your ability to do business, the implications can be far-reaching for employees, customers and the bottom line.

Today's technology and digital transformation initiatives continue to increase the number of applications businesses use to manage data, drive profitability or enhance customer experience — and these applications require bandwidth.

It's easy to underestimate the amount of capacity your company is using and truly needs. Tracking and analyzing all the network-dependent applications and bandwidth utilization from end to end is something most companies struggle with. That's why periodic network audits are so important. If it's been a while since you've done it, there's no better time than right now.

As you evaluate what may be impacting your bandwidth usage — from business drivers to projections based on tomorrow's technology — this guide can help you determine if the backbone of your business needs a bandwidth boost.

INTRODUCTION

As our reliance on technology increases so do the expectations of our business networks. Today's enterprise networks manage core organizational workloads, including routine internet usage, business-critical applications, multiple office locations and more — and effectively managing these workloads requires bandwidth.

The lifeblood of your organization hinges on decisions about bandwidth usage and infrastructure. IT departments aren't alone in feeling the weight of these decisions, either. Business owners, sales leaders, technical engineers, product designers and even visitors are all clamoring for their share of bandwidth and are impacted by these decisions — it's often hard to know exactly how much bandwidth is required or being used network-wide.

At a corporate level, it's easy to check off email, Office 365 and Salesforce as resources in use today. However, departmental decision-making within a company also impacts network requirements. For example, marketing may opt to purchase a new automation tool which requires additional bandwidth, or customer service might adopt an AI-powered assistant to handle repetitive tasks. This is known as Shadow IT, defined as the use of IT-related hardware or software by a department or individual without the knowledge of the organization's IT department. Notably, cloud-based services are the main culprit, as users can quickly and easily access apps and services from the cloud without requiring the help of tech personnel.

The quality of your network also has a direct impact on the success or failure of digital initiatives. Up to 95% of digital transformations fail.[1] Unrealistic expectations, inadequate support from leadership and poor execution are among the reasons to blame. But there's one factor that can quickly doom any transformation project — insufficient network capacity. Investing in digital transformation platforms without ensuring your network can handle the added demand for bandwidth could lead to disastrous results.

The needs of every business and industry are different, but they all have one expectation in common — fast, reliable, secure connectivity.

While the needs and demands of every business are unique, every organization expects the same thing from their network — fast, reliable, secure connectivity. A network that is truly ready to serve your needs is one that can rapidly adapt to the ever-changing demands of the enterprise with high-bandwidth, low-latency capabilities that allow for more agility and greater operational efficiency.

BUSINESS BANDWIDTH DRIVERS

Network capacity is a frequent point of conversation — and frustration — as cloud-based applications, real-time communication and collaboration platforms, and data management and replication tools compete for available bandwidth.

Operating a manufacturing site from a single outlet, centralizing a busy emergency room around one hand-washing station, trying to run a popular restaurant with an undersized cooktop … none of these scenarios are practical or sustainable.

The same goes for trying to get by with mismatched bandwidth demand and network capacity. IT infrastructure needs are constantly changing. Understanding these factors will help determine what your network will need — and if an additional "outlet" is necessary — to support the digital needs of your organization in the future.

Considering how your capacity needs could change and planning for the future? Start with these five common bandwidth consumers.

1. Network-Dependent Applications

Businesses depend on an average of 976 applications to maintain their operations.[2] Virtual meeting platforms, real-time collaboration tools, cloud-based software as a service (SaaS) systems, CMS, ERP and CRM … the list goes on.

Additionally, some organizations must contend with stringent regulatory and compliance requirements for privacy, data processing and record retention and storage, to name a few. Keeping up with the volume of those demands requires technology that can help ease the time and resources involved with each. That includes the right connectivity.

A reliable, high-speed, low-latency connection is necessary to successfully utilize these applications and deliver for your business. Two of the most important components of enterprise-grade connectivity are symmetrical speeds and scalable capacity that can adapt to changing bandwidth demands and accommodate huge volumes of data and traffic moving across a network in real time.

Traditional connectivity methods such as cable and DSL are often asymmetrical, delivering uneven upload and download speeds, with upload speeds often a mere fraction of download speeds. Now that virtual meeting and cloud applications have emerged as foundational tools to keep employees connected and productive, sending and receiving information without lag or interruption requires bandwidth that can move quickly in both directions.

