

Lucent Technologies
Bell Labs Innovations

Network Convergence

Highlights

- The importance of voice over alternative technologies (VoAT) to respondents' IT strategies has declined in the last year, but will increase steadily in importance over the next two years.
- This year, the primary benefit expected from network convergence is to reduce administrative costs. Last year, the top benefit was to increase network capabilities for new applications.
- Getting IT and telecom departments to work together is the biggest hurdle of network convergence for 34 percent of respondents. Resolving process issues is the top challenge.
- The top three barriers to implementing a converged network solution are: unreliability, poor voice quality, and unproven technologies.
- The percentage of voice traffic transported over alternative technologies will increase steadily over the next year, with the most rapid growth coming from international calls.
- IP is growing more popular as an alternative technology for voice services, while frame relay and ATM are decreasing in popularity.
- Network reliability and voice quality are the most important criteria respondents look for in a VoAT solution. Technical and support capabilities are tops when selecting a VoAT service provider.

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About Lucent Technologies Worldwide Services

Lucent Worldwide Services provides a full life cycle of services and solutions that help our customers plan, design, implement, and operate networks in today's rapidly changing and complex environment. We have a proven track record with the broadest cross-section of service provider and enterprise customers, evidenced by an extensive portfolio of more than 15,000 engagements worldwide. Our commitment to our customers' success includes a commitment to planning, designing, building, and operating successful networks. We operate 150 customer networks from our world-class Knowledge Centers around the world.

Lucent Technologies is headquartered in Murray Hill, New Jersey, USA. Visit the Lucent Services Web site at http://www.lucent.com/businessunit/worldwide.html

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. Survey report topics include:

- ASP Network Infrastructure
- E-Business Network Architecture/Infrastructure
- Enterprise Operating Systems and Directory Services
- Management Intranets
- Network and Systems Management Total Cost of Ownership
- Network Challenges and Opportunities in Uncertain Times
- Network Convergence
- Network Operations Centers
- Network Professionals Job Satisfaction
- Network Quality of Service
- Network Security
- Performance Management and Engineering
- Remote and Mobile Network Access
- Remote Network Management
- Service Level Management
- Virtual Private Networks

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

http://www.lucent.com/businessunit/worldwide.html.

For more information regarding this survey, please contact:

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Introduction

The merging of telephony and data networks into a single multiservice network holds the promise of many benefits, such as lower costs and new networking capabilities. This "converged network" topology, employing technologies such as IP, frame relay, and ATM, brings along with it many technological and organizational challenges, which are slowing the pace of adoption considerably in those enterprises focused on network ROI. Still, the world is becoming more IP-centric, and convergence looms large on the horizon.

From July 12, 2001 through August 31, 2001, Lucent Technologies Worldwide Services conducted a Web-based survey on network convergence, which was completed by 109 network professionals around the globe. The results of this survey yield valuable insights into the past, current, and future network convergence strategies of today's enterprises and service providers. Moreover, these results identify the significant barriers and challenges network professionals face as they plan, design, and implement converged networks 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 Lucent industry surveys are available at **www.lucent.com/knowledge/resourcelib**.

For the purposes of this survey, network convergence was defined as the merging of telephony and data networks into a single multiservice network employing digital technologies such as IP, frame relay, ATM, and xDSL. Delivery of voice and video services using any of these digital technologies is referred to in this survey as voice/video over alternative technologies (VoAT).

The Bottom Line

Although the cost and technological immaturity of network convergence is slowing its adoption, smart network designers will consider their current network development efforts with a converged network future in mind in order to be prepared for the next wave of emerging applications. This means understanding which business needs will drive the market, what technologies are mostly likely to be implemented, and which processes must be put in place to make a smooth transition.

Based on the results of this survey, when considering the opportunities for network convergence, network managers should:

- Determine which convergence applications will provide the most favorable cost/benefit ratio to the business by increasing revenue opportunities, as well as consider cost reduction opportunities from network consolidation and/or voice call, toll charge bypass.
- Begin by planning your current network so that it can integrate seamlessly with future convergence technologies, which requires constant evaluation of likely technologies and standards that will succeed in meeting market demands.
- Explore outsourcing convergence applications to service providers with converged network capabilities in order to minimize investment risk and cost effectively acquire advanced technical skills.
- Start bringing together the telecommunications and IT organizations to work on convergence plans in concert, including the daunting tasks of establishing common processes and procedures and melding two distinct cultures into a single cohesive organization.

The State of Convergence

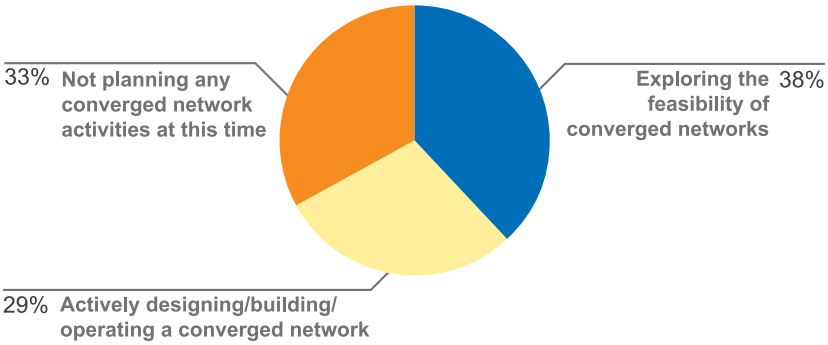
Of the 109 respondents to this survey, two-thirds are involved in some aspect of converging their voice and data networks. More than half of these respondents are in the very initial stage, that is, simply exploring the feasibility of converged networks. But a sizable portion (29 percent of all respondents) are actively planning, designing, implementing, or operating a converged network.

Of the two-thirds of respondents who are involved in network convergence, 64 percent plan to have implemented a solution within 24 months. Only 2 percent have already done so.

