# Service Level Management

*By Rick Blum, Research Programs Manager, and Jeffrey M. Kaplan, Director, Strategic Marketing*

**Lucent NPS**
*The knowledge behind the network*

**Lucent Technologies**
Bell Labs Innovations

## Highlights

► Fifty-eight percent of respondents with service level management (SLM) capabilities in place are satisfied with those capabilities.

► Organizational and managerial issues are the top challenge to implementing or improving SLM for 72% of respondents. Only 28% identify technological issues as their top challenge.

► Improving SLM capabilities remains important for nearly all respondents (93%). Network and application availability are the most important components for measuring SLM.

► Most respondents need help in at least two of the four network lifecycle stages for implementing SLM, i.e., planning, design, implementation, and operations.

► Having competitive service level agreements (SLAs) from network service providers is important to 90% of respondents. The top objectives of these SLAs is to define required performance levels and measure quality of services provided. But the difficulty in defining and negotiating SLAs is a significant barrier to implementing or improving SLM for 56% of respondents. Another 47% of respondents identify difficulty in measuring SLAs as a significant barrier.

► The top elements that respondents will add to SLAs in the next six months are application availability and customer service metrics.

► Overall, respondents consider SLM tools to be only somewhat effective.

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## About Lucent Technologies NetworkCare Professional Services (Lucent NPS)

Lucent Technologies NetworkCare℠ Professional Services (Lucent NPS) is a global provider of network consulting and software solutions for the full lifecycle of a network, including planning and design, implementation, and operations. We maintain expertise in the most complex network technologies and multivendor environments. Through our VitalSoft division, Lucent NPS offers industry-leading software solutions for managing and optimizing application-ready networks. Lucent Technologies is headquartered in Murray Hill, New Jersey, USA. The Lucent NPS website is http://www.lucent-networkcare.com.

For information regarding Lucent NPS 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

Network managers are faced with a wide array of service choices, ranging from simple leased-line management, to managed network services, and now even to mission-critical application outsourcing. The number of choices has never been greater, and the opportunity to realize real savings and service improvements has never been better. Understanding service level management (SLM) and service level agreements (SLAs) is a vital first step in selecting a service offering and verifying its value. Service level management is critical to getting the most from networks and network services. Without a clear understanding of SLAs, network managers run the risk of paying too much and getting too little from their service providers. Without well designed and enforceable SLAs, service providers run the risk of losing important customers and missing out on the opportunity to differentiate their service offerings.

Throughout June 2000, Lucent NPS conducted a Web-based industry survey on a broad range of issues impacting service level management. This survey, which was completed by 121 network professionals, is a follow-on to two previous network SLM surveys conducted by Lucent NPS (formerly International Network Services) in April 1999 and May 1998. This current survey, combined with the results of the two previous surveys, is intended to yield valuable insight into the past, current, and future SLM strategies of network professionals. It also identifies the barriers and challenges that network professionals expect to encounter as they plan and implement SLAs. These results will assist networking organizations to assess their individual progress as compared to the industry, and identify opportunities for improvement. The complete results of all three surveys are available at www.lucentnps.com/surveys.

For the purposes of this survey, service level management was defined as the set of activities required to measure and manage the quality of information services provided by service providers and to internal organizations.

## THE BOTTOM LINE

The marked improvement in SLM satisfaction levels from 1998 to 1999 did not continue in 2000, with overall SLM capabilities and tool effectiveness ratings declining in this year's survey. At the same time, a growing emphasis on enterprise application performance across the network raises the bar for managing service levels in the year ahead. This bar will be pushed even higher as electronic commerce and other network-intensive applications continue to gobble up bandwidth.

Network professionals involved in SLM must not operate in a reactive mode. They need to implement SLM products and tools, as well as SLAs, to clearly define, measure, and monitor the performance and availability of the networks and network-based applications. This survey points toward a number of areas in which the highest dividends can be accrued.

► Guard against taking a technology-only focus. Organizational and managerial issues are major challenges to achieving superior SLM. Spend equal parts of your day understanding and proactively dealing with these issues, along with the technological demands.

► Establishing and monitoring SLAs may be the most difficult — and most important—factor in a successful SLM program. SLAs can be used to set expectations and ensure that delivery of promised service levels occurs at an acceptable cost. Though negotiating SLAs can be arduous, the effort will pay off in the long term.

► Customer (end user) satisfaction is the ultimate goal, and applications are the looking-glass through which users see the network. Focus as much as practical on those services that produce high satisfaction, such as application availability and end-to-end response time.

► SLM is complex technologically, organizationally and managerially. If you lack the experience and/or expertise on your own staff to address this full range of challenges, work with out-tasking organizations that make SLM their business. The payback will be realized quickly.
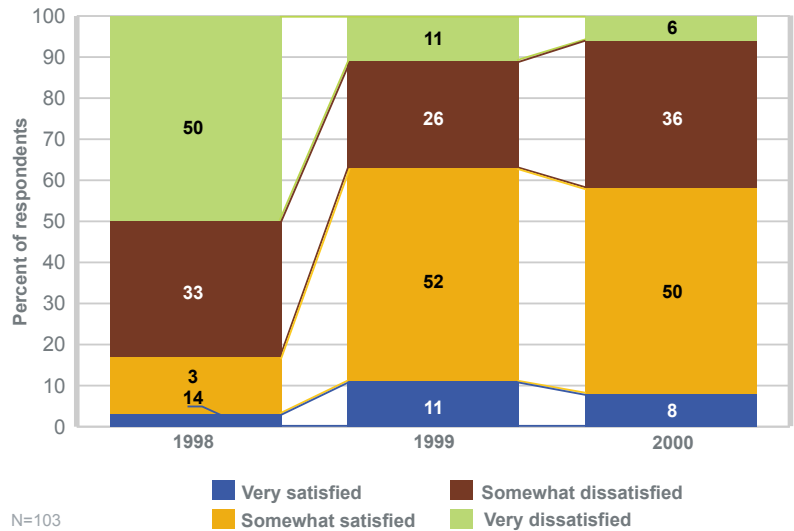
## Importance and Satisfaction with SLM

Of the 103 respondents whose organizations currently have service level management capabilities in place (18 respondents do not currently have SLM capabilities for their networks), 58% are satisfied with those capabilities. This result is similar to last year's survey, and confirms the marked improvement from 1998 when only 17% of respondents were satisfied with their organization's SLM capabilities. Still, with the increasing importance placed on overall network performance, the trend this year did not continue upward, with more than four out of ten respondents dissatisfied with their SLM capabilities. Clearly, there remains a significant amount of improvement that can be made to SLM in order to help IT professionals manage their networks.

*…there is great variability in satisfaction with both SLM product/tools and services from 1998 to 1999 to 2000.*

The slight decline this year in satisfaction with SLM capabilities is mirrored by a decline in the satisfaction with the SLM capabilities of NSM products and tools, as well as with NSM services delivered by network service providers. As with the satisfaction with SLM capabilities, there is great variability in satisfaction with both SLM product/tools and services from 1998 to 1999 to 2000. While the results were very encouraging in 1999, this year's small decline should be a cautionary flag to vendors of these products and services that satisfaction levels are currently very volatile.

