Lucent Technologies
Bell Labs Innovations

Network Operations Centers

By Rick Blum, Senior Research Programs Manager

HIGHLIGHTS

► Lack of experienced staff is most frequently a significant barrier to improving NOC capabilities, a concern of 56% of respondents. For 47% of respondents, justifying costs/benefits to upper management is also a significant barrier, a 15% increase from last year.

► While the cost of outsourcing or out-tasking network operations is most frequently a barrier to implementing these strategies, lack of solutions providers with multivendor skills is often a significant barrier for both out-sourcing respondents (57%) and out-tasking respondents (49%).

► Ensuring that effective process-es/procedures are in place is increasingly important for a successful network management operation, especially for organizations that support 2,000 or more network elements.

► Less than one-fifth of respon-dents are completely satisfied with their network operations performance in each of the FCAPS categories, with security having the biggest gap between overall satisfaction and importance.

► Ensuring NOC staffs possess the appropriate skills is the most important task for optimizing network operations (this is critical for 57% of respondents).

► Continuing an upward trend, 83% of networking organiza-tions are achieving some level of integration in the management of their network and systems operations. 24% have achieved a totally integrated strategy.

► In keeping with past survey trends, 85% of respondents consider the NOC a critical component of an integrated enterprise management center.

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ABOUT LUCENT WORLDWIDE SERVICES NETWORK INDUSTRY SURVEYS

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Introduction

The network operations center (NOC) plays a central role in today's multivendor distributed networks by helping network engineers keep track of the performance, reliability and stability of the entire network. With the continual increase in the importance that networking plays in the success of the core business, effective NOC management is vital.

In November 2000, Lucent Technologies Worldwide Services conducted a Web-based survey to assess current and future capabilities of NOCs worldwide. The results of this survey, which was completed by 175 network professionals, render valuable insights into their current and planned strategies for the successful operation of their NOCs, as well as identify some of the barriers to improving network operations.

In this fourth annual survey of network operations center activities, we will compare results with previous surveys to assess how respondents' perceptions have changed, how NOC usage is evolving, and identify significant industry trends. These results will enable networking organizations to better understand how their operations compare with other NOCs, and where they might find areas for improvement. Complete survey results are available at www.lucentservices.com/surveys.

For the purposes of this survey, a NOC is defined as a combination of organizational structures, staffing, processes, technology products and tools, and service providers designed to provide reliable operational service levels to end users of multivendor, heterogeneous, distributed networks. Many organizations incorporate their NOC(s) into a broader enterprise management center.

THE BOTTOM LINE

Today many businesses must operate their networks in a multitechnology, multivendor environment that is increasingly costly and complex to operate and manage. As core business functions rely increasingly on networks for communications and delivery of critical data, network management strategy is driven by the need to minimize network failure, improve service quality, reduce operating costs, and enable new business opportunities.

Keeping the network running efficiently at all times, especially during periods of rapid expansion, requires being able to assemble a team of network professionals with the necessary technical skills, establish processes and polices to control the activity, and provide skillful management of the entire operation. Managers responsible for network operations must consider the following:

► The most formidable challenge for most organizations is to hire, train, and retain a cadre of highly skilled network professionals who can make sense of the many-faceted elements of a modern enterprise network. A focus on these goals may be more important to success than good technology.

► Outsourcing and/or out-tasking offer relief from the staffing and skills dilemma, allowing organizations to attain instant network expertise for maximizing network performance, and help with critical functions, such as security.

► Pay careful attention to processes and procedures that can maximize the value of the network management technologies you deploy. As you grow your NOC capabilities, be sure to keep the future in mind, knowing that you'll have to integrate new technologies and services into your NOC, thus requiring adaptation of staffing requirements and organizational adjustments.

NOC Profile

Surveys of network operations centers over the past four years have shown a clear trend toward more integration of the management of network operations and systems operations. This year 83% of networking organizations report achieving some level of integration. This is up from 66% reported in 1998. Most significantly, the percentage of organizations achieving a totally integrated strategy has jumped from 14% in previous years to 24% today. Moreover, this year shows a decrease in both the percentages of respondents who have partially integrated management of network and systems operations and those who have totally separated these functions.

Among respondents who currently have a NOC, a single centralized center remains the most common configuration, although the percentage of respondents whose NOC is organized in this way has dropped substantially
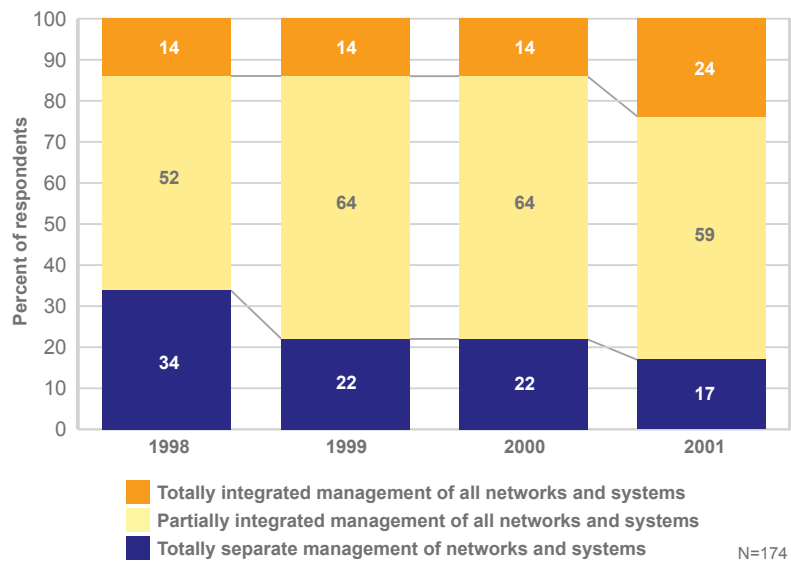
from 53% last year and 56% in 1998 to only 39% this year. The percentage of respondent organizations with multiple local/regional centers with integration at a centralized site has fluctuated over the four years the surveys have been conducted, but remains the primary alternative to a single, centralized center. For other NOC configurations the results remain about the same as for the past several surveys.

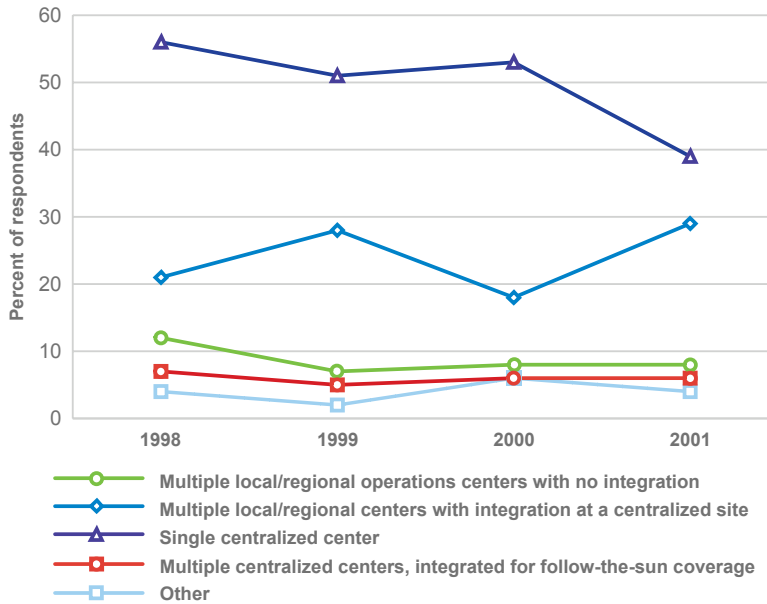Wide-area network (WAN) and local-area network (LAN) services

continue to be those services most frequently offered by respondents' NOCs. This year, eight out of ten NOCs supported these services. This percentage has not changed significantly over the last four surveys, nor is it expected to increase significantly in the coming year.

