



MANAGING THE NETWORK INFRASTRUCTURE:

A Peer-to-Peer Look at Trends and Challenges

TABLE OF CONTENTS

Executive Summary	3
Purpose and Methodology	5
Managing the Network Infrastructure.....	7
Infrastructure Concerns	7
Infrastructure Priorities	9
Network Access Control (NAC).....	11
Familiarity	11
Deployment	12
Benefits Realized from Deployment	14
Inhibitors to Deployment.....	15
Load Balancing.....	16
Familiarity	16
Deployment	17
Benefits Realized from Deployment	18
Inhibitors to Deployment.....	18
Purchasing Infrastructure Products	19
Resources Dedicated to Network Infrastructure	19
Purchase Plans for Products	20
Buyers Speaker Out: Advice to Improve the Purchase Process	21

TABLE OF CONTENTS

Executive Summary	3
Purpose and Methodology	5
Managing the Network Infrastructure	7
Network Access Control (NAC) ..	11
Load Balancing	16
Purchasing Infrastructure Products	19

EXECUTIVE SUMMARY

The purpose of this research is to investigate how organizations manage their network infrastructure — challenges they face, areas to which they devote the most attention and products they plan to purchase. The deployment of Network Access Control and Load Balancing is also investigated. An online survey was sent to members of Network World's research panel; results are based on 224 respondents involved with the purchase of infrastructure products for their organization.

Top Issues Related to the Network Infrastructure

- Study respondents are most worried about ensuring adequate performance of applications and network downtime due to viruses and worms.
- Organizations' infrastructure priorities in the next 12 months will be increasing bandwidth, upgrading switches and improving how access is granted to data center resources.

Network Access Control

- Network Access Control (NAC) is still considered an emerging technology space, and while there is no universal standard definition of NAC, many vendors are starting to offer NAC solutions. In this study, 89% of respondents expressed some level of familiarity with NAC, but only 26% have deployed it, and another 14% will do so within 12 months.
- Those with the technology already deployed said it has delivered on its ability to restrict unauthorized access to the network. The technology also delivered on other key benefits including the reduction of threats seen on the network and the ability to ensure endpoints conform to security policy.
- There is no single inhibitor to deployment among those with no definite plans for the technology. The top reasons for not using NAC include: 1) standards are still emerging; 2) technology too new; 3) lack of internal resources to support NAC; and 4) lack of financial resources.

Load Balancing

- Server availability is extremely important to any business that sells over the Web or uses it to support critical business applications. Load balancing helps spread work among servers and allow service to continue, even in the face of server downtime due to server failure or server maintenance. Almost all (97%) respondents in this study have some level of familiarity with load balancing, but the deployment of the technology varies drastically by size of company. While 62% of respondents from large organizations are using load balancing, only 34% of medium-sized businesses and 23% of small companies have deployed it.
- At least 8 out of 10 respondents who have deployed load balancing indicated the technology has delivered improved network reliability, improved scalability and faster application performance. In addition, almost 7 out of 10 said deploying it reduced equipment costs because they did not have to add or upgrade equipment.
- The top reason for not using load balancing is that there is not enough traffic on the network to warrant deployment.

TABLE OF CONTENTS

Executive Summary	3
Purpose and Methodology	5
Managing the Network Infrastructure	7
Network Access Control (NAC) ..	11
Load Balancing	16
Purchasing Infrastructure Products	19

Infrastructure Purchase Process

- One-third (33%) will increase spending on infrastructure endeavors, and another 44% will spend the same amount. Almost all organizations surveyed (98%) will purchase an infrastructure product in the next 12 months. The products most likely to be purchased are:

Large companies

- Access switch
- Network server
- Access router
- Wireless LAN

Medium companies

- Network server
- Backbone switch
- Access router

Small Companies

- Network server
- Enterprise Firewall
- Intrusion Detection or
Prevention Systems

TABLE OF CONTENTS

Executive Summary	3
Purpose and Methodology	5
Managing the Network Infrastructure	7
Network Access Control (NAC) ..	11
Load Balancing	16
Purchasing Infrastructure Products	19

PURPOSE AND METHODOLOGY

Purpose

The objective of this research is to investigate key issues surrounding the network infrastructure, implementation of different technologies and the purchase of infrastructure products. Specifically, the following insights are provided:

Infrastructure management:

- Level of concern with different network infrastructure issues.
- Infrastructure activities that organizations will be focusing on in the next 12 months.

Technologies:

- Status of:
 - Network Access Control
 - Load Balancing
- Benefits organizations have realized as a result of implementing these technologies.
- Reasons for not deploying technologies.

Product purchase:

- Specific products planned for purchase.
- How the purchase process could be improved.

TABLE OF CONTENTS

Executive Summary 3
 Purpose and Methodology 5
 Managing the Network Infrastructure 7
 Network Access Control (NAC) . 11
 Load Balancing 16
 Purchasing Infrastructure Products 19

Methodology

An e-mail blast was sent to members of Network World’s Research Panel in May 2007 asking for participation in a survey related to their organization’s network infrastructure. There were 224 qualified respondents involved in the purchase of products and services for their organization’s network infrastructure. All survey results are based on 224 respondents unless otherwise indicated. Some percentages may not add up to exactly 100% due to rounding.

