

Escalating Demands Strain Aging Network



Why it's Time to Modernize Your IT Infrastructure

Rapid advancements in processing power, according to Moore's Law, typically render PCs and servers obsolete every 12 to 18 months. In response, most companies update their computer equipment regularly. A similar dynamic of rapid change has occurred in the networking environment with older switches and routers needing to be replaced every few years. Many companies, however, continue to operate with less-than-fully optimized network infrastructures.

The effect on a business can be substantial. Networks designed years ago to counter minimal security threats with a router or a simple firewall cannot keep up with today's fast-moving viruses, worms, malware, and denial-of-service attacks. This same aging switching infrastructure must also keep up with the phenomenal explosion of network transactions per-day—including e-mail messages, instant messages, and Web downloads—that will only continue to grow in the coming years. For these and numerous other reasons presented in this paper, it makes excellent business and technical sense to engage the Cisco account team or a Cisco® certified partner to provide a full network assessment. From extending and enhancing employee productivity to making it simple for customers to reach you, to converging voice and video while providing systemwide security—the benefits and opportunities of a modernized infrastructure are significant.

Many of today's networks were designed and deployed several years ago to support relatively simple business and IT requirements. These needs were generally limited to basic file and print sharing, group e-mail, low-speed Internet connectivity, and remote branch-office connections through low-speed dialup or Frame Relay circuits. Even the more sophisticated organizations with early e-commerce implementations are now facing architectural and technological limitations.

Most people could not have predicted the exponential growth that has led to today's sophisticated Internet, or the vast expansion of all aspects of business to internal intranets. As a result, organizations have not yet adequately upgraded their Web infrastructures to support important new requirements and capabilities for e-commerce, productivity tools, sales and business operations, and customer service. Although organizations are often aware of these new requirements, they must balance them with pragmatic operational realities and financial constraints.

Even from a security perspective, IT has historically focused primarily on managing employee access login authorization, versus dealing with the continuous waves of new security threats. In fact, only a handful of network viruses existed a few years ago, and those could be handled easily with simple antivirus software applications.

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The network is a strategic success factor for many businesses today. One infrastructure is now expected to support many more network-based applications, a greater complexity of users, and a range of latency-sensitive, high-bandwidth traffic, including large e-mail documents, voice, video, and collaboration tools. Given the increased reliance on IT infrastructure, the network is expected to be robust and available 24 hours a day—downtime is not acceptable.

Many elements must work together to provide the highest resiliency and security, and perhaps one of the most important places to start is your underlying routing and switching foundation. Not only does the latest-generation switching, routing, and security infrastructure enable end-to-end advanced security, but it also delivers integrated voice over IP telephony (VoIP), wireless LAN (WLAN), and video communications over the same network. In a broader sense, a modern infrastructure will enable a wide range of business applications.

Enhance Your Business Through IT and Networking Investment

Consider the new challenges your company faces and the potential opportunities available with the most advanced technologies—technologies that were not available just a few years ago. Your company can now:

- **Dramatically enhance network security**—Deploy a systems approach across a Cisco Intelligent Network and the network actively participates in its own protection.
- **Offer flexibility**—Enable customers to do business with your company quickly and easily, through any method they desire, whether PC, phone, or personal digital assistant (PDA). Your support costs will decrease if you can direct customers to the Web. Keep in mind that meeting your broad customer demands with intranet and Internet tools may require optimizing your overall network capacity and performance.
- **Roll out networked business applications more rapidly**—Such applications include programs for sales, marketing, engineering, finance, manufacturing, accounting, and human resources. Providing your IT organization with the modern network infrastructure and resources it needs will enable deployment of scalable, Web-based systems for these new programs.
- **Reduce operating expenses (OpEx)**—Converging multiple services and networks onto a single, unified infrastructure offers a great opportunity to reduce your OpEx. For example, eliminating redundant networks, including older private branch exchange (PBX)-based voice systems, or closed-circuit video surveillance, will reduce staffing costs and increase overall operational efficiency. IP telephony and VoIP offer tremendous reduction in voice long-distance toll charges.
- **Extend and enhance employee productivity:**
 - Extend your network to wherever your employees need it, with integrated services such as voice and video delivered to remote users while being protected by low-cost VPN or secure WLAN connections, enabling them to check e-mail, conduct conferences, and work anytime, anywhere.
 - Provide efficient access to data for a broad range of business needs. Enable employee efficiency in production sites, warehouses, or in call centers. Even today's IP phones can deliver immediate access to sales or inventory data, and wireless networking enables the latest radio frequency identification (RFID) technology to provide fast and easy scanning of supplies such as boxes and parts.