Most respondents are still studying the viability of a VoAT solution, although 22 percent have completed a project plan and 13 percent have completed the network design.

With the worsening of the economy in the first half of 2001, particularly in the technology sector, IT organizations are focused on delivering the most important services, with many putting future technology development on the back burner. This strategy is reflected in our survey results, as the importance of delivering voice over alternative technologies to the overall IT strategy took a decided dip since the last survey was conducted in the spring of 2000. Currently, only 35 percent of respondents consider VoAT very or somewhat important to their IT strategy within the next six months.

Plans to Build Converged Networks for Data, Voice, and Video Services



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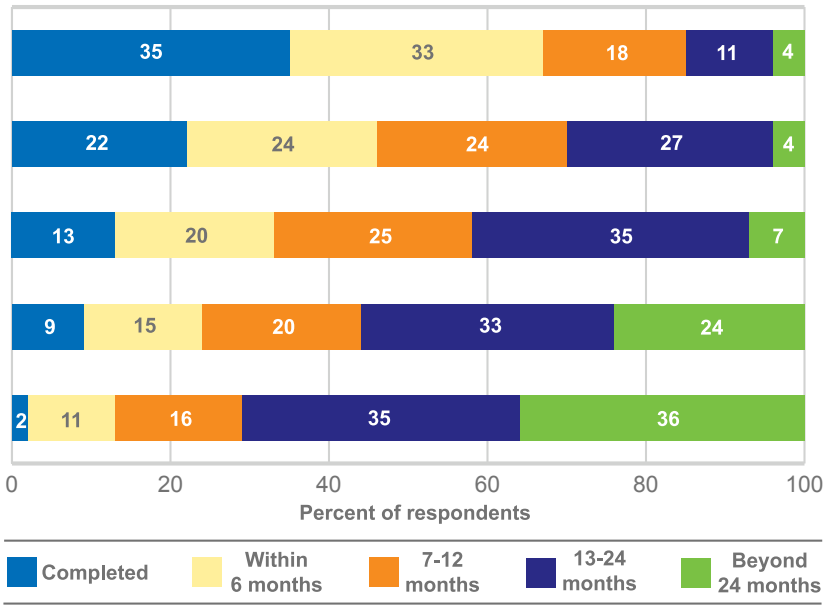
Timeframe for Delivering VoAT Solution



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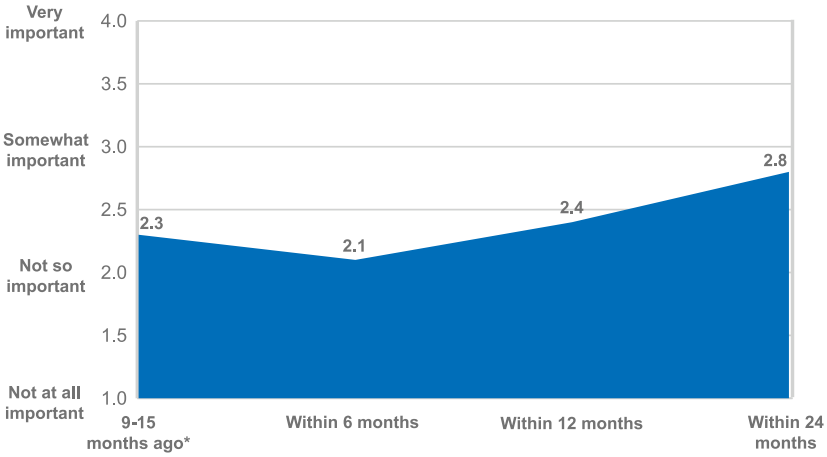
Most respondents are still studying the viability of a VoAT solution…

That's the bad news. The good news is that this situation will be turning around in the longer term. Within 12 months, VoAT will become important in the IT strategy of 54 percent of respondents, and within 24 months, that figure will jump to 64 percent. However, to keep this in perspective, these percentages are both lower than predicted a little over a year ago. Clearly, a more cautious attitude toward network convergence has emerged.

VoAT is still making inroads in many companies. There was a 50 percent jump (from 13 percent to 20 percent) in the percentage of voice traffic in respondent companies that was transported using alternative technologies this year as compared with 2000. And respondents expect to see an even bigger increase next year, particularly in international voice traffic, where the opportunity for savings is greatest.

Because the remaining questions in this survey required that respondents have some involvement with network convergence in order to provide a knowledgeable perspective, survey respondents who are not planning any converged network activities were excluded from answering these questions.

Importance to IT Strategy of Delivering Voice over Alternative Technologies



* From 2000 survey

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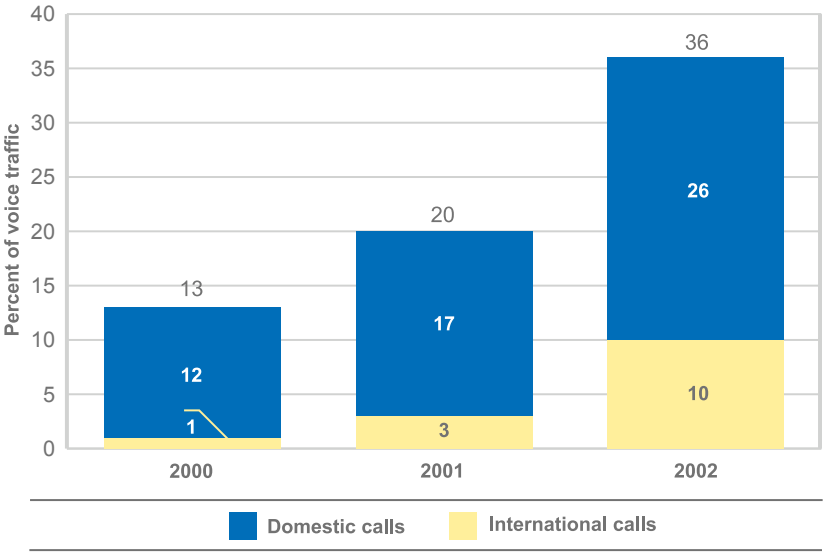
Percentage of Voice Traffic Transported over Alternative Technologies