The specific ways in which respondents are involved in the purchase process for network infrastructure-related products and services are outlined below:

RESPONDENTS' ROLE IN PURCHASING INFRASTRUCTURE PRODUCTS	% RESPONDING
Determine the business need	77%
Determine the technology solution	84%
Oversee purchase process	51%
Research vendors and technology solutions	79%
Create short list of vendors	63%
Select final vendor	61%
Manage/responsible for budget	43%
Approve budget	21%

The majority of respondents have a network/IT job function (71%). Ten percent are Corporate Management and 7% are Independent Consultants (the remaining 11% are classified as “Other”). Respondents represent a diversity of industries; those mentioned by at least 3% include ASP/SSP/MSP (14%); Web Hosting/ISP (13%); Manufacturing – not computer related (8%); Business Services (8%); Aerospace (6%); Insurance/Real Estate/Legal (6%); Travel/Entertainment (6%); Education (5%); Utilities (4%); Consulting – Independent (4%); Manufacturing – computer-related (4%); Financial Services (3%); and Carriers/Voice/Data/ISP (3%).

Respondents work in SMBs and large organizations. Results are reported across these categories where differences existed.

	DEFINITION	% RESPONDING
Large companies	1,000+ employees	53%
Medium-sized companies	100 to 999 employees	26%
Small companies	Less than 100 employees	22%

TABLE OF CONTENTS

Executive Summary	3
Purpose and Methodology	5
Managing the Network Infrastructure	7
Network Access Control (NAC) ..	11
Load Balancing	16
Purchasing Infrastructure Products	19

MANAGING THE NETWORK INFRASTRUCTURE

Infrastructure Concerns

What network infrastructure issues keep IT professionals up at night? Respondents rated their level of concern on 5 different infrastructure issues (1 = Not at all concerned to 5 = Very concerned). As seen in Figure 1, just over 7 out of 10 respondents are concerned with ensuring adequate performance for applications. The other top concern is network downtime. Less than half of respondents are worried about the remaining issues — handling mobile access, dealing with fatter applications and supporting remote offices.

Figure 1: Network Infrastructure Concerns

(% “Very concerned” or “Concerned”)

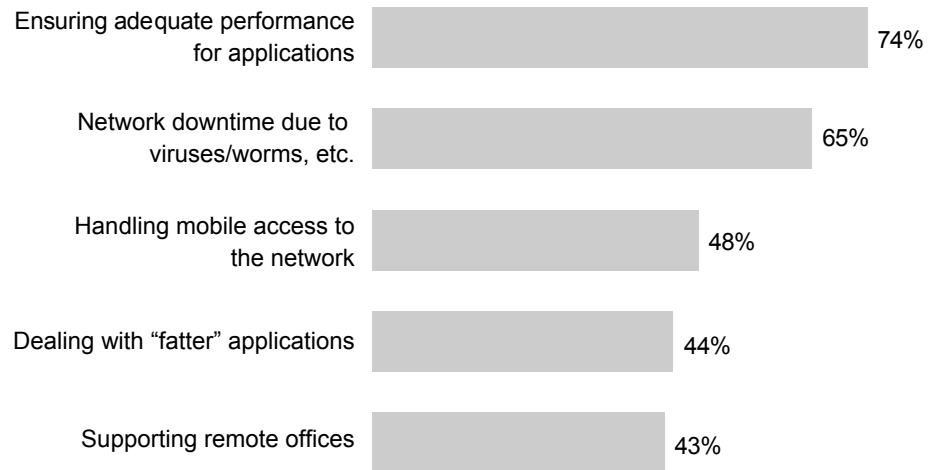


TABLE OF CONTENTS

Executive Summary 3
 Purpose and Methodology 5
 Managing the Network Infrastructure 7
 Network Access Control (NAC) . 11
 Load Balancing 16
 Purchasing Infrastructure Products 19

Figure 1a shows concerns by company size. Small companies are more concerned with network downtime than medium-sized and large organizations. In fact, small companies are just as worried about network downtime as they are with ensuring adequate performance for applications. These smaller businesses may not have the redundancy built into their networks like many larger organizations, which is why downtime is such a concern.

The results also show that larger companies are more worried about handling mobile access to the network than smaller companies. Both large and medium-sized companies are more concerned with supporting mobile offices than smaller companies.

Figure 1a: Network Infrastructure Concerns by Company Size
 (% “Very concerned” or “Concerned”)