Importance of Overall Network Evaluation

Although many companies have clearly invested in their networking infrastructures over the past few years, many of the upgrades have been piecemeal, often as a quick fix to a specific group's requirements. For long-term viability and growth, however, it is now essential to reevaluate the state of your network systemwide, and to assess your business requirements, as well as plan for tomorrow's inevitable growth.

A high percentage of today's networks still have network elements that are either obsolete or aged (including routers, switches, wireless access points, and security software and appliances). Inventory profiling and analytical network assessments will identify these elements and help clear the network of potential performance weaknesses and security vulnerabilities. Work with your partners to obtain inventory profiling or detailed network assessment support.

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Reevaluation Priorities

Several aspects of networking have evolved considerably over the last few years, so network managers need to reassess their infrastructures in the following areas:

- Security
- WAN and LAN performance (capacity, resilience, and application awareness)
- Wireless connectivity
- Remote access and VPN
- Voice and IP telephony
- Multimedia and rich-media collaboration

Security

Only a few years ago you could protect your network with a router, a few access control lists, and a simple firewall. Today, network security threats are much more aggressive and destructive. Viruses self-replicate and seek new areas of attack if the first target is blocked. Trojan horses are deposited on your employee's PCs at homes or coffee shop hotspots and await instructions to attack servers when connected to the corporate network.

In addition, hacking into networks has grown from student pranks to a worldwide net of criminal activity. These fundamental changes in security requirements often mean that older network designs and network elements, including old firewalls, routers, switches, and wireless access points, need to be upgraded quickly to address today's security needs. In fact, security must now be implemented on a systemwide level from the core of the network down to individual switch ports, also including the data center, branch offices, each individual server and PC, and of course the WAN. In some cases, organizations also need to provide variable levels of access to specific sites and data for employees and partners based on their particular level of authorization.

Columbus State University Eliminates Threat for Server and Desktop Computing Systems

Columbus State University (CSU), a four-year higher educational institution located in Columbus, Georgia, experienced a major security breach involving 3 critical servers. CSU staff dedicated many hours to rebuilding the servers, and allow the rest of their responsibilities to fall by the wayside during that time.

CSU chose Cisco Security Agent because of its integrated threat protection for server and desktop computing systems. Cisco Security Agent aggregates multiple security functionalities combining host intrusion prevention, distributed firewall, malicious mobile code protection, operating system integrity assurance, and audit log consolidation in a single agent package. By identifying and preventing malicious behavior before it can adversely affect the network, Cisco Security Agent eliminates potential known and unknown ("Day Zero") security risks that threaten networks and applications..

According to Senior System Support Specialist Mack Ragan, "So far, we've had zero problems on servers that are protected by Cisco Security Agents—no penetrations or compromises. Cisco Security Agent has provided 100 percent protection. I would definitely recommend it to anyone—and I do."

A Cisco Self-Defending Network provides the resilience and flexibility to support all these requirements. This secure solution is delivered through integrated security in Cisco Systems® routers, switches, and appliances, as well as software-based solutions for servers and PCs. And because security breaches often result in major data loss, companies should also seriously reassess the state of their data backup and storage capabilities.