Server services (offered by three-fourths of respondents) continue its moderate yearly growth in usage from 1998 through 2001. Desktop services and traditional voice services (both

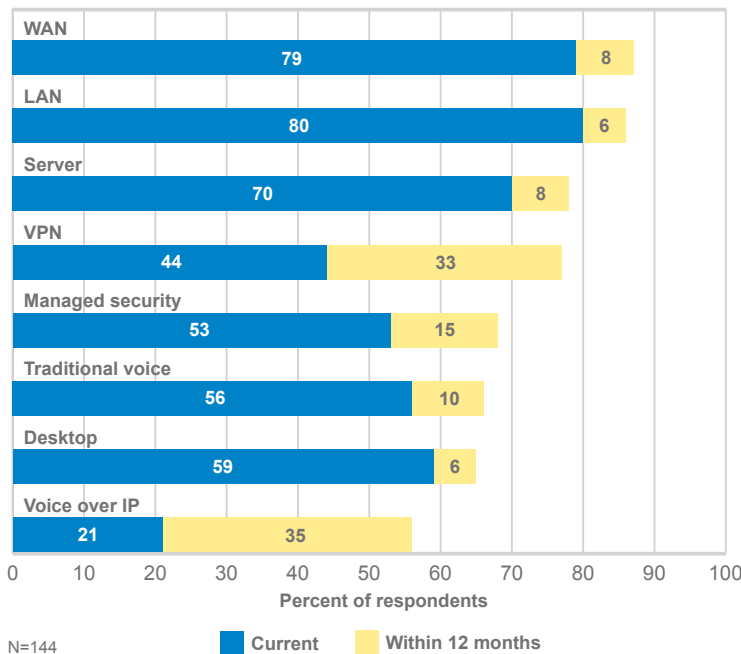## Integration Level for Networks and Systems

Totally integrated management of all networks and systems
Partially integrated management of all networks and systems
Totally separate management of networks and systems

N=174

NOC Organizational Structure

Percent of respondents (y-axis)

Years: 1998, 1999, 2000, 2001

Legend:
- Multiple local/regional operations centers with no integration
- Multiple local/regional centers with integration at a centralized site
- Single centralized center
- Multiple centralized centers, integrated for follow-the-sun coverage
- Other

N=160

NOC Services Offered

Service	Current	Within 12 months
WAN	79	8
LAN	80	6
Server	70	8
VPN	44	33
Managed security	53	15
Traditional voice	56	10
Desktop	59	6
Voice over IP	21	35

Percent of respondents (x-axis: 0–100)

N=144

Legend: Current / Within 12 months

offered by well over half of respondents) have continued their significant upward trend in usage and will soon be supported by nearly two-thirds of respondent organizations.

The greatest anticipated changes in NOC services are expected to be in support of two relatively new technologies: voice over IP (VoIP) and virtual private networks (VPNs). Support for VoIP was essentially unchanged from last year's survey, which indicates that this technology has yet to catch on with most organizations. However, the year ahead promises significant changes, with over half of the respondents indicating they plan to have this capability within 12 months. VPN services display a steadier growth rate, increasing from 33% of respondent NOCs last year, to 44% this year, to more than three-fourths in the year ahead.

Managed security, a new service added to this year's survey, is currently offered by 53% of respondents and is expected to increase to 68% utilization within 12 months. This is a clear reflection of security concerns taking center stage in various e-business transactions.

Server services continue its moderate yearly growth in usage from 1998 through 2001.

In addition to these basic services, respondents listed a multitude of other more specialized services that they offer including videoconferencing, colocation, and Internet access. In the coming year, some respondents will be adding new services for customized portals and uni-fied messaging, among many others.

Enterprises are increasingly creating integrated enterprise management centers, which combine their NOCs with other support organizations such as help desk, customer service center, data center, and desktop support. In keeping with past surveys that show 80-90% of respondents consider the NOC as a critical component of an integrated center, currently 85% hold this view. Additionally, help desk is viewed by 72% of respondents as a critical component.

Although most of the other components are considered important by about the same percentage of respondents as in previous years, there was an increase (from 54% last year to 65% this year) in the percentage of respondents who believe the data center is vital to an integrated support strategy. Whether this indicates the start of a trend remains to be seen.

Changes in NOC Services Offered
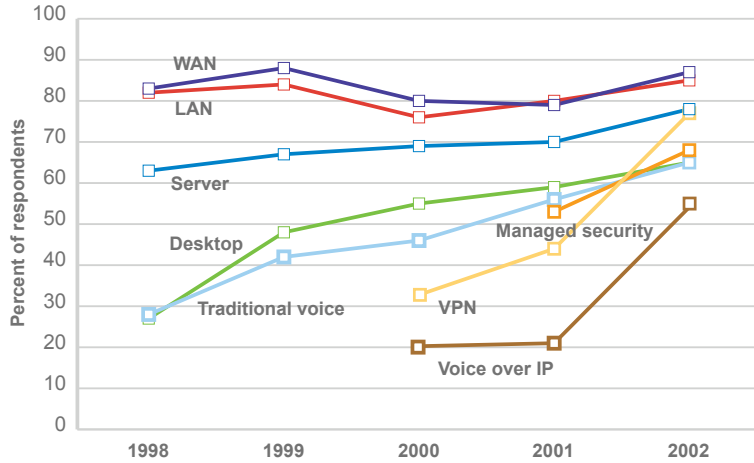
Components Considered Vital to an Integrated Enterprise Management Center
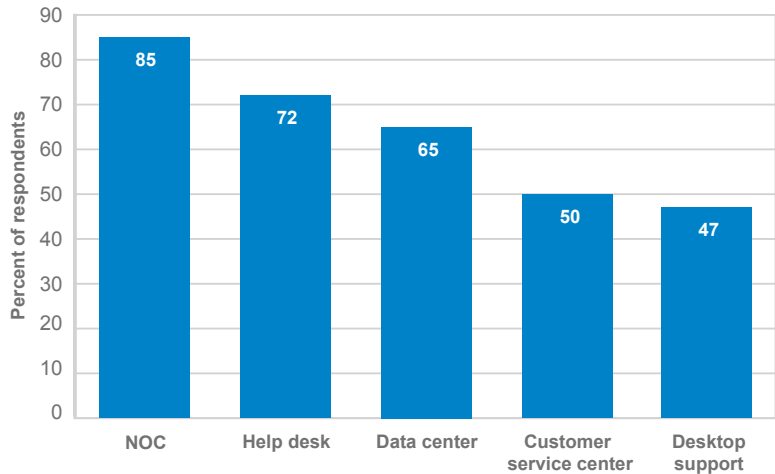
N=169

Measuring and Improving Network Operations

Ensuring NOC staff possess appropriate skills, and have established effective processes and procedures are regarded as the most important tasks for optimizing network operations. These tasks are considered critically important by 57% and 42% of respondents, respectively. Two other tasks, using tools effectively and having an effective organization structure, are also deemed important by a large percentage of respondents. Although all four of these tasks maintain high importance across the last three surveys, respondents in this year's survey indicate that ensuring effective processes and procedures are in place has become even more important to successful network management.

As networks become larger and involve more elements to be managed, having effective processes and procedures gain significantly in importance. Respondents whose networks support 2,000 or more elements rated effective processes and procedures substantially higher in importance than did respondents with smaller networks. Half of the former group deems these characteristics critical, while only one-third of the latter group agree with this assessment.

Rating the importance of various tasks for optimizing network operations is one thing; satisfaction with these tasks is quite another issue.

