Planning for the New Network

Ten Trends Rewriting the Rules for Midsized Business

Spectrum ENTERPRISE

With more than three out of four midsize companies describing their business as being "network dependent,"[1] network planning has become an operational make-or-break proposition. The new business network creates value by eliminating barriers of time and distance, enabling workers to access applications and connect with each other as if they were down the hall—even when they are around town or across the country. This is a sea change from the days of simply linking "local" workers and applications within a single office location.

Ten Trends to Manage

The new network is rewriting long-standing planning rules. It is essential for information technology (IT) teams to manage the ten trends driving the new network transition.

Cloud services are the number-one application class driving an increase in Internet traffic for businesses.

1. Cloud: To access leading-edge technology solutions while minimizing capital and staffing expenses, eight out of 10 businesses report using at least one cloud service. On average, companies report using 2.7 cloud services.[2] The top business cloud application categories are storage, social networking, email, collaboration, customer relationship management (CRM), and sales force automation.[3] In a recent survey businesses reported cloud services as the number-one application class driving an increase in their Internet traffic. Number two on the list: mobile device support.[4]

2. BYOD: More than 70 percent of U.S. consumers now own a smartphone or tablet[5] and they bring them work. Today's workers are as likely to connect to the company network with a laptop, tablet or smartphone as a desktop PC. Highlighting the trend, nearly three out of four companies say they currently or plan to support bring-your-own-device (BYOD) access.[6]

With BYOD here to stay, IT departments are challenged to implement asset management and security solutions for an increasingly complex mix of devices and applications. Additionally, offering mobile access to corporate email, file servers and Microsoft® Office® applications is a priority to drive productivity. IT professionals expect the number of mobile devices accessing their network to more than double in the next two years and nine out of ten IT pros expect the trend to have a major network impact.[7]

3. Remote Workers: Employees are increasingly using their assortment of devices to connect with company applications and information while on the go. Indeed, research finds that U.S. employees now spend 40 percent of their work time outside of the office.[8] Given the trend, employee data traffic is often flowing from the outside in rather than the inside out—entering the company through a wide area network (WAN) rather than originating within the local area network (LAN).

Nearly

3 out 4

companies say they currently or plan to support BYOD.

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4. UC and VoIP: Unified Communications (UC) integrates telephone, text messaging, voicemail, fax and email to enhance employee collaboration and customer service. Research finds that seven out of ten businesses have deployed voice over IP (VoIP) to reduce costs and enhance features, while nearly half now use instant messaging.[9] As businesses increasingly rely on VoIP to connect with the public switched telephone network (PSTN), they must maintain call quality of service across the company data network.

5. Video: Videoconferencing and streaming video applications are becoming essential business productivity tools. Research finds that more than six out of 10 businesses currently use videoconferencing[10] and seven out of 10 produce videos to communicate internally with employees.[11] However, the bandwidth and latency requirements of video can devour network resources. A single high-definition videoconference with 1080p resolution requires a 4.5 Mbps data stream. A recent traffic analysis of business networks found that video applications on average accounted for 18 percent of a company's total bandwidth usage.[12]

6. Social Networking: More than six out of ten businesses use social media platforms to engage with current and prospective customers and half of businesses gather social information to make better business decisions.[13] Not only must IT support corporate social media efforts—personal use of social media on the company network is a growing application class to manage. In an analysis of several thousand organizations, an average of 29 different social applications were found to be operating on business networks, accounting for five percent of total business bandwidth usage.[14]

7. Big Data: Stores of marketing and operating data—from social media, email and website usage to customer transactions and financial market figures—can be analyzed to gain valuable business intelligence. To capitalize on the opportunity, 70 percent of enterprises and 56 percent of medium and small businesses have deployed or plan to deploy big-data projects. Organizations are expecting rapid

growth in the amount of data managed with an increase of 76 percent forecast within 18 months. As a result, more than one in four companies say they are already increasing network bandwidth to support big data.[15]

8. Backup and Recovery: Data storage, backup and recovery are essential to fulfilling business continuity plans. Among IT professionals, 64 percent report that business continuity and disaster recovery is a compliance requirement for their organization.[16] Cloud solutions are proving to be an increasingly attractive option. In a recent survey 94 percent of US small and mid-sized businesses reported backing up some portion of their data to the cloud.[17] In support of business continuity and disaster recovery plans, companies should not underestimate the importance of solid network diversity and redundancy solutions.

