

Why it's Time to Modernize

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 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.

An aging network's 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 deal with the phenomenal explosion of peer-to-peer traffic, video, and voice, which 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 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 years ago to support relatively simple business and IT requirements. These needs were generally limited to basic file and print sharing, group email, and low speed Internet connectivity.

Most people could not have predicted the exponential growth that led to today's sophisticated Internet, or the vast expansion of all aspects of business to internal intranets. As a result, many organizations have not yet adequately upgraded their infrastructures to support important new requirements and capabilities for e-commerce, productivity tools, sales and business operations, and customer service.

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

The network is a strategic success factor for 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 email documents, voice, video, and collaboration tools. The network is expected to be robust and available 24 hours a day, and downtime is not acceptable.

Many elements must work together to provide the highest network resiliency and security, and perhaps one of the most important places to start is the underlying routing and switching foundation. The latest-generation switching, routing, and security infrastructure not only supports end-to-end advanced security, 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 help 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—Use a systems approach to deploy a Cisco Self-Defending Network.

- Offer flexibility—Allow customers to do business with your company quickly and easily, through any method they desire, whether through a PC, phone, or personal digital assistant (PDA). Your support costs will decrease as you 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.
- Rollout 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 help 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 lower 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 can greatly reduce voice long-distance toll charges.
- Extend and enhance employee productivity:
 - Extend your network to anywhere 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. This allows employees to check email, conduct conferences, and work anytime, from anywhere.
 - Provide efficient access to data for a broad range of business needs. Help enable employee efficiency in production sites, warehouses, or in call centers. Even today's IP phones can immediately access sales or inventory data, and wireless networking supports the latest radio frequency identification (RFID) technology, to provide fast, 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 these 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 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.

New 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:

- Regulatory compliance
- Security
- WAN and LAN performance
- Anytime, anywhere access
- Voice and IP telephony
- Rich-media collaboration for cost savings
- IP video

Regulatory Compliance: How Technology Can Help

Around the world, governments, major corporations, and even the public are insisting that organizations take appropriate steps to help ensure the proper protection of both corporate and personal communications and information. As a result, industry and government bodies continue to introduce new regulations.

Table 1 shows examples of common compliance regulations and the type of information each one is intended to protect.

Table 1. Common Compliance Standards

Regulation	Information Protected
Health Insurance Portability and Accountability Act (HIPAA)	Health information of patients
Gramm-Leach-Bliley Act (GLBA)	Consumer financial information
Sarbanes-Oxley Act of 2002	Business and financial accounting information
Federal Information Security Management Act (FISMA)	Information maintained by U.S. federal systems
Payment Card Industry (PCI) Data Security Standard	Credit card information
Federal Financial Institution Examination Council (FFIEC)	Business and consumer financial information
Basel II	Business financial and accounting information

Helping to ensure a business's regulatory compliance is a corporate concern, but it poses the greatest challenge for IT managers. Most regulations do not specifically state what they require from an IT perspective, and often several different regulations apply to a given organization, making it difficult for IT managers to know what to do to meet their compliance goals. Because the consequences of noncompliance can be quite severe, including fines and even jail time for egregious offenses, many IT managers are understandably apprehensive about this important subject.

As organizations are challenged to respond to the growing list of compliance-related IT demands, many find that their networks, which have served them well for some years, cannot provide the new functions required to address their security and compliance needs.

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 to address today's security needs. Security can now be implemented on a systemwide level from the core of the network down to individual switch ports, and can include the data center, branch offices, each individual server and PC, and the WAN. In some cases, organizations also need to provide variable levels of access to specific data for employees and partners, based on their level of authorization.

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 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 reassess the state of their data backup and storage capabilities.

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. 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.

Network-based application acceleration and server off-load capabilities allows networks to decrease unnecessary processing burden on web and application servers, translating to lower latency, higher network and application availability, and greatly reduced downtime.

Anytime, Anywhere Access

In the past, companies were based primarily in one, or perhaps a few locations. Employees lived in nearby communities, and came into the office every day to access all the resources they needed. For many of today's workers, that has all changed.

Today's organizations are becoming more geographically dispersed. Employees are increasingly working from their homes and remote sites, and the tools and information they need may be spread across several sites. And even those who are "in the office" must have access to applications and data across the campus.

What today's businesses need is a flexible, cost-effective architecture that supports the secure, consistent delivery of services to all network users, regardless of location.

At the WAN edge, the proper solution allows companies and organizations to link hundreds or even thousands of branch offices to headquarters. This solution provides access to data and applications in milliseconds all over the world. It supports real-time collaboration among multiple sites. It provides high-quality voice and video to all locations. And it delivers all these benefits while protecting data.

Inside the network, a unified wired and wireless network can provide transparent mobile access. This network must be reliable, pervasive, and easy to maintain. Older access points have limited capacity and capabilities. They are also autonomous, meaning they must be individually managed and secured.