### Satisfaction with Organization's SLM Capabilities



Percent of respondents

| | 1998 | 1999 | 2000 |
|---|---|---|---|
| Very dissatisfied | 50 | 11 | 6 |
| Somewhat dissatisfied | 33 | 26 | 36 |
| Somewhat satisfied | 14 | 52 | 50 |
| Very satisfied | 3 / (14) | 11 | 8 |

■ Very satisfied  ■ Somewhat dissatisfied
■ Somewhat satisfied  ■ Very dissatisfied

N=103

### Satisfaction with SLM Capabilities of NSM Products/Tools and Services



| | Products/tools | Services |
|---|---|---|
| 1998 | 1.9 | 1.8 |
| 1999 | 3.3 | 3.3 |
| 2000 | 2.7 | 2.6 |

■ 1998  ■ 1999  ■ 2000

N=112

## Effectiveness of SLM Tools

**Fault notification/event handling**
- 2.8
- 3.3
- 3.0

**Network management platform**
**NA**
- 3.3
- 3.0

**Application management**
- 2.6
- 3.0
- 3.0

**Network performance management**
- 2.6
- 3.3
- 2.9

**Trouble ticketing/help desk**
- 2.9
- 3.0
- 2.9

**Event correlation and aggregation**
- 2.6
- 2.9
- 2.8

| 1.0 | 1.5 | 2.0 | 2.5 | 3.0 | 3.5 | 4.0 |
|-----|-----|-----|-----|-----|-----|-----|
| Not at all effective | | Not so effective | | Somewhat effective | | Very effective |

N=112    ■ 1998    ■ 1999    ■ 2000

## Importance of Improving Organization's SLM Capabilities

Percent of respondents

| | 1998 | 1999 | 2000 |
|---|---|---|---|
| Not at all important | | | 3 |
| Not so important | 9 | 6 | 4 |
| Somewhat important | 24 | 28 | 32 |
| Very important | 67 | 66 | 62 |

N=59    ■ Very important    ■ Not so important
■ Somewhat important    ■ Not at all important

This year's rating of the effectiveness of SLM tools is generally consistent across the board, from fault notification and handling to event correlation and aggregation, with the average rating falling in the "somewhat e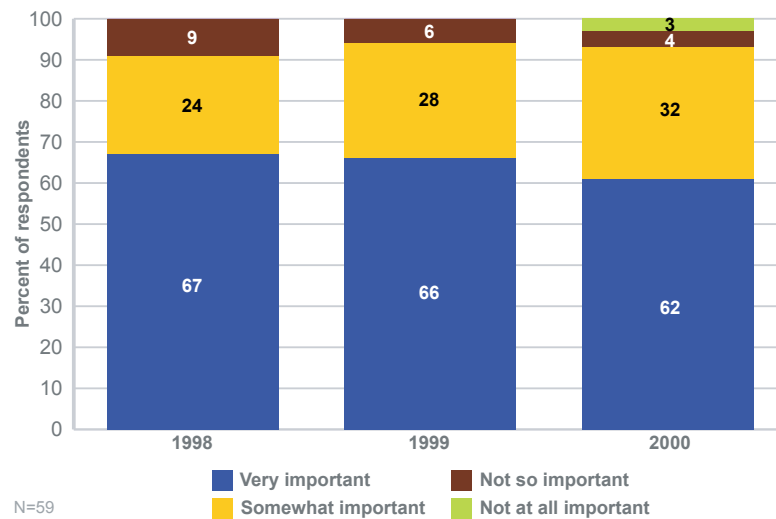ffective" range. However, these ratings, like those for satisfaction, are consistently lower than in 1999. Again, this should be taken as a cautionary flag for vendors of these tools.

The need for better SLM is borne out by the overwhelming sentiment (by 94% of respondents) that improvement to their SLM capabilities is very or some-what important. This nearly unanimous opinion has not changed significantly for the last three years, and reflects the continued emphasis on network per formance driven by ever-increasing connectivity requirements to enable e-commerce and other new computing applications. And the end is not in sight, as these new applications will continue to push enterprise and service provider networks to the limit for the foreseeable future.

When viewed on a component level, network availability and application availability are the two most important measures for service level management. This outcome reflects an increase in the relative importance of application availability, which was only the fourth most important component on last year's survey. This change in emphasis is consistent with a finding in the most recent "Enterprise Performance Management" survey, published in November 1999, which found that the top concern of network professionals has shifted from a dominantly network performance concern to an equal concern for enterprise application and network performance.

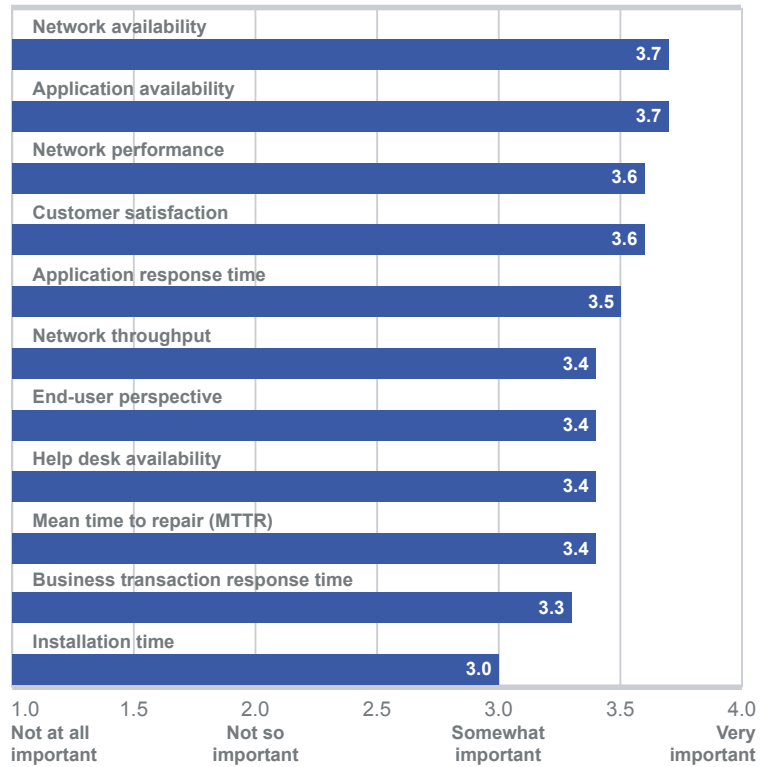Very close in importance to network availability and application availability are network performance and customer satisfaction. These were also rated among the top four components in importance in last year's survey.

