WHITE PAPER

Operational Excellence in Networking: Industry Leaders Point the Way

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EXECUTIVE SUMMARY

To meet today's demands for high-performing IT services in a cost-conscious business setting, network managers at leading organizations are employing a number of best practices to improve network services levels, reduce the complexity of their networking infrastructure, and optimize organizational efficiency. Some practices bring more standardization and automation to the networking environment. Others focus on consolidating the number of physical devices, networks, and vendors involved (e.g., using single network devices to satisfy many different requirements). Still other practices employ virtualization to make the best use of networked resources.

With all these best practices, the objective is to reduce network costs, improve staff effectiveness, increase network resiliency, and boost network responsiveness. To determine how well organizations are meeting this objective, IDC interviewed network executives at more than 40 large enterprises and mid-sized businesses in the United States in a variety of industries. IDC asked a series of questions about the level of consolidation, standardization, integration, virtualization, and automation undertaken, and which best practices were used.

The survey found that organizations with the highest return on IT have reduced IT spending on infrastructure by an average of 18% by using these specific best practices. The practice with the greatest impact on operational efficiency, as measured by networking cost per employee, was standardizing on one consistent set of networking services. For companies that followed this practice, the networking costs per employee were 46% lower, on average, than for companies that did not.

Consolidating router, switch, and voice vendors, and employing virtualization to make the best use of networked resources also had significant impact. Consolidating router, switch, and voice vendors saved an average of 45.6%, while companies that made greater use of server virtualization averaged savings of 42.2%.

Among other best practices, companies with more automated systems saved an average of 35.9%, and those with formal service-level agreements (SLAs) achieved average cost savings of 33.9%.

In its survey, IDC also asked respondents to identify the three actions that had had the greatest impact in reducing their network's total cost of operations. Financial institutions attributed their cost savings and improved operational efficiency to a variety of actions, including the addition of switch and other redundancy in the network, and the increased use of automated management tools, tiered storage, and server virtualization.

Healthcare firms mentioned datacenter consolidation and standardizing on a single vendor as main reasons for reducing their network total cost of operations. Among retailers, companies cut costs by consolidating to a single hardware vendor or to a single carrier for wireless, data, and voice services, and renegotiating much cheaper rates. One retailer was able to reduce training costs and avoid hiring additional IT staff by standardizing its hardware across the organization.

Manufacturers reported implementing a variety of cost-saving measures, ranging from virtualization and server consolidation to standardizing hardware and network devices and using a single vendor. Consolidation and standardization of network hardware were cited by many utilities as vehicles for improving operational efficiency. Others mentioned the combining of voice and data groups. Transportation companies are also turning to consolidation, virtualization, and standardization to increase operational efficiency.

In this white paper, IDC reports on the survey findings and recommends best practices for reducing networking costs, increasing network resiliency, and boosting network service levels. The paper also describes an online Network Operations Assessment tool developed from the survey findings by IDC and its software partner, Alinean. The tool calculates an organization's operations excellence quotient based on a self-assessment of current network capabilities, spending, and best practices. Besides helping an organization to compare its network operational practices against top-performing leaders in its industry, the assessment tool also offers IDC recommendations for improving the organization's network infrastructure, procedures, and skills.

INTRODUCTION

To keep their organizations competitive in today's global economy, IT executives and managers must provide business services with optimum performance, reliability and security while dealing with limited staffing and budget. In particular, they must be able to respond quickly to changing business priorities, and rapidly deploy and support new applications and initiatives. Another vital imperative is to accommodate growth while minimizing capital and operating costs.

Network managers are doing their part by reducing the complexity of the network infrastructure with the aim of easing and speeding deployment of new applications and services and increasing business agility. By streamlining support and maintenance, and automating many network administration tasks, they are also reducing operating costs, speeding problem resolution, and minimizing downtime. Together these benefits translate into higher user productivity and satisfaction, cost savings, and improved business results.

IDC has found that network managers at leading organizations are improving services levels and driving maximum operational efficiency by following a number of key practices, including:

- ☑ **Consolidation.** Consolidation efforts are under way in multiple areas of networking and IT. To maximize bandwidth utilization and reduce WAN, wiring and facilities costs, organizations are combining voice, data, and video traffic over a single network, often an IP network. Another consolidation move is to reduce the number of router, switch, security, wireless, and voice vendors to simplify operations and reduce support complexity. These efforts, implemented across the network, complement datacenter consolidation and server consolidation initiatives.

- ☑ **Standardization**. Standardizing networking hardware, software, and services reduces network complexity and training costs while heightening network effectiveness. Companies that standardize on one consistent set of network devices also maximize the utility and lifetime of network components.

- ☑ **Integration**. Having single network devices satisfies many different requirements and drives operational efficiency by reducing the number of devices managed. Using networking devices that support not only connectivity, but also security and voice services, simplifies network operations and offers the added benefit of consistent service delivery across the network.

- ☑ **Virtualization.** Employing virtualization to make the best use of networked resources not only increases resource availability, but also reduces IT spending. Virtualization is enabling a consolidated and efficient infrastructure across the IT spectrum.