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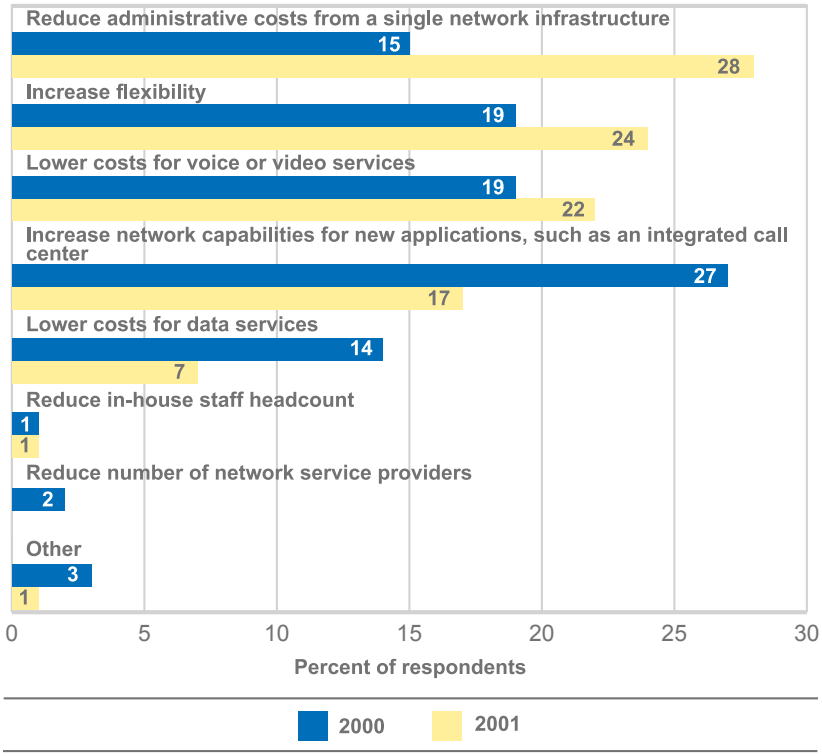
Why Convergence

There are numerous objectives for considering and implementing a converged network, with cost considerations leading the way in 2001. For 28 percent of respondents to this year's survey, reducing administrative costs is the primary benefit anticipated from having a single, converged network infrastructure. This is a marked difference from the 2000 survey, when only 15 percent of respondents identified this as the primary benefit. This change should not be surprising, as IT budgets have tightened significantly over the last 12-15 months, which increases the scrutiny on expenditures and ways to reduce expenses.

When factoring in the 22 percent of respondents who expect lower voice and video costs along with the seven percent who expect lower costs for data services, it's clear that cost control is in the forefront of convergence benefits, and likely to stay there for the near future.

With costs having more emphasis, simply increasing network capabilities to accommodate new applications is less important than a year ago. However, these applications are still important drivers of network convergence, even if they are not the primary benefit.

Primary Benefit Expected from Network Convergence



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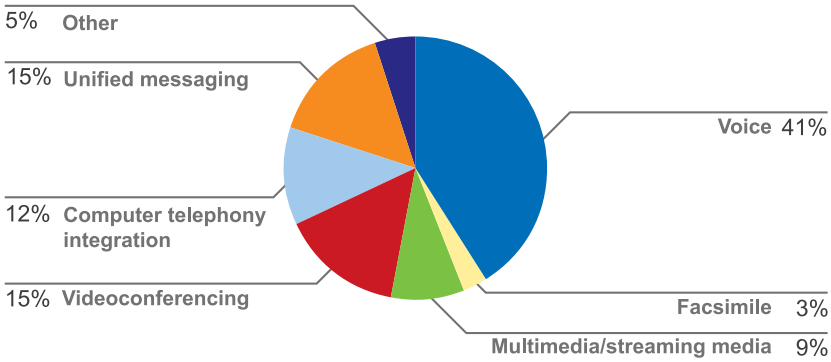
Primary Driver of Voice Services over Alternative Technologies