Application response time, which was sixth in importance last year, has move up to the fifth slot this year, above network throughput. Again, the importance of application performance on the network, which has a more visible impact on the end user, is taking more

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*…network availability and application availability are the two most important measures for SLM.*

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### Importance of Components for Measuring SLM

| Component | Rating |
|---|---|
| Network availability | 3.7 |
| Application availability | 3.7 |
| Network performance | 3.6 |
| Customer satisfaction | 3.6 |
| Application response time | 3.5 |
| Network throughput | 3.4 |
| End-user perspective | 3.4 |
| Help desk availability | 3.4 |
| Mean time to repair (MTTR) | 3.4 |
| Business transaction response time | 3.3 |
| Installation time | 3.0 |

Scale: 1.0 Not at all important — 2.0 Not so important — 3.0 Somewhat important — 4.0 Very important
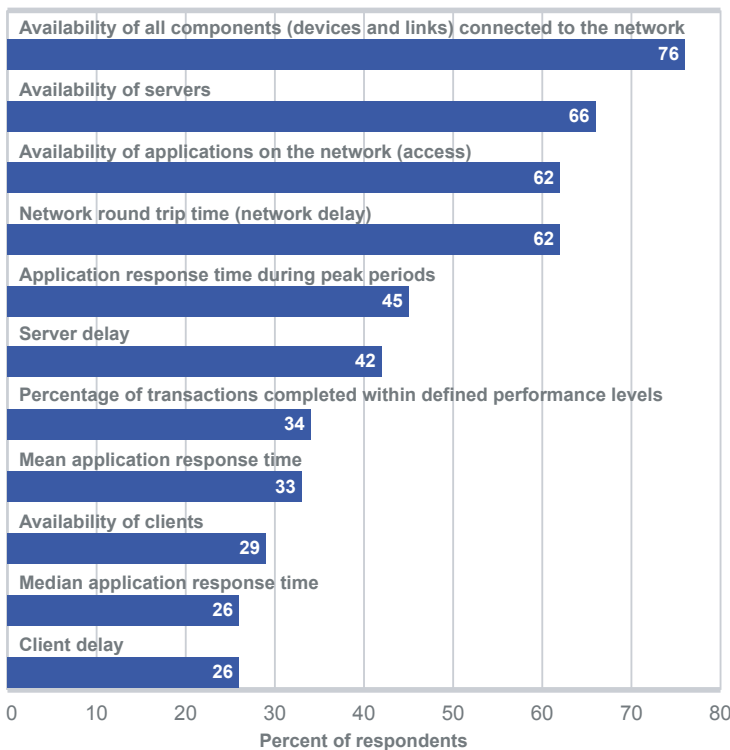
N=121

prominence in service level manage-ment. A new component to this year's survey is business transaction response time, which is the ability to track spe-cific transactions within an application. Although near the bottom of the impor-tance hierarchy, business transaction response time is still considered an important component for measuring SLM by 83% of respondents, reinforcing the increasing focus on application per-formance, not just network performance.

Although the pendulum is swinging to application performance, the most prevalent metrics used to define and measure network availability and perfor-mance focus on components (devices and links) connected to the network and the availability of servers connected to the network. However, 62% of respondents track the availability of applications on the network and 45% track application response time during peak periods as measures of network availability and performance.

Interestingly, network round trip delay time (also called "network delay") is the only metric that showed a signifi-cant increase from last year's survey, up from 46% of respondents last year to 62% of respondents this year.

**Metrics Used to Define and Measure Network Availability/ Performance**

Availability of all components (devices and links) connected to the network
**76**

Availability of servers
**66**

Availability of applications on the network (access)
**62**

Network round trip time (network delay)
**62**

Application response time during peak periods
**45**

Server delay
**42**

Percentage of transactions completed within defined performance levels
**34**

Mean application response time
**33**

Availability of clients
**29**

Median application response time
**26**

Client delay
**26**

0    10    20    30    40    50    60    70    80
**Percent of respondents**

N=113

*…business transaction response time is considered an important component for measuring SLM…*

## The Role of SLAs in SLM

Service level agreements have gained a prominent role in the SLM process, both for delivering network services to internal organizations and acquiring them from external service providers. SLAs enable network managers to set expectations levels, as well as define remedial steps that should be taken when those expectations are not met.

When selecting a network service provider, the ability of the provider to deliver competitive SLAs is very important to 45% of respondents, and somewhat important to another 45% of respondents. Taken together, this importance rating is a small increase (5%) as compared to the 1999 survey.

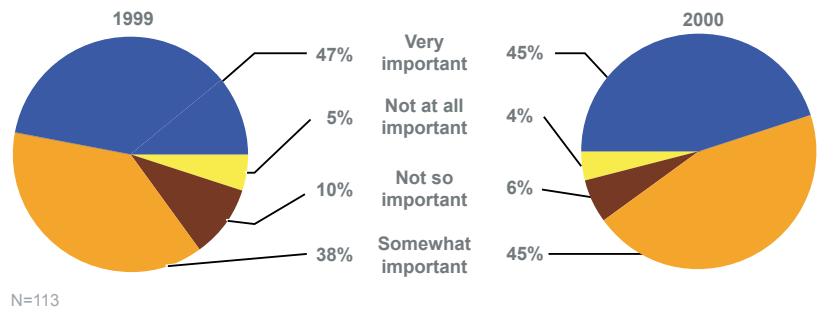*The average number of implemented SLAs in this year's survey is 2.2…*

Fifty-six percent of respondents in the survey have SLAs currently in place, up from 49% in last year's survey. Those respondents with SLAs in place typically have from 1 to 5, although a few respondents can number their SLAs in the double digits. The average num-ber of implemented SLAs in this year's survey is 2.2, down significantly from last year when the typical respondent had 3.0 in place.

More than half of respondents are planning to implement new or additional SLAs in the coming six months.

### Importance of Competitive SLAs in Network Service Provider Selection Process

1999          2000

| | |
|---|---|
| 47% | Very important | 45% |
| 5% | Not at all important | 4% |
| 10% | Not so important | 6% |
| 38% | Somewhat important | 45% |

N=113

### Number of SLAs Currently in Place

4%  **11 or more**

6%  **6-10**

17%  **3-5**

0  44%

1  13%

2  16%

N=108                    **Mean = 2.2**
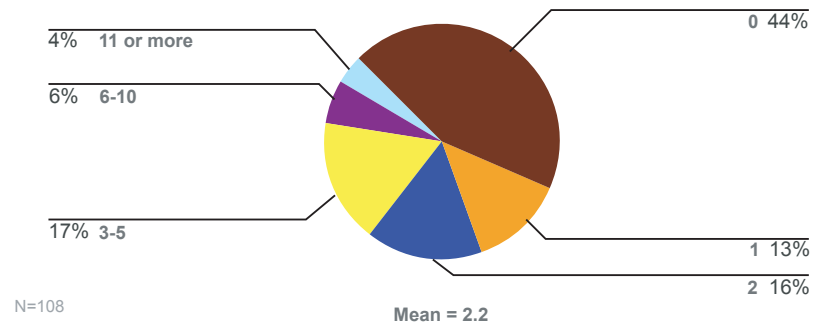
Approximately one-quarter of respondents who do not currently have SLAs in place plan to implement at least one in the next six months. Again, the average number of SLAs being planned by this survey group is only 2.9, down from la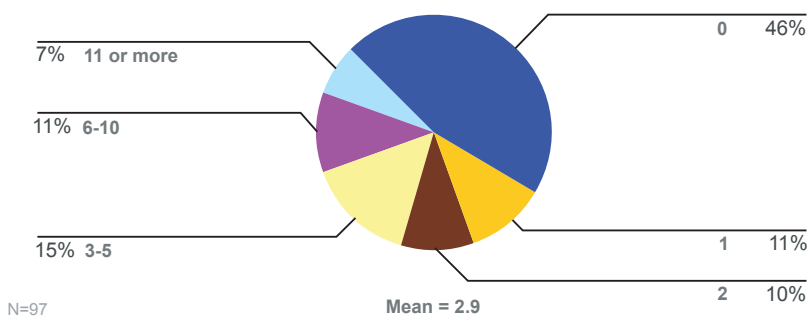st years' survey group, which was planning to implement an average of 4.5. This decline may be a reflection of the difficulties that a majority of respondents are having in defining and negotiating SLAs.