- ☑ **Automated administration**. By automating manual network administration tasks, organizations save on labor costs and free valuable IT staff for more productive work in support of business goals. Automation also lessens the risk of error-driven networking problems such as incorrect configurations or incomplete changes. When there are problems, automated systems also speed the identification and repair of network faults, often before they impact service levels. Operating with a minimal number of management systems can further reduce costs and complexity.

IDC Survey to Validate Business Benefits

With all these best practices, the objective is to reduce network costs, improve staff effectiveness, increase network resiliency, and boost network responsiveness. To determine the impact of these best practices on network operational excellence, IDC interviewed network executives at more than 40 companies in the United States in a variety of industries.

IDC asked a series of questions about the level of consolidation, standardization, integration, virtualization, and automation undertaken, and which best practices they used. To establish a benchmark for best practices, IDC interviewed companies with the highest levels of IT operational excellence compared with their peers in the same industry. Additionally, IDC interviewed roughly equal numbers of large enterprises and mid-sized businesses to see if there were any differences in their best practices.

To identify the top performers in IT operational excellence in each industry, IDC used the Peer Comparison global company database and Return on IT (ROIT) metrics of its partner, Alinean Inc. (See the sidebar, Identifying IT Leaders in Operational Efficiency). Within each industry, IDC chose three or four large enterprises and a similar number of mid-sized businesses with the highest return on IT performance. All the companies are based or headquartered in the United States. The selected industries were financial services, healthcare, retail, manufacturing, transportation, and utilities.

Identifying IT Leaders in Operational Efficiency

To identify companies with the highest IT operational efficiency, IDC used the Peer Comparison global company database compiled by its partner, Alinean Inc., a leading developer of research, methodologies, and software tools to measure and quantify the value and return on investment (ROI) from information technology solutions.

The database includes information on 20,000 public companies in 100 countries, including 15,000 in the United States. Large companies, with sales revenue greater than $1 billion annually, account for about 40% of the database. Small companies, with revenues between $3 million and $50 million, account for a further 20%, with medium-sized firms making up the balance.

Using this database, Alinean has developed a return on IT (ROIT) metric for gauging overall IT spending efficiency and effectiveness, based on the ratio of economic value add (EVA) to IT spending. EVA data is a proprietary offering licensed by Alinean from Stern Stewart and Co., a global consulting firm. For companies not covered by Stern Stewart research, Alinean calculates the EVA based on the equity investment reporting method.

IT spending includes the formal IT investments allocated and controlled by the CIO and IT group and the IT spending controlled by business units and leaders. It also includes the indirect, or "hidden," IT expenditures of business units and users. The data comes from IDC research on IT spending by 400 companies in 36 industries, which is continually updated.

For the surveyed companies, the IT budget averages 2% of annual revenue, amounting to $3,538 per employee. The average networking budget is 22% of the IT budget. On average, there are 485 users for each networking full-time employee (FTE). It takes the companies an average of 9.8 hours to deploy a new networking device and 36.8 hours to deploy a new networking service. Network downtime averages 1.9 hours a month.

In the interviews, IDC asked questions about the makeup of the network infrastructure, spending and performance levels, and the infrastructure's impact on

revenue and business. IDC also asked about organization, workflow, and strategies, as well as best practices applied to network operations.

On Being Leaders — Methodology and Analysis

Leaders were chosen for the study based on their overall financial performance versus their return on IT spending. IDC then benchmarked their networking performance versus the average company in their industry. Finally we looked at which practices common to these leaders had the most impact on three key metrics:

☑ Networking costs, based on the annual networking FTE labor cost per user

☑ Networking service delivery, measured in annual network downtime hours

☑ Networking agility, measured in the number of hours required to roll out a new networking service to the entire company

Overall we found that the leaders tend to perform better in all three metrics. Their average costs per user are 5% less, they are delivering 30% more uptime, and they can launch a new service 40% faster.

BEST PRACTICES FOR OPTIMIZATION

The survey found that organizations with the highest return on IT (ROIT) measurement have reduced IT spending on infrastructure by an average of 18%. The savings from improved network resiliency and responsiveness varied by industry.

Using networking costs per employee as a measure of network operational excellence, the survey showed that the best practice with the greatest impact was standardizing on one consistent set of networking services, followed by consolidating router, switch and voice vendors, and employing virtualization to make the best use of networked resources. Deploying automated systems to ensure rapid, accurate, and efficient network administration, establishing formal SLAs, and standardizing on one consistent device also correlated with significantly improved network operational excellence.

The networking costs per employee for companies that standardized on one consistent set of networking services were 46% lower, on average, than for companies that did not (see Table 1). The difference was particularly pronounced with financial services and healthcare firms, where the average difference was greater than 60%. In standardizing on a consistent set of networking services, IT is able to "simplify" the network. This simplification enables network managers to deliver on best practices in the network with consistent training and support for appropriate, companywide network services.