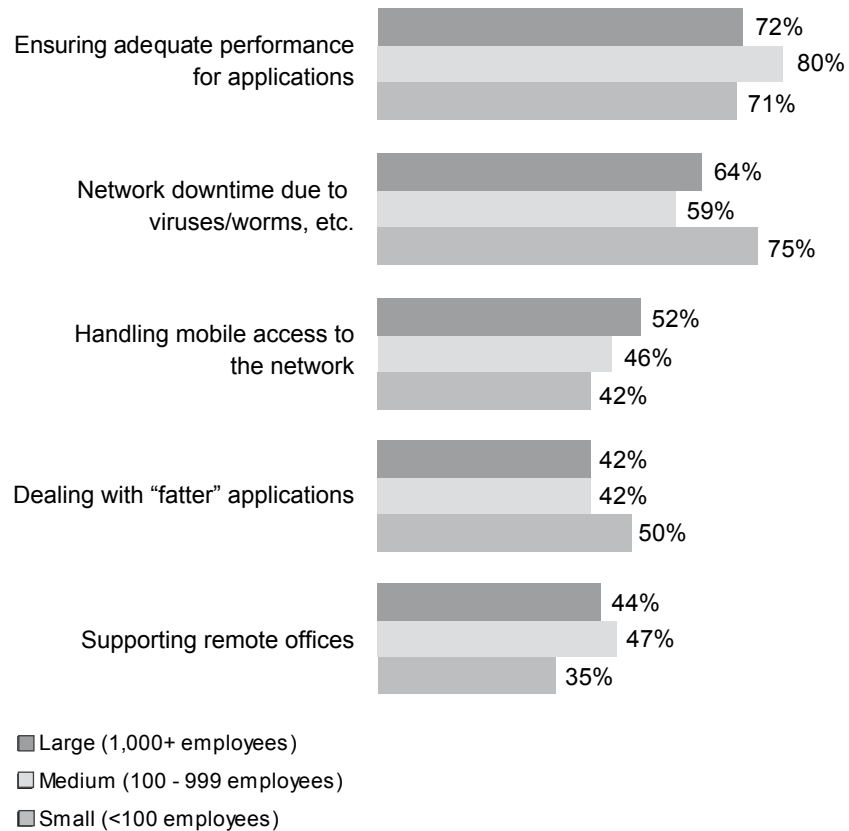


TABLE OF CONTENTS

Executive Summary 3
 Purpose and Methodology 5
 Managing the Network
 Infrastructure 7
 Network Access Control (NAC) . 11
 Load Balancing 16
 Purchasing Infrastructure
 Products 19

Infrastructure Priorities

Respondents were asked which infrastructure activities their organization will be involved with in the next 12 months (see Figure 2). Almost two-thirds of respondents (62%) indicated their organization will be increasing bandwidth, a simple fix to improving the capabilities of the infrastructure. At least half will also be upgrading switches (53%) and improving how access is granted to data center resources (50%).

Figure 2: Involvement with Infrastructure-Related Activities in Next 2 Months

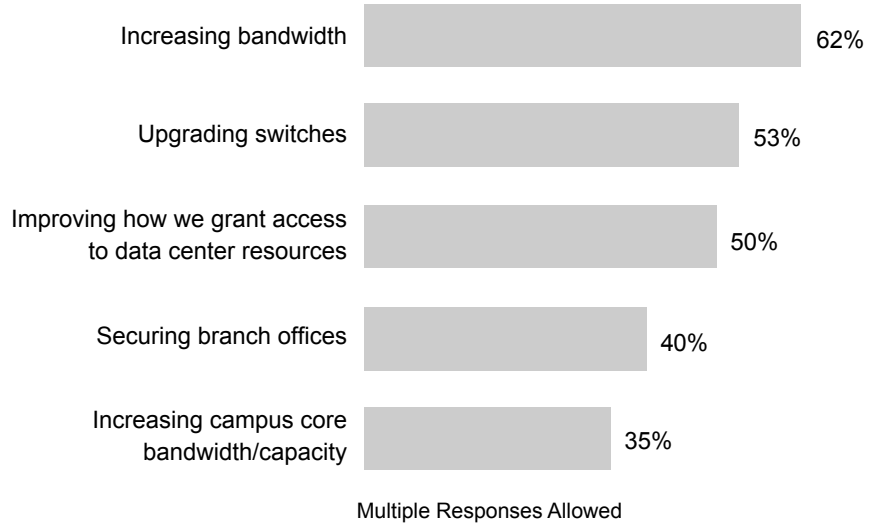


TABLE OF CONTENTS

Executive Summary 3
 Purpose and Methodology 5
 Managing the Network Infrastructure 7
 Network Access Control (NAC) . 11
 Load Balancing 16
 Purchasing Infrastructure Products 19

In a few cases, priorities varied by company size (see Figure 2a). Specifically, larger organizations are more likely to be upgrading switches and increasing campus core bandwidth than medium-sized and smaller companies. Large and medium-sized companies are more likely to improve how access is granted to data center resources than smaller companies.

