

Lucent Technologies
Bell Labs Innovations

Network and Systems Management Total Cost of Ownership

HIGHLIGHTS

- Ninety-six percent of respondents say improving their NSM capabilities is important, while 90 percent say that reducing overall NSM cost of ownership is also important.
- The top driver of network strategies is to increase the quality of the services delivered to end users, cited by nearly four out of ten respondents. The number of respondents who say that enabling new business opportunities is the primary driver has fallen by half in the past year.
- The most frequent strategy employed to reduce NSM TCO is simply spending more time training support staff, which is also one of the most effective strategies. But one-quarter of respondents are reducing staff as a cost-reduction strategy this year, compared to only 16 percent who used this strategy in 2000.
- The high cost of products is a significant barrier to reducing NSM TCO for three-quarters of respondents, up by 14 percent from last year. Additionally, the cost of services is a significant barrier for 55 percent of respondents.
- There is a direct relationship between the percentage of network and systems infrastructure budgets allocated to NSM and satisfaction with NSM TCO. As one goes up, so does the other. More and more of that budget, however, is being spent on acquisition costs.

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About Lucent Technologies Worldwide Services

Lucent Technologies Worldwide Services offers service providers and enterprises a comprehensive portfolio of network consulting and software solutions for the full lifecycle of a network, including planning and design, implementation, and operations. Lucent Services provides professional services, technical support services, mobility solution services, engineering and installation services, and software solutions for network and application performance management, comprising VitalSuite', VitalQIP', and VitalAccess'. Lucent Technologies is headquartered in Murray Hill, New Jersey, USA. Visit the Lucent Services Web site at **http://www.lucent.com/businessunit/worldwide.html**

For information regarding Lucent network consulting and software solutions capabilities, call 1-888-767-2988 in the U.S., or 1-650-318-1020 outside the U.S., or email: networkcare@lucent.com.

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Introduction

As every IT manager is painfully aware, networks don't run themselves. In fact, constant surveillance and real-time problem management are every-day requirements. But as networks become more complex and interconnected, this task becomes increasingly difficult while even more critical to achieving network performance and availability objectives. Effectively managing their networks and systems to provide maximum functionality at an acceptable cost is a goal to which every network manager strives.

From April 2 through April 30, 2001, Lucent conducted a Web-based survey on network and systems management total cost of ownership (NSM TCO), which was completed by 72 people around the globe. Previous surveys on NSM TCO were conducted in January 2000, January 1999, and February 1998.

Together, these survey results yield valuable insight into the past, current, and future NSM TCO strategies of today's service providers and enterprises. Moreover, these results identify the significant barriers and challenges network professionals face as they plan, design, and implement a network and systems management strategy for their organizations. These results should enable networking organizations to better understand how their operations compare with others in the industry and identify possible areas for improvement. Complete results for all four surveys are available at www.lucent.com/knowledge/resourcelib

For this survey, network and systems management (NSM) is defined as the set of controlling and automating processes and technologies that are required to manage networked computer systems and enable managers to maximize operational performance. NSM total cost of ownership (TCO) is the cost, including labor and technology expenses, associated with building and maintaining (i.e., planning, acquisition, deployment, and operations) an infrastructure to support NSM.

The Bottom Line

The last year has been a difficult one for network managers. A slowing economy has put greater pressure on them to manage their operations more efficiently and cost effectively. While investing in NSM tools can help reduce cost in the long run, justifying the ever-rising cost of those tools can be a daunting task. Nevertheless, not investing is a prescription for chaos down the road.

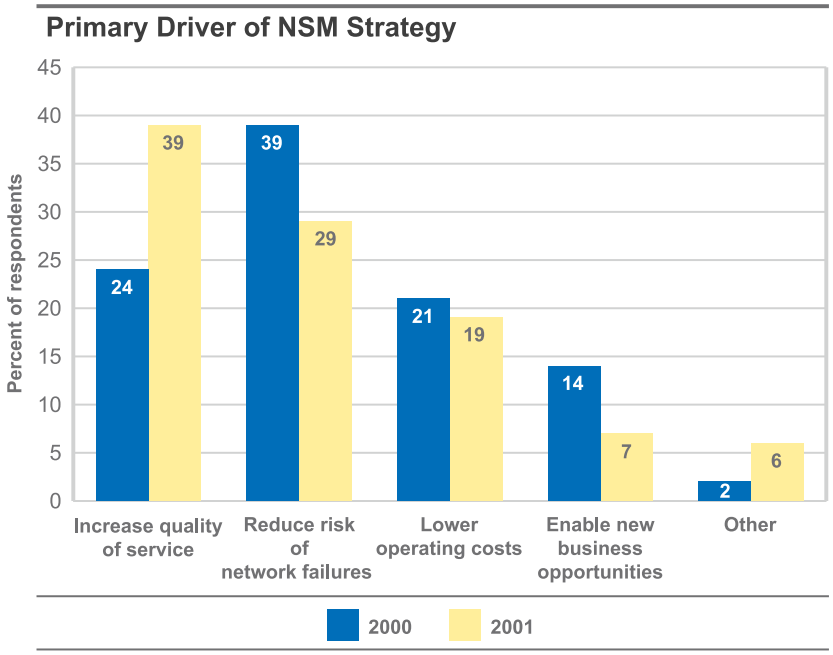
In order to meet these growing challenges, network managers should pay attention to each of the following:

- Planning – Although the urgency of implementing new NSM tools and processes is high, network managers should spend sufficient time in the planning stage of the network lifecycle to ensure a successful outcome. Using outside consulting vendors during this stage is good insurance to avoid overlooking critical issues that can have catastrophic consequences further on in the project.
- Training – People are the heart of any system, and never more so than in managing a complex network. Spend time to make sure every network administrator and engineer is thoroughly trained on the tools they use to complete their tasks, as well as on the processes to deal with emergencies as well as everyday issues.
- Processes – With networks growing rapidly in size and functionality, the importance of standardized processes to enable smooth operations is paramount. Centralization and reduction of complexity in the network environment will succeed only when appropriate processes to deal with a myriad of potential snafus are developed and implemented in parallel.

NSM Drivers

Managing networks and the systems they connect is a difficult and challenging job. But investing in the tools to help network administrators and network engineers achieve a trouble-free operation is based on business goals, not technology.

In this year's survey, the top driver of network strategies is to increase the quality of the services (e.g., response time) delivered to end users, cited by nearly four out of ten respondents. This result represents a large shift in focus from last year, when only one-quarter of respondents identified this as their primary business driver and 39 percent identified reducing the risk of failures as their top driver. It may well be that respondents have been successful in stabilizing their networks, and are now turning their attention to improving services.



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One fallout from the uncertain economic conditions of the last 6-9 months is reflected in a 50 percent decrease in the number of respondents whose NSM strategy is driven primarily by enabling new business opportunities. In the current climate, network managers are focusing on the basics.