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Increasing WAN and LAN Performance—Campus, Core, and Applications

Major increases in application and bandwidth requirements have created the need to upgrade many older routers and switches in the LAN and WAN. For example, as the average number of network transactions per day (including e-mail messages, instant messages, and Web downloads) has grown exponentially, current servers must deliver vastly greater amounts of traffic per link than ever before. This situation is due to the growth in numbers of users, an increase in the number of applications that they access, and a dramatic increase in the amount of time spent on the network as collaboration options have gained widespread appeal. All this means that yesterday's switches simply cannot keep up.

One of the critical underlying reasons for increased bandwidth and performance requirements is that in the past few years many common business applications—such as enterprise resource planning (ERP), customer relationship management (CRM), and MRP—have shifted from their original, simple client-server model to being served through the Web and intranets. This situation places a huge strain on traditional IT infrastructures.

Gigabit Ethernet, 10 Gigabit Ethernet switching, high-speed WLAN connectivity, embedded cache, and high-speed packet processing are just a few examples of technological advances that can be used today across the LAN, WAN, campus network, and data centers.

The recent introduction of network-based application acceleration and server off-load capabilities enables networks to decrease unnecessary processing burden on Web and application servers, translating to lower latency, higher network and application availability, and greatly reduced downtime.

Networks with Cisco equipment are also more manageable, thanks to the evolution of embedded traffic management and troubleshooting tools in Cisco network elements. The results are increased uptime and greatly reduced support-related expenses.

Central Utah Clinic's Network-Based Electronic Medical Records System not only Reduced Expenses, but also Increased Revenues

Central Utah Clinic, based Provo, Utah, implemented an integrated electronic medical records (EMR) system that runs over a Cisco network. The immediate cost saving is more than \$1 million in the first year of implementation by eliminating dictation costs, storage space, and paper-based charts. In addition, the clinic gained almost \$1.7 million in revenue by accuracy in coding of insurance procedures.

Wireless Connectivity

In addition to the obvious ease of access provided by WLAN technology, WLAN also provides a cost-effective alternative to wiring Ethernet cabling throughout every building or campus environment. WLAN is ideal for serving new, mobile, or temporary environments. Furthermore, it clearly offers greater employee productivity by keeping workers connected, enabling them to use portable PCs or PDAs in different locations during the work day. WLAN also enables remote business connectivity from various wireless hotspots, including hotels, home offices, or coffee shops.

But WLAN also provides a link to a growing number of strategic unwired applications, including inventory management, RFID, retail theft control, physical security, IP video surveillance, and even wireless e-mail and WLAN telephony.

Your network infrastructure needs to provide integrated WLAN capabilities, integrated transparently with security and collaboration services, so that your WLAN extends all the capabilities of your network to your users.

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Remote-Access VPN

VPNs offer fully secured remote connectivity to employees on an authorized basis. Because most employees rely on network connectivity to perform their jobs, providing extended access to the network from home or while traveling (from hotels or airports) offers unquestionable productivity gains. In addition, most employee laptops and PCs now have access to low-cost, high-speed DSL- or cable-based Internet access, often with built-in WLAN access—a dramatic change from the old, slow, dialup access they relied on just a few years ago. This transformation in Internet access is leading to a greater demand on IT staffs to provide scalable remote access for a rapidly increasing number of employees. You need to update your core and campus routers, switches, and security infrastructure in order to deliver resilient, scalable, and manageable VPN access.

Voice and IP Telephony

The migration of voice communications from separate, traditional, PBX-based networks to a fully converged voice and data IP LAN or WAN is now a commonly accepted business and IT practice.

Many fundamental reasons justify upgrading your network to support integrated IP telephony: cost, flexibility, and productivity. From a financial perspective, there is no longer a compelling business reason to maintain two separate networks and two separate staffs. Traditional PBX environments require continuous expenses associated with physical moves, adds, and changes—including rewiring offices and reconfiguring phones. Furthermore, by fully integrating your voice, telephony, and data on the same Cisco LAN or WAN, you can now work with a single source for your converged network infrastructure, further reducing your costs and management complexity.