Figure 2a: Involvement with Infrastructure-Related Activities by Company Size

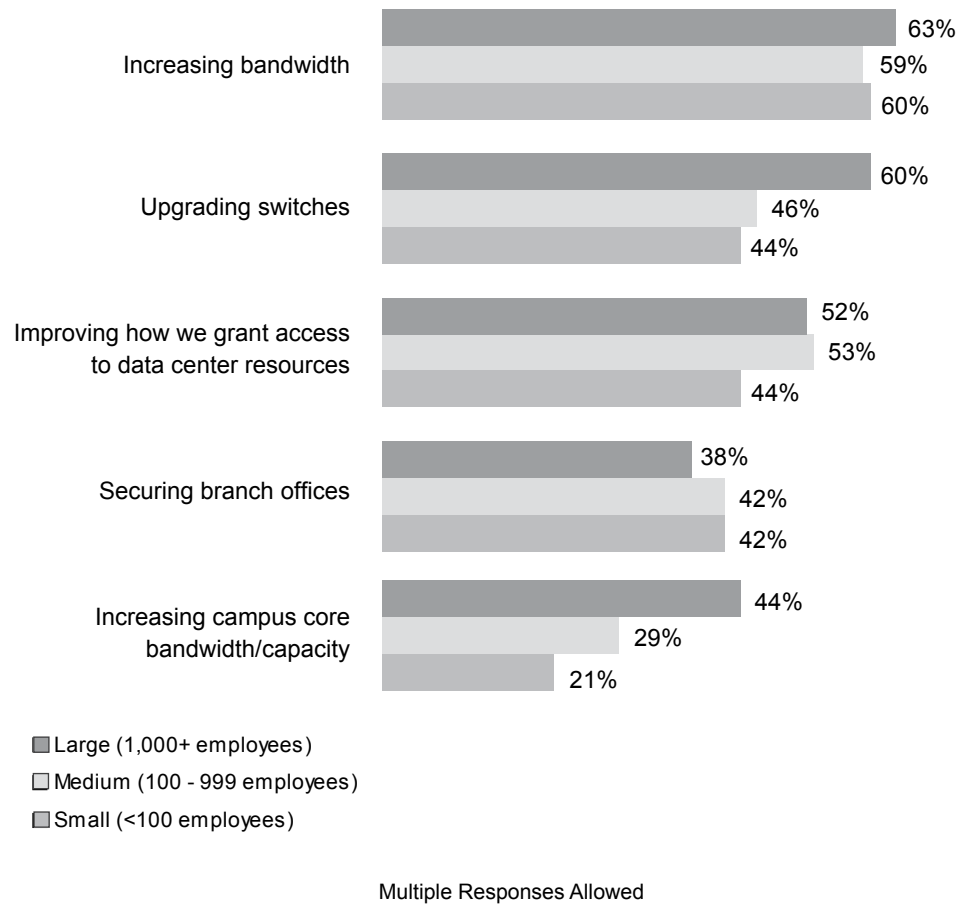


TABLE OF CONTENTS

Executive Summary 3
 Purpose and Methodology 5
 Managing the Network Infrastructure 7
 Network Access Control (NAC) . 11
 Load Balancing 16
 Purchasing Infrastructure Products 19

NETWORK ACCESS CONTROL (NAC)

Familiarity

Securing corporate networks is a hot topic these days, and Network Access Control (NAC) is a method of bolstering security by only allowing network access to endpoint devices that comply with a defined security policy. NAC takes direct aim at laptop users who want to disable security software for better performance — these users will not be allowed access when they try to connect to the corporate network.

Figure 3 below shows respondents' familiarity with NAC. Almost 9 out of 10 (89%) have some level of familiarity, and 54% are either "Very familiar" or "Familiar" with the technology.

Figure 3: Familiarity with NAC

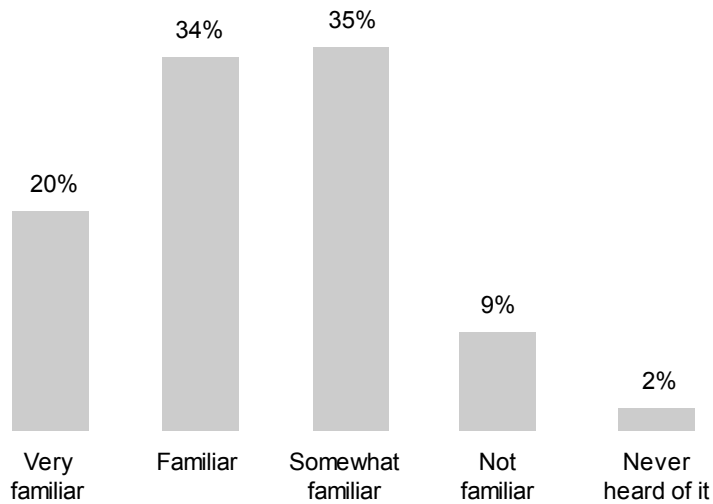


TABLE OF CONTENTS

Executive Summary 3
 Purpose and Methodology 5
 Managing the Network Infrastructure 7
 Network Access Control (NAC) . 11
 Load Balancing 16
 Purchasing Infrastructure Products 19

Deployment

While some industry observers have called NAC one of the hottest technologies in IT security, others have expressed doubt about the practicality of its deployment in networks with large numbers of diverse users and devices, the nature of which constantly changes. For instance, it is extremely difficult to create a security protocol for a network with numerous access points and thousands of users with various backgrounds and objectives. In this research, 26% of the respondents indicated NAC has been deployed and another 14% will do so within 12 months, bringing deployment to 40% of organizations surveyed. Just under one-third (32%) are considering implementation.

Figure 4: Network Access Control Status

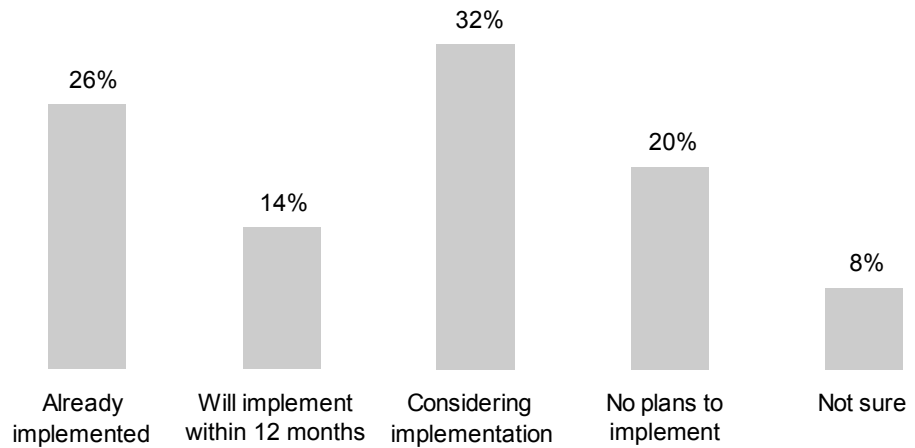


TABLE OF CONTENTS

Executive Summary 3
 Purpose and Methodology 5
 Managing the Network Infrastructure 7
 Network Access Control (NAC) . 11
 Load Balancing 16
 Purchasing Infrastructure Products 19