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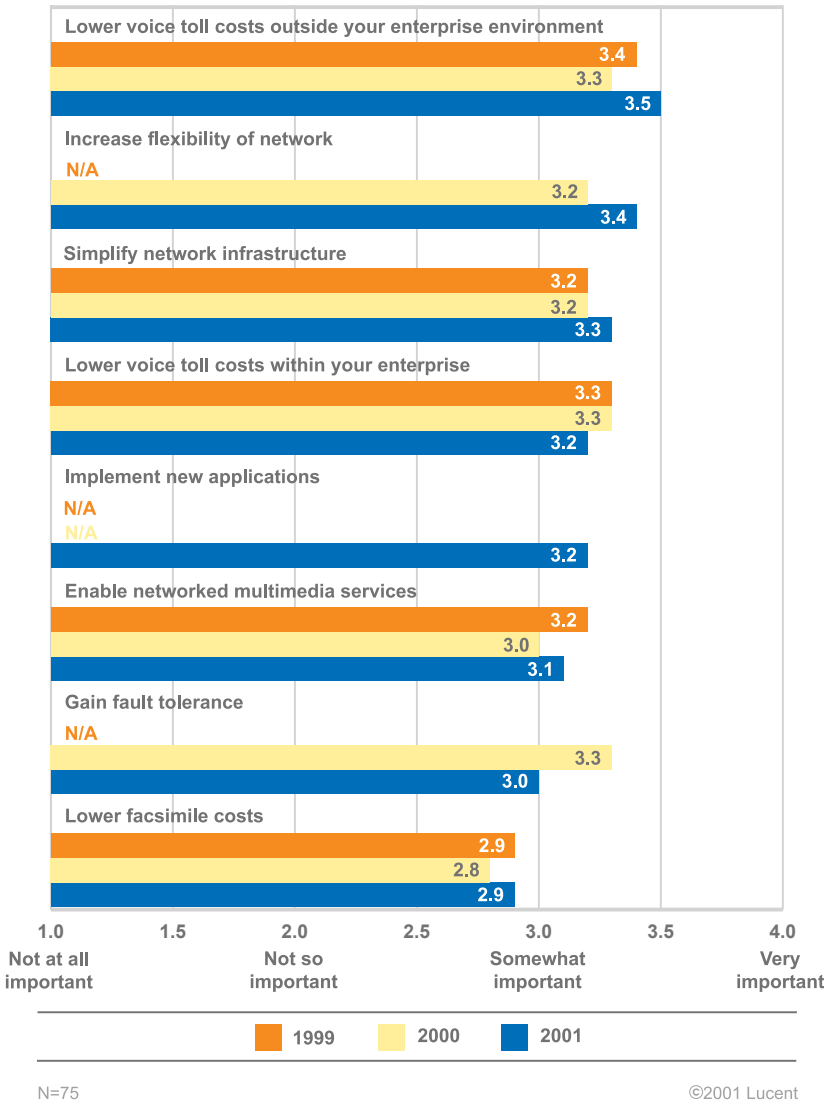
Many applications besides voice can run over a converged network. Voice, however, is the primary driver of VoAT for 41 percent of respondents. But unified messaging (15 percent), videoconferencing (15 percent), computer/telephony integration (12 percent), and multimedia/streaming media (9 percent) all contribute significantly to driving respondents' efforts in pursuing alternative technologies for delivery of the services.

Delivering voice over alternative technologies enables enterprises to bypass the traditional public, switched telephone network (PSTN), and its time- and distance-based fee structure. Continuing the cost theme, lowering voice toll charges, especially for calls outside the enterprise, is the most important objective overall. Nearly two-thirds of respondents say that this is a very important objective.

Beyond cost savings, increasing the flexibility of the network while simplifying its infrastructure are the next two objective in terms of importance. More than eight out of ten respondents indicate that this is an important objective driving efforts to replace the PSTN with VoAT.

Importance of Objectives for Replacing PSTN with Alternative Technologies for Voice



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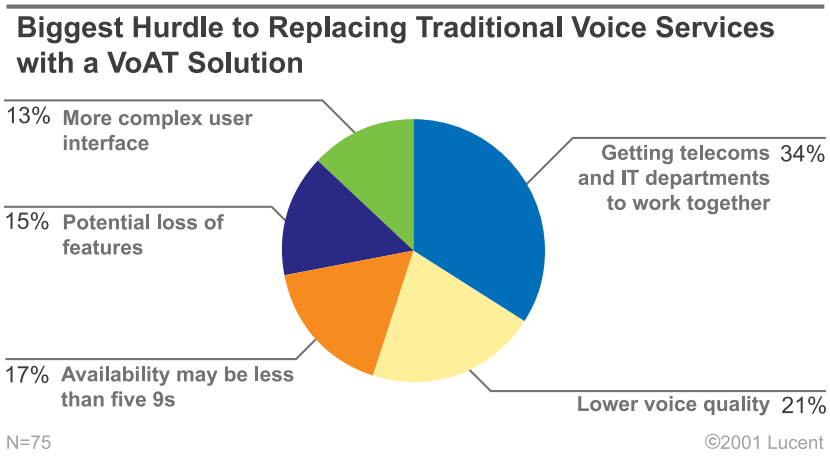
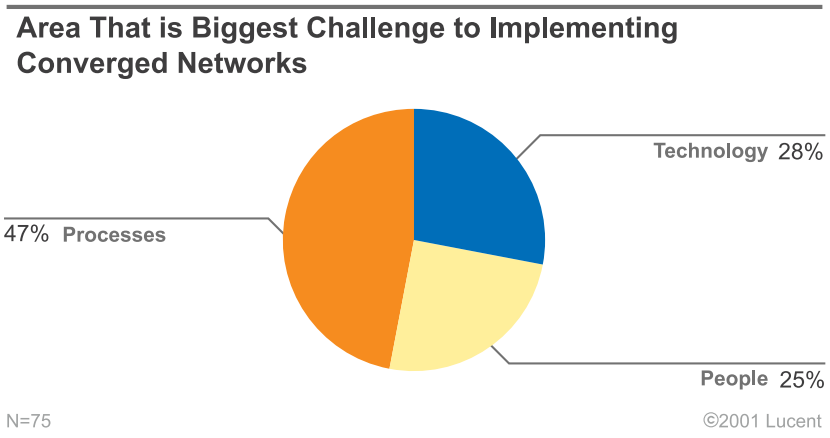
Overcoming Convergence's Hurdles

When viewed from a macro level, five issues commonly appear when considering replacement of traditional voice services with a VoAT solution. Most often cited as being the biggest hurdle is simply getting the telecoms and IT departments to work together. Dealing with both people and process issues that arise in this type of consolidation will keep most network managers busy for a long time.