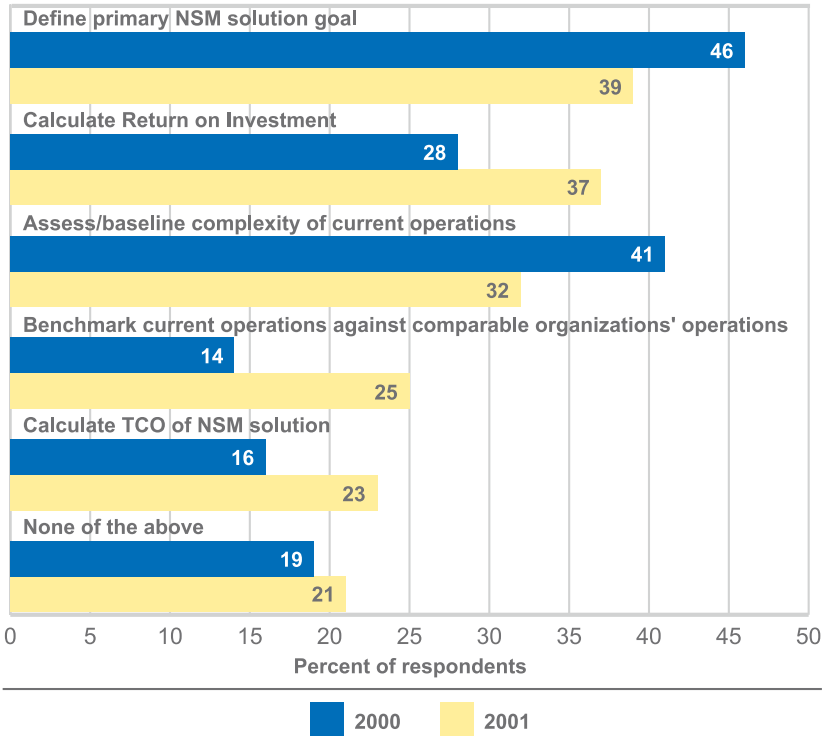
Whichever business goal is driving NSM strategies, there are a number of actions that should be taken before implementing an NSM solution, including

- Defining the goal
- Benchmarking current operations against comparable organizations' operations
- Assessing/baselining the complexity of current operations
- Calculating TCO of the proposed solution
- Calculating the return on investment (ROI) of the proposed solution

Although these seem like important actions, most respondents' organizations have accomplished only one or two prior to implementing an NSM solution, and more than one-fifth have not taken any of these steps. These results are about the same as last year, and again raise concerns that networking organizations are not getting the most from their investments.

One area in which there has been more awareness and action since the survey last year is in the financial implication of an NSM solution. Both calculating ROI (which increased from 28 percent to 37 percent) and calculating TCO (which increased from 16 percent to 23 percent) were more often performed in the past year than the prior year, although both results are not significantly different to declare a clear trend. Still, the direction is a positive one, possibly born out of necessity, as network budgets have been tightened in many companies.

Steps Taken Before Implementing NSM Solution



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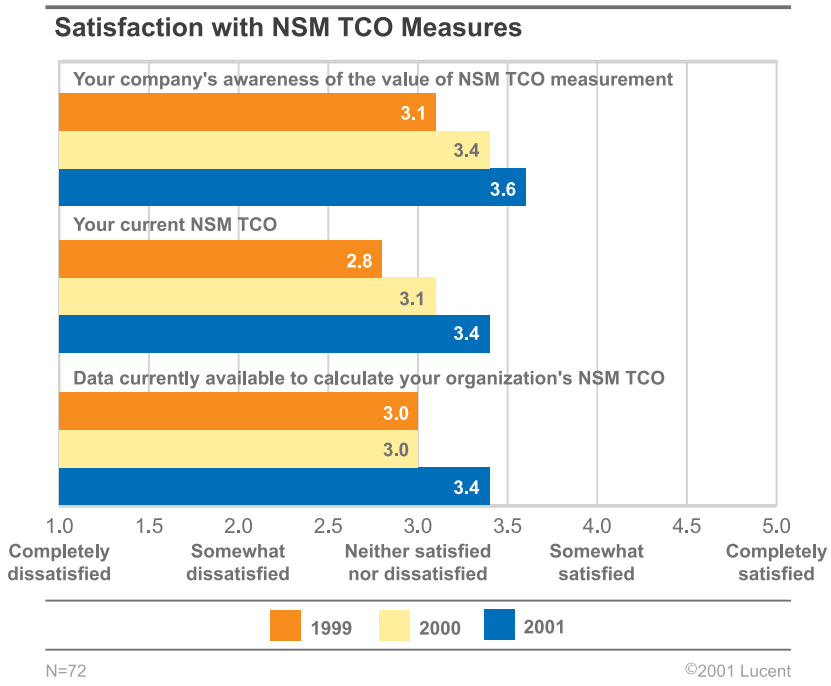
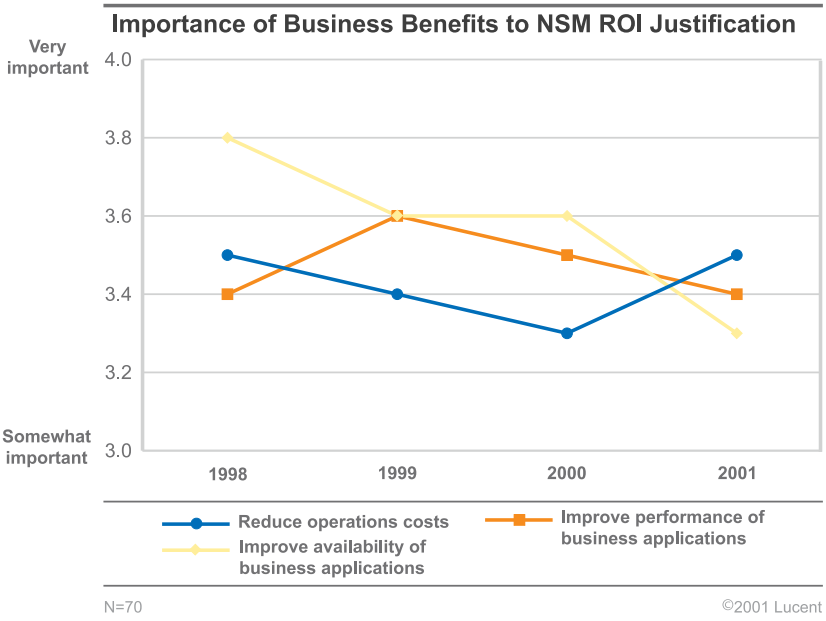
TCO has been employed less often than ROI as a financial decision-making tool simply because it is more inclusive and requires additional time and resources to complete. Awareness of the value of TCO, however, has grown steadily over the last few years. This year we see a significant jump in the data available to calculate TCO, and concomitantly a significant increase in respondents' satisfaction with their current NSM TCO. In fact, if we look back to the 1998 survey when satisfaction with current NSM TCO registered only 2.3 on the satisfaction scale, the trend is very positive toward higher satisfaction.

On the other hand, all three NSM TCO measures fall short of an overall rating of somewhat satisfied, and fewer than 15 percent are completely satisfied, which means that despite the improvements this year, there is still much room for improvement.

One of the goals of TCO as compared to ROI as a measure of the efficacy of implementing an NSM solution is to factor in business benefits. The survey presented three common benefits: reducing operations costs, improving performance of business applications, and improving availability of business applications. Going back to 1998, there was a fair amount of disparity in the importance placed on each of these benefits, with improving availability significantly higher in importance than the other two. But that rating has declined steadily over the last three years, to the point where there is little differentiation among the three – with all rating well above somewhat important.