Current and planned deployment does not vary much by company size. In 12 months, 46% of large companies surveyed will be using NAC compared to 34% of medium-sized companies and 35% of smaller organizations. The difference appears when examining organizations that have no deployment plans. While only 13% of large companies indicated no plans for NAC, 30% of small companies said they have no plans for the technology.

Figure 4a: NAC Status by Company Size

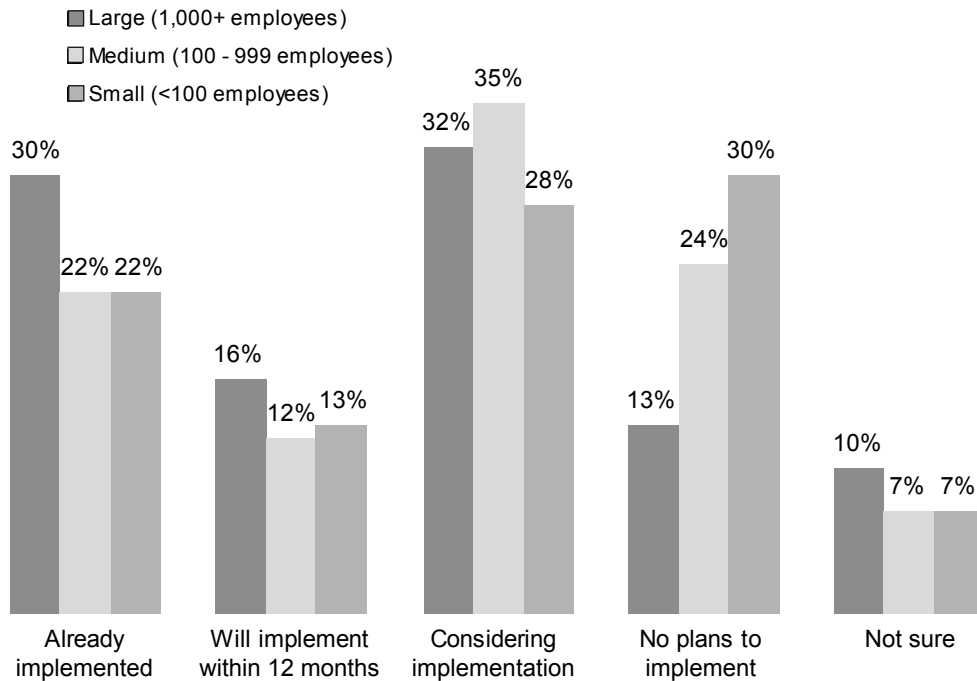


TABLE OF CONTENTS

Executive Summary 3
 Purpose and Methodology 5
 Managing the Network Infrastructure 7
 Network Access Control (NAC) . 11
 Load Balancing 16
 Purchasing Infrastructure Products 19

Benefits Realized from Deployment

Respondents who have already deployed NAC were asked to what extent the technology delivered on four specific benefits (see Table 1). The results indicate that users have found NAC to do exactly what the name implies — control access to the network. Specifically, more than 9 out of 10 (92%) indicated NAC has either exceeded or met expectations on its ability to restrict unauthorized network access. It has also exceeded or met expectations for at least 8 out of 10 in regards to two more important benefits — reduction in the threats seen on the network and its ability to ensure endpoints conform to security policies. A reduction in operating costs for end-point security was realized by 62% of respondents.

Table 1: Ability of NAC to Deliver Benefits

	NET EXCEEDED OR MET	EXCEEDED OUR EXPECTATIONS	MET OUR EXPECTATIONS	DID NOT MEET OUR EXPECTATIONS	TOO SOON TO TELL
Ability to restrict unauthorized access to the network	92%	14%	78%	3%	5%
Reduction in malware and other threats we see on the network	81%	9%	72%	7%	12%
Ability to ensure endpoints (laptops, PCs, PDAs, servers, etc.) conform to security policy	80%	9%	71%	9%	12%
Reduction in operating costs for end-point security	62%	5%	57%	19%	19%

Base = 58 (Among respondents who have already implemented NAC)

TABLE OF CONTENTS

Executive Summary 3
 Purpose and Methodology 5
 Managing the Network Infrastructure 7
 Network Access Control (NAC) . 11
 Load Balancing 16
 Purchasing Infrastructure Products 19

Inhibitors to Deployment

NAC presents a unique challenge in that it requires that the desktop operations, networking and security functions all collaborate. In addition, solutions are relatively complex because they require the integration of components at the endpoint of the network, within the network and in the back end with policy servers.

Respondents either considering NAC implementation or with no plans for the technology were asked which factors were holding them back from deployment. The results here show that one reason does not stand out, but rather quite a few factors are holding back organizations from using the technology — standards that are still emerging; the technology is too new; lack of internal resources to support; and lack of financial resources. As the technology further develops and solutions become easier to deploy, this should drive down costs and integration issues, helping to build momentum for deployment.