TABLE 1

Impact of Best Practices on Networking Costs

Best Practice	Average Reduction in Networking Costs (%)	Top Performers
Standardizing on one consistent set of networking services	46.00	Financial services, healthcare
Consolidating router, switch, and voice vendors	45.60	Financial services, utilities
Use of server virtualization	42.20	Utilities
Use of automated systems for network administration	35.90	Utilities
Use of formal SLAs	33.90	Healthcare
Standardizing on one consistent device	32.30	Healthcare, retail

Source: IDC, 2007

As for the benefits of consolidating router, switch, security, wireless, and voice vendors, networking costs per employee were an average of 45.6% higher for organizations with six or more vendors compared with those with five or fewer. The biggest differences occurred with financial services firms and utilities, where the average delta was greater than 60%. Consolidation around a fixed set of vendors is a goal that IT has pursued for many years. The results show that taking a proactive approach to vendor consolidation does reduce costs.

Companies that made greater use of virtualization to get the most from networked resources averaged 42.2% lower network costs per employee than companies making less use of the practice. Utilities registered the largest disparity. Cost reduction is a clear benefit to companies that have embraced virtualization. It also provides the added benefit of improving service levels to end users. Here, underutilized resources are applied to user demand, and resource overload is avoided.

Utilities also were the greatest beneficiaries of using automated systems to ensure rapid, accurate and efficient network administration. Utilities with more automated systems had 63.8% lower networking costs per employee than those with less automation. For all companies, the difference was 35.9%. Organizations report recoverability and fast deployments as concrete examples of how they have been able to achieve real-time operations.

Organizations with formal SLAs also had lower networking costs per employee than those without. The average cost difference was 33.9%. For healthcare firms, the average difference was 47.1%. Companies with formal SLAs also had an average of 22.1% less downtime. Implementation of formal SLAs empowers IT to have frank conversations with its suppliers, as well as its constituents within the organization, with the ultimate benefit of delivering on the required network reliability and availability.

Companies that standardized on one consistent device were more efficient than ones that did not by an average of 32.3%. Downtime was also lower by 20.2%. Healthcare firms and retailers showed the biggest differences. By standardizing on a consistent device across the enterprisewide network, organizations can substantially reduce training, support, and inventory costs.

There were smaller differences between companies that did and did not leverage single network devices for multiple services. On average the difference in networking costs per employee was 18.9%, though it was higher with manufacturers and retailers. The average time to deploy a new service was also 9.8% lower with companies using this practice. Network management and support cost benefits are realized when companies integrate multiple services onto a single device.

Companies able to identify and repair more than 50% of network problems before they impacted network service levels were more efficient than companies with poorer records. The average difference in networking costs per employee was 15.3%, with manufacturers and healthcare firms registering differences of more than 40%. In essence, the ability to identify problems before users become aware of them transitions the network staff from reactive problem solvers to strategic contributors to the business.

Networking costs per employee were also slightly lower (by less than 10%) for companies that combined power delivery and LAN connectivity over a single link, though utilities and transportation companies showed better results. The link between power over Ethernet and reduced costs is likely a carry-over benefit from consolidating network services such as voice over IP (VoIP) and WLAN onto the network.

The message that resonates from our research is that, by reducing complexity, companies can achieve operational excellence. Gains in efficiency enable IT to become more effective in providing strategic services to meet rapidly challenging and changing business objectives (Figure 1).

FIGURE 1

Networking Best Practices by Percentage of Networking Cost Reductions
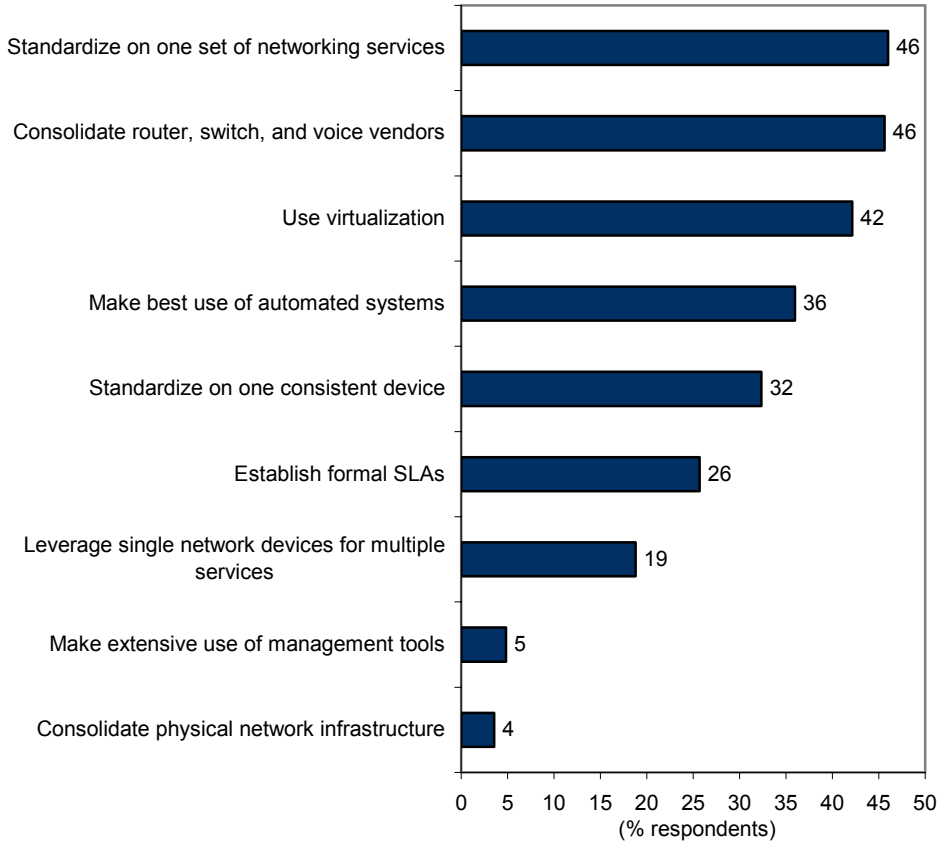
Source: IDC, 2007

Key Actions and Initiatives

In its survey, IDC also asked the respondents to identify which IT initiatives had the greatest impact in reducing their network's total cost of operations.