2. Data Creation, Management, Transfer and Replication

The volume of data that is being created every day is staggering. Nearly 329 million terabytes of data are created daily[3] — that number will only grow larger as IoT devices and mobile technologies grow in sophistication. Businesses and individuals have become treasure troves of data, pumping out huge volumes of information every day and competing for bandwidth in the process.

With so much information being created, the management, transfer, backup and replication of data has become a critical IT consideration for businesses of all sizes and specialties. The growing volume of new data enterprises use to support daily business operations also requires new practices for processing, handling, storing and retrieving data in real time, adding to the growing demand for bandwidth.

In the healthcare industry alone, digital imaging and telemedicine continue to push the limits of network capacity, forcing healthcare systems to continually adjust and expand their IT environments.

Currently, the dataset for a complete CT scan can range from 20 GB to over 100 GB, depending on several factors, such as the resolution and quantity of images generated.[11] As medical imaging technology evolves, the size of radiology datasets and electronic medical records (EMRs) will expand at rates that are difficult to forecast. On top of that, smart devices and Internet of Medical Things (IoMT) technologies are helping providers deliver a greater, more accurate level of care. Satisfying those bandwidth demands without compromising HIPAA standards requires healthcare IT networks to make transformational shifts in preparation for the future.

Healthcare data accounts for approximately **30% of new data created**, at a rate of roughly 50 petabytes every year.[4]

Handling and analyzing digital information has become a major area of focus for law firms – **60% use at least one data analytics tool in their practice.**[5]

92% of leaders in financial services have begun to implement digital tools in their firms, but **only 11% felt their adoption was at an "advanced stage."**[6]

Regardless of industry, data creation and storage will be major forces that IT networks will have to contend with in the coming decade. Artificial intelligence, virtual and augmented reality, cloud computing and Software as a Service (SaaS) will dominate the marketplace. As adoption and usage increase, bandwidth and storage will need to evolve as well.

Increasing capacity demands aren't limited to physical networks and wireless access. Mobile connectivity will feel the pinch, too. If current trends are accurate, worldwide mobile device users will rise to 9.1 billion by 2028, more than doubling the demand for bandwidth — 47 GB per month per device compared to 16 GB in 2022.[10]

The business network of the future will be built on a foundation that can easily scale to accommodate growing data requirements. Whether a business is creating new data, retrieving and working with existing data, transferring large digital documents or safeguarding files through replication, a reliable, scalable connection with ample bandwidth is critical to ensure companies remain competitive in a changing landscape.

By 2025, 160 zettabytes of information will be stored annually, with much of it residing in the cloud.[9]

3. Number of Employees and Locations

Beyond the demands of technology and applications, employee headcount and a business's physical footprint also factor into bandwidth demands. Determining bandwidth needs depends heavily on factors such as the number of employees using the network, how to best cater to each individual and site and whether a business runs a single location or multiple sites.

On top of geographic location, the rise and ubiquity of remote and hybrid work arrangements has complicated the equation of capacity versus demand even further, requiring networks to evolve in order to support the shift in off-site employee access to business systems and applications.

Whether ensuring access at branch locations or making cloud assets securely available, it is critical that today's businesses have adequate network support and low-latency access so that users at a company's headquarters have the same experiences as those at satellite offices or from remote-work locations.

4. User Experience

Digital interactions define customer perceptions and influence their decisions about the businesses they support, especially when it comes to retail and service operations. As much as 86% of customers will abandon a brand they formerly supported after only two poor experiences — for 1 in 6, one poor experience is all it takes.[7]

Convenience is key. If customers feel they have to exert too much effort to find the information or items they need, or if they feel that their needs aren't being adequately satisfied, they'll leave.

Case Study: Hospitality

For example, hotels rely heavily on their networks as part of the amenities available to their guests, who check in with an average of three devices each.[6] They expect to simultaneously conduct video calls, stream and share online content with no delays in service, whether in-room or poolside — and that's just for the guest experience.

In addition to increasing the bandwidth needed to exceed guest expectations, hotels must account for their business operations too.