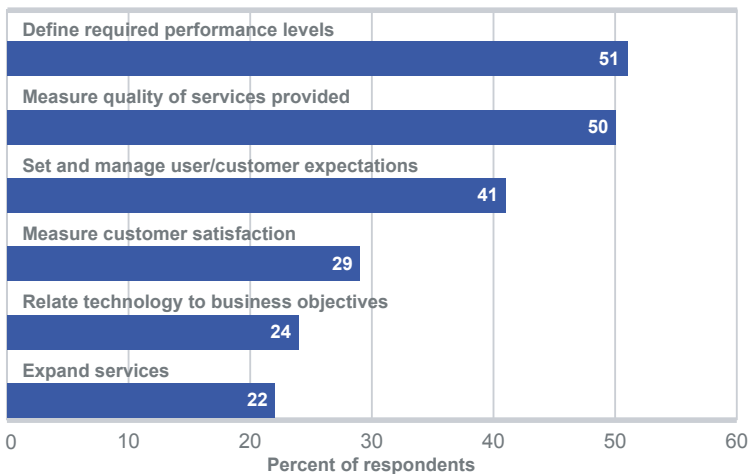We asked respondents to select the top three objectives (out of eleven choices) they have for developing SLAs with both external service providers and internal organizations. Defining required performance levels is most frequently mentioned as a top-three objective with both external service providers (51%) and internal organizations (42%). Yet, it is also the most frequent barrier (along with negotiating) in implementing SLAs, which puts many network professionals in a tight squeeze when it comes to meeting this objective.

For SLAs with external service providers, respondents selection of the top three objectives coalesces around just two other objectives. The second and third most frequent objectives are to measure the quality of services provided to the organization, followed by setting and managing user expectations. Overall, the top three objective for external service providers account for nearly half of the selections among the eleven possible objectives listed on the survey, indicating their significantly higher ranking in importance.

### Number of SLAs Planned to be Implemented in Next Six Months



7%  **11 or more**

11%  **6-10**

15%  **3-5**

N=97

0    46%

1    11%

2    10%

Mean = 2.9

### Top Objectives for Developing SLAs with External Service Providers



Define required performance levels — 51
Measure quality of services provided — 50
Set and manage user/customer expectations — 41
Measure customer satisfaction — 29
Relate technology to business objectives — 24
Expand services — 22
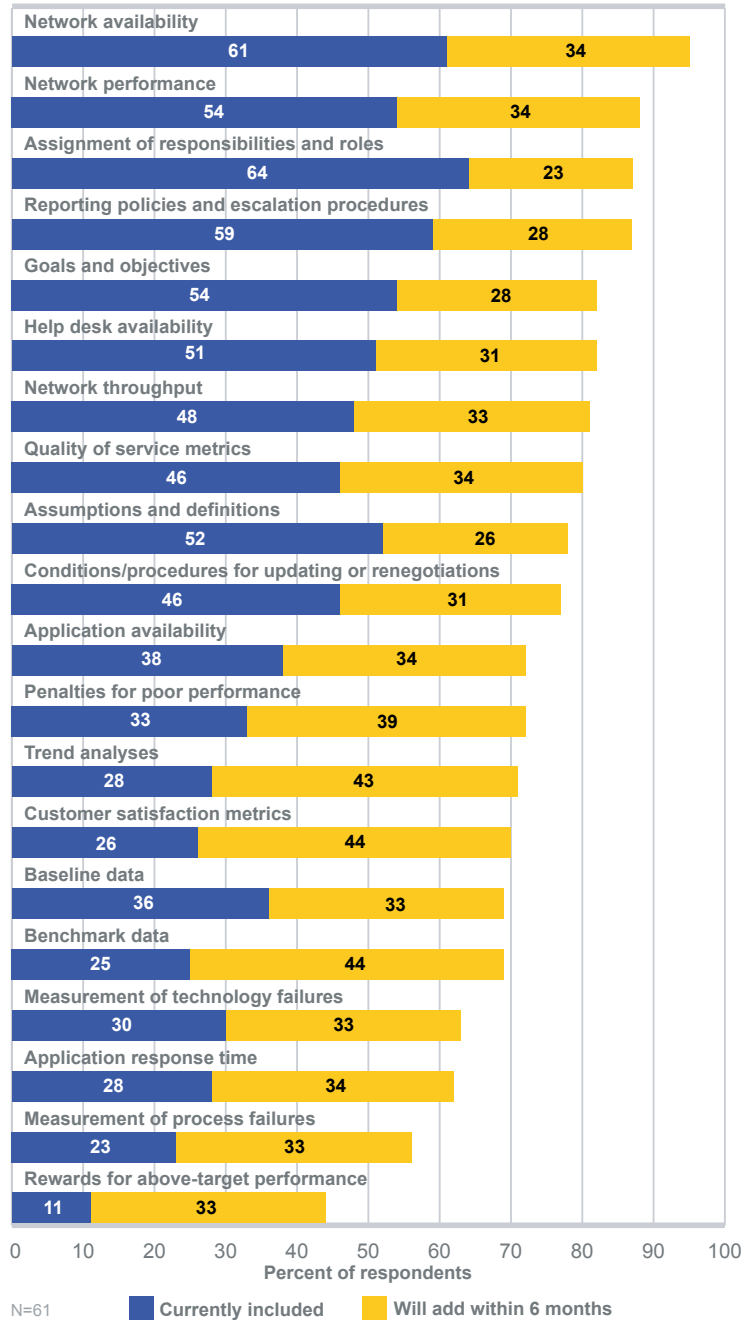
Percent of respondents

N=90

The objectives of developing SLAs with external service providers are typically translated into specific elements that are included in those SLAs. Assignment of roles and responsibilities is most frequently included today, with network availability and reporting of policies and escalation procedures not far behind. Very few respondents (11%) currently include rewards for above-target performance in their SLAs, although one-third are planning to add this element in the next six months.

In the 1999 survey, only 20% of respondents were planning to add application availability to SLAs, and 22% were planning to add application response time. This year, those percentages have increased to 34% for both elements, again confirming the change in emphasis from a primarily network performance perspective to a balanced network and application performance perspective.

*Very few respondents (11%) currently include rewards for above-target performance in their SLAs*

### Elements Included in SLAs with External Service Providers



Network availability — 61, 34
Network performance — 54, 34
Assignment of responsibilities and roles — 64, 23
Reporting policies and escalation procedures — 59, 28
Goals and objectives — 54, 28
Help desk availability — 51, 31
Network throughput — 48, 33
Quality of service metrics — 46, 34
Assumptions and definitions — 52, 26
Conditions/procedures for updating or renegotiations — 46, 31
Application availability — 38, 34
Penalties for poor performance — 33, 39
Trend analyses — 28, 43
Customer satisfaction metrics — 26, 44
Baseline data — 36, 33
Benchmark data — 25, 44
Measurement of technology failures — 30, 33
Application response time — 28, 34
Measurement of process failures — 23, 33
Rewards for above-target performance — 11, 33