Financial services. Financial institutions interviewed for the study attributed cost savings and operational excellence to a variety of actions, including the addition of redundancy in the network and the increased use of automated management tools, tiered storage, and server virtualization. Some firms added new services, such as VoIP that eliminated or offset other costs. A couple of companies had renegotiated their carrier contracts to achieve substantial savings from better leasing terms, cross training, and added functionality from VoIP and other new services.

As a group, the financial services organizations take a proactive approach to the network by standardizing on a consistent set of networking services and consolidating the number of vendors. They also report a strong degree of working with other IT departments such as server, storage and security to achieve best practices in networking. For example, one company created extensive diagrams to handle frequent changes in data and servers among 400 departments spread across 32 floors with different pools of data. Each department now has its own diagram showing what they have, what data they share, and how they want to share it.

Healthcare. IT is evolving within the healthcare industry to go beyond reducing costs so as to contribute to increased quality of care. As a result, the respondents reported specific steps to improve services, as well as reduce costs. Examples of how they reduced their network total cost of operations included:

- Datacenter consolidation

- Standardizing on a single vendor

- Single protocol for all network traffic

- Equipment and technology upgrades

- Negotiating volume carrier agreements and using multiple "innovative" carriers

In order to improve network service levels, leaders reported a consistent communication between the rest of IT, including the security group, and line-of-business managers.

Retail. IT organizations within retail are uniquely dependent on the network, focusing on the closest point possible to the end customer. Given the scale and distribution of IT assets, leading retail organizations were aggressive in applying best practices to reduce complexity and costs in their widespread networks. For example, by standardizing hardware across the organization, one retailer was able to reduce training costs and avoid hiring additional IT staff. Others cut costs by consolidating to a single hardware vendor or to a single carrier for wireless, data, and voice services and renegotiating much cheaper rates.

Network improvements figured prominently in the responses of retailers. It is the leading vertical for integrating multiple services into single systems. One retailer with 91 stores reduced long-distance costs by deploying a wide area network to link all the devices in its stores and to support VoIP. Another implemented a storage area network to reduce disk and storage costs. Information capture and security were also big areas of focus for retailers. One retailer interfaced its point-of-sale registers to a corporate database via a single computer in each store. This system was designed to capture sales information without fear of it being modified.

Manufacturing. Manufacturers reported implementing a variety of cost-saving measures, ranging from virtualization and server consolidation to standardizing hardware and network devices and using a single vendor. As a group, manufacturers lead the way in standardizing network systems and services. "Previously we had various manufacturers and models of switches, which made it more difficult to support

and manage," said one respondent. "We decided to standardize on a single vendor and a single product range, which means that if there is a firmware upgrade, for example, it's the same firmware that's being applied to everything. It's much easier to manage now."

One manufacturer saved by replacing different phone systems in various countries with a single phone system, reducing maintenance costs and consolidating five vendor contracts into one. Others cut costs by renegotiating their WAN and carrier contracts, or by deploying an MPLS (Multi-Protocol Label Switching) network. Deploying appliances to accelerate web operations increased the operational efficiency of one manufacturer, particularly in exchanging documents with its Asia offices, without incurring the costs of increased WAN bandwidth.

Another manufacturing respondent reported spending quite a bit of time and effort on coming up with security policies and standards. "Once we had those in place, it made the operation and management of the network easier just because we had a formal plan to follow," he noted. Has it saved time or money? "Both," he says.

Utilities. Consolidation and standardization of network hardware were cited by many utilities as vehicles for improving operational efficiency. Others mentioned the combining of voice and data groups. "By combining the two groups we now have one team, with a single reporting structure and management," the respondent said. "Having two separate groups was inefficient and caused a number of problems."

As expected, this vertical leads all others in consolidating the physical network infrastructure. One utility respondent reported that deploying an $11-million, 700-mile fiber SONET network was one of the most strategic and important decisions his organization made. "We installed our own fiber backbone, connecting all of our major locations," said the respondent. "SONET technology allows us to be fully redundant, so if the cable were cut or dug up by a backhoe, it would continue to operate. We put all of our internal communications — voice; data; video; supervisory, control, and data acquisition (SCADA) circuits and radio — on the network. We gave ourselves such an opportunity for growth that we continue to reap the rewards."