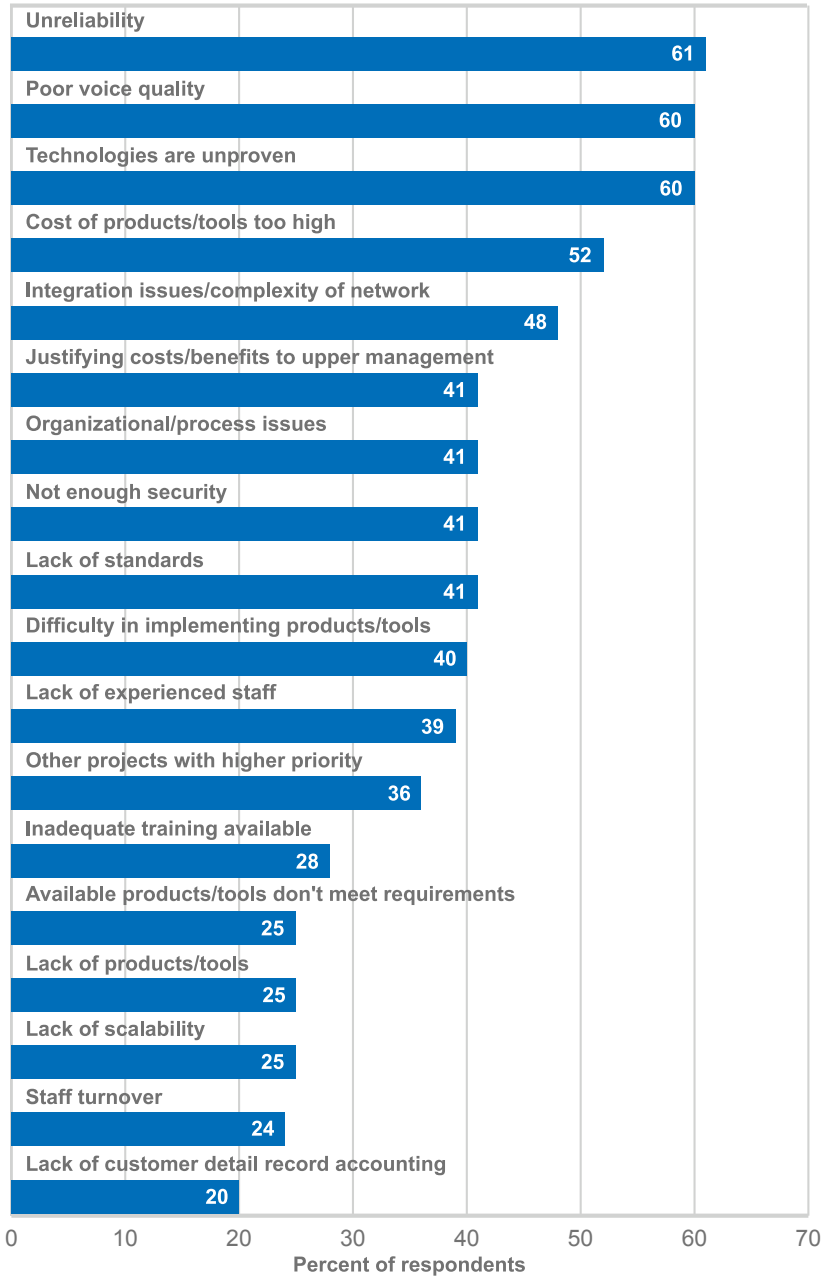
The other four issues – lower voice quality, availability less than "five 9s" (99.999%), loss of features and a complex user interface – focus more on technology, but also have to be dealt with.

When we look at challenges network professionals will face when trying to implement a converged network, we see that technology is viewed as the top challenge by less than one-third of respondents. Instead, getting the processes right – such as troubleshooting, problem escalation rules and procedures, documentation requirements, establishing security policies – is the top challenge for nearly half of respondents. Although the technologies for converged networks are still far from mature, network professionals understand that this is only a small piece of the big picture when implementing a converged network solution.





Significant Barriers to Implementing a Converged Network Solution



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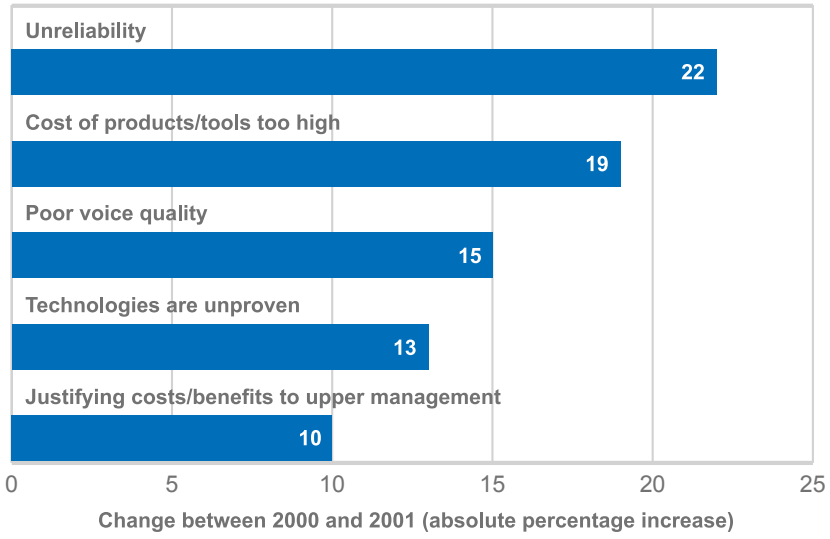
Taking a more micro view of potential barriers to implementing a converged network solution, three are deemed significant by six out of ten respondents: unreliability, poor voice quality, and the fact that many VoAT technologies are still unproven. Not only are the three tops in this year's survey, but they also show large increases from just a little over one year ago. Generally, technology improvements will lessen these barriers from year to year. In this case, as people have explored converged networks more fully, they have become more skeptical of the current crop of products' ability to meet these expectations.

For a little more than half of respondents, the cost of VoAT products is a significant barrier, and nearly as many cite integration issues and network complexity as significant barriers to achieving this goal.

On the bright side, few respondents view the lack of detail record accounting and scalability of products as a concern. Staff turnover is also not a problem for most, a situation that could change as the economy turns around.