Because Cisco IP Communications is based on standard IP Protocol, it offers another less-obvious advantage: integration with your existing business applications and databases. Cisco IP Communications offers transparent integration of telephony-based applications, including unified messaging (voicemail, e-mail, or fax), rich-media collaboration, integrated videoconferencing, call-center management, and even WLAN telephony. Even IP video telephony is now a practical solution, given the easy availability of high-bandwidth connectivity.

Furthermore, because it relies on an IP, standards-based, open architecture, Cisco IP Communications helps enable a wide variety of third-party IP phone applications, including digital voice recording, voice encryption, digital timecards, inventory or sales data look-up from phones, and menu-based service applications. IP telephony provides cost savings, business solutions, and IT flexibility that are not available with traditional PBX telephone systems.

Seven Counties Services Reduced Network Operation, Maintenance, Expansion Costs, and Provide Improved Patient Services

Seven Counties Services, Inc. in Louisville, Kentucky is a private, nonprofit corporation that provides support services for mental health, alcohol and drug abuse, mental retardation, and developmental disabilities. Seven Counties Services initiated the migration of legacy PBX and all of its phones to Cisco IP Communications, and increased network security with Cisco PIX® firewalls and Cisco intrusion detection systems (IDSs) to comply with the patient privacy requirements of electronic healthcare.

“We now have a secure, flexible network that lets us easily adapt electronic business processes,” says Gerry Brazeau, Vice President and Chief Information Officer. The infrastructure now allows the agency to easily add bandwidth, prioritize traffic using Quality of Service (QoS), and operate bandwidth-intensive applications.

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Multimedia and Rich-Media Collaboration

Traditionally, meetings involve assembling individuals together physically in the same room, city, or country. In addition to the obvious significant travel cost reductions enabled through Internet collaboration, another equally important advantage is that organizations can now tap into a broader audience on very short notice.

The right specialists, senior management, or customers may not be available to travel all day for a one-hour meeting, but they can easily make themselves available for a highly productive one-hour Web-based session. Beyond sharing typical documents such as spreadsheets, text, or pictures, Web collaboration tools also transparently integrate voice, audio, and video material. In addition, rich-media collaboration enables low-cost customer, sales, or other Webcasts or seminars to any audience with Internet access.

Whether involving big or small teams, effective Web collaboration is enabled by a modern network infrastructure with sufficient bandwidth and performance to support the variety of applications involved.

The Next Step to Modernizing the Network

The Cisco® Smart Business Roadmap provides a structured, planned evolution path to help businesses keep pace with change and make informed technology purchases. This roadmap enable businesses to align a network technology plan with their business priorities, effectively address current challenges, and evolve to take on new challenges.

Work with your Cisco certified partner, who will define an assessment roadmap. Together, you should consider your company's IT and business objectives, followed by an examination of the elements in your network, including old and obsolete network elements. Together, you can determine the gaps between where your network is now and where you want it to be.

Signs that you need to take a deeper look at your network follow:

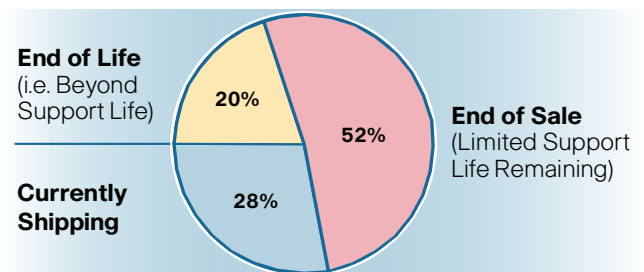
- Numerous security “events” occurred in the last year that froze your servers or caused you to lose critical data.
- Expiring support contracts on end-of-sale or end-of-life products means any network outages associated with unsupported platforms are not easily fixed.
- Your IT personnel spend a significant part of their time installing patches and security updates to company PCs, laptops, and other mobile devices.
- Dozens of multivendor products populate your network, slowing your ability to roll out new solutions and increasing training and maintenance costs.
- Customers are unable to reach your technical, sales, or other specialists easily through the channel they desire—phone, chat, e-mail, or Web.
- Your IT staff is unable to quickly adapt to changing business models and is limited by the capabilities of the core infrastructure.