Percent of respondents

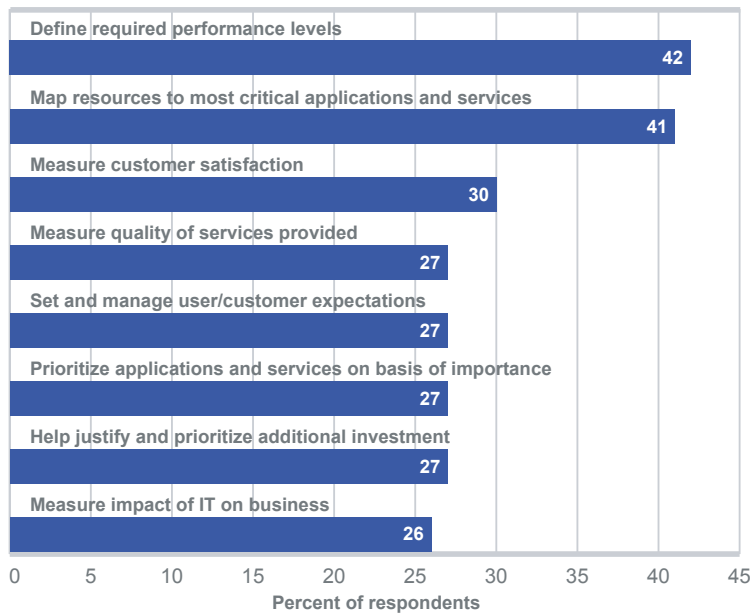N=61   ■ Currently included   ■ Will add within 6 months

For SLAs with internal organizations, defining required performance levels and mapping resources to most critical applications and services are each top-three objectives for at least 40% of respondents. After these two, top objectives are fairly evenly distributed among the other options. These results are similar to last years' survey, with the exception of measuring the quality of service provided, which was a top-three objective for only 35% of respondents in 1999.

The elements included in SLAs with internal organizations have a greater emphasis on applications than on those with external service providers. Network availability is still the most frequently included element in these SLAs (54% today, and 84% within six months), but nearly as many respondents (81%) expect to include application availability as an element in their internal organization SLAs within six months. The inclusion of application response time will see a similar increase in the coming

six months, putting it among the top eight elements.

Penalties for poor performance and rewards for above-target performance are not widely implemented today in internal organization SLAs. As might be expected, penalties for poor performance are much more likely to be found in SLAs with external service providers (33% external vs. 21% internal), while rewards for above-target performance are more likely to be found in SLAs with internal organizations (18% internal vs. 11% external). Both elements, however, will become much more widely used in the coming six months according to survey respondents.

*…penalties for poor performance are much more likely to be found in SLAs with external service providers…*

**Top Objectives for Developing SLAs with Internal Organizations**



Define required performance levels — 42
Map resources to most critical applications and services — 41
Measure customer satisfaction — 30
Measure quality of services provided — 27
Set and manage user/customer expectations — 27
Prioritize applications and services on basis of importance — 27
Help justify and prioritize additional investment — 27
Measure impact of IT on business — 26
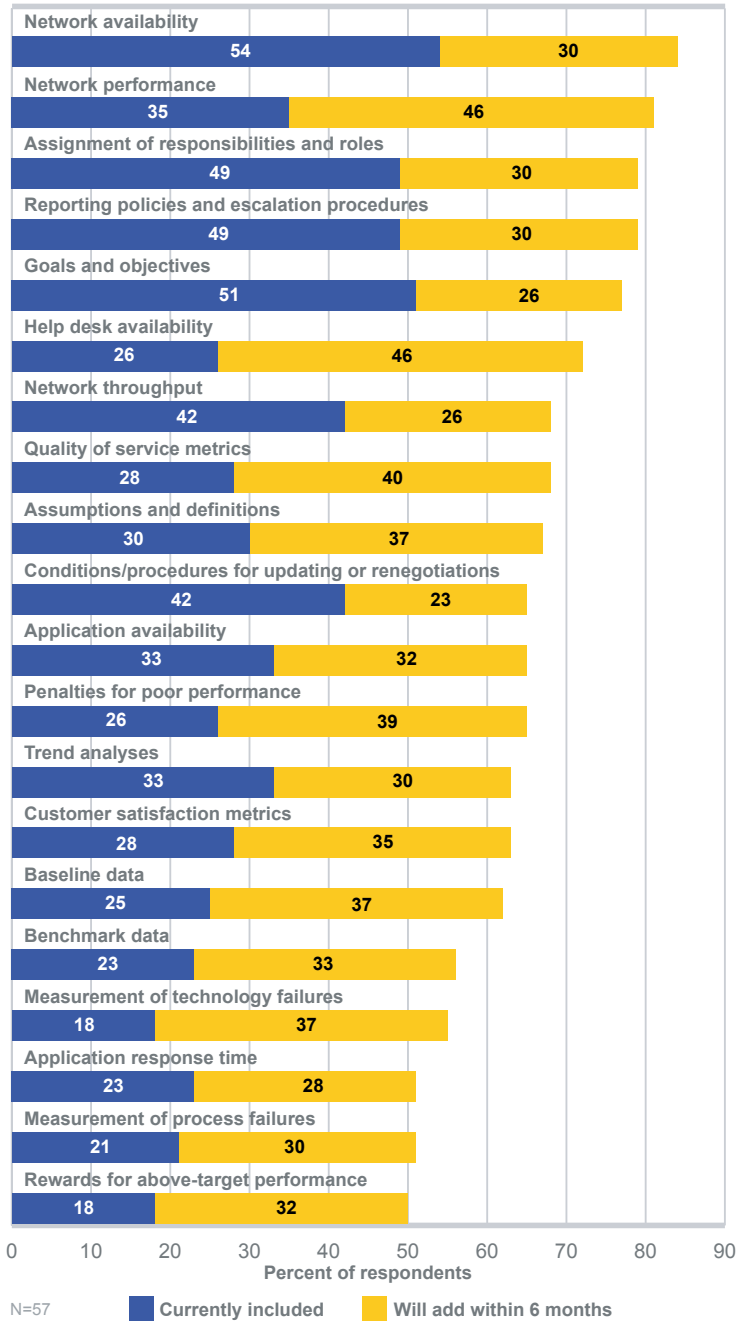
Percent of respondents

N=91

The top elements that the greatest percentage of respondents plan to add within the next six months to their SLAs fall into three categories: customer satisfaction, applications, and analytical data.

Under customer satisfaction, 46% and 44% of respondents plan to add customer satisfaction metrics to their SLAs with internal organizations and external service providers, respectively.
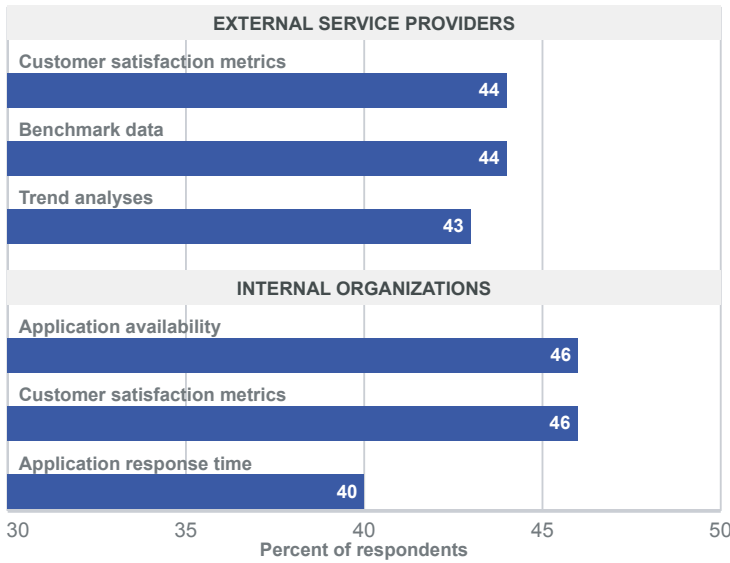
Under applications, 46% of respondents will add application availability to SLAs with internal organizations, while 40% of respondents will add application response time to these same SLAs. Clearly, these two elements are related to the customer satisfaction elements, as application availability and response time having a big impact on overall customer satisfaction.