Transportation. Transportation companies are also turning to consolidation, virtualization, and standardization to increase operational efficiency and effectiveness. One transportation company adopted server standardization, while others focused on equipment or configuration standardization. "Because we're on standardized hardware and software platforms, our people are more efficient in deploying new applications or resolving problems," said one respondent. Other transportation companies cited operating system upgrades and infrastructure improvements as important contributors to higher operational efficiency. In transportation, where logistical information is critical to market share growth, these companies had the highest reported use of automated systems to ensure rapid, accurate, and efficient network administration

Taken in their entirety, the specific best practices can be applied in all industries. It is worth noting, however, that the leading initiatives in each industry are directly related to the top concerns of the specific business. Because the network is the lifeblood of any utility, for instance, consolidating on a physical network took top priority. Similarly,

in retail, where a multitude of services must be available at the point of customer interaction, consolidating multiple services onto a single device provided a significant return.

Operating Metrics

To determine a baseline of operational excellence in networking, IDC asked respondents a series of questions across a wide spectrum of networking capabilities, operational practices, and network spending. The network assessment ranged from network service quality and return to asset and configuration management, and administration and change management. IDC also assessed performance management and optimization, problem management, and security management.

Organizational Interaction

The first step was to determine the level and type of organizational interaction at companies with high-operating excellence quotients. IDC asked its survey respondents to rank the amount of interaction that takes place among networking support staff and other operational and business groups. The results indicate that even the leaders have significant room for improvement.

In particular, most respondents reported minimal interaction with the application development groups. In order for IT and network managers to be perceived as a vital life blood of the transactions and interactions of the enterprise, the network must be included in the strategic process of developing business applications. In those organizations where interaction is at a minimum, the network is relegated to a reactive position with little warning as to "what's next" on the network. The good news is that among large enterprises, interaction with the server and storage support group is strong. Additionally, most reported extensive communication with the corporate security group. These ties are furthering best practices on the network and leading to the adoption of a next-generation network infrastructure that supports IT consolidation, high-performance computing, VoIP, and iSCSI.

Network Service Quality and Return

In order to gauge the state of their networks, we asked the respondents to rank their network on a variety of factors, including availability, responsiveness, service levels, and cost of ownership. Table 2 provides a complete list as well as a look at top performing industries. The respondents who ranked their networks the highest in overall service quality invest in the network from a system's viewpoint. They are more likely to consolidate on a limited number of vendors, but approach security and other services much like a Swiss army knife —- employ one cost-effective tool that provides many required functions. This enables the leaders to achieve efficiency through simplification while also empowering the network to support organizational goals relating to such areas as worker productivity, regulatory compliance, and business agility.

TABLE 2

Industry Rankings for Network Service Quality and Return

Network Capability	Top Performing Industries
Network availability, site and geographical coverage	Financial services, utilities
Network responsiveness	Financial services, utilities
Network security	Utilities, healthcare
Networks improve worker productivity	Utilities, financial services
Networks meet required service levels	Financial services, utilities
Networks meet all business applications needs	Financial services, utilities
Networks meet voice communications demands	Utilities, financial services
Networks utilize bandwidth efficiently	Manufacturing, healthcare
Effective use of support staff time and expertise.	Manufacturing, healthcare
Service capabilities	Manufacturing, healthcare
Impact on revenue	Financial services, utilities
Impact on customer service	Utilities, financial services
Impact on partner interaction	Healthcare, financial services
Lowest total cost of ownership	Financial services, manufacturing

Source: IDC, 2007

Asset and Configuration Management

The approach taken to asset and configuration management is vital to increasing the overall return on the network. All the activities mentioned in Table 3 provide some cost savings, but it is important to prioritize those by the greatest return. The three activities that provide the greatest cost savings and service improvements are the use of automated systems for network administration, the use of virtualization to get the most from network resources, and standardizing on networks and services.

These activities provide savings by reducing staff time spent on problem solving in the case of the use of automated systems, as well as reducing infrastructure costs in the case of virtualization. Service improvements are seen through lower end-user response times and help desk calls and increased availability of networked resources — applications, information, servers, and storage.

The industry often debates the question of leveraging a single network device for multiple services. The results highlight that the greatest benefit to this integration is achieved in uptime. As companies integrate onto single platforms they have fewer devices to manage and monitor and are able to see problems before they become serious and to handle downtime more quickly. Often overlooked, but contributing to uptime, is combining power delivery and LAN connectivity over a common cabling infrastructure.

TABLE 3

Industry Rankings for Asset and Configuration Management

Networking Approach	Top Performing Industries
Combine voice, data and video traffic over a common physical network	Utilities, transportation
Combine power delivery and LAN connectivity over a common cabling infrastructure	Utilities
Standardize network systems and services	Manufacturing, healthcare
Integrate multiple services into single systems	Financial services, retail
Use virtualization to get the most from network resources	Financial services, healthcare
Use automated systems for network administration	Financial services, manufacturing
Leverage consistent systems and services in the data center	Manufacturing, financial services
Leverage consistent systems and services in the wiring closet	Healthcare
Leverage consistent systems and services in remote/branch offices	Utilities
Leverage consistent systems and services in the campus LAN backbone	Retailers
Leverage consistent systems and services in the WAN backbone	Financial services
Leverage up-to-date and consistent software across like devices	Transportation, financial services

Source: IDC, 2007

Administration and Change Management

Within administration and change management, the most common practice is to use consistent procedures and automated systems to do moves, adds, and changes with regard to end users. Manufacturers were the leading practitioners, followed by transportation and healthcare firms (see Table 4). The second most common practice is to leverage devices that readily accommodate changes in connectivity and service capabilities. This is followed closely by the application of consistent systems and processes to update existing networking devices. The use of administration and change management involves initial upfront costs, making the cost savings harder to quantify. These initial costs more than make up for themselves by allowing companies to maintain existing support staff levels rather than hiring more people.