Respondents exhibited only lukewarm satisfaction with the way these tasks actually played out in their network operations. As a result, no component received a "completely satisfied" rating by more than 14% of respondents. The most dissatisfaction lies with effective processes and procedures, whereby 22% of respondents say they are completely dissatisfied. Although

Importance of Tasks for Optimizing Network Operations

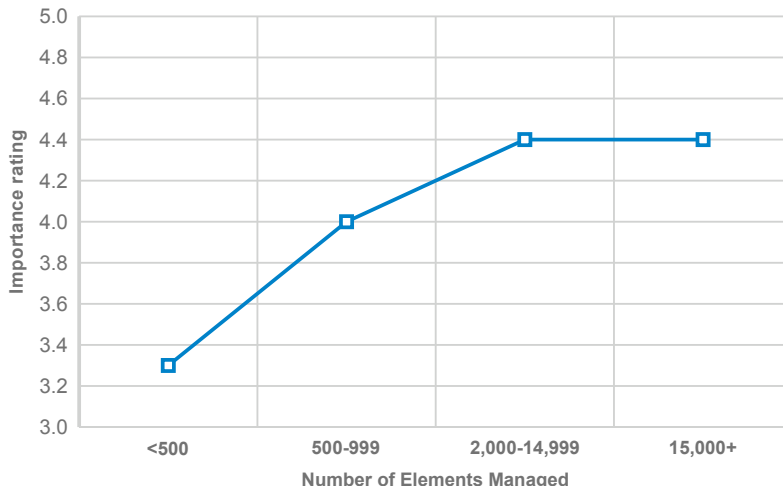

N=141   ■ 1999   ■ 2000   ■ 2001
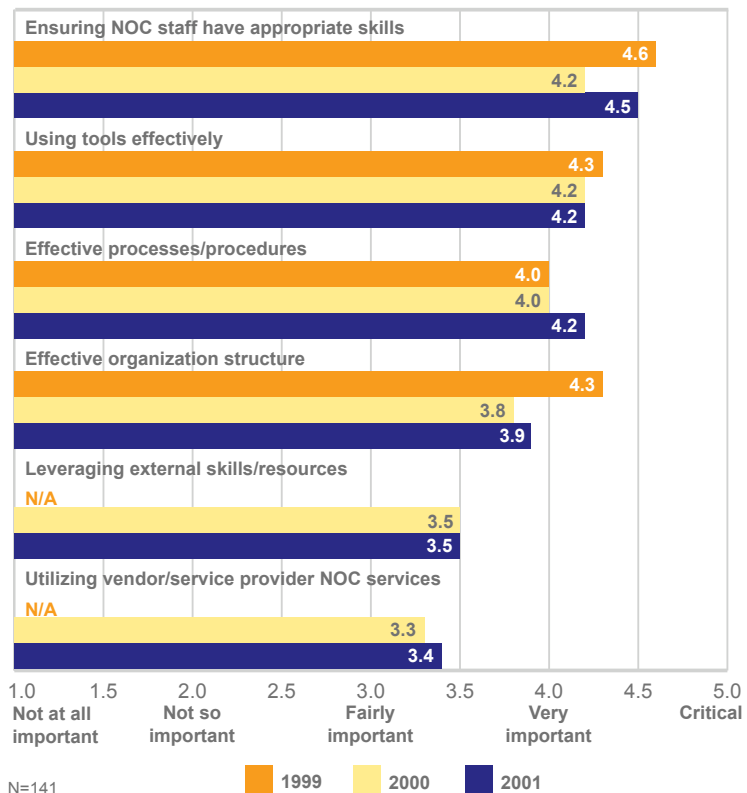
the changes in satisfaction from 1999 to 2001 are not dramatic, the good news is that overall they are at least heading in the right direction.

In spite of the less than enthusiastic expression of satisfaction with various aspects of network operations, the small improvement in satisfaction and minimal change in importance means that the gap between importance and satisfaction (of the four network operations surveyed in 1998), has narrowed slightly over the past three years, from an average gap of 1.0 in 1998 to 0.7 in 2001.
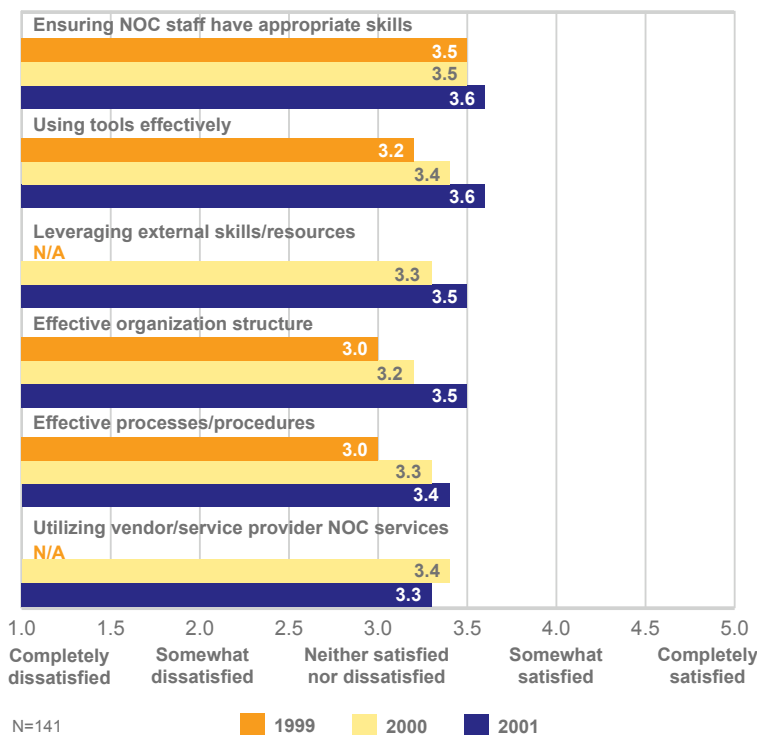
The small upticks in several categories (staffing NOC with appropriate skills, effective processes and procedures, and utilizing vendor/service provider NOC services) have more than offset the narrowing gap for using tools effectively, effective organization structure, and leveraging external skills and resources. Still, it will take at least another year of data to confirm these trends.

A multitude of concerns can hinder organizations in their efforts to improve NOC capabilities and performance, as indicated by the relatively high (slightly less than five) average number of significant barriers selected by respondents from a list of 14. Leading all other issues, lack of experienced staff is tagged by
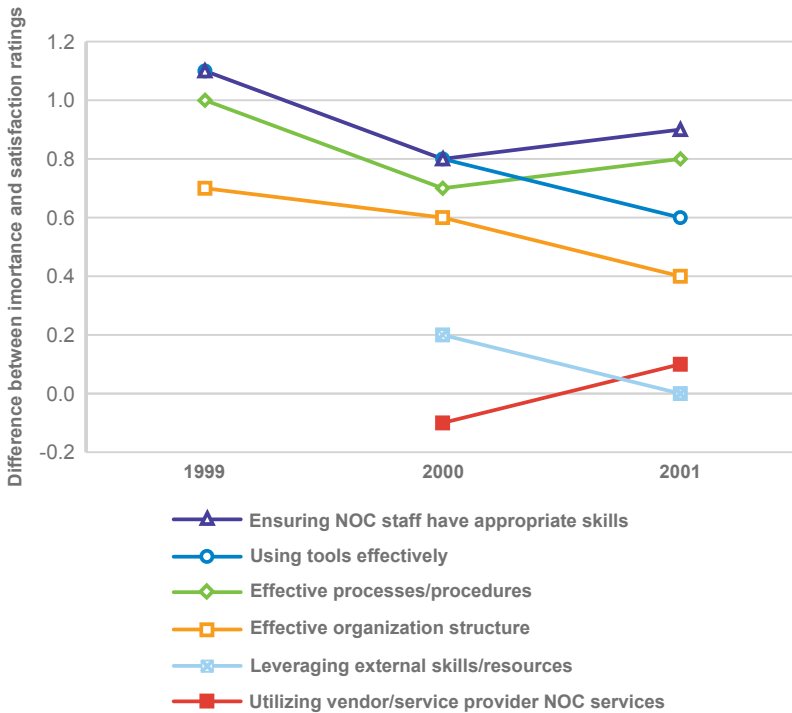
Correlation Between Network Size and Importance of Effective Processes/Procedures

Satisfaction with Tasks Required for Optimizing Network Operations

Ensuring NOC staff have appropriate skills
1999: 3.5
2000: 3.5
2001: 3.6

Using tools effectively
1999: 3.2
2000: 3.4
2001: 3.6

Leveraging external skills/resources
1999: N/A
2000: 3.3
2001: 3.5

Effective organization structure
1999: 3.0
2000: 3.2
2001: 3.5

Effective processes/procedures
1999: 3.0
2000: 3.3
2001: 3.4

Utilizing vendor/service provider NOC services
1999: N/A
2000: 3.4
2001: 3.3

Scale: 1.0 Completely dissatisfied — 2.0 Somewhat dissatisfied — 3.0 Neither satisfied nor dissatisfied — 4.0 Somewhat satisfied — 5.0 Completely satisfied

N=141   1999   2000   2001

Gap Between Network Operations Importance and Satisfaction

Difference between imortance and satisfaction ratings

Legend:
- Ensuring NOC staff have appropriate skills
- Using tools effectively
- Effective processes/procedures
- Effective organization structure
- Leveraging external skills/resources
- Utilizing vendor/service provider NOC services

Significant Barriers to Improving NOC Capabilities

Barrier	Percent
Lack of experienced staff	56
Justifying costs/benefits to upper management	47
Cost of products/tools too high	45
Lack of products/tools	40
Difficulty in implementing products/tools	40
Inadequate training available	37
Organizational/process issues	36
Available products/tools don't meet requirements	33
Lack of metrics	33
Lack of SLAs	30
Other projects with higher priority	28
Excessive staff turnover	28
Lack of proven business benefit	13
Other	5

N=141

Percent of respondents

56% of respondents (same as last year) as a significant barrier to improving NOC capabilities. Organizational and process issues and inadequate training available exacerbate this staffing problem for more than one-third of respondents each. For another 28%, excessive staff turnover is a significant barrier.