The next-generation Cisco Unified Wireless Network, which includes new WLAN controllers and new wireless access points, supports 802.11n for increased coverage and capacity. Together with Cisco Catalyst switch features such as enhanced PoE and integrated security, the Cisco Unified Wireless facilitates mobile computing over a secure, high-performance, network.

Voice and IP Telephony: Helping to Enable a More Responsive Workforce

With the advent of tools and technologies that increase the productivity of the workforce, it is no surprise that the adoption of IP telephony and voice over IP (VoIP) continues to grow. Dynamic call routing for contact centers is allowing companies to staff their call centers with geographically-dispersed resources. The integration of web technologies with IP telephony is allowing companies to significantly improve customer relationships.

Because VoIP has been around for several years, some IT personnel assume that their existing network can provide the support needed for a VoIP deployment, and discovering that their networks are not ready. VoIP requires bandwidth allocation and queuing mechanisms to help ensure Quality of Service. For many older networking devices,

these mechanisms are insufficient. Also, the deployment and ongoing use of VoIP is greatly simplified by Power over Ethernet (PoE), which is not widely supported in older devices. Additionally, new wireless technologies, such as voice over wireless LAN (VoWLAN) and dual-mode phones that combine cellular and Wi-Fi communications, require features that are available only in the latest wireless access points and wireless LAN (WLAN) controllers.

Today's Cisco Catalyst switches and Cisco integrated services routers (ISRs) allow organizations to take advantage of the productivity and cost-saving benefits of VoIP through:

- Power over Ethernet, Cisco Discovery Protocol, and Intelligent Power Management, which help enable the infrastructure to automatically recognize an IP phone, provide the appropriate configuration and QoS, and negotiate the precise level of power required
- Extensive queuing mechanisms (with simplified configuration using AutoQoS)

Rich-Media Collaboration: Cost Savings through Business Transformation

Traditionally, meetings involve assembling individuals together physically in the same room. In addition to the obvious significant travel cost reductions gained through Internet collaboration, another equally important advantage is that organizations can now tap into a broader audience with 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 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 supports 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 provided by a modern network infrastructure with sufficient bandwidth and performance to support the variety of applications involved.

Cisco offers a variety of IP-based collaboration solutions, including IP phone and video conferencing, WebEx® web-based conferencing, and TelePresence, which can replace many in-person meetings. As mentioned previously, these online collaborative technologies solutions rely on advanced features and technologies, many of which are available only in newer Cisco routing and switching platforms.

IP Video: Solutions to Promote Learning, Safety, and Collaboration

In today's global marketplace, companies are looking to their networks to bring their employees, customers, and business partners together. Moving beyond simple voice communications, enterprises are turning to rich-media applications, such as video, to increase worker productivity. In addition, advancements in digital video are making it possible for companies to use their IP networks to improve physical security through IP video surveillance, and to improve their customer reach through digital signage.

To take full advantage of these innovations, companies need to be sure that their network is ready to meet the demands that video applications place on the infrastructure, including increased bandwidth requirements and the need for advanced QoS tools to help ensure delivery. As a developer and supplier of both video solutions and the IP infrastructure on which they reside, Cisco is uniquely positioned to deliver the technologies needed to support a variety of video deployments.

The Next Step to Modernizing Your Network

You may need to take a closer look at your network if you have experienced any of these items:

- Numerous security “events” occurring in the last year that affected your servers or caused you to lose critical data
- Expiring support contracts on end-of-sale or end-of-life products that potentially put your network at risk
- Your IT personnel spending a significant part of their time installing patches and security updates to company PCs, laptops, and other mobile devices
- Dozens of products from many vendors populating 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 phone, chat, email, 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. Having a partner perform a formal inventory profile, or “network assessment”, will provide 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.

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 routers, switches, wireless, advanced security, networked storage, and voice technology. These technologies have garnered world-class status individually, but work much better together. With Cisco solutions, you can lower your risk and total cost of ownership, accelerate your deployment of a converged voice and data network, improve operational efficiency, and enhance the customer experience.

By upgrading to newer Cisco technologies, your business can acquire an industry-leading network platform that adapts to current and future business needs and provides numerous benefits, including:

- Enhanced protection of information and assets
- Unconstrained, secure collaboration between employees, vendors, and customers
- Secure, easy access to applications, information, and resources within the organization, regardless of location
- Faster, easier deployment of applications and services, including voice and video
- Scalability to support network expansion due to growth, acquisitions, and partnerships
- Enhanced ability to comply with government and industry regulations
- Lowered operating expenses through an integrated network that reduces complexity and training requirements
- Cost savings through reduced power consumption and reduction of travel

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 equipment.

While your network may include outdated components, 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.



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