Table 2: Factors Holding Back NAC Adoption

	% RESPONDING
Standards are still emerging	36%
Technology too new/not yet proven	36%
Do not have the internal resources to support the technology	35%
Lack of financial resources	34%
We do not have a need for different levels of access control to the network	27%
Other	12%
Not sure	4%

Base = 113 (Among respondents without definite implementation plans)
 Multiple Responses Allowed

TABLE OF CONTENTS

Executive Summary 3
 Purpose and Methodology 5
 Managing the Network Infrastructure 7
 Network Access Control (NAC) . 11
 Load Balancing 16
 Purchasing Infrastructure Products 19

LOAD BALANCING

Familiarity

No business wants to be in a situation in which all of a sudden its Web site sees a lot of activity and the servers get swamped, unable to handle the traffic. This is the type of situation load balancing can prevent. Load-balancing technology distributes communications activity evenly across a network so no single device is overwhelmed. It is especially important for networks where it is difficult to predict the number of requests that will be issued to a server. If one server gets inundated, requests are forwarded to another server with more capacity.

When initially introduced, load-balancing technology was extremely expensive and familiarity with the technology was relatively low. As seen in Figure 5, almost all respondents (98%) have some level of familiarity with load balancing, and 74% are either “Very familiar” or “Familiar.”

Figure 5: Familiarity with Load Balancing

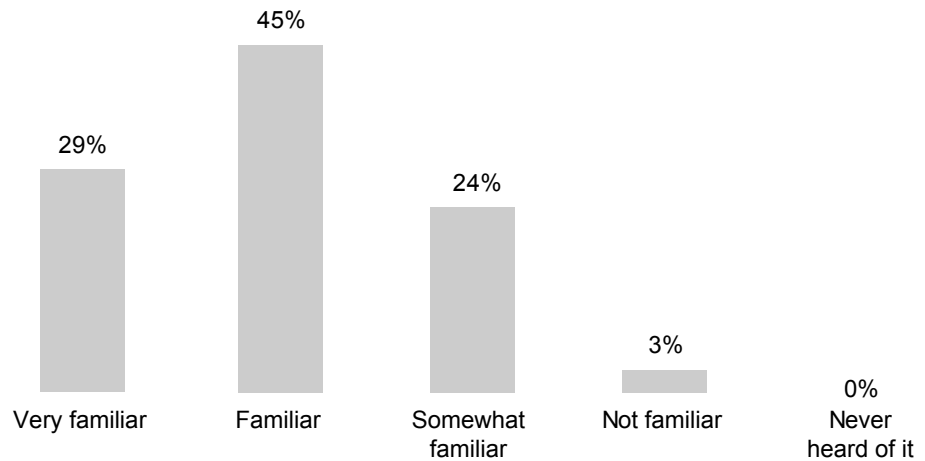


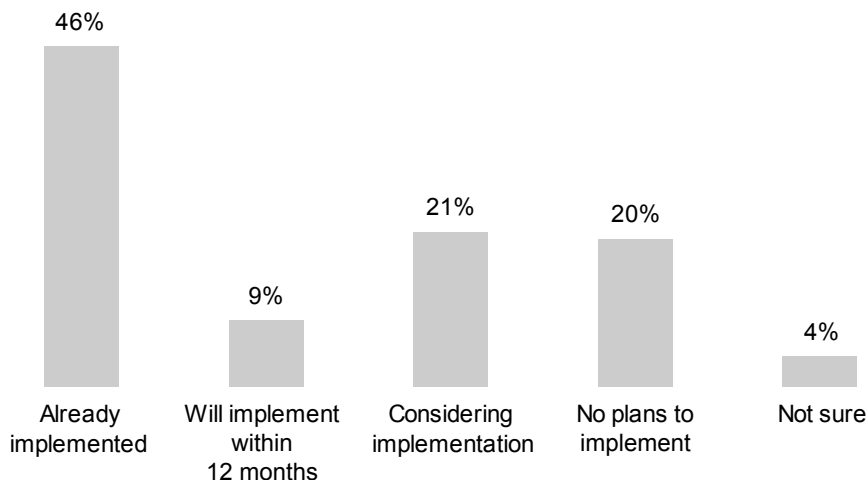
TABLE OF CONTENTS

Executive Summary 3
 Purpose and Methodology 5
 Managing the Network Infrastructure 7
 Network Access Control (NAC) . 11
 Load Balancing 16
 Purchasing Infrastructure Products 19

Deployment

Figure 6 shows the deployment of load balancing. Just under one-half (46%) is already using the technology, and another 9% will be within a year. This brings usage of load balancing to more than half of organizations surveyed within 12 months.

Figure 6: Load-Balancing Status



The deployment of load balancing differs dramatically by company size. While 62% of the large companies are already using the technology, only 34% of medium-sized companies and 23% of small companies have deployed it.