TABLE 4

Industry Rankings for Administration and Change Management

Network Practice	Top Performing Industries
Use consistent procedures and automated systems for moves, adds and changes	Manufacturing, transportation
Leverage devices to accommodate changes in connectivity and service capabilities	Financial services, retail
Leverage consistent systems and processes to update existing networking devices	Transportation
Use consistent procedures and automated systems to deploy new services across the network	Manufacturing, financial services
Use consistent procedures and automated systems to track and manage changes to the network	Manufacturing, financial services
Unify wired and wireless LAN administration and control.	Healthcare, utilities
Unify network and security management systems.	Utilities

Source: IDC, 2007

Performance Management and Optimization

The larger enterprises in the study made greater use of performance management and optimization practices than the mid-sized businesses. The most common practice is to use consistent procedures and automated systems in monitoring the network. Transportation companies are the greatest practitioners, followed by financial services firms and manufacturers (see Table 5). Financial services firms are the leading users of consistent procedures and automated systems to both adjust and tune the network and to analyze and simulate network conditions. Many respondents reported that the use of performance management and optimization enables a proactive approach to network management. These companies are redirecting traffic before major bottlenecks or crashes occur. The business benefits result from reduced downtime and increased performance on the network.

TABLE 5

Industry Rankings for Performance Management and Optimization

Network Practice	Top Performing Industries
Use consistent procedures and automated systems to monitor the network	Transportation, financial services
Use consistent procedures and automated systems to adjust and tune the network	Financial services, manufacturing
Use consistent procedures and automated systems to analyze and simulate network conditions	Financial services, manufacturing

TABLE 5

Industry Rankings for Performance Management and Optimization

Network Practice	Top Performing Industries

Source: IDC, 2007

Problem Management

Problem management practices are equally common among both the larger and mid-sized companies in the survey. Use of consistent procedures and automated systems to detect and identify problems is slightly more common than for repairing problems.

Transportation companies are the foremost proponents of using consistent procedures and automated systems to detect and identify problems, followed by manufacturers, financial services firms and utilities (see Table 6). In the use of consistent procedures and automated systems to repair problems, manufacturers take the top spot, trailed by transportation companies and utilities.

TABLE 6

Industry Rankings For Problem Management

Network Practice	Top Performing Industries
Use consistent procedures and automated systems to detect and identify problems	Transportation, manufacturing
Use consistent procedures and automated systems to repair problems	Manufacturing, transportation

Source: IDC, 2007

Security Management

All the survey respondents reported the use of security management practices. The most common practices are to leverage virus scanning and firewalls wherever needed. Larger enterprises put greater emphasis on using consistent procedures and automated systems to detect security incidents. With mid-sized businesses, the next most common practices are to leverage access control and user authentication. The ability to respond to potential problems on the network before users notice them is seen as the biggest impact of security management practices. The organizations with the highest use of all types of security management reported over 70% of network problems are identified and repaired before having an impact on network service levels — or being noticed or reported by clients. Network managers who are tasked with supporting a 24 x 7 IT infrastructure must consider applying a holistic approach to security management. Table 7 highlights the top performing industries by practice.

TABLE 7

Industry Rankings for Security Management

Network Practice	Top Performing Industries
Leverage virus scanning	Transportation, financial services
Leverage firewalls	Healthcare, manufacturing
Leverage access control	Healthcare, manufacturing
Leverage user authentication	Financial Services, manufacturing
Use consistent procedures and automated systems to detect security incidents	Manufacturing, financial services
Use consistent procedures and automated systems to respond to security incidents	Transportation, financial services
Leverage intrusion detection and prevention	Financial services, transportation
Leverage network admission control	Financial services, manufacturing
Leverage identity management	Healthcare, manufacturing
Leverage URL filtering	Manufacturing, financial services

Source: IDC, 2007

RECOMMENDED ACTIONS TO IMPROVE OPERATIONAL EXCELLENCE

IDC's research on the best practices employed by the industry leaders in IT operational excellence shows that certain actions can improve network service levels and reduce networking costs. While each individual network has its own unique requirements, the following actions are proven to drive operational excellence in networking. IDC lists these in order according to greatest potential benefit to the organization.

Standardize on one consistent set of networking services. Standard networking services reduce the complexity of upgrading any one end point in the network. The benefits include limiting downtime, administration resources, and costs. This approach encourages higher services for the majority. IDC believes this empowers and simplifies management of the network.

Virtualization. Server virtualization on x86 platforms is well on its way to becoming a mainstream technology that enables server consolidation and reduces costs. IDC believes that network managers should take notice because the benefits of server virtualization extend far beyond the server to include benefits to the network. Initial hardware savings translate into less network ports and cables in use. As virtualization matures, the benefits will extend into a flexible, rapidly deployable, and scalable IT and network infrastructure. Looking ahead, companies should explore how virtualizing network services will enable greater network resiliency.