Improving NSM TCO

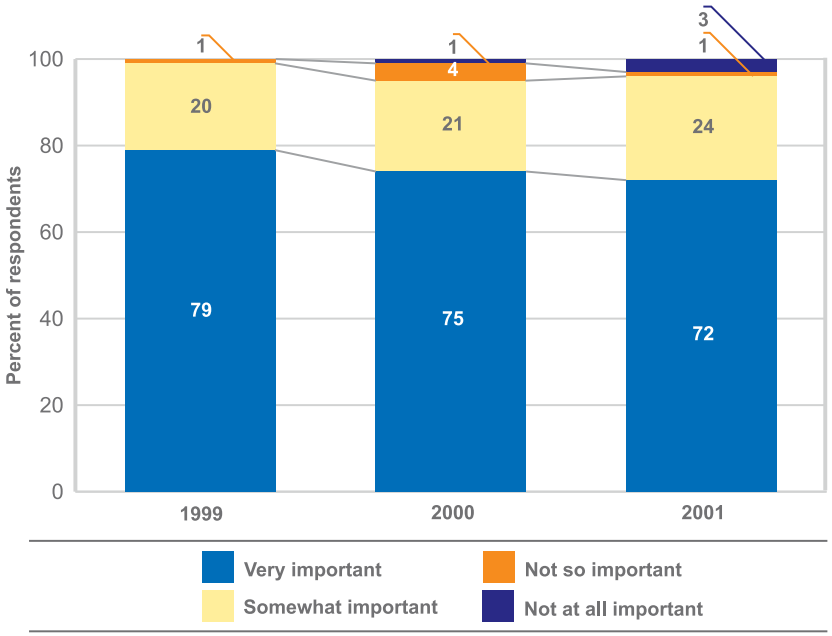
While the overall importance of improving NSM TCO has slipped somewhat over the last couple of years, the overwhelming majority of respondents still considers it important, with a large majority calling it very important. Clearly, network and systems management is one of the key aspects of operating large networks.

Recognizing the importance of network and systems management is the first step in the process; however, recognition alone does not guarantee success. Network organizations need to be competent in each of the network lifecycle phases – planning, acquisition, deployment, and operations – to effect improvements to their NSM capabilities.

Implementing change starts with the planning phase, which is perhaps the most critical. It is also the phase in which the largest percentage (48 percent) of respondents say they need help. This percentage has changed little over the last couple of years.

In contrast, the percentage of respondents who need help in the acquisition, deployment, and operations phases of the network lifecycle has declined significantly since 1999. The largest drop is in the deployment phase, which went from 43 percent of respondents who needed help in 1999, to only 27 percent today. Overall, this shows that NSM skills are improving, but planning is still the "Achilles' heel" of many organizations.

Importance of Improving NSM Capabilities



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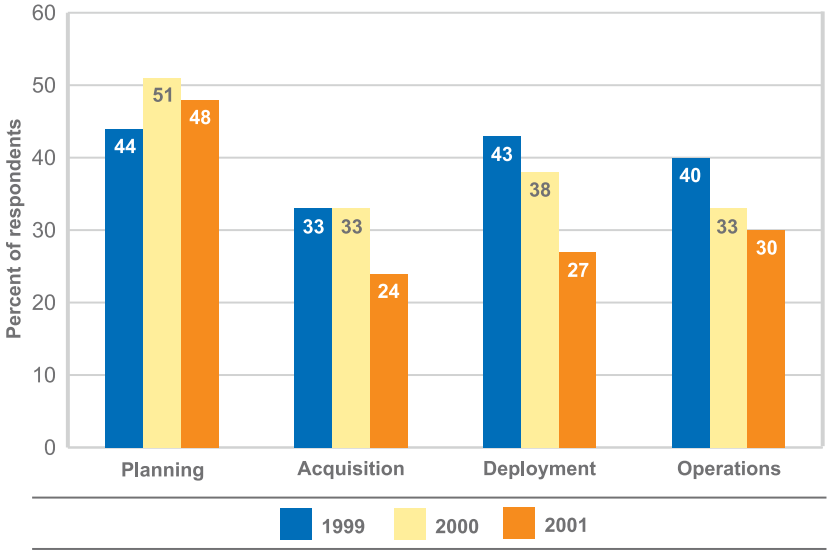
Lifecycle Stages Where Help is Needed to Improve NSM Capabilities



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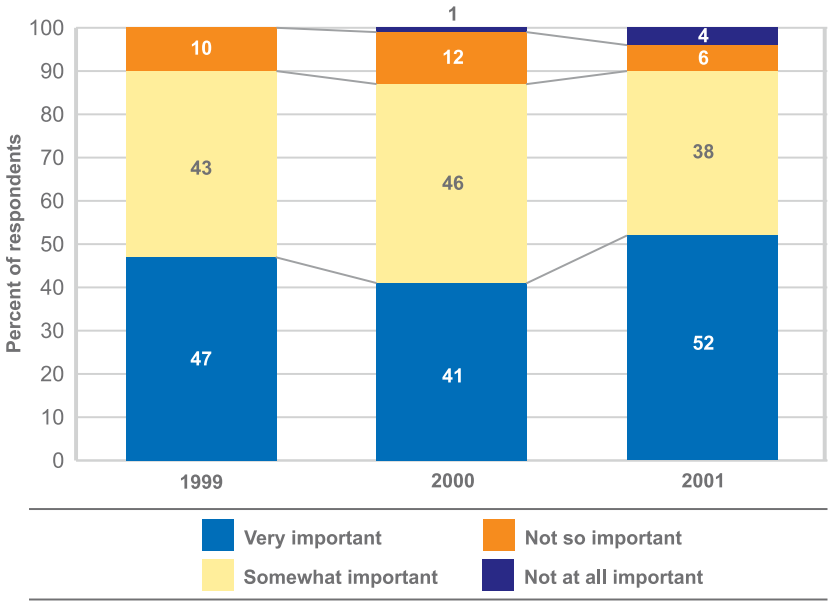
While 96 percent of respondents say improving their NSM capabilities is important, 90 percent say that reducing overall NSM cost of ownership is also important, although far more of these respondents fall into the *somewhat important* category. However, in contrast to improving capabilities, this percentage for lowering cost of ownership has remained steady the past couple of years rather than declining. In fact the percentage of respondents calling this goal very important increased to more than half, an indication that once capabilities are in place, the focus turns to lowering cost of ownership.

The picture of those requiring help to lower NSM cost of ownership is a little different than for improving NSM capabilities. Again, the planning phase is most often cited as the area in which help is needed, but by only a little more than one-third of respondents. Still, both the deployment and operations phases present difficulties, with nearly as many respondents saying they need help in those areas. The greatest competency is in the acquisition phase, where only one-quarter of respondents need help.

...once (NSM) capabilities are in place, the focus turns to lowering cost of ownership.