*The top elements that the greatest percentage of respondents plan to add within the next six months to their SLAs fall into three categories: customer satisfaction, applications, and analytical data.*

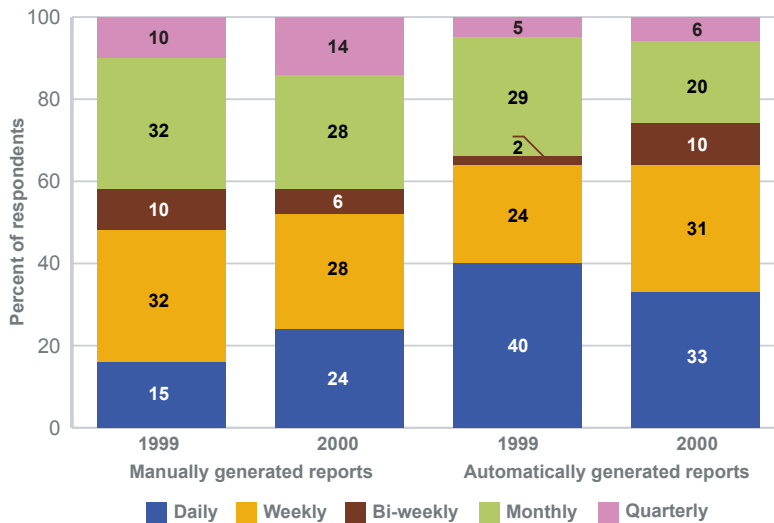## Elements Included in SLAs with Internal Organizations

| Element | Currently included | Will add within 6 months |
|---|---|---|
| Network availability | 54 | 30 |
| Network performance | 35 | 46 |
| Assignment of responsibilities and roles | 49 | 30 |
| Reporting policies and escalation procedures | 49 | 30 |
| Goals and objectives | 51 | 26 |
| Help desk availability | 26 | 46 |
| Network throughput | 42 | 26 |
| Quality of service metrics | 28 | 40 |
| Assumptions and definitions | 30 | 37 |
| Conditions/procedures for updating or renegotiations | 42 | 23 |
| Application availability | 33 | 32 |
| Penalties for poor performance | 26 | 39 |
| Trend analyses | 33 | 30 |
| Customer satisfaction metrics | 28 | 35 |
| Baseline data | 25 | 37 |
| Benchmark data | 23 | 33 |
| Measurement of technology failures | 18 | 37 |
| Application response time | 23 | 28 |
| Measurement of process failures | 21 | 30 |
| Rewards for above-target performance | 18 | 32 |

Percent of respondents

N=57

■ Currently included  ■ Will add within 6 months

## Top Elements to be Added to SLAs within Six Months

### EXTERNAL SERVICE PROVIDERS

**Customer satisfaction metrics**
44

**Benchmark data**
44

**Trend analyses**
43

### INTERNAL ORGANIZATIONS

**Application availability**
46

**Customer satisfaction metrics**
46

**Application response time**
40

Percent of respondents

*(x-axis: 30, 35, 40, 45, 50)*

## Frequency of Status/Activity Reports Generated as Part of SLAs

Percent of respondents

**Manually generated reports**

1999: Daily 15, Weekly 32, Bi-weekly 10, Monthly 32, Quarterly 10
2000: Daily 24, Weekly 28, Bi-weekly 6, Monthly 28, Quarterly 14

**Automatically generated reports**

1999: Daily 40, Weekly 24, Bi-weekly 2, Monthly 29, Quarterly 5
2000: Daily 33, Weekly 31, Bi-weekly 10, Monthly 20, Quarterly 6

Legend: ■ Daily  ■ Weekly  ■ Bi-weekly  ■ Monthly  ■ Quarterly

N=59

The third category, analytical data, includes benchmark data and trend analyses. Respondents plan to add these elements to external service provider SLAs at about the same rate, i.e., 44% and 43%, respectively. We are seeing a definite trend toward better measurement of network and application performance in order to understand trends that will enable proactive steps for managing service levels instead of just reactive steps.

To track the various elements of an SLA, status and activity reports must be generated either manually or automatically. As might be expected, automatically generated reports are generated on a daily basis far more often than manually generated reports. However, this year's survey recorded a significant increase in the percentage of daily, manually generated reports (from 15% to 24%) and a decrease in daily, automatically generated reports (from 40% to 33%). The overall trend, on the other hand, is toward far more frequent reporting, whether generated manually or automatically.

## Implementing and Improving SLM

As we saw previously, 94% of respondents believe that improving their organization's SLM capabilities is very or somewhat important. But improving those capabilities can be difficult, especially in today's environment where networks carry more and more critical applications, while users come to expect high levels of network reliability and consistent performance. In this climate, it is not technological, but rather organizational challenges that vex network professionals in their quest for better SLM (although not nearly as much as in last year's survey). Organizational challenges include developing processes, procedures, and policies that enable an organization to provide quality service level management on a consistent basis.

Managerial issues are the most difficult challenge for nearly one-third of respondents—about the same percentage as in 1999. When these hurdles are all considered, it is clear that network managers need to have multiple skills to achieve their SLM goals.

SLAs are the leading source of frustration when trying to implement or improve service level management. For 56% of respondents, difficulty in defining and negotiating SLAs is considered a significant barrier, up from 45% in 1999. For nearly as many respondents (47%), difficulty in measuring SLAs is a significant barrier this year. Given that 90% of respondents consider SLAs important in the selection process for network service providers, it is clear that SLAs are a critical piece of the SLM process, but one that is not being met effectively at this time.

The third most frequent barrier to implementing or improving SLM is simply organizational and process issues, listed by 46% of respondents. This supports the finding that the top challenge for network professionals is organizational issues. On a more positive note, however, in 1999, 60%