In addition to staffing and organizational matters, several technological concerns continue to be significant barriers to improving NOC capabilities. These include lack of products/tools, difficulty in implementing products/tools (both cited by 40% of respondents), available products and tools that don't meet requirements and the lack of metrics (both cited by one-third of respondents).

As if technological and staffing/organizational challenges weren't enough, 47% of respondents mentioned justifying costs/benefits to upper management as significant barriers to improving NOC capabilities. In fact, this barrier has become much more prevalent this year with a 15% increase from last year. This change, perhaps, is an indicator of increased scrutiny of budgets in an uncertain economy.
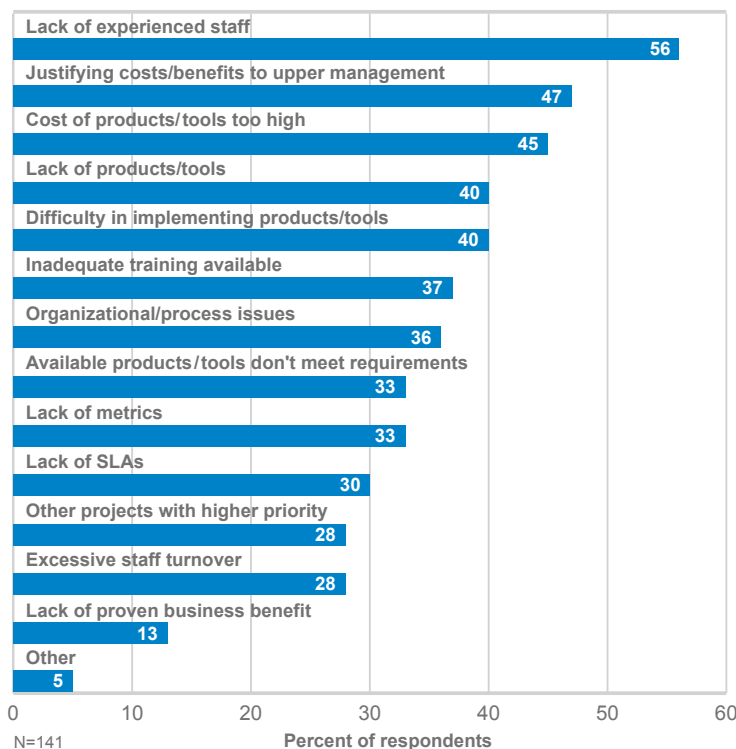
A multitude of concerns can hinder organizations in their efforts to improve NOC capabilities and performance…

Other substantial increases to NOC improvement barriers since last year's survey come from two areas that were previously not near the top of the list. The high cost of products and tools is now considered a significant barrier to 45% of respondents (17% increase), with the lack of products and tools now being considered a significant barrier to 40% of respondents (15% increase). This is a clarion call to product and tools vendors that the bar has been raised.

With lack of experienced staff being the most prominent barrier to improved NOC operations, we asked what factors have the greatest impact on staffing the NOC. Not surprisingly, respondents indicate that recruiting, training, and retaining skilled network professionals together comprise over 60% of this challenge. Recruitment of skilled network professionals is most significant; as cited by 28% of respondents, followed closely by the challenge of retaining these people once they are on board.

Also impacting staffing efforts is the complexity of the technological environment supported by the NOC (18%) as well as the implementation/ administration of new technologies (16% of total challenge). Of the many other reasons cited by respondents, funding and budgetary constraints are mentioned most often as having impacted staffing of NOCs.

Biggest Increases to NOC Barriers, 2000 to 2001
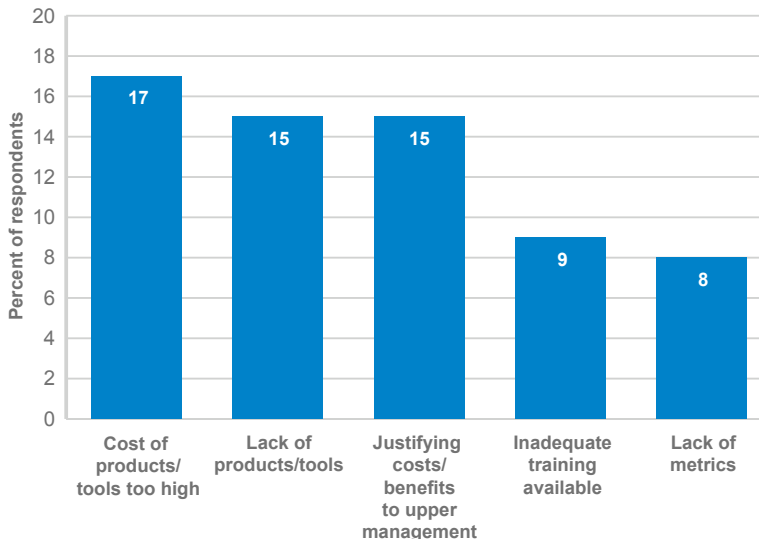
Factor Having Greatest Impact on Staffing NOC

N=145
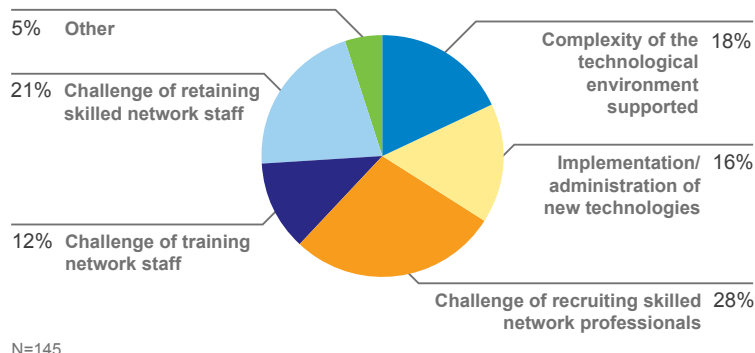
Managing NOCs: Metrics and Tools

Like the previous three years, network performance, availability and customer satisfaction are the most frequently employed metrics used to manage NOC effectiveness. Although last year there had been some signs of a possible shift away from these metrics, this was apparently an aberration since the percentages for this year are much the same as for the previous two years. Cost of services (total cost of ownership) as a metric for NOC effectiveness showed the greatest rise in usage, climbing from 22% of respondents last year to 34% of respondents this year.

The typical respondent uses four metrics to measure the effectiveness of their NOC, with nearly all employing two of the top three measures, i.e., network performance, availability and customer satisfaction.