Importance of Reducing Overall NSM Cost of Ownership



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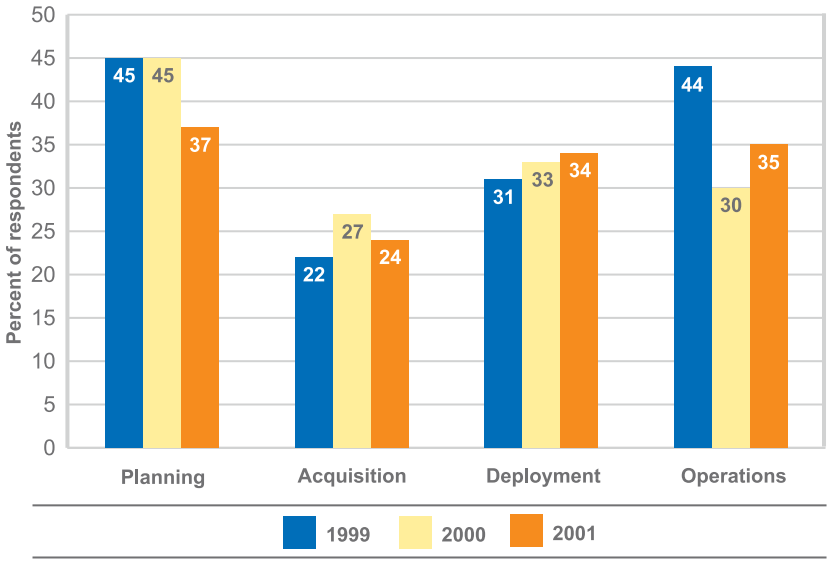
Lifecycle Stages Where Help is Needed to Lower NSM TCO



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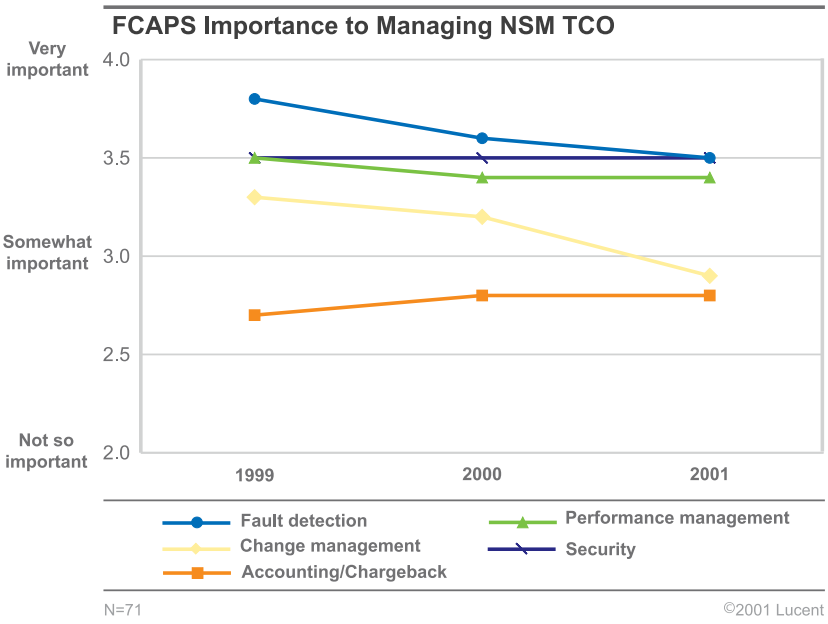
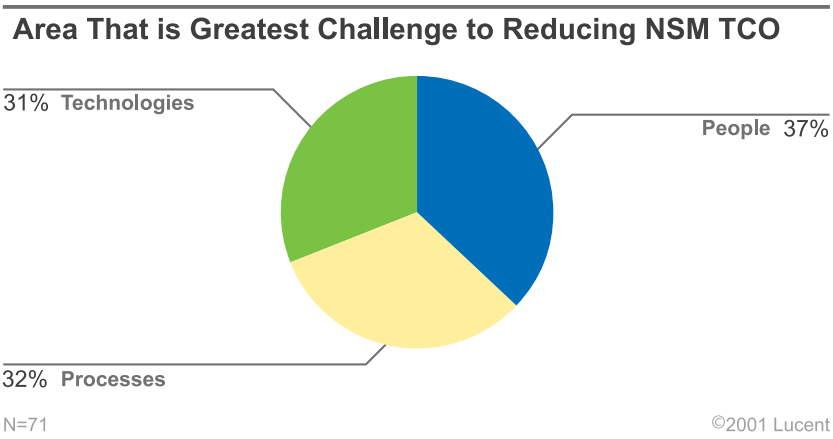
To achieve their goals of greater capabilities and lower overall cost of ownership, network managers use a variety of tools as defined by the FCAPS Model (Fault detection, Change management, Accounting/chargeback, Performance management, and Security). Tools in each of these categories are important to varying degrees in managing NSM TCO. Tools in three categories – fault detection, security, and performance management – are the most important, rating scores that fall approximately halfway between somewhat important and very important. Change management and accounting/chargeback tools rate considerably lower, falling just below somewhat important. Surprisingly, change management tools have declined in importance since 1999, although the relatively large decline in this year's survey may be an anomaly. It bears watching in future surveys.



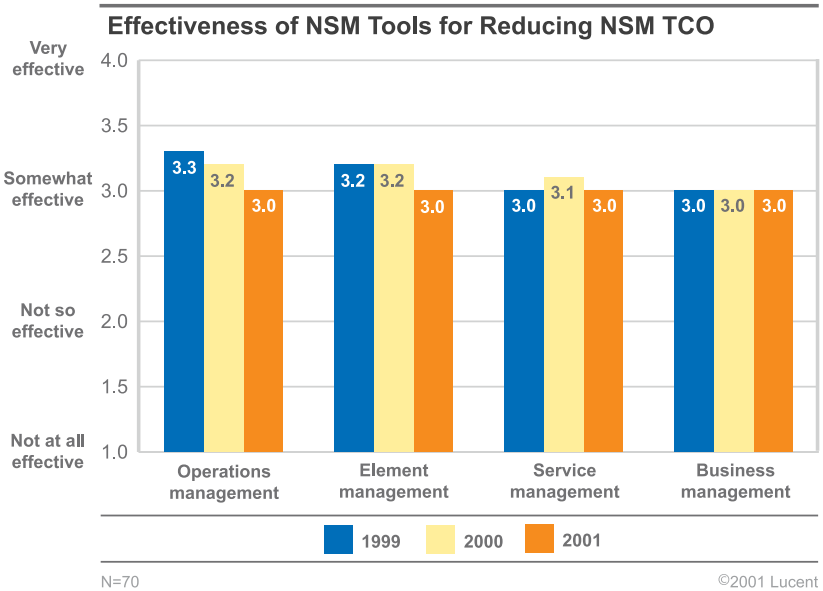
Successful Strategies for Reducing NSM TCO

In any network project, be it network management, service level management, or any other goal, three factors come into play: the technology deployed, the people managing/operating the network, and the processes to smooth the interaction between the two. When respondents were asked which of these three areas was the single biggest challenge to reducing their NSM TCO, they came out nearly equally divided among each of the three. The important insight here is that technology represents only a piece of the challenge, and that successful network managers pay as much attention to people issues (e.g., scheduling, training, recruiting, and role definition) and process issues (e.g., troubleshooting, monitoring, dispatch, and quality audits).