**Area that is Biggest Challenge to Implementing and/or Improving SLM**



1999

34% Managerial

15% Technological

51% Organizational

N=112

2000

32%

28%

40%
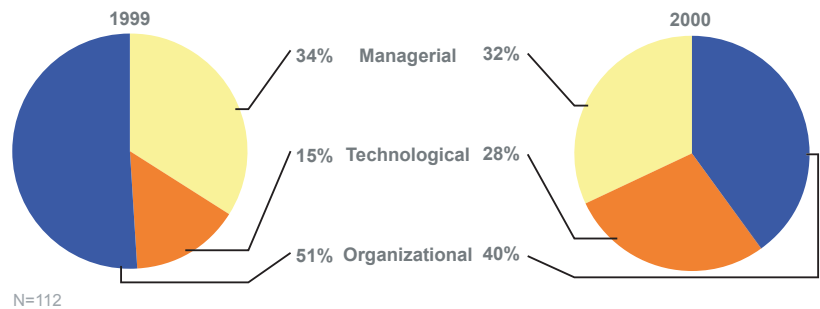
of respondents identified organizational and process issues as a significant barrier, so the trend is downward.
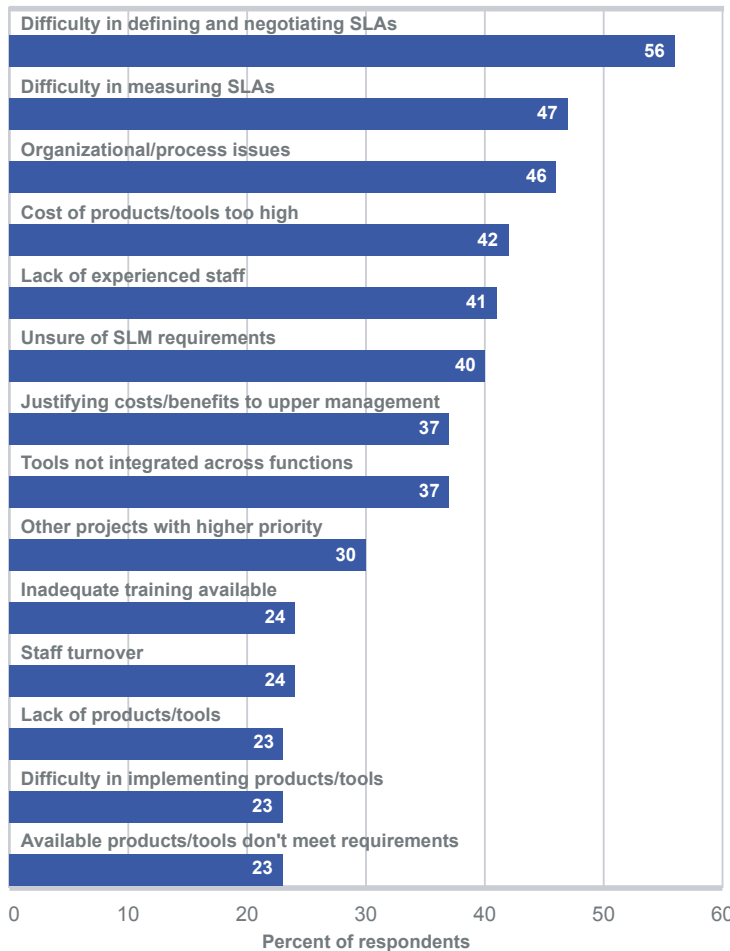
Most characteristics of SLM products and tools currently available are generally not considered significant barriers by most respondents with the exception of the cost of those products and tools, which is a barrier for 42% of respondents. However, most tools, as was reported previously, are rated somewhat effective. Consequently, less than one-quarter of respondents see either the lack of, the difficulty in implementing, or availability of these SLM products and tools as a significant barrier.

Lack of experienced staff is an issue that runs across the entire networking industry. As related specifically to implementing or improving SLM, 41% of respondents believe that this issue is a significant barrier, and points to a need for supplemental help from outsourcing and out-tasking vendors. This problem has not improved over the last year, when 42% of respondents cited lack of experienced staff as a significant barrier.

*Lack of experienced staff is an issue that runs across the entire networking industry.*

**Significant Barriers to Implementing or Improving SLM**

| Barrier | Percent |
|---|---|
| Difficulty in defining and negotiating SLAs | 56 |
| Difficulty in measuring SLAs | 47 |
| Organizational/process issues | 46 |
| Cost of products/tools too high | 42 |
| Lack of experienced staff | 41 |
| Unsure of SLM requirements | 40 |
| Justifying costs/benefits to upper management | 37 |
| Tools not integrated across functions | 37 |
| Other projects with higher priority | 30 |
| Inadequate training available | 24 |
| Staff turnover | 24 |
| Lack of products/tools | 23 |
| Difficulty in implementing products/tools | 23 |
| Available products/tools don't meet requirements | 23 |

Percent of respondents

N=115

On the good news side, overall, respondents listed fewer barriers (4.9) on average this year than on last year's survey (5.4). Showing the most improvement is the lack of products and tools for SLM, which declined by 17% of respondents, and other projects with higher priority, which declined by 16% of respondents. Organizational and process issues also showed marked improvement, although is still ranks among the three most frequent barriers to implementing or improving SLM.

The most frequent barrier in this year's survey, difficulty in defining and negotiating SLAs, went in the opposite direction, increasing from a barrier for 45% of respondents in 1999 to a barrier for 56% of respondents this year. Difficult in measuring SLAs, however, was a barrier for the same percentage of respondents in both 1999 and 2000.

With numerous and varied challenges and barriers, nearly all respondents indicate their need for assistance in at least one stage of the network lifecycle, and most indicate need for help in two or more.

Although the need for help in the planning and design stages decreased slightly this year, it increased slightly in the implementation and operations stages, and show a continuing strong need across the entire lifecycle.

## Change in Significant Barriers, 1999 to 2000



Change from 1999 to 2000 (absolute percentage increase/decrease)
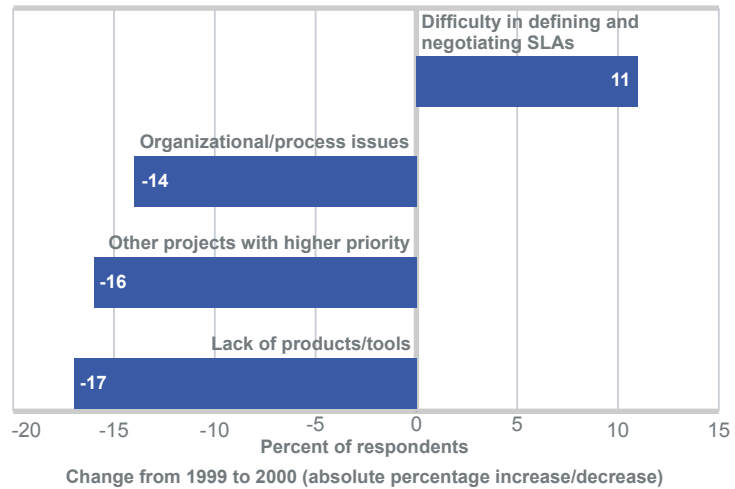
## Areas in Which Help is Needed to Implement or Improve SLM
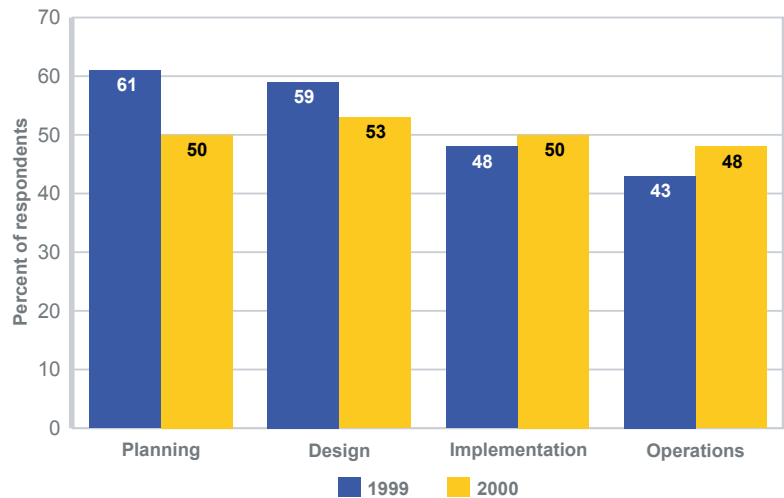
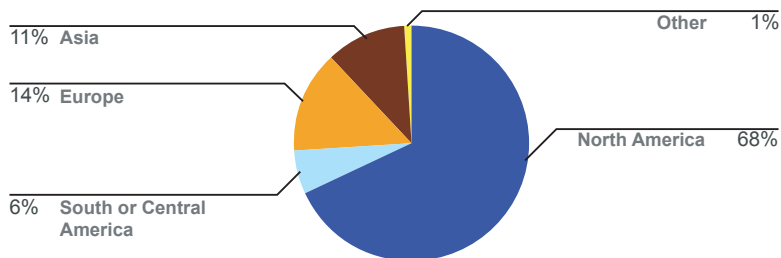

N=103

# Respondent Demographics

Survey respondents are primarily from North America (68%), with Europe (14%), Asia (11%), and South and Central America (6%) also represented.