Use automated systems to ensure rapid, accurate, and efficient network administration. Automated systems enable the network manager to take a proactive approach by anticipating heavy traffic or failures before they occur. IDC believes this practice provides overall process optimization.

Vendor consolidation. Many companies report consolidating networking services globally on one carrier. By limiting the number of network vendors, companies simplify problem resolution and increase their chances of negotiating the best contracts. IDC believes that reducing the number of vendors for any given area to three or less contributes to operational efficiency.

Standardize on one consistent device — hardware, software, and associated services — in each place in the network. IDC believes that this standardization results in not only reduced support and administration costs, but also improved service levels and business responsiveness.

These recommendations have a common theme of looking at the network, not as a collection of individual devices, but as a system that touches every aspect of an organization's IT assets. Successful network managers will utilize these best practices to migrate the network into a driver for change in the business. As IT looks to centralize assets in the datacenter, as well as consolidate via server and storage virtualization, the network is becoming all the more critical. Network resiliency and responsiveness is paramount for IT to respond to rapidly changing business demands.

IDC has specific recommendations for companies with much higher networking costs per user than the industry norm. To reduce costs, these companies should standardize on one consistent device and/or on one consistent set of network services. Where there are several vendors, companies should consider consolidating their router, switch, security, wireless, and voice suppliers. When network service quality is poor, companies are advised to make better use of automated systems to ensure more rapid, accurate, and efficient network administration. Other recommended actions appear in the Appendix, including leveraging single network devices for multiple services, consolidating the physical network infrastructure, making more extensive use of management tools, and employing virtualization to make better use of networked resources.

If network downtime is much higher than average, the recommended action to increase network resiliency is to leverage single network devices for multiple services. Where problem management is poor, establish formal SLAs and make better use of automated systems to improve network administration. Companies should also consolidate router, switch, and voice suppliers if there are many vendors, and deploy security management procedures and technology where security management is poor. Other recommended actions, listed in the Appendix, include deploying one single, secure IP network, standardizing on one consistent device, operating with up-to-date and consistent operating systems across all portions of the network, and making more extensive use of management tools.

For companies whose time to deploy network services is much higher than average, the recommended actions for improving network responsiveness are to leverage single network devices for multiple services, standardize network systems and services, and integrate multiple services into single systems. Consolidating the physical network infrastructure and employing virtualization to make better use of networked resources will also help.

If the time spent on resolving network problems is much higher than average, the recommended actions are to establish formal SLAs and integrate multiple services into single systems. Companies should also make better use of automated systems for improved network administration, standardize network management procedures, and consolidate router, switch, and voice suppliers if there are multiple vendors. Companies can also improve network responsiveness by making more extensive use of management tools.

CHALLENGES/OPPORTUNITIES

Delivering network that is both maximally effective and minimally expensive will remain the most significant challenge for network mangers in the foreseeable future. Evaluating which actions will have the greatest business impact "for the money" is a difficult undertaking and relies on not only evaluating network infrastructure practices but in taking a holistic approach to the IT infrastructure. A critical success factor in this approach will be to bridge the gap that exists between IT and the business. Aligning the goals and practices — and expertise — of both IT and the business drives the best possible results. Here, the greatest opportunity to contribute to the business for network managers will be to take a strategic view of how network services can

contribute to top-line revenue growth. IDC believes that this is achieved not through boosting bandwidth or adding connections to the network but rather through the effective use of high-impact intelligent networking services such as VoIP and application optimization. These services drive network performance to the next level and best prepare the network for more user demands and business shifts to come.

CONCLUSION

In interviews with 40 leading enterprises and mid-sized companies in the United States, IDC found that network managers are improving services levels and driving maximum operational efficiency by following a number of key practices. Some of the practices bring more standardization and automation to the networking environment. Others focus on consolidating the number of physical devices, networks, and the vendors involved. Still others employ virtualization to make the best use of networked resources.

With all these best practices, the objective is to reduce network costs, improve staff effectiveness, increase network resiliency, and boost network responsiveness. According to the survey, organizations with the highest return on IT have reduced spending on IT infrastructure by an average of 18% by using these specific best practices. IDC found that the savings from improved network resiliency and responsiveness varied by industry.

Overall, the practice with the greatest impact on operational efficiency, as measured by networking cost per employee, was standardizing on one consistent set of networking services. For companies that followed this practice, the networking costs per employee were 46% lower, on average, than for companies that did not.

For companies that consolidated their router, switch, security, wireless, and voice vendors, the networking costs per employee were an average of 45.6% lower for organizations with five or fewer vendors compared with those with six or more. Additionally, companies that made greater use of virtualization to get the most from networked resources averaged 42.2% lower network costs per employee than companies making less use of the practice.

Financial institutions mentioned the addition of switch and other redundancy in the network, and the increased use of automated management tools, tiered storage, and server virtualization as primary vehicles for improving operational efficiency and cutting costs.

Healthcare firms cited datacenter consolidation and standardizing on a single vendor as major cost savers, while retailers said they cut costs by consolidating to a single hardware vendor or to a single carrier for wireless, data, and voice services, and renegotiating much cheaper rates.

For manufacturers, cost-saving measures ranged from virtualization and server consolidation to standardizing hardware and network devices and using a single vendor. Utilities and transportation companies are also turning to consolidation, virtualization, and standardization to increase operational efficiency.