Barriers with Greatest Increase in Significance Since 2000



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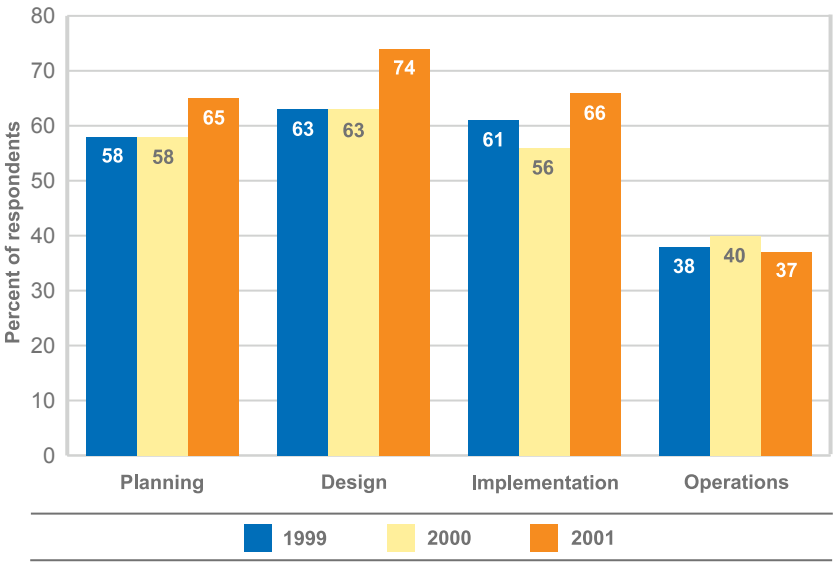
Areas in Which Help is Needed to Move to a Converged Network



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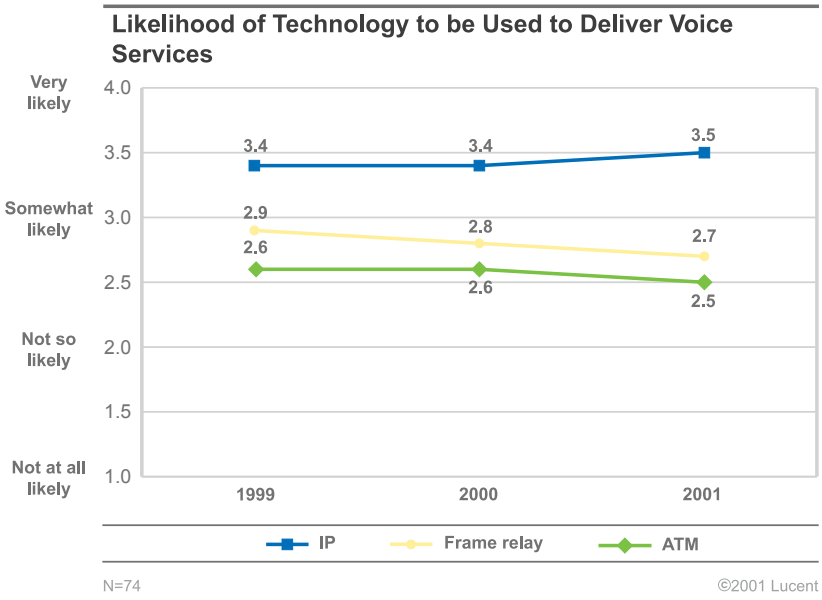
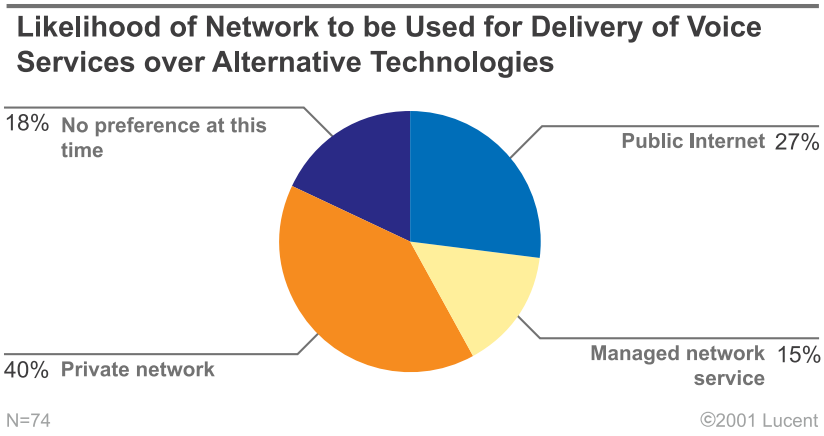
Given these hurdles, challenges and barriers, you would expect most respondents would need help in one or more phases of planning, designing, implementing, and operating a converged network. And you would be correct. Of the 65 percent of respondents who need assistance, most need help in two or more of these phases, nearly evenly split among planning, design, and implementation.