For four of the five FCAPS tool types, usage by respondents in this year's survey is slightly higher than the average usage of the past three survey years. Accounting tools, the notable exception, show a marked increase in usage by respondents. A notable 53% of respondents today versus an average of 33% over the past three years.
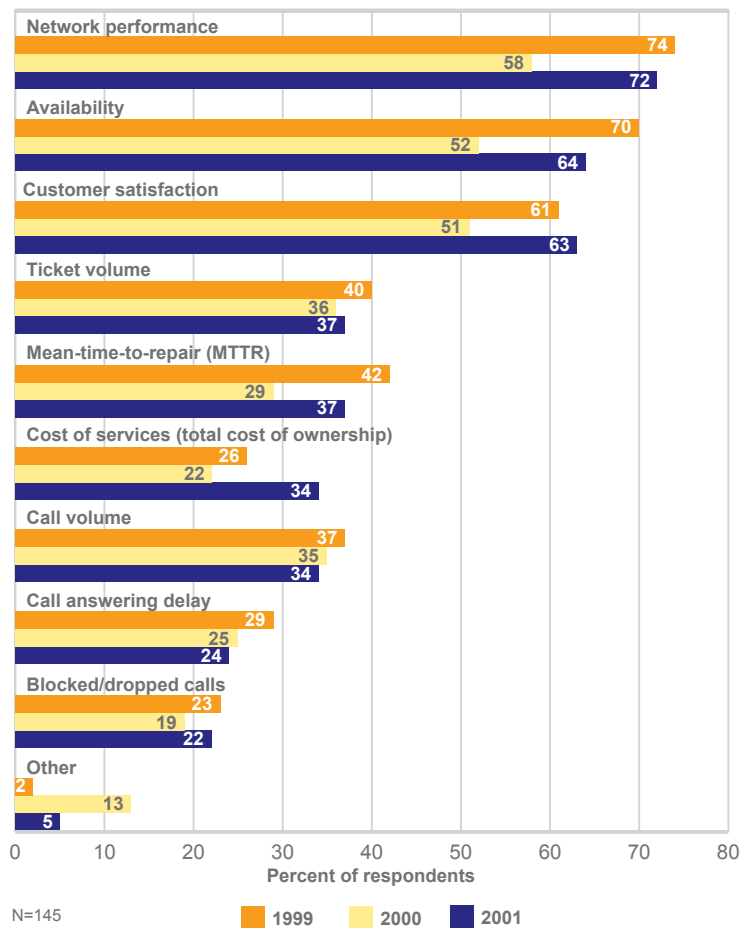
Additionally, 76% of respondents say they will use accounting tools within the next 12 months, resulting in a substantially increased emphasis on these tools in just a couple of years.

Fault detection, performance, and configuration tools will also show substantial increases in usage over the next 12 months. Somewhat surprisingly, however, despite the spotlight that has shone on security issues in 2000, planned usage of security tools in NOCs will show a marginal increase, with more than one-quarter of respondents' NOCs still not using these tools today or in the coming 12 months.

The most rapid growth in tool usage in the year ahead is reserved for asset verification. An astounding one-third of respondents plan to add this tool to their NOC tool kit in the year ahead.

Metrics Used to Manage NOC Effectiveness

Network performance
1999: 74
2000: 58
2001: 72

Availability
1999: 70
2000: 52
2001: 64

Customer satisfaction
1999: 61
2000: 51
2001: 63

Ticket volume
1999: 40
2000: 36
2001: 37

Mean-time-to-repair (MTTR)
1999: 42
2000: 29
2001: 37

Cost of services (total cost of ownership)
1999: 26
2000: 22
2001: 34

Call volume
1999: 37
2000: 35
2001: 34

Call answering delay
1999: 29
2000: 25
2001: 24

Blocked/dropped calls
1999: 23
2000: 19
2001: 22

Other
1999: 2
2000: 13
2001: 5

Percent of respondents

N=145   1999   2000   2001

Interestingly, the importance of every tool type of the FCAPS (fault detection, configuration, accounting, performance, and security) model used in NOCs has increased in this year's survey, as compared to the average importance rating on the last three surveys. Fault detection tools continue to be viewed as most important for optimizing network operations, and are considered critically important by 65% of respondents. Security tools are considered critically important by more than half of respondents.

Accounting, which last year was viewed as critically important by only 8% of respondents, is gaining in overall importance. This year, it is considered critically important for optimizing network operations by 14% of respondents. Overall, accounting showed the
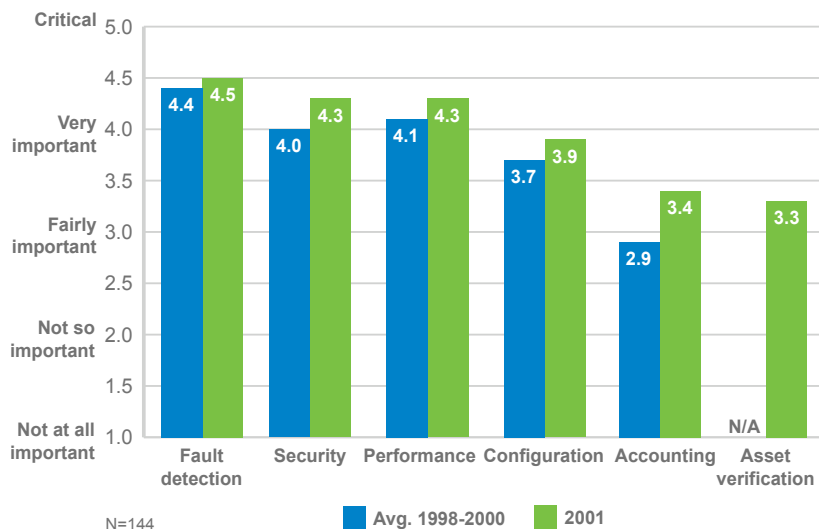
Tool Types Used in NOCs

N=144
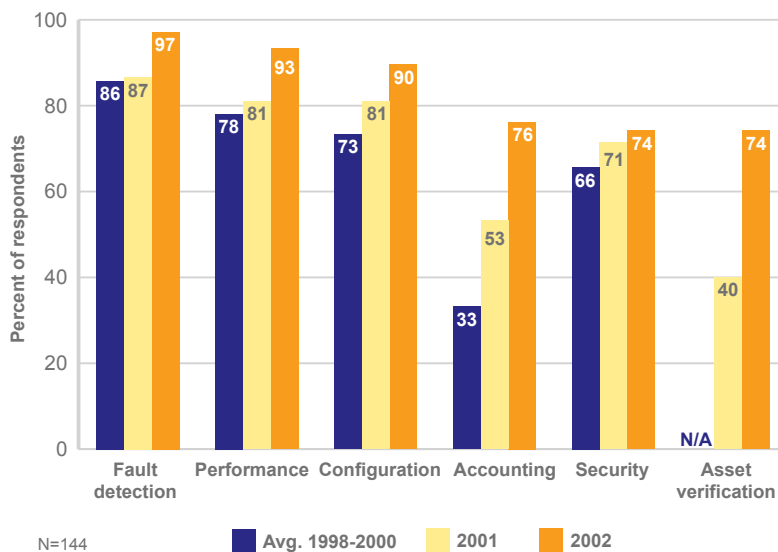
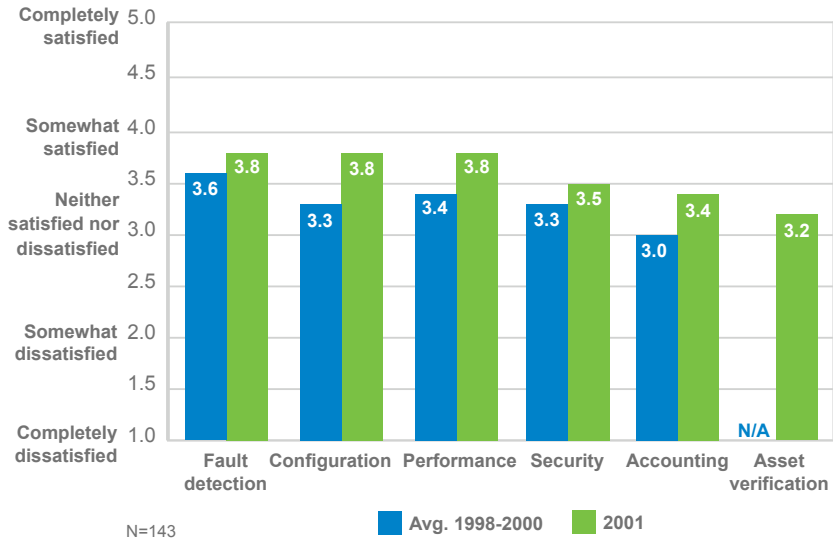largest increase in importance rating among the five FCAPS categories.

Asset verification tools, a new category in the survey this year, is considered to be critically important by 14% of respondents, and overall rates nearly as important as accounting tools.

Generally, as compared to the average satisfaction ratings from 1998, 1999, and 2000 surveys, there has been an increase in satisfaction with network operations in all FCAPS categories. In fact, in all five categories, satisfaction levels in 2001 were equal to (fault detection and security) or higher than (configuration, performance, and

Importance of Tools for Optimizing Network Operations

N=144

Satisfaction with Network Operations

N=143

tion with network operations in the equivalent category. This is said with the exception of accounting tools, which went from a 0.3 higher satisfaction rating than importance rating to equal ratings for both.