Increasingly, hotel properties need to:

Offer the ability to manage rooms via smart devices. 73% of guests want self-service options to manage their stay. 38% want a completely self-managed model with staff contact only as needed.[8]

Deploy and leverage mobile-based solutions that help guests engage with hotel staff for concierge services, order room service or request service from housekeeping or the front desk.

Inadequate bandwidth can mean a loss in revenue and declining guest satisfaction if customers take their business elsewhere. Today's users want fast, fluid, digital solutions that will enhance their communication, productivity and, ultimately, their overall experience.

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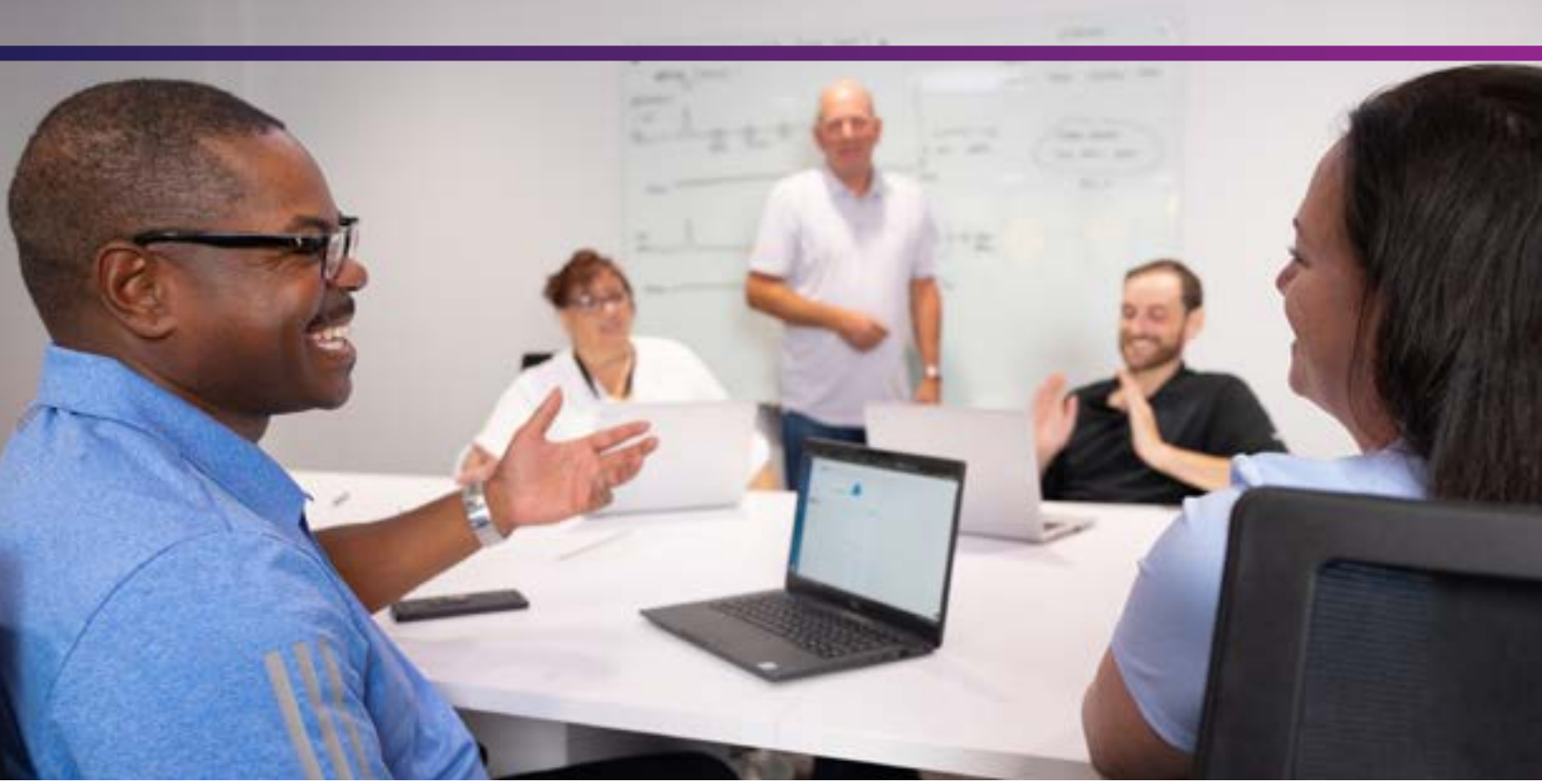

5. Real-Time Communication and Collaboration

Today's workforce is highly mobile and highly distributed. The shift from in-office to remote work has moved seamless communication platforms such as video conferencing, voice over IP (VoIP) and Unified Communication as a Service (UCaaS) from helpful tools to essential infrastructure that depends on high-bandwidth, low-latency connectivity.