In previous surveys, the results were somewhat different, as were the categories: technological, managerial, and organizational. However, even in that configuration, technological issues were the biggest challenge to less than one-third of respondents – a result consistent with this year's survey.

Four types of tools, in particular, are critical in reducing the total cost of ownership of network and systems management: operations management tools, element management tools, service management tools, and business management tools. Respondents in this year's survey rated all four tool types as being somewhat effective. These ratings are virtually unchanged over the last three years for business management and service management tools, but represent a decline for operations management and element management tools. It is too soon to say, however, whether this is a trend, but definitely indicates something to watch in the year ahead. The lower rating, if indeed different from previous years, could reflect the increasing complexity and rapid growth of networks, marking an inability of the tools to keep up.



...technology represents only a piece of the challenge.

Overall, the effectiveness of these tools is good, although there is certainly room for improvement. But there are many things network managers are doing to reduce NSM TCO. The most frequent strategy is simply spending more time training their support staffs. This again reflects the balance between technology and people issues. Training has consistently ranked among the top three strategies for reducing NSM TCO.

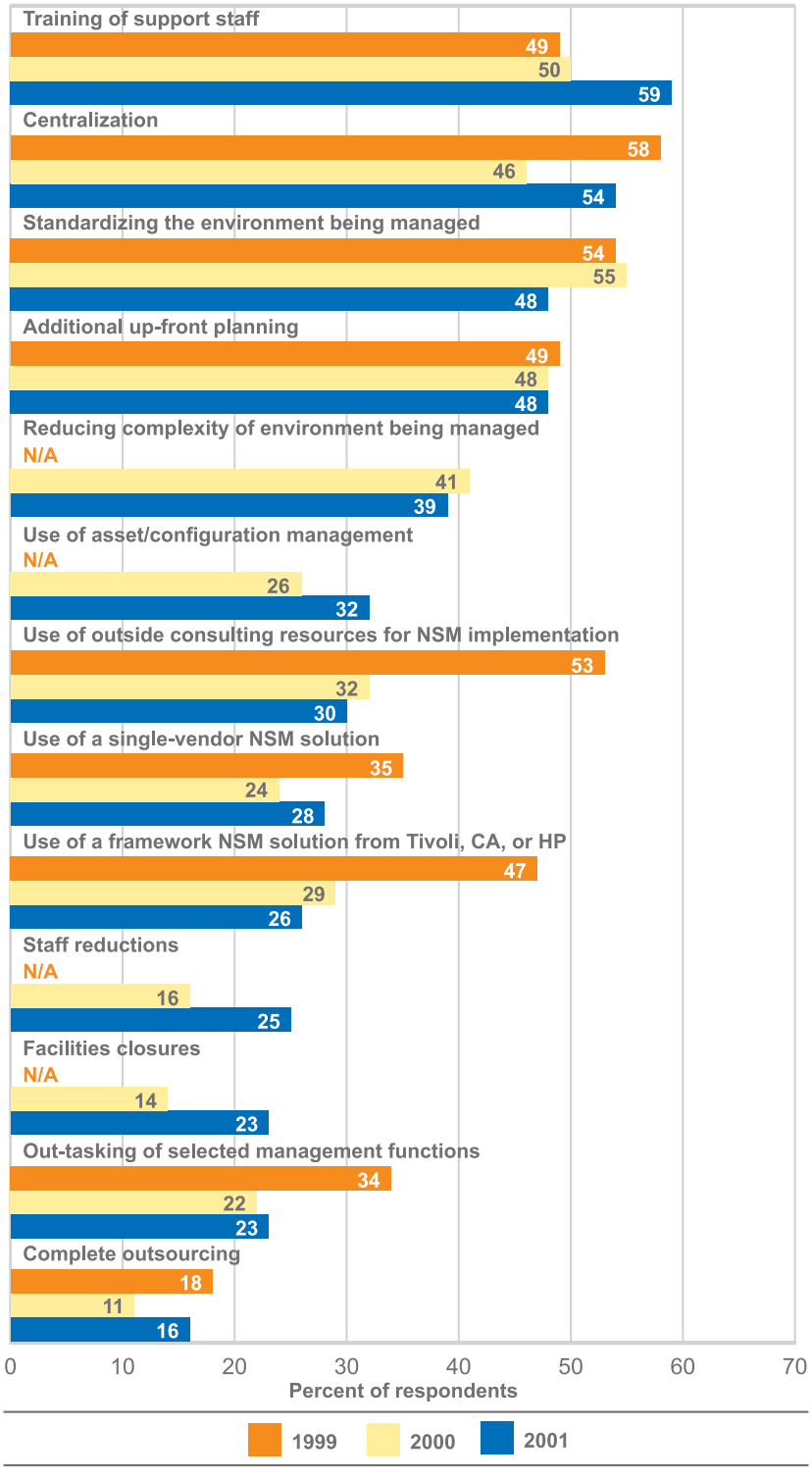
Centralization is a second strategy that has consistently ranked as a leading strategy, as has been standardizing the environment being managed. Coupled with reducing the complexity of the environment being managed, these three strategies can produce significant savings if implemented effectively. One way to produce savings is to reduce staff levels, which is being employed by one-quarter of respondents as a cost-reduction strategy this year.

Consistent with earlier results, additional up-front planning is being pursued by nearly half of respondents as a cost-reduction strategy. As indicated previously, this is the leading network lifecycle phase in which people require help. However, only 30 percent use outside consulting resources, far fewer than in 1999, although relatively unchanged from last year.

The list of strategies offered in the survey only scratches the surface. Respondents provided numerous other tactics they are employing, including

- Automating processes
- Re-engineering
- Deploying thin clients
- Deploying unified communications

Strategies Used to Reduce NSM TCO



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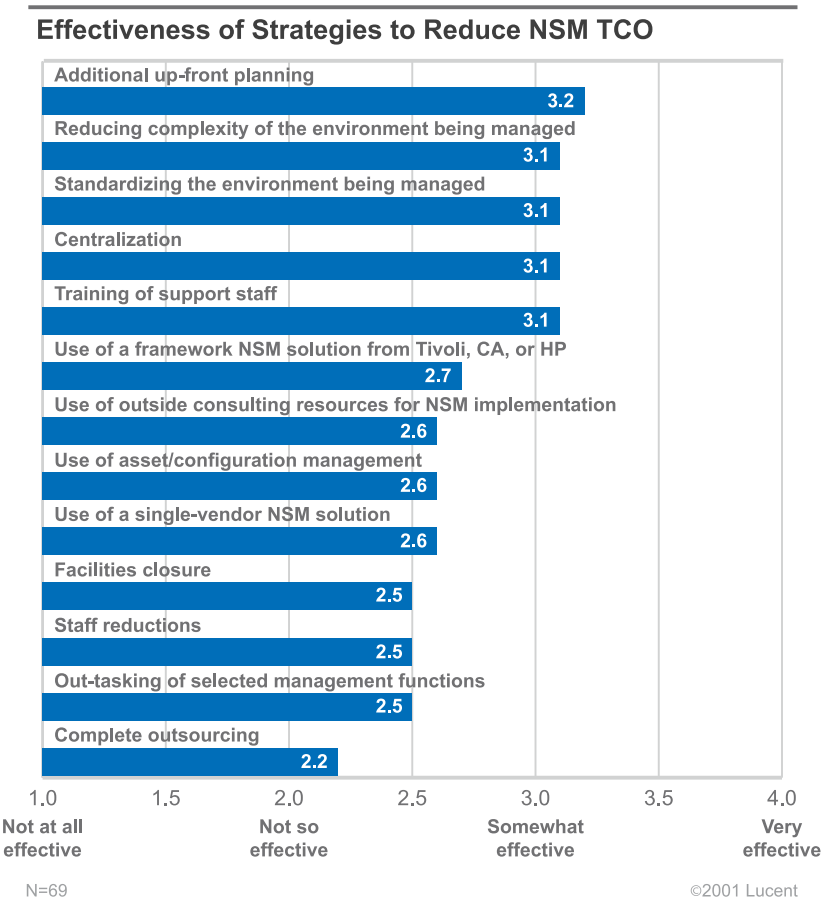