Over the past three years, the gap between importance and satisfaction for configuration tools has closed by the greatest amount, principally because satisfaction has risen faster than importance for this category. Security remains an issue as increased exposure of networks place greater emphasis on the importance of high security. Satisfaction with network operations security is not increasing fast enough to close the gap between them. Undoubtedly, this is related to the fact that more than one-quarter of respondents are not currently utilizing security tools.

accounting) levels in the 2000 survey. Configuration shows the largest gain in satisfaction by respondents compared to 1998, when it garnered only a 2.9 satisfaction rating.

While increased overall satisfaction is the good news; there is still a long way to go. Less than 20% of respondents are completely satisfied with any of the tool types discussed.
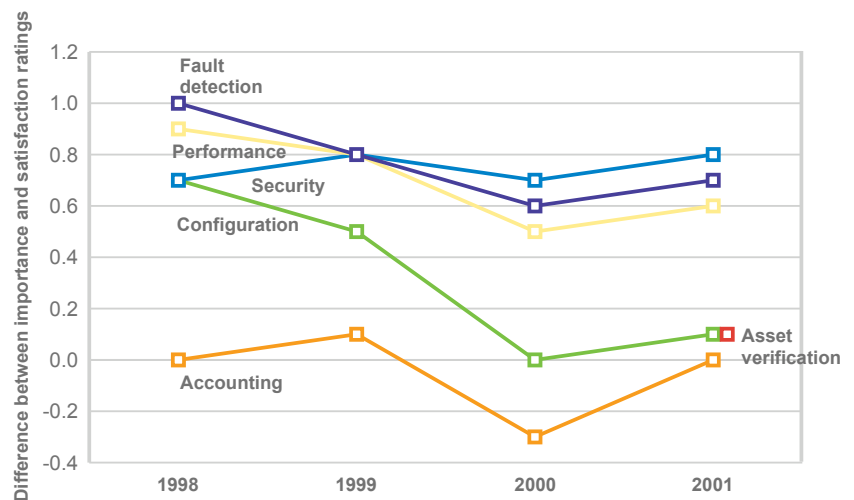
Compared with last year's results, this year's survey shows there has been no significant change in the gap

between the importance respondent's place on most tools and their satisfac-

Gap Between Tool Importance and Satisfaction with Network Operations

NOC Outsourcing and Out-tasking

Similar to previous surveys, approximately half of respondents have currently either outsourced their network operations (including security), out-tasked selected network activities, or are considering one of these alternatives. Also consistent over the past three years is the expressed preference, by a wide margin, for out-tasking selected network functions rather than outsourcing all network operations. This year, more than four times as many organizations are out-tasking some network operations as opposed to outsourcing their entire network. However, the percentage of respondents considering each of these options is about the same.
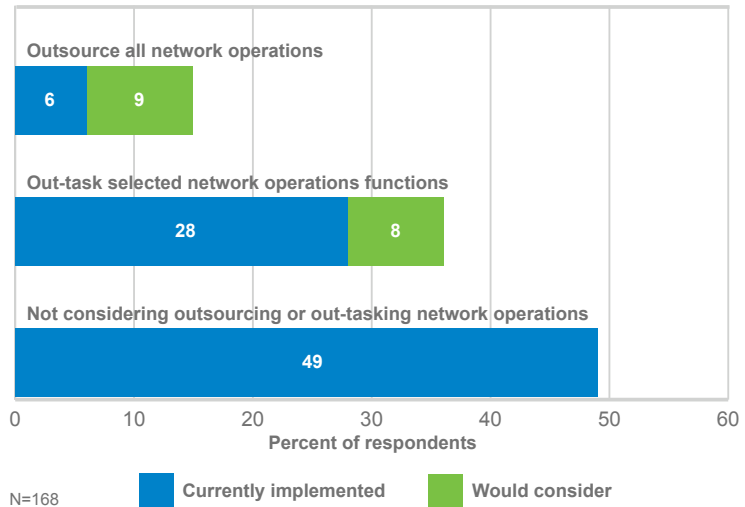
We asked respondents who currently outsource or out-task their network operations, or are considering doing so, which types of service providers they either use or are considering for use. Between 36 – 44% of out-tasking respondents generally consider four types of providers for use. These types

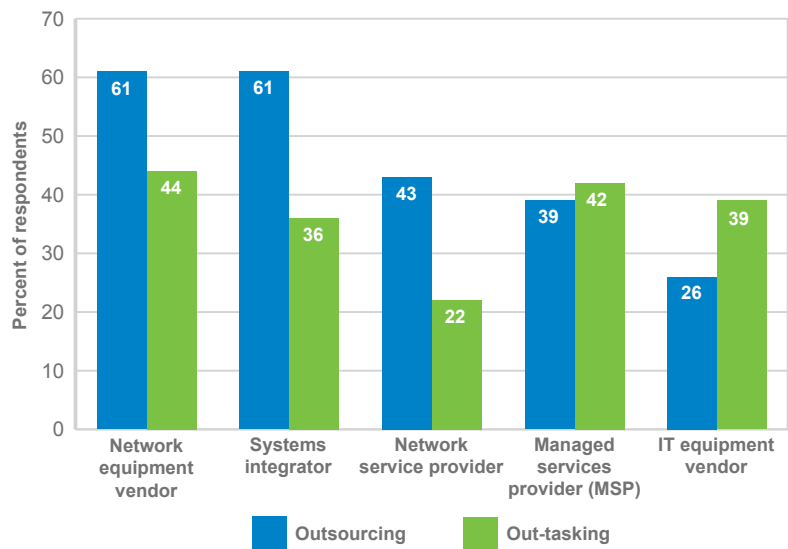*…more than four times as many organizations are out-tasking some network operations…*

of providers are network and IT equipment vendors, systems integrators, and managed service providers (MSPs). However, outsourcing respondents

are much more likely to look to network equipment vendors and systems integrators for outside help than to other types of vendors. Network equipment vendors

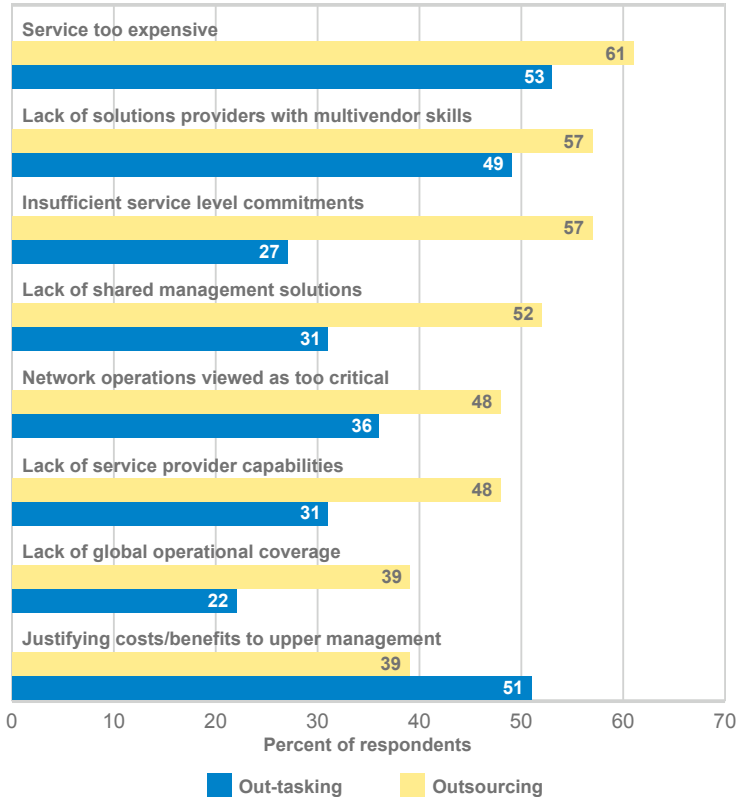### View of Network Operations Outsourcing and Out-tasking

Outsource all network operations — Currently implemented: 6, Would consider: 9

Out-task selected network operations functions — Currently implemented: 28, Would consider: 8