Any interruptions or delays that stem from capacity issues — even a delay of less than two-tenths of a second — can result in poor network performance, subpar communication and lost or corrupted data in the form of packet loss.

Likewise, no one wants to think about their voice calls. We simply expect a clear, crisp connection. However, when using a VoIP phone service, the quality of your calls and how many lines can be supported will largely depend on bandwidth. If your internet access goes down, your call goes with it.

VoIP calls compete with other data and communication needs across the same connection — downloads, server connectivity, chat, email and more. As a result, VoIP calls only receive a share of the connection and may run the risk of call quality deterioration during peak times. With no way to determine the number of employees using VoIP at any given time, it is difficult to segment an adequate amount of bandwidth all the time.

There is only so much that optimizing can do. To avoid poor user experience and even a hit to your company's reputation, the best way to maintain a quality connection is to increase the amount of bandwidth.

From healthcare and hospitality to manufacturing and education, an organization's appetite for data creation and bandwidth consumption is an integral part of determining its bandwidth requirements.

Today's businesses and employees are doing and creating things that weren't possible even just a few years ago. That means more speed, more power, more data and, yes, more bandwidth are necessary to remain effective and competitive.

FUTURE BANDWIDTH PROJECTIONS

What you are doing today is just the beginning. The future of your organization hinges on infrastructure decisions, from increases in bandwidth-hungry applications and the widespread usage of cloud computing to the implementation of real-time collaboration platforms and next-generation cybersecurity measures.

Everything that is done right now — hardware upgrades, software implementations, network architecting and more — will affect your ability to remain agile as new and emerging technologies define the way work is done.

Tomorrow's Trends Today

Emerging trends that were closer to fantasy than fact only a decade ago — Big data, AI, IoT and smart devices, virtual and augmented reality — are already here and radically altering the relationship between data quantities and capacity. Whether or not you're using them in your operations, their impacts must be included in the broader considerations around bandwidth demands.

The so-called "AI revolution" is already here, and businesses are capitalizing on the value and efficiency of platforms like ChatGPT, Stable Diffusion and DALL-E. The true scale of the power of AI for business is coming into sharp focus. As many as 70% of companies will utilize AI in some capacity by 2030, generating year-over-year GDP gains of approximately 1.2% and adding as much as $13 trillion in new economic activity by the end of the decade.[12]

Going further, the worldwide market for virtual reality is expected to reach $435.7 billion by the end of the decade.[12] Verticals that are focused heavily on user immersion or personalized service — education, healthcare, hospitality and industrial training, for example — are likely to be the biggest adopters and drivers of VR/AR innovation.

Embracing those trends requires networks to be agile, scalable, secure and flexible — traits that legacy systems either struggle with or lack completely. Approximately 31% of an organization's technology stack is made up of legacy equipment, which consumes up to 80% of IT budgets. Trillions of dollars each year — $1.14 trillion, though likely higher, according to one estimate — are spent on maintaining and working with and around the limitations imposed by such systems.[14]

Whether your business is leveraging these tools in the present or preparing for a future powered by emerging technologies, successful business IT networking will be defined by the quality and availability of reliable bandwidth.

CLOSING SUMMARY

Simply put, it's essential to develop the clearest possible understanding of who and what might impact your available bandwidth as well as how much bandwidth is needed for your company to run efficiently and effectively. And that target is constantly moving.

Bandwidth-intensive applications, data replication, cloud computing and real-time applications all rely on reliable access but compete for available capacity. Misaligned availability and demand will create problems that lead to lost productivity and greater frustration across all levels of your organization.

Despite the challenges, preparing for the uncertainties of the future requires a holistic evaluation of your network — including the current bandwidth demands and opportunities for future growth — and comprehensive strategies that will help you successfully navigate potential network curveballs of tomorrow and beyond.

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