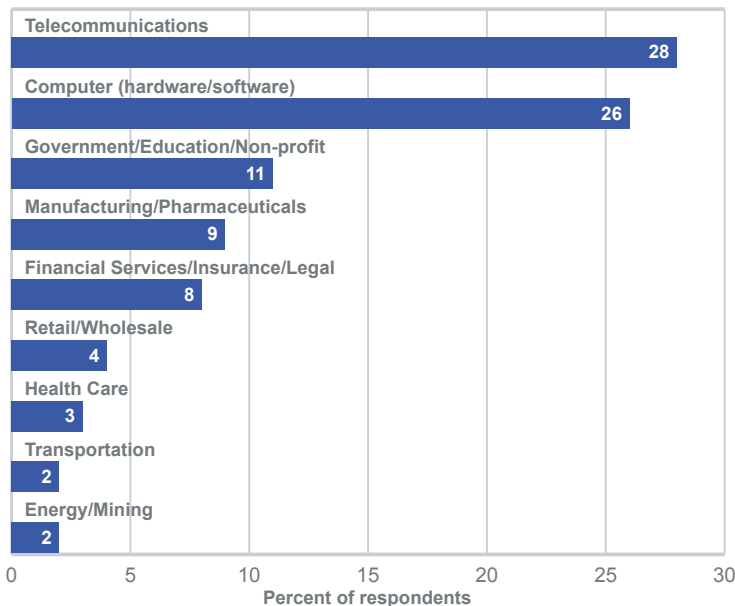Survey respondents represent a cross-section of industries led by telecommunications and computer hardware and software vendors, which each represent slightly more than one-quarter of respondents. Other industries well represented include, government/education/non-profit (11%), manufacturing/pharmaceuticals (9%), and financial services/insurance/legal (8%).
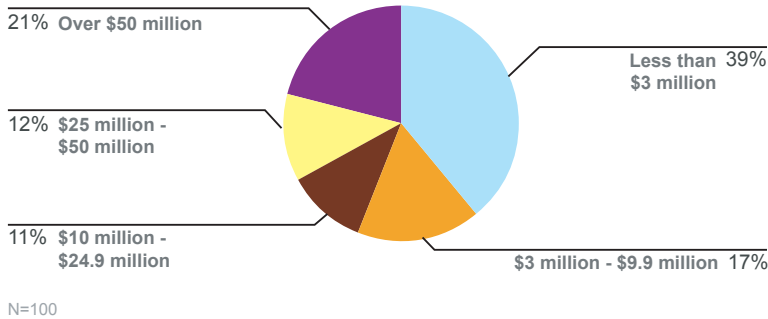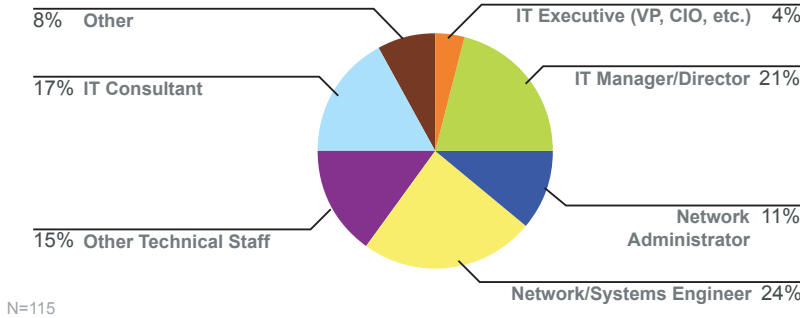
## Respondents' Location

11%  **Asia**

14%  **Europe**

6%  **South or Central America**

**Other**  1%

**North America**  68%

N=117

## Respondents' Industry

**Telecommunications** — 28

**Computer (hardware/software)** — 26

**Government/Education/Non-profit** — 11

**Manufacturing/Pharmaceuticals** — 9

**Financial Services/Insurance/Legal** — 8

**Retail/Wholesale** — 4

**Health Care** — 3

**Transportation** — 2

**Energy/Mining** — 2

0    5    10    15    20    25    30

**Percent of respondents**

N=116

## Respondents' Organizations' Data Networking Budget

21% **Over $50 million**

12% **$25 million - $50 million**

11% **$10 million - $24.9 million**

**Less than** 39% **$3 million**

**$3 million - $9.9 million** 17%

N=100

The size of the respondents' company's data networking budget ranges from less than $3 million to more than $50 million.

Respondent job functions are led by network/systems engineers (24%), followed by IT manager/directors (21%), IT consultants (17%), other technical staff (15%), and network administrators (11%).

## Respondents' Job Title/Function

8% **Other**

17% **IT Consultant**

15% **Other Technical Staff**

**IT Executive (VP, CIO, etc.)** 4%

**IT Manager/Director** 21%

**Network** 11% **Administrator**

**Network/Systems Engineer** 24%

N=115

## Respondent Comments

► *SLAs have to be tailored to individual business lines, and most tools attempt to be one size and solution fits all.*

► *I think that most of our customers and even consultants are not accustomed to SLM or SLAs. We need an easy guide to…implement SLM.*

► *Of course we are lacking SLM or any kind of SLA because we never face regulations about protecting customers, but we need*

*to improve those ASAP because of the liberalisation and change of regulation that push us to increase the level of SLA.*

► *The (SLM) industry is new, and lacks experienced management.*

## About Lucent NPS Network Industry Surveys

Lucent Technologies NPS 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:

- ► Network Security
- ► Convergence and New World Services Providers
- ► E-Business Network Architecture/Infrastructure
- ► Network Professionals Job Satisfaction
- ► Network and Systems Management Total Cost of Ownership
- ► Networking in the 21st Century
- ► Virtual Private Networks
- ► Network Operations Centers
- ► Enterprise Performance Management
- ► Enterprise Operating Systems and Directory Services
- ► Management Intranets
- ► Network Prospects for the New Millennium
- ► Performance Management
- ► Web/Java-based Management
- ► Remote Access Services

To see the results of these surveys or participate in the latest Lucent NPS network industry survey, see our website at:

**http://www.lucent-networkcare.com/surveys**

*If you would like to learn how Lucent NPS 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 in conjunction with a number of network-oriented organizations. Lucent NPS would like to thank those organizations for their cooperation and support of this research project.

The survey was conducted from June 1 – July 3, 2000 at:

www.lucent-networkcare.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% due to rounding.

For additional information, please
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