Figure 6a: Load-Balancing Status by Company Size

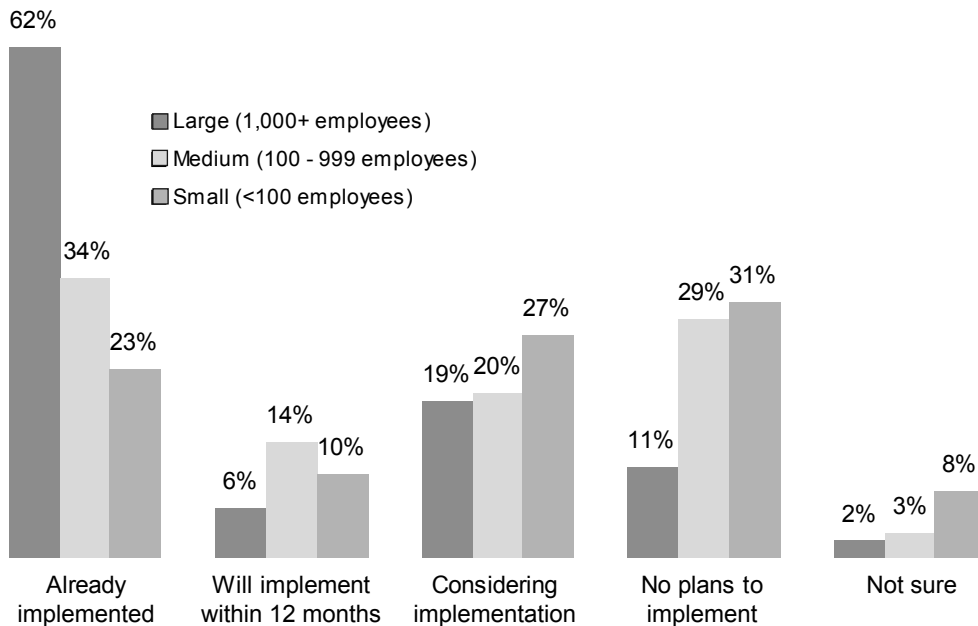


TABLE OF CONTENTS

Executive Summary 3
 Purpose and Methodology 5
 Managing the Network Infrastructure 7
 Network Access Control (NAC) . 11
 Load Balancing 16
 Purchasing Infrastructure Products 19

Benefits Realized from Deployment

Load-balancing solutions are designed to distribute processing and communications activity evenly across a computer network, so no single device is overwhelmed. The objective is to decrease network downtime due to server failure. Based on results of this research, users have been satisfied with the technology. Specifically, at least 8 out of 10 indicated that load balancing improved network reliability (88%), scalability (87%) and led to faster application performance (82%). Some vendors are using the return on investment message that deploying a load-balancing product might negate the purchase of additional servers. In this study, 69% of respondents indicated that deploying load balancing did lead to reduced equipment costs.

Table 3: Ability of Load Balancing to Deliver Benefits

	NET EXCEEDED OR MET	EXCEEDED OUR EXPECTATIONS	MET OUR EXPECTATIONS	DID NOT MEET OUR EXPECTATIONS	TOO SOON TO TELL
Improved network reliability	88%	16%	72%	8%	4%
Improved network scalability	87%	8%	79%	7%	7%
Faster application performance	82%	9%	73%	11%	8%
Reduced equipment costs (did not have to add/upgrade)	69%	7%	62%	15%	16%

Base = 104 (Among respondents who have already implemented load balancing)

Inhibitors to Deployment

Respondents who have no definite plans for deploying load balancing were asked which factors are holding them back. The top inhibitor to deployment is lack of a perceived need — 49% indicated there is not enough traffic on the network to warrant deploying.

Table 4: Factors Holding Back Load-Balancing Adoption

	% RESPONDING
Not enough traffic on our network to warrant deploying	49%
Application performance is fine as is	30%
Lack of financial resources	22%
Do not have the internal resources to support the technology	18%
Standards are still emerging	10%
Technology too new/not yet proven	9%
Other	5%

Base = 92 (Among respondents without definite implementation plans)
 Multiple Responses Allowed

TABLE OF CONTENTS

Executive Summary 3
 Purpose and Methodology 5
 Managing the Network Infrastructure 7
 Network Access Control (NAC) . 11
 Load Balancing 16
 Purchasing Infrastructure Products 19

PURCHASING INFRASTRUCTURE PRODUCTS

Resources Dedicated to Network Infrastructure

Respondents were asked if the amount of financial resources dedicated to their organization’s network infrastructure will be more, less or the same as it was last year. One-third of respondents (33%) said their organization will increase spending on infrastructure endeavors, and 44% will maintain spending levels. Only 14% will decrease spending.

Figure 7: Change in Amount of Financial Resources Dedicated to Network Infrastructure

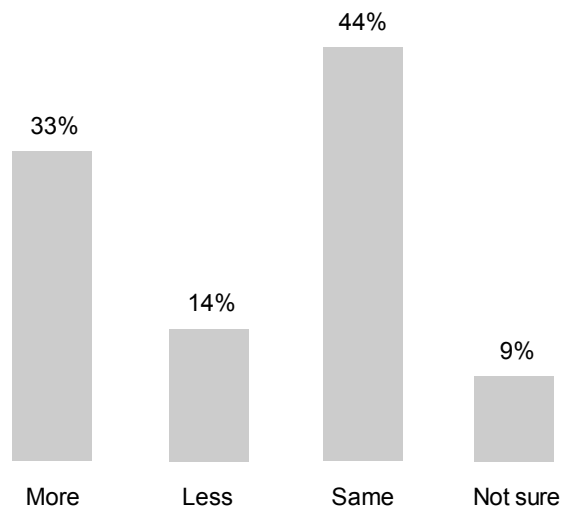


TABLE OF CONTENTS

Executive Summary 3
 Purpose and Methodology 5
 Managing the Network Infrastructure 7
 Network Access Control (NAC) . 11
 Load Balancing 16
 Purchasing Infrastructure Products 19

Purchase Plans for Products

Table 5 below shows specific infrastructure products that are being considered or planned for purchase in the next 12 months. Almost all organizations surveyed (98%) will make a purchase. In some cases, the purchase plans varied by company size. The companies that were most likely to purchase are highlighted below. For instance, more large and small companies plan to purchase network servers than medium companies. More large and medium companies plan to purchase backbone switches than small companies.