Not considering outsourcing or out-tasking network operations — 49

Percent of respondents

N=168

■ Currently implemented   ■ Would consider

Types of Providers Currently Used or Considering for Outsourcing or Out-tasking

	Outsourcing	Out-tasking
Network equipment vendor	61	44
Systems integrator	61	36
Network service provider	43	22
Managed services provider (MSP)	39	42
IT equipment vendor	26	39

Percent of respondents

■ Outsourcing   ■ Out-tasking

N=23 (respondents currently outsourcing or considering outsourcing)
N=59 (respondents currently out-tasking or considering out-tasking)

Significant Barriers to Outsourcing or Out-Tasking Network Operations

Service too expensive
61
53

Lack of solutions providers with multivendor skills
57
49

Insufficient service level commitments
57
27

Lack of shared management solutions
52
31

Network operations viewed as too critical
48
36

Lack of service provider capabilities
48
31

Lack of global operational coverage
39
22

Justifying costs/benefits to upper management
39
51

Percent of respondents

■ Out-tasking   ■ Outsourcing

N=23 (respondents currently outsourcing or considering outsourcing)
N=45 (respondents currently out-tasking or considering out-tasking)

and systems integrators are more likely to be considered by people who are outsourcing than they are by people who are out-tasking.

Out-tasking respondents are more likely to look to an MSP as opposed to a network services provider, whereas outsourcing respondent's look to network services providers just as often as MSPs. On the average, respondents who outsource will consider more providers types (2.3 choices) than respondents who out-task (1.8 choices).

We further asked respondents who are either outsourcing or out-tasking all or part of their networking operations, or are considering doing so, to identify significant barriers to this strategy.

Both outsourcing respondents (61%) and out-tasking respondents (53%) say most often that a significant barrier to assigning network operations

to an external service provider is that the service is too expensive. Both also agree that lack of solutions providers with multivendor skills is a frequent barrier to outsourcing or out-tasking. In fact, both types of respondents view this factor as a barrier more frequently today than last year (49% of out-tasking respondents in this survey vs. 37% of respondents last year; and 57% of outsourcing respondents in this survey vs. 43% last year).

Outsourcing respondents more often consider insufficient service level commitments, lack of shared management solutions, and lack of global operational coverage as a significant barrier than do out-tasking respondents. Interestingly, outsourcing respondents mentioned an average of 4.2 barriers to outsourcing, while out-tasking respondents cited an average of only 3.0 barriers. Clearly, outsourcing presents more hurdles than does out-tasking.

In our last survey, lack of service provider capabilities was the number one hindrance to implementing an outsourcing strategy. However, in this survey that factor, although still frequently cited as a significant barrier, is ranked much farther down the list, declining by 19%. Global operational coverage also declined (by 15%) as compared to last year.

NOC Demographics

More than two-thirds of respondents who participated in this survey operate their NOCs on an around-the-clock (24 x 7) schedule. Less than one-quarter follow a five day, eight hour per day (5 x 8) schedule. Other schedules include 5 x 16, 5 x 24, 7 x 8, and 7 x 12.

In this survey, respondents represent a wide range of network capabilities in terms of number of network elements managed. While 30% of respondents manage less than 500 network elements, 35% manage 5,000 or more elements. On average, respondents manage approximately 6,700 network elements from their NOCs.
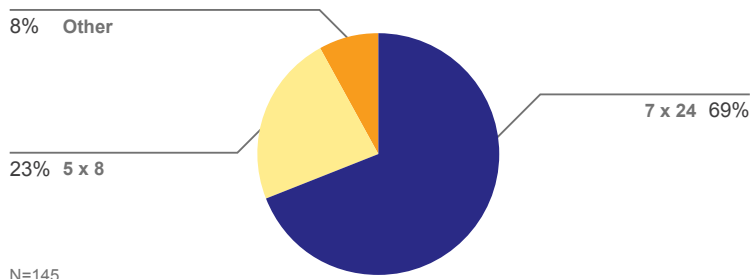
Another way to view NOC size is by the number of full-time equivalents (FTEs) employed in managing NOC

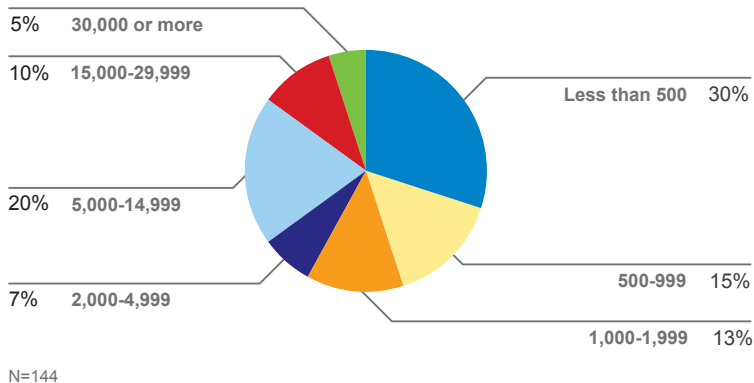*On average, respondents manage approximately 6,700 network elements from their NOCs.*

activities. Although the average NOC is managing fewer elements this year than last, they employ more FTEs this year (27) on average than last year (26). Also, 34% of respondents employ less than 5 FTEs, an increase of over 28% from respondents in last year's survey. In the larger shops, there appears to be little change in the number of FTEs engaged in NOC activities.
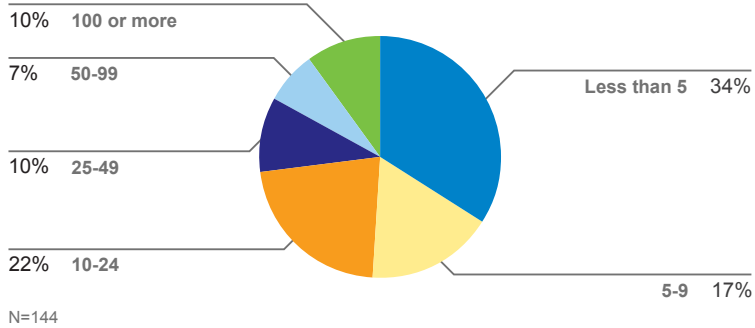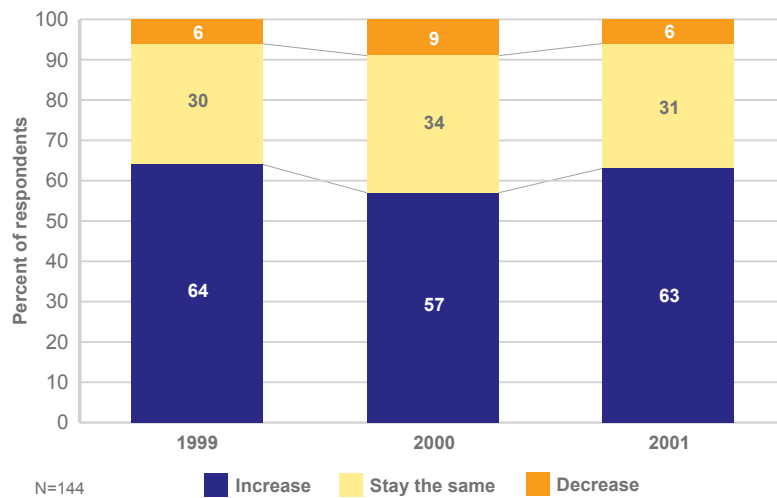
NOC Operating Hours

8% **Other**

7 x 24 69%

23% **5 x 8**

N=145

Number of Elements Managed by NOCs

5% **30,000 or more**

10% **15,000-29,999**

Less than 500 30%

20% **5,000-14,999**

500-999 15%

7% **2,000-4,999**

1,000-1,999 13%

N=144

Number of FTEs Engaged in NOC Activities

10% **100 or more**

7% **50-99**

10% **25-49**

Less than 5 34%

22% **10-24**

5-9 17%

N=144

Anticipated Change in Network Operations Staffing

Percent of respondents

	1999	2000	2001
Decrease	6	9	6
Stay the same	30	34	31
Increase	64	57	63

N=144 ■ **Increase** ■ **Stay the same** ■ **Decrease**

Confirming the expectations expressed in last year's survey, the average NOC staff size grew over the last year. This trend is likely to continue into the year ahead. Although the percentages did reflect a slightly more pessimistic view last year, on the whole the numbers for anticipated changes in NOC staffing echo a similar theme over the past three surveys. Virtually identical to two years ago, this year 63% of respondents expect to increase the size of their staff in the next 12 months, while 31% of respondents anticipate staffing will remain at current levels.