Selecting Technologies and Solutions

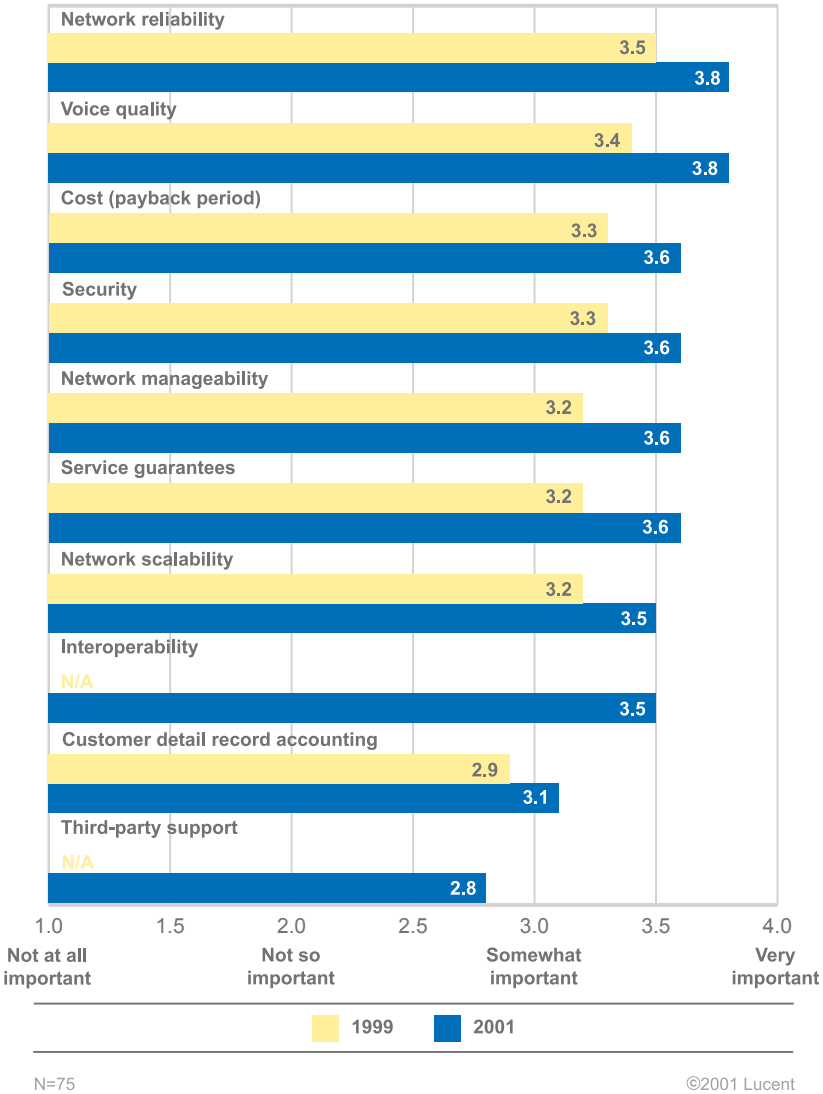
Three technologies have been the primary alternative platforms for voice services: Internet Protocol (IP), frame relay, and Asynchronous Transfer Mode (ATM). Of these three, IP clearly has been the technology of choice since 1999, and is increasing that margin. This is a trend that is likely to continue for the foreseeable future.

Like technologies, three network choices are available for implementing VoAT solutions: the public Internet, a managed network service, and a private network. Of these, private networks are the top choice of a substantial percentage (40 percent) of respondents, with the public Internet (27 percent) and a managed network services (15 percent) much less popular. The private network solution, of course, affords network managers much greater control and security than the other two alternatives.





Importance of Criteria When Selecting a VoAT Solution



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When looking for a VoAT solution, the top criteria are network reliability and voice quality, both cited by more than 80 percent of respondents as being very important.

Overall, this respondents to this year's survey are much more demanding of any VoAT solution, with significantly higher importance being put on all criteria. The bar for VoAT solution providers has clearly gone up in the last year.

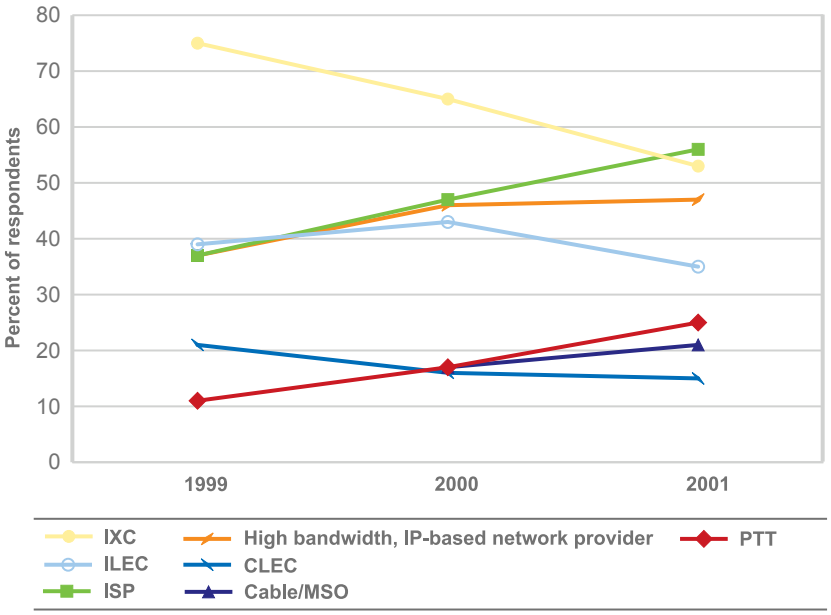
Selecting a Service Provider

Many different types of service providers are stepping up with VoAT services. Just a couple of years ago, inter-exchange carriers (IXCs) were the overwhelming choice for these services. But the picture has changed rapidly and dramatically over the last two years, with respondents now being just as likely to look to Internet service providers (ISPs) and high-bandwidth, IP-based network service providers for their VoAT solutions.

More discouraging for IXCs is that the trend is on a downward slope for them, and steadily upward for their rivals. The trend is also upward for post, telephone, and telegraph companies (PTTs), which are the IXC equivalent outside the U.S., but this trend may be more a reflection of a higher participation in this year's survey by non-U.S. respondents than a real change in perception.

This conclusion on PTTs is supported by the relatively low position that they have in respondents' perceptions of providers with the highest level of VoAT competence. Viewed from this angle, high-bandwidth, IP-based network providers take top billing for providing either the best or acceptable solutions. IXCs and ISPs are farther behind, although clearly ahead of all the other competition.