Table 5: Infrastructure Products Plan to Purchase

	TOTAL	LARGE COMPANIES	MEDIUM COMPANIES	SMALL COMPANIES
Net purchase plans	98%	98%	98%	96%
Network Server	47%	49%	41%	52%
Access Router	40%	47%	31%	35%
Access Switch	38%	50%	25%	27%
Wireless LAN	38%	46%	24%	33%
Blade Server	35%	40%	25%	33%
Backbone Switch	34%	38%	34%	25%
Enterprise Firewall	30%	30%	24%	40%
Network Test Gear	30%	36%	19%	29%
Intrusion Detection or Prevention Systems	29%	27%	25%	38%
Enterprise Wireless LAN	28%	33%	24%	21%
KVM Switch	27%	30%	27%	21%
IPSec VPN	23%	25%	17%	25%
SSL VPN	23%	26%	17%	25%
Enterprise Core Router	20%	29%	12%	8%
Fibre Channel Switch	17%	18%	15%	17%
Layer 4 – Layer 7 Content Switch	16%	20%	10%	15%
WiMax	10%	11%	9%	10%
Unified Threat Management	9%	11%	3%	10%
Will not purchase any products	2%	2%	2%	4%

Multiple Responses Allowed

TABLE OF CONTENTS

Executive Summary	3
Purpose and Methodology	5
Managing the Network Infrastructure	7
Network Access Control (NAC) ..	11
Load Balancing	16
Purchasing Infrastructure Products	19

Buyers Speaker Out: Advice to Improve the Purchase Process

Respondents were asked what feedback they would give vendors that would improve the purchase of network infrastructure products at their organization. The verbatim responses were organized into different areas and are shown below.

Some respondents offered very specific insights as to type of information vendors could provide that would help them in the decision-making process for infrastructure products:

- *Demo real-world situations and address real-world business needs.*
- *I am tired of companies trying to use a sales brochure as the technical document for the item I am trying to buy. Give better/more detailed specs on the product. Half the time, the sales people do not know enough about the product to tell me if it will work in our system.*
- *I need more extensive examples — case studies and use cases — for how their technology or a class of technology can be employed to provide business value.*
- *More detailed information on each product on their respective web sites.*
- *Provide more evaluation hardware/software.*
- *Provide real-world, tested solutions.*
- *Know your cabling infrastructure.*
- *Recommend grant resources for law enforcement agencies' technology budgets. Provide research and proven implementation strategies at other law enforcement agencies. Provide after-action benchmark results of proven performance increases.*

One segment is looking for products that are easier to use. While some want complete solutions from a single vendor, a few mentioned they want better interoperability so they are not limited to one vendor:

- *Be ready and willing to implement solutions in a multivendor environment instead of only attempting to sell package units — some of us have significant investments in new equipment.*
- *One-vendor solutions.*
- *Need to make interoperability with other vendors more clear at the outset of the presentation of their products.*
- *Ease of use.*
- *With the proliferation of appliances critical to network infrastructure, it is critical that vendors put time and effort into interfaces that are easy-to-use and intuitive. If administrators have to continuously relearn interfaces, it prevents us from taking advantage of a product's full potential.*
- *Total packages. We went with ATT because they could do the entire package and it was still a lot of work on our part.*
- *Offer bundled, complete packages.*
- *What and if I purchase will depend upon if the new soft / hardware will improve upon what is currently working at each client location. My clients each have different requirements and solutions in place now. What will make the difference for them in the future is what we can do to increase security without having to undo their infrastructure to solve a problem.*

TABLE OF CONTENTS

Executive Summary	3
Purpose and Methodology	5
Managing the Network Infrastructure	7
Network Access Control (NAC) ..	11
Load Balancing	16
Purchasing Infrastructure Products	19

A few would like to see improvements in training and support:

- *Support.*
- *Training.*
- *Stop outsourcing tech support to India or at least offer a higher cost but “keep it local so I can understand them” tech support with American-speaking tech support folks.*
- *Offer more free technology training more often.*
- *Step-by-step information regarding the upgrades of router access.*

Some specific technical improvements to products were offered:

- *Better algorithms for load balancing.*
- *How about support for IPv6? We need products that will handle IPv6 and there seems to be reluctance on the part of many vendors to address IPv6 in the security products space.*
- *Make sure MULTICAST traffic is supported on the WLANs. This is a huge problem in the entire industry.*
- *Integrate host firewall into access edge switches with scalable policy management.*
- *Provide state aggregation for large-scale enterprise firewalls.*

Better pricing was mentioned as well:

- *Keep the cost down.*
- *Keep the prices down.*
- *Lower their prices.*
- *Lower your costs to meet customer needs and improve customer service.*