63% of respondents expect to increase the size of their staff in the next 12 months…
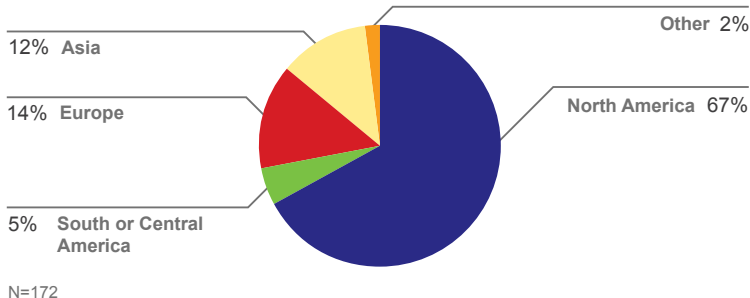
Respondent Demographics

The largest percentage of survey responses came from North America (67%). Compared with last year's survey, there was an increase in the percentage of responses from both Europe (14% this year vs. 10% last year) and Asia (12% this year vs. 8% last year).

Survey respondents come from a wide variety of end-user organizations (59%), with the remainder of respondents identified as telecom/computer services providers (41%). The largest end-user group represented in the survey is the combined category of government/education/non-profit (14% of respondents), followed by financial services/insurance/legal firms (9% of respondents) and telecom/computer hardware/software manufacturers (9%).
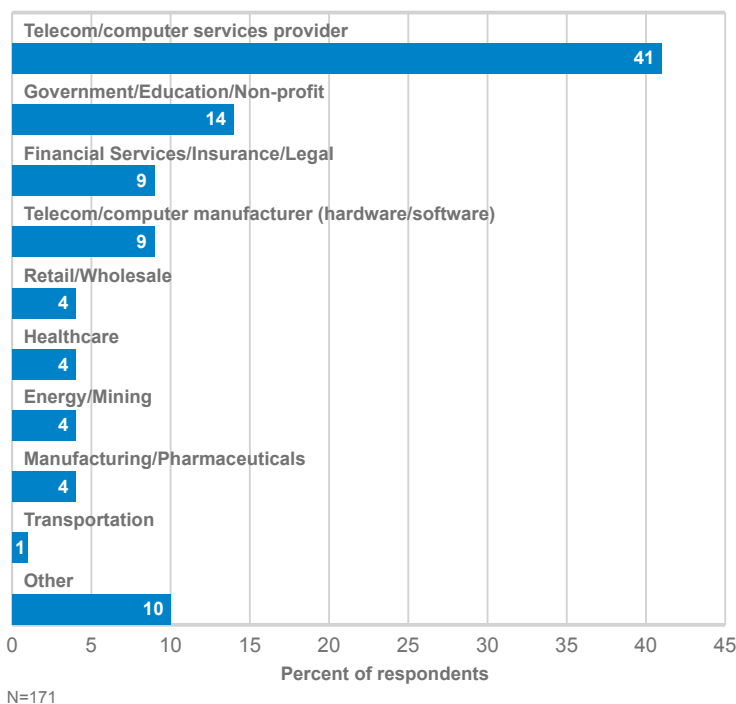
Earlier we noted the smaller average number of network elements supported and the higher percentage of respondents saying they employ less than 5 FTEs. Reflecting this concentration on the smaller end, 45% of respondents report having a data networking budget of less than $3 million (vs. 39% of respondents last year).

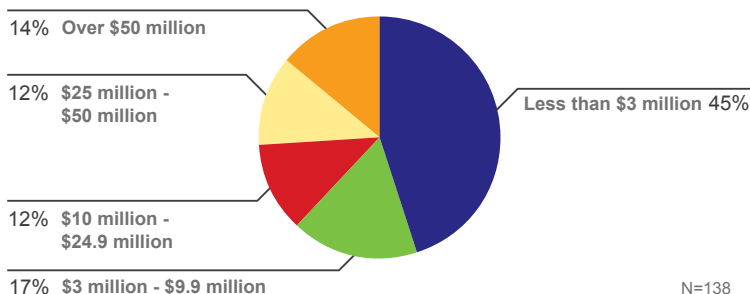*The largest end-user group represented in the survey is the combined category of government/education/ non-profit…*
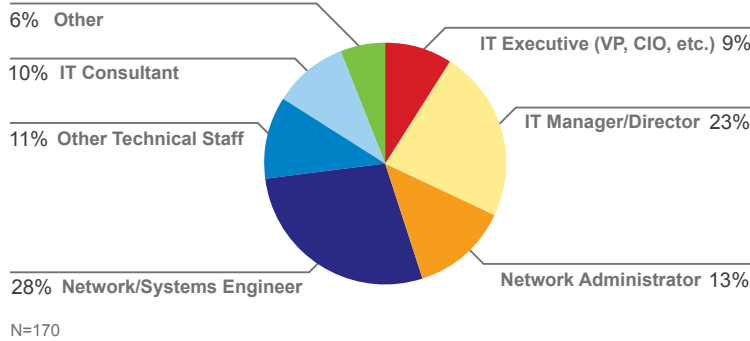
Respondents' Location

12% Asia
14% Europe
5% South or Central America
Other 2%
North America 67%

N=172

Respondents' Industry

Industry	Percent
Telecom/computer services provider	41
Government/Education/Non-profit	14
Financial Services/Insurance/Legal	9
Telecom/computer manufacturer (hardware/software)	9
Retail/Wholesale	4
Healthcare	4
Energy/Mining	4
Manufacturing/Pharmaceuticals	4
Transportation	1
Other	10

Percent of respondents

N=171

Respondents' Companies' Data Networking Budget

14% Over $50 million
12% $25 million - $50 million
12% $10 million - $24.9 million
17% $3 million - $9.9 million
Less than $3 million 45%

N=138

Respondents' Job Title / Function

6% Other
10% IT Consultant
11% Other Technical Staff
28% Network/Systems Engineer
N=170

IT Executive (VP, CIO, etc.) 9%
IT Manager/Director 23%
Network Administrator 13%

Although the largest percentage of respondents identified themselves as network/systems engineers (28%), management personnel were also represented strongly (23% manager/director, and 9% executive level, including VP and CIO titles).

Respondent Comments

► In my opinion, the term 'Network Operations Center' is outdated. I believe the term 'Service Management Center' is far more appropriate. Our job is to manage services, not simply network components. SMC is customer-centric, developing a culture and mindset that is required to deliver QoS. As telecommunications is the key enabler for business today, the customer is only interested in end-to-end service levels and not individual router availability. The SMC places a business focus on the IT.

► NMS utilized in the NOC must be capable of rapidly diagnosing and, through artificial intelligence, directing the entire recovery process to meet QoS commitments.

► The NOC is the window to the world. A well run NOC will ensure customer satisfaction and network reliability.

► Networking is the means in achieving our ends in centralizing data processing with telephone integration. Basic tools and equipment are refined enough for normal, lower performance and security-oriented processes. Only when challenged with more than networking do we find difficulties in getting proper support and tools.

► We have a fairly unique circumstance in that our operations involve highly critical, confidential, and financially volatile market information that mitigates against outsourcing, while our actual data and netcenter operations would benefit from an outsourcing solution. What we have done, essentially, is to create in-house outsourcing, in which one division of our company is an outsourcer and supplier to a single customer, who is in turn a source of market tools for a wider consumer base.

► We have identified a great need for "must-have" tools and employees, but have no budget to implement the expansion of quality improvements.

► Staffing issues are chronic and persistent, and will probably continue into the future.

► I have been a network control technician for about 18 months and think operation network service should have more up-to-date classes for technicians on network equipment to help to understand their function.

► A traditional NOC (career) with its shift hours and somewhat repetitive nature of the tasks performed suffers in comparison to more desirable, high-paying jobs.

Methodology

This survey was conducted over the World Wide Web from November 6 through December 11, 2000 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 excluded 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% due to rounding.

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