During extensive technical inventories of nearly 500 customer networks, more than 70 percent were found to have obsolete or aging network elements still in operation, including routers and switches. In many cases, these old network elements were either hidden deeply in the networking core or simply forgotten at remote branch offices-but should have been upgraded years ago. Having a partner perform a formal inventory profile, or “network discovery”, will provide a useful insight into the current state of your network and help identify areas that are overdue for upgrade or redesign. These very units may be the weakest link in your network from a performance, bandwidth capacity, or security perspective.

Figure 1. Summary of Inventory Profile

Network is Only as Strong as its Weakest Link— Danger of Obsolete Equipment

Approximately 70% of Networks Assessed
Included Obsolete Equipment



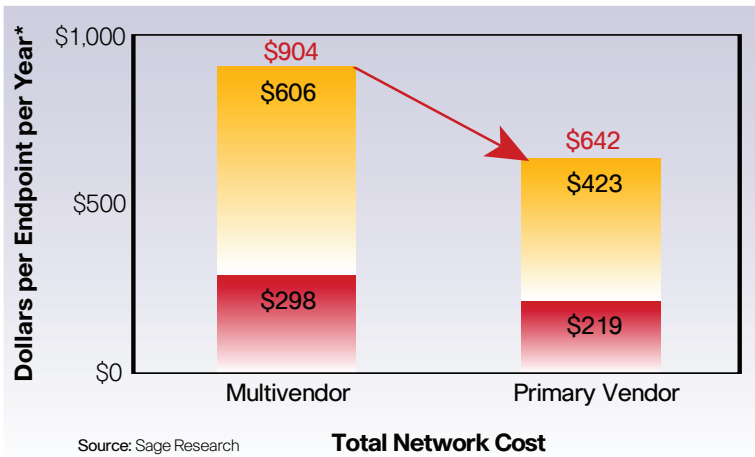
Conclusion

Maintaining a modern IT and network infrastructure is not a one-time event. Requirements evolve continuously, as do technologies. Therefore, refreshing your network should be an ongoing process of network optimization or outright repair.

Cisco offers a complete line of computer network components – routers, switches, wireless, advanced security, networked storage, and voice technology. Each of these technologies has garnered world-class status individually, but works much better together. You will lower your risk and total cost of ownership, accelerate your deployment of a converged voice and data network, improve operational efficiency, and enhances the customer experience.

Figure 2. Working with a Single, Best-in-Class Vendor Can Save You Significant Resources

Value of an Integrated Systems Approach Financial Benefits



Primary Sources of Savings:

- More time for network planning and design
- Improved network monitoring and troubleshooting
- Resolution of incidents in hours compared to days (for parallelism)
- Integrated voice and data staff
- Better package deals

■ OpEx ■ CapEx

* Endpoint is defined as a network-connected computer

Not all aspects of your network need to be upgraded at the same time, and most organizations have budgetary constraints. From a financial perspective, leasing can provide a powerful alternative to outright purchase of new infrastructure. In the same way that leases allow people to drive the latest-model cars, lease packages can enable more fluid and ongoing adoption of the most current and required networking solutions.

Most likely, your network is in the mature phase of its lifecycle, yet your business needs have significantly expanded over the past few years. This is exactly the right time to discuss your evolving business requirements with your local Cisco certified partner and Cisco account team.

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