9. Security: Managing security threats protects the availability, usability and integrity of a company's network and data. In a recent survey more than three out of four organizations reported detecting a security event in the preceding 12 months. The most frequent types of incidents include malware, phishing, network interruption, spyware, and denial of service (DoS) attacks.[18] IT professionals report that their organizations experience an average of 4.5 DoS events per year with each of these attacks typically consuming 1.7 GB of bandwidth.[19]

10. Desktop Virtualization: This solution decouples a company's standard desktop environment—often Windows-based—and makes it available to virtually any employee device through the cloud. It is a powerful way for IT departments to deliver a secure, consistent user experience for a wide array of devices and operating systems. In a recent survey two out of three IT executives said their company currently or plans to use virtual desktop solutions.[20]

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The New Network Traffic Flow

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The new mix of users, devices and applications shatters classic network traffic assumptions. Historically, LAN and WAN designs have been based on a local-centric 80/20 rule for traffic flow. That is, 80 percent of traffic remained local within the LAN and only 20 percent traveled beyond to the WAN. This tenet has been turned upside down, however. Industry heavyweights like Cisco Systems and Gartner now forecast that 80 percent of a company's traffic is likely to flow outside the LAN, significantly increasing performance requirements for WAN and Internet connections.

In particular, mobile device diversity, remote workers, cloud applications, IP video and unified communications are transforming traffic volume and flow patterns. In a survey by *InformationWeek* two out of three IT leaders said they expect demand for WAN bandwidth will increase at their company over the next year.[21]

The Importance of WAN Performance

Business-critical cloud applications like desktop virtualization, as well as IP video and voice calls, significantly raise the bar on WAN performance requirements. When service thresholds are not met, productivity suffers with sluggish cloud applications, garbled voice conversations and pixelated video.

Reflecting the rigorous requirements of such IP applications, more than eight in ten companies report than WAN performance challenges occasionally or frequently impact business-critical applications. To address the challenge, IT leaders say their WAN budget is three times more likely to increase rather than decrease.[22]

There are three key factors which drive WAN performance: bandwidth, latency and availability. An ideal WAN delivers maximum bandwidth and availability with

minimal latency, jitter and packet loss. Table 1 details the stringent performance requirements for some of today's essential applications.

TABLE 1

WAN Performance Requirements by Application

Service Level Parameter	Low-Quality Videoconference	High-Quality Videoconference	VoIP	Desktop Virtualization
Bandwidth*	384 kps to 768 kps	1.5 Mbps to 12.6 Mbps	21 to 30 kbps	100 to 150 kbps
Latency	400-450 ms	150 ms	150 ms	250 ms
Jitter	30-50 ms	10 ms	10 ms	10 ms
Packet Loss	1%	.05%	1%	1%

Source: Cisco Systems[21], VMware[22]

As network-based applications become mission-critical contributors to business success, companies increasingly depend on service level agreements (SLAs) from their WAN and Internet service providers. SLAs set performance benchmarks for service reliability and, should an unplanned outage occur, responsiveness for repair and restoration. Therefore, SLAs play a critical role in helping companies meet their business continuity plans.

Performance characteristics for a SLA may include measures for availability and mean-time-to-restore (MTTR), as well as bandwidth, latency and packet loss between defined IP access points. A sample summary of SLA targets is shown in Table 2.

TABLE 2

Sample SLA Targets

Service	Business Ethernet / Dedicated Internet
Availability	End to End: 99.97% (On-Net Circuit)
MTTR	Restore: Priority 1 Outage within 4 hours
Latency	50ms (Roundtrip)
Packet Loss	<0.1%

Source: Kinetic Strategies

Key WAN Performance Measures

Bandwidth is a measure of both the capacity of a data connection and the amount of data delivered through it, expressed as Mbps or Gbps.*

Latency is a measure of time required for a data packet to travel to a destination, either one way or round trip, measured in milliseconds (ms). Packet loss occurs when packets traveling across a data network fail to reach their destination. Jitter measures the variability of latency within a particular flow of packets.

Availability is a measure of reliability, typically reported as a percentage, describing network uptime.

**Megabits per second (Mbps) = 1 million bits per second.*

Gigabits per second (Gbps) = 1 billion bits per second.