Those respondents who conduct additional up-front planning are happy with the results, with 86 percent rating this effort as effective in reducing costs. Nearly as effective are the three other frequently implemented strategies: reducing complexity of the environment being managed, standardizing the environment being managed, and centralization. Also seen as highly effective is training of support staff. All in all, there is perfect synchronization between those strategies that respondents are mostly likely to be using, and those they consider most effective.

Those respondents who conduct additional up-front planning are happy with the results...

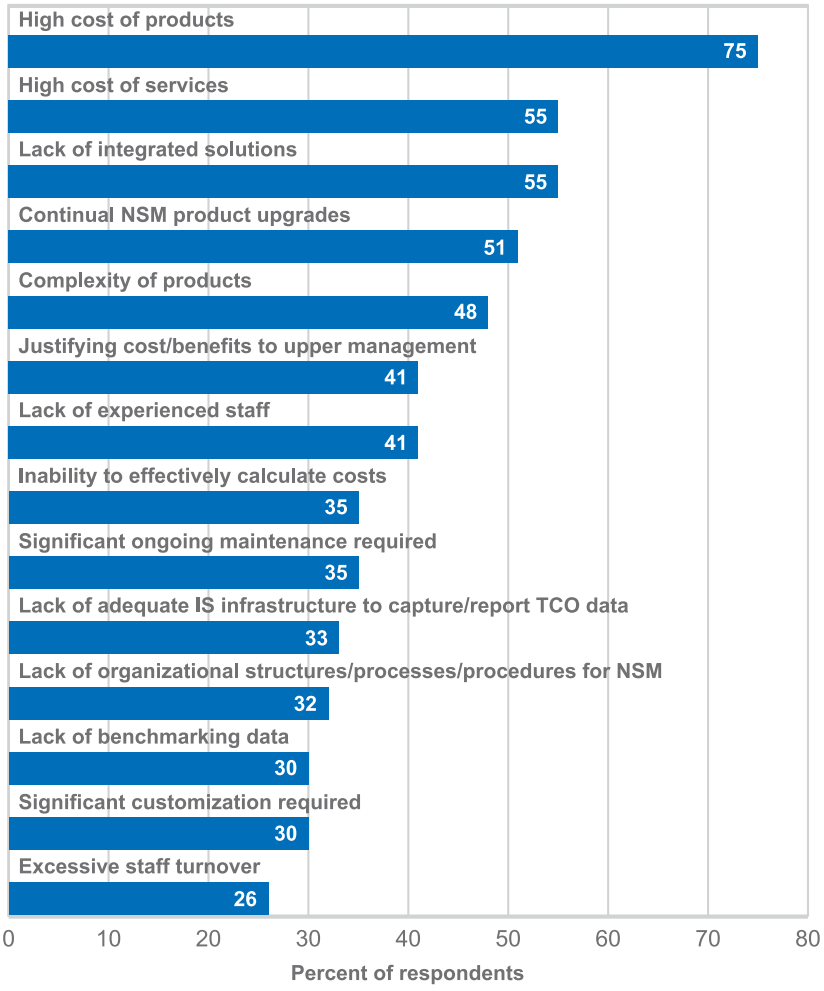
Barriers to Reducing NSM TCO

Consistent with last year, the top two significant barriers to reducing NSM TCO are cost related: the high cost of products and the high cost of services. Product cost in particular is an issue for respondents this year. Fully three-quarters of respondents cite this is a barrier this year as opposed to only 61 percent in the 2000 survey. On the other hand, the cost of services has not changed significantly since last year, rising only two points to 55 percent of respondents. Either way you cut it though, cost is a large and continuing problem for reducing NSM TCO.

The cost issue is further exacerbated by two other related problems. One is that for half of respondents, continual NSM product upgrades, which can be costly in and of themselves, represent a significant barrier to their efforts to reduce NSM TCO. Additionally, even when the need for these expenditures is identified, justifying those expenditures and their benefits to upper management is a hurdle for 41 percent of respondents.

Two other barriers that affect approximately half of respondents are also related: the lack of integrated solutions and the complexity of the products. Given that reducing the complexity of the environment being managed is one of the most effective strategies for reducing NSM TCO, and integrated solutions can help along this path, both product complexity and lack of integrated solutions are major issues. Vendors of these products should see an opportunity to meet the needs of network managers by simplifying their products and enabling them to be easily integrated into a total solution.

Significant Barriers to Reducing NSM TCO



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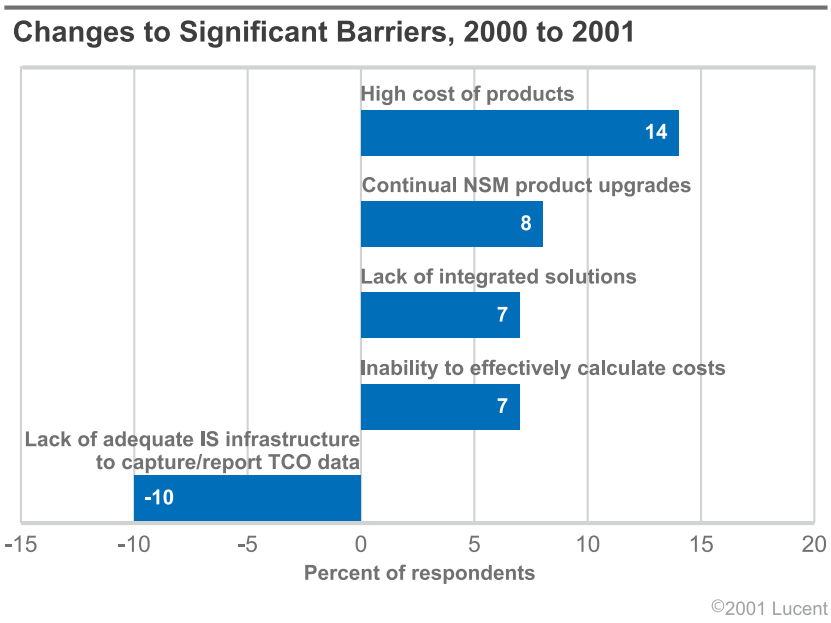

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As we pointed out, the cost of products has increased dramatically over the last year as a significant barrier. Other barriers that have also increased, but only by half as much, are continual product upgrades, lack of integrated solutions, and the inability to effectively calculate costs.

