Planning For The New Network:
Ten Trends Rewriting The Rules For Midsized Business

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Michael Harris,
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With more than three out of four midsize companies now describing their business as being “network dependent,” 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.

1. Device Diversity: More than half of today’s information workers use three or more devices on the job. As a result, workers are now more likely to connect to the company network with a laptop, tablet or smartphone than a desktop PC. In a recent survey, 80 percent of IT professionals agreed that bring-your-own-device (BYOD) is the “new normal” at work. 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. However, because 84 percent of IT professionals say BYOD significantly increased demand for bandwidth, network capacity must be scaled accordingly.

2. Remote Workers: Employees are increasingly using their assortment of devices to connect with company applications and information from outside the traditional office environment. Indeed, research finds 56 percent of employees work away from the office regularly, whether at home, on the road or from customer locations. With a majority of workers regularly working outside the office, 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).

3. Cloud: To access leading-edge technology solutions while minimizing capital and staffing expenses, 61 percent of midsize businesses now take advantage of the cloud. These companies use more than four cloud services on average, with the most popular being web and email hosting, content filtering, online backup and recovery, application hosting, sales support, business support and voice over (VoIP). A challenge is that some cloud applications have stringent performance requirements for bandwidth and latency. A company’s network must be ready to meet them.

4. 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. Not surprisingly, 80 percent of companies are considering desktop virtualization as part of their IT strategy.

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5. **Video:** Videoconferencing and streaming video applications are becoming essential business productivity tools. Research finds that 58 percent of businesses currently use videoconferencing, and 71 percent of companies produce videos to communicate internally with employees. However, their bandwidth and latency requirements can devour network resources. A single TelePresence videoconference room operating at 60 frames per second and 1080p resolution will require a 4.5 Mbps data stream.

6. **Social Networking:** To better engage with customers, 59 percent of companies now use social media, and 46 percent of businesses plan to increase their investment in the technology. Not only must IT support corporate social media efforts—personal use of social media on the company network is a new application class to manage. In a survey of 3,000 organizations, an average of 29 different social applications were found to be operating on enterprise networks. Research from Microsoft finds 50 percent of information workers use personal social networks while on the job at least once a day.

7. **Security:** Managing security threats—such as viruses, worms, hacker attacks and information interception—protects the availability, usability and integrity of a company’s network and data. IT professionals rank maintaining security and compliance as their number-one challenge. Increasingly, IT teams are seeking help from the outside. Some 60 percent of companies currently use, or plan to use, outsourced desktop management and security services.

8. **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, 43 percent of businesses are investing in or investigating big data technology. In a recent survey 73 percent of businesses say their collection of data has increased over the past year. Additionally, a majority of companies with a strategy focused on collecting and analyzing the most valuable data were found to financially outperform their competitors.

9. **Backup and Recovery:** Data storage, backup and recovery are essential to fulfilling business continuity plans. Among IT professionals, 58 percent say their company has a formal disaster recovery plan; and 67 percent currently back up highly sensitive data. Cloud solutions are an increasingly attractive option, with 44 percent of companies reporting they currently use, or plan to use, an online backup service. In support of business continuity and disaster recovery plans, companies should not underestimate the importance of solid network diversity and redundancy solutions.

10. **UC and VoIP:** Unified Communications (UC) integrates telephone, text messaging, voicemail, fax and email to enhance employee collaboration and customer service. As businesses migrate voice traffic to IP from the public switched telephone network (PSTN) to reduce costs and enhance features, they must maintain call quality of service across the company data network. In a recent survey more than half of businesses identified migrating voice traffic to IP as a top priority.
The New Network Traffic Flow

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 travelled 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 patterns. Not surprisingly, when asked about the biggest networking challenges their company faced to support remote locations and workers, IT professionals reported WAN performance management as their top concern.

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 streams.

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.

Reflecting the rigorous requirements of such IP applications, an analysis by AppNeta found that only 34 percent of companies currently have a high-performance WAN ready to support advanced cloud services. When the bar is raised to include desktop virtualization, only 18 percent of business WANs now make the cut. Table 1 details the stringent performance requirements for some of these services.

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. *Megabits per second (Mbps) = 1 million bits per second, Gigabits per second (Gbps) = 1 billion bits per second

**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.

Table 1

WAN Performance Requirements by Application

<table>
<thead>
<tr>
<th>Service Level Parameter</th>
<th>Low-Quality Videoconference</th>
<th>High-Quality Videoconference</th>
<th>VoIP</th>
<th>Desktop Virtualization</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bandwidth</td>
<td>384 kps to 768 kps</td>
<td>1.5 Mbps to 12.6 Mbps</td>
<td>21 to 30 kbps</td>
<td>100 to 150 kbps</td>
</tr>
<tr>
<td>Latency</td>
<td>400-450 ms</td>
<td>150 ms</td>
<td>150 ms</td>
<td>250 ms</td>
</tr>
<tr>
<td>Jitter</td>
<td>30-50 ms</td>
<td>10 ms</td>
<td>10 ms</td>
<td>10 ms</td>
</tr>
<tr>
<td>Packet Loss</td>
<td>1%</td>
<td>.05%</td>
<td>1%</td>
<td>1%</td>
</tr>
</tbody>
</table>

Source: Cisco Systems21, VMware22
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

<table>
<thead>
<tr>
<th>Service</th>
<th>Business Ethernet / Dedicated Internet</th>
</tr>
</thead>
<tbody>
<tr>
<td>Availability</td>
<td>End to End: 99.97% (On-Net Circuit)</td>
</tr>
<tr>
<td>MTTR</td>
<td>Restore: Priority 1 Outage within 4 hours</td>
</tr>
<tr>
<td>Latency</td>
<td>50ms (Round Trip)</td>
</tr>
<tr>
<td>Packet Loss</td>
<td>&lt; 0.1%</td>
</tr>
</tbody>
</table>

Source: Kinetic Strategies

“**The WAN configuration decision will depend on the number of office locations, as well as the mix of users, devices and applications at each location.**”

**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 network 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 the 60 percent of 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 a very important decision.

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.

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 Time Warner Cable Business Class, 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.

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
Michael Harris is principal consultant at Phoenix, Arizona-based Kinetic Strategies, Inc. Applying more than 15 years of experience as a strategist, research analyst and journalist, Michael consults with select clients in the networking, Internet and telecommunications industries.

About Time Warner Cable Business Class
Time Warner Cable Business Class, a division of Time Warner Cable (NYSE: TWC), offers a full complement of business communications tools to small and medium-sized businesses and enterprise-sized companies. Its phone, Internet, Ethernet, cable TV and security solutions are enhanced by award-winning customer service and local support teams. Through its NaviSite subsidiary, the Company also offers managed and outsourced information technology solutions and cloud services. Time Warner Cable Business Class was founded in 1998. Today, it serves over 550,000 business customers throughout Time Warner Cable’s markets.

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