Network Configuration

WANs can be deployed in three different configurations: point-to-point, point-to-multipoint and multipoint-to-multipoint. The configuration decision will depend on the number of office locations to be connected through the WAN, as well as the mix of users, devices and applications at each location.

A point-to-point connection provides a dedicated link between two locations: for example, a headquarters and a branch office. Point-to-multipoint configurations connect additional sites, such as offices or a data center, from the central location using a hub-and-spoke approach. A multipoint-to-multipoint architecture expands the reach of a company's LAN across the WAN to multiple locations. The solution seamlessly extends business-critical applications to all locations on the network.

Whichever of the three WAN configurations is selected, another key decision is whether to centralize or distribute the company's Internet connection. When centralized, Internet traffic is transported over the WAN to branch locations. The advantage is maximizing control over Internet traffic on the business network; the downside is that latency is increased and additional WAN bandwidth is consumed. For businesses that rely on Internet-delivered cloud applications, distributed Internet connections may deliver optimal performance for each remote office location.

Selecting the Right Service Provider

With the inversion of the 80/20 rule, businesses are challenged to create WANs that deliver LAN-like performance. Because WAN and Internet service providers increasingly offer a range of high-value services to support the new network, making the right choice becomes very important.

A survey by Cisco Systems found that a majority of businesses consider reliability and quality of service to be the most important factors in choosing a provider for

Internet, WAN and voice services. Due to the mission-critical nature of these connections, it is not surprising that performance measures ranked higher than cost concerns. Other key factors include offering SLAs, responsiveness and information transparency.[23]

To simplify management and implementation, many businesses prefer to purchase cloud services from their Internet or WAN service provider. Therefore, it is important to evaluate a provider's ability to deliver cloud solutions and other managed services that free up IT staff resources while reducing technology investment and risk. One such provider is Spectrum Enterprise, which offers the benefit of owning and operating its own network to maximize performance, and delivers a comprehensive set of service options and cloud solutions for today's environment.

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Making the Shift

With the wide range of devices and applications that must be supported among office locations and remote workers, traditional assumptions for network planning have been turned upside down. Some 80 percent of a company's traffic is poised to traverse the WAN rather than remain on the LAN. Furthermore, the stringent requirements of IP video, voice and many cloud applications significantly boost WAN performance needs. This seismic shift in traffic flows and applications requires that today's WAN deliver LAN-like capabilities for bandwidth, latency and availability.

Although planning for the new network creates challenges, those companies that make the shift are poised to benefit from enhanced productivity, cost savings, market velocity, and IT operating efficiencies.

About the Author

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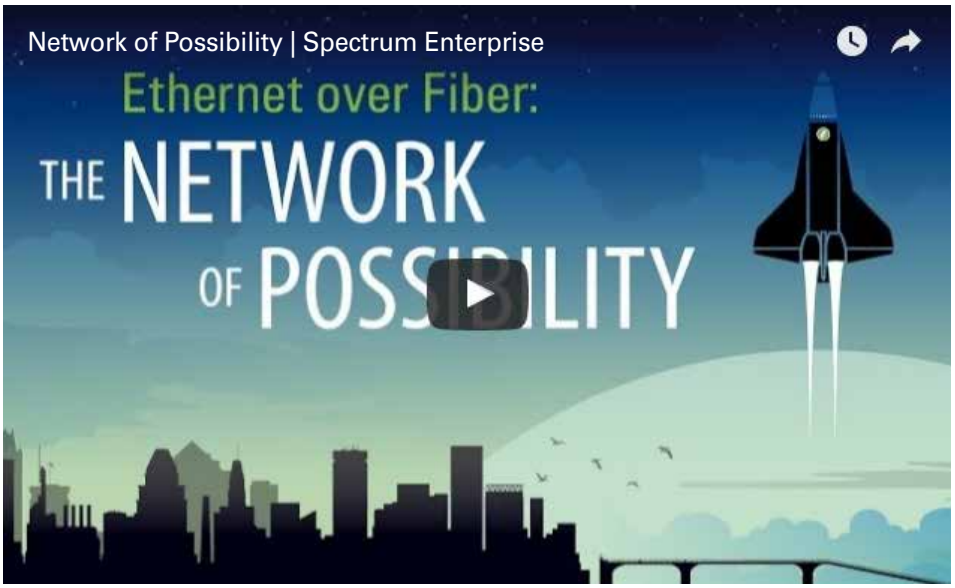

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