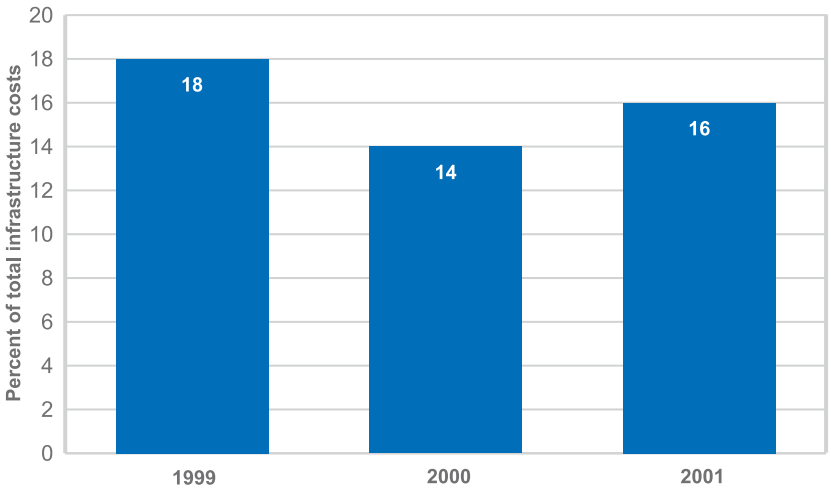
On the other side of the coin, only one barrier has gone down: the lack of adequate IS infrastructure to capture/report TCO data, which came down from 43 percent in 2000 and 51 percent in 1999. So, some progress is being made, but only for capturing data to analyze the situation.

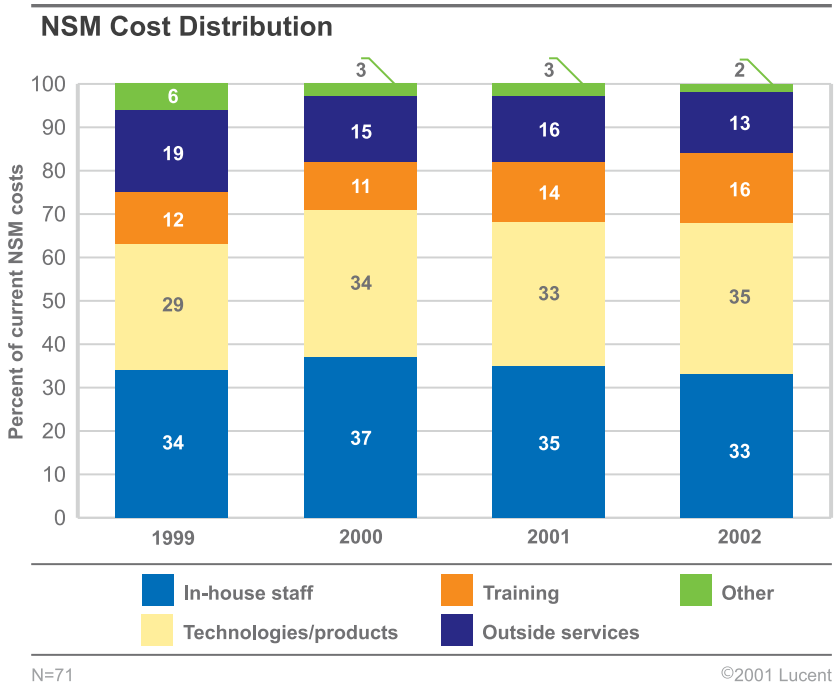
NSM Cost Allocation

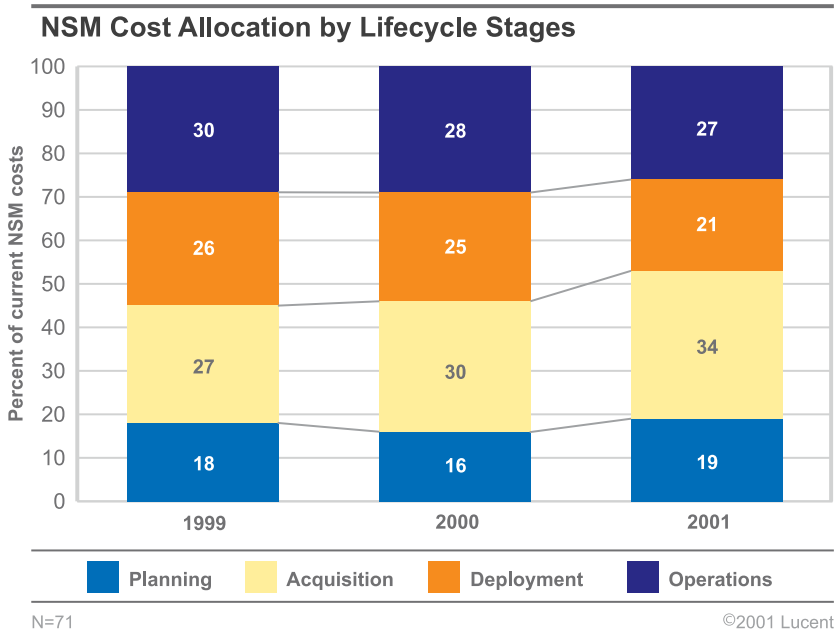
On average, respondents' networking organizations have dedicated 16 percent of their total network and systems infrastructure budgets to network and systems management – about the same percentage as in previous years.

Approximately one-quarter of respondents get by with less than five percent of their budget dedicated to NSM. Not surprisingly, these respondents are also much more likely to be dissatisfied with their current NSM TCO (34 percent) than those who spend 5-25 percent on NSM (13 percent). Conversely, only 11 percent of respondents who allocate more than 25 percent of their network and systems infrastructure budget to NSM are dissatisfied with their current NSM TCO. Clearly, the relationship between expenditures on NSM and satisfaction with NSM TCO is directly proportional – to improve NSM TCO, you must spend a greater percentage of your budget on NSM.

Percentage of Network and Systems Infrastructure Costs Dedicated to NSM







The distribution of network and systems management expenditures has been consistent over the last few years, and does not show any sign of changing significantly in the year ahead. Approximately on-third of the budget is allocated each to in-house staff and technologies and products. Training and outside services split most of the remaining budget. However, training appears to be growing slowly, while the use of outside services is declining.

Looking at cost allocation according to network lifecycle stages, the greatest percentage of expenditures is in acquisition costs, a reflection consistent with the growing percentage of respondents who identify the high cost of products and services as a significant barrier to reducing NSM TCO. This area is also growing steadily, a trend that does not augur well for the future.

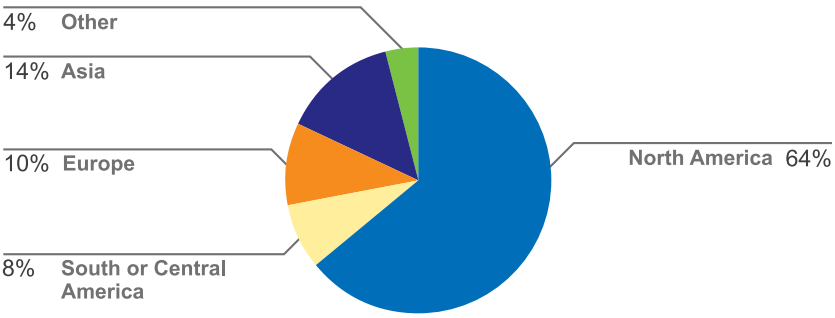
The distribution of network and systems management expenditures has been consistent over the last few years...