APPENDIX

Evaluating Operational Excellence in Networking

To help organizations determine their network operational excellence, IDC and Alinean have developed the online Network Operations Assessment tool, which calculates an operations excellence quotient based on a self-assessment of current network capabilities, spending, and practices. The tool uses interview data from IDC's survey of industry leaders in IT operational excellence as the baseline for determining the quotient.

Besides helping an organization to compare its network operational efficiency against top-performing leaders in its industry or by company size, the tool also offers recommendations for improving the organization's network infrastructure, procedures, and skills.

In a typical application, the online tool takes entered data on an organization's network operations, calculates an overall network operations quotient, and compares it with the quotient of leaders in the same industry or the same company size. The Network Operations Assessment tool also projects the potential savings in network infrastructure costs that would be achieved by adopting the best practices of the industry leaders.

Additionally, the tool indicates the improvements in network resiliency and responsiveness that would result from raising the network operations quotient to the level of the leaders. These improvements include such things as savings in user productivity and recaptured revenue from reduced network downtime.

Recommended Actions

The tool offers advice on how to reduce networking costs, increase network resiliency, and boost network responsiveness based on current levels of networking cost per user, network downtime, and the time needed to deploy network services.

Reducing Networking Costs

Table 8 lists the recommended actions for various management deficiencies if networking costs per user are more than double the average.

TABLE 8

Recommended Actions When Networking Cost Per User Is More than Double the Average

Management Deficiency	Recommended Action
If asset and configuration management is fair	Standardize on one consistent device
If asset and configuration management is poor	Standardize on one consistent set of network services
If there are too many vendors	Consolidate router, switch, and voice suppliers
If network service quality is poor	Make better use of automated systems to ensure more rapid, accurate, and efficient network administration

Source: IDC, 2007

Table 9 shows the recommended actions for various management deficiencies if networking cost per user is slightly higher than average.

TABLE 9

Recommended Actions When Networking Cost Per User Is Slightly Higher than the Average

Management Deficiency	Recommended Action
If asset and configuration management is fair	Leverage single network devices for multiple services
If asset and configuration management is poor	Consolidate the physical network infrastructure
If network service quality is fair	Make more extensive use of management tools
If network service quality is poor	Employ virtualization to make better use of networked resources

Source: IDC, 2007

Increasing Network Resiliency

Table 10 lists the recommended actions for various management deficiencies if network downtime is more than double the average.

T A B L E 1 0	
Recommended Actions When Network Downtime Is More than Double the Average	
Management Deficiency	Recommended Action
If asset and configuration management is fair	Leverage single network devices for multiple services
If there are too many vendors	Consolidate router, switch and voice suppliers
If problem management is poor	Establish formal SLAs and make better use of automated systems to improve network administration
If security management is poor	Deploy security management procedures and technology

Source: IDC, 2007

Table 11 lists the recommended actions for various management deficiencies if network downtime is slightly higher than average.

T A B L E 1 1	
Recommended Actions When Network Downtime Is Slightly Higher than Average	
Management Deficiency	Recommended Action
If asset and configuration management is fair	Deploy one single, secure IP network
If asset and configuration management is poor	Standardize on one consistent device
If admin and change management is poor	Operate with up-to-date and consistent operating systems across all portions of the network
If performance management is fair	Make more extensive use of management tools

Source: IDC, 2007

Boosting Network Responsiveness

Table 12 lists the recommended actions for various management deficiencies if the time to deploy network services is more than double the average.

TABLE 12

Recommended Actions When Time To Deploy Network Services Is More than Double the Average

Management Deficiency	Recommended Action
If asset and configuration management is fair	Leverage single network devices for multiple services
If asset and configuration management is poor	Standardize network systems and services
If network service quality is poor	Integrate multiple services into single systems

Source: IDC, 2007

Table 13 lists recommended actions for various management deficiencies if the time to deploy network services is slightly higher than average.

TABLE 13

Recommended Actions When Time To Deploy Network Services Is Slightly Higher than Average

Management Deficiency	Recommended Action
If asset and configuration management is poor	Consolidate the physical network infrastructure
If network service quality is fair	Employ virtualization to make better use of networked resources

Source: IDC, 2007

Table 14 lists the recommended actions for various management deficiencies if the time spent on resolving network problems is more than double the average.

TABLE 14

Recommended Actions When Time Spent Resolving Network Problems Is More than Double the Average

Management Deficiency	Recommended Action
If problem management is poor	Establish formal SLAs
If network service quality is poor	Integrate multiple services into single systems
If performance management and optimization is poor	Make better use of automated systems for improved network administration
If admin and change management is poor	Standardize network management procedures
If there are too many vendors	Consolidate router, switch, and voice suppliers

Source: IDC, 2007

If the time spent on resolving network problems is slightly higher than average, Table 15 lists the recommended actions for various management deficiencies.

TABLE 15

Recommended Actions When Time Spent Resolving Network Problems Is Slightly Higher than Average

Management Deficiency	Recommended Action
If performance management and optimization is poor	Make more extensive use of management tools
If network service quality is poor	Employ virtualization to make better use of networked resources

Source: IDC, 2007

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