Respondent Demographics

Sixty-four percent of respondents are located in North America, while Asia (14 percent), Europe (10 percent), and South or Central America (8 percent) account for most of the remaining respondents. The "Other" category includes outposts such as South Africa and Australia.

Survey respondents represented a fairly broad cross-section of industries, led strongly by telecommunications/computer services providers, which represent 33 percent of respondents. Other well-represented industries include telecommunications/computer hardware and software manufacturers (17 percent), government/education/nonprofit organizations (14 percent), financial services/insurance/legal firms (7 percent), and retailers/wholesalers (7 percent).

Respondents' Locations



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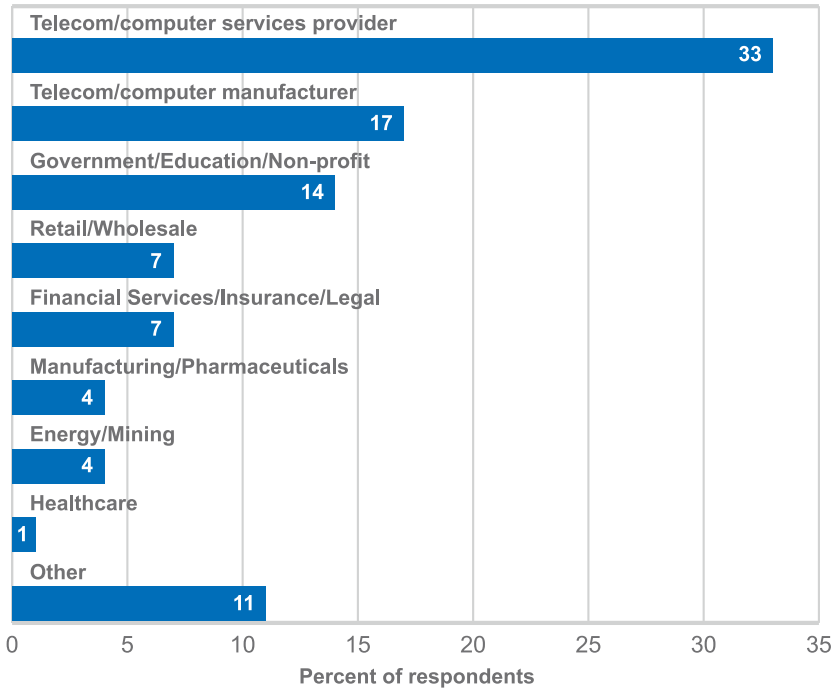
Respondents' Industries



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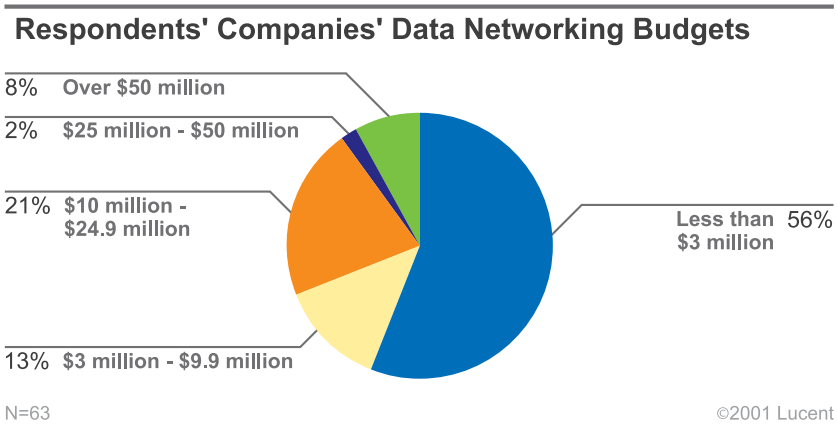
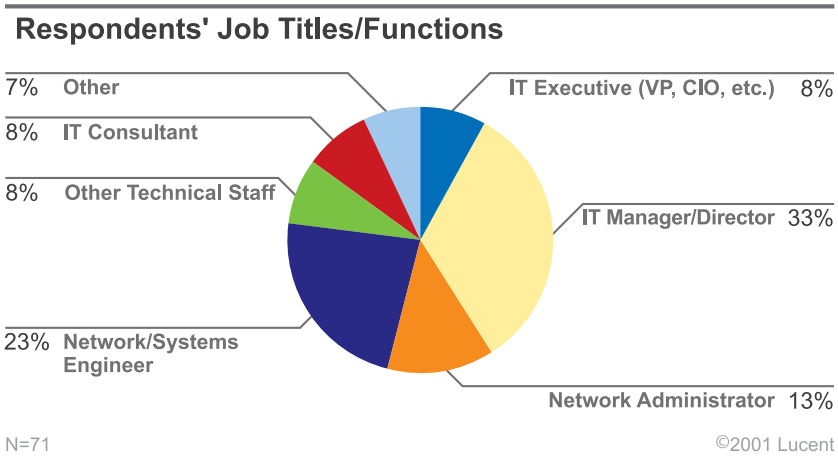
At the high end, eight percent of respondents' companies budget in excess of $50 million annually for data networking. The majority of respondents' companies work with budgets of under $3 million.

The highest percentage job title/function category is IT manager/director (33 percent), followed by network/systems engineer (23 percent), and network administrator (13 percent).





About Lucent Worldwide Services Network Industry Surveys

Lucent Worldwide Services conducts monthly industry survey projects intended to provide IT managers with insight into key issues impacting the ability to develop and deploy network-centric business applications. Previous survey reports include:

- Remote and Mobile Network Access
- Network Professionals Job Satisfaction
- Virtual Private Networks
- Network Challenges and Opportunities in Uncertain Times
- Network Operations Centers
- Performance Management and Engineering
- Network Quality of Service
- ASP Network Infrastructure
- Service Level Management
- Network Security
- Convergence and New World Services Providers
- E-Business Network Architecture/Infrastructure
- Network and Systems Management Total Cost of Ownership
- Networking in the 21st Century
- Enterprise Operating Systems and Directory Services
- Management Intranets
- Web/Java-based Management

To see the results of these surveys or to participate in the latest Lucent network industry survey, visit our web site at:

http://www.lucent.com/knowledge/resourcelib

If you would like to learn how Lucent can help you implement or improve your networking capabilities, please call us at 1-888-767-2988 in the U.S., or 1-650-318-1020 outside the U.S., or email: networkcare@lucent.com.

Methodology

This survey was conducted over the World Wide Web from April 2, 2001 – April 30, 2001 at:
http://www.lucentservices.com/surveys

All Web survey responses were automatically collected into a survey tool. Any questions skipped or incorrectly answered by survey respondents were not included in the tabulations. Not-applicable responses were also not included in the tabulations.

Each chart includes the number of valid responses for that particular question (e.g., N=100 indicates 100 responses). Percentages shown in charts may not equal 100 percent due to rounding.

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