Service Provider Type Most Likely to be Used for VoAT Services



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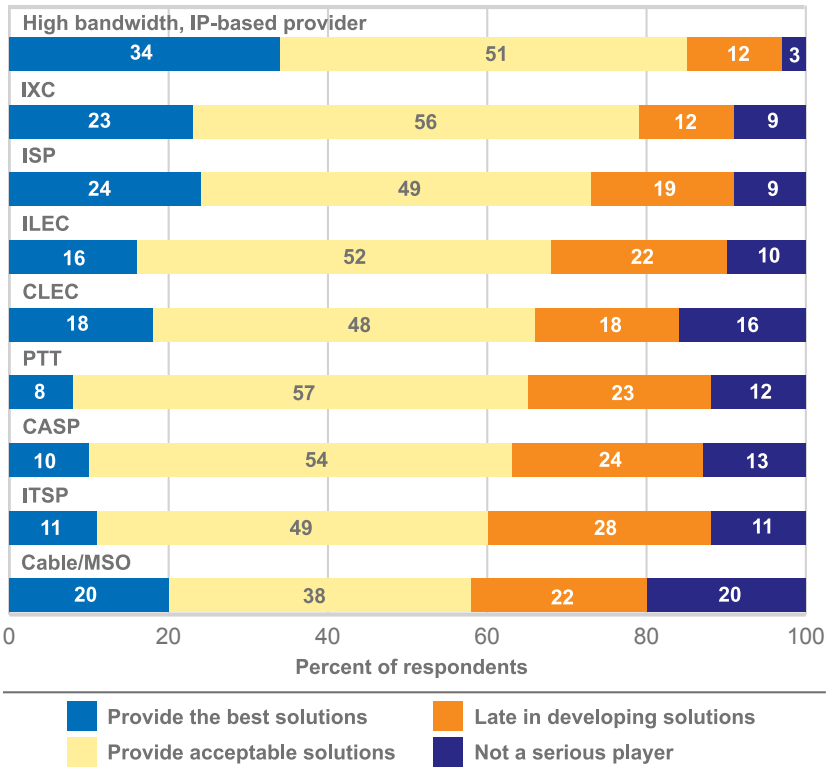
Perception of Service Providers' VoAT Services Competence



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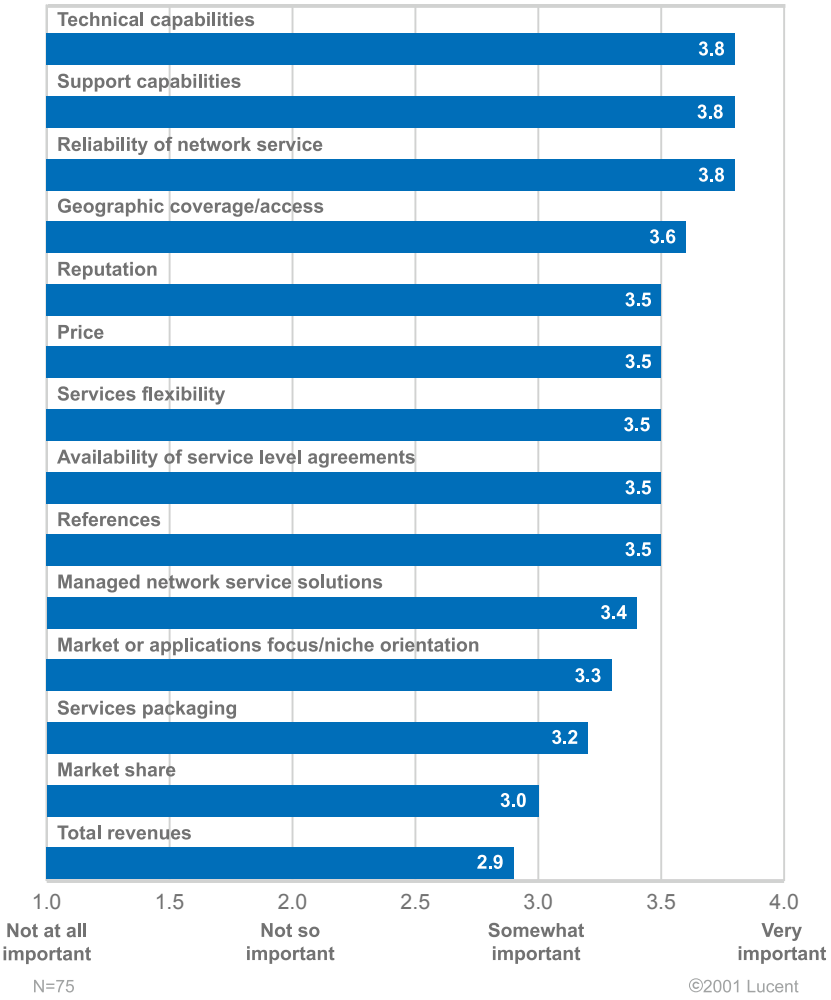
Service Provider Selection Criteria Importance for VoAT Services



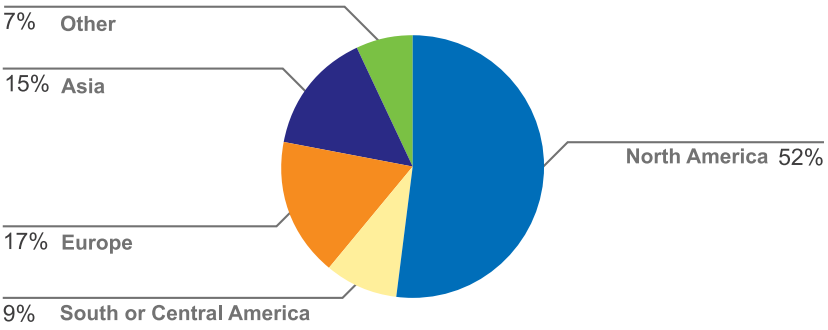
When respondents look to service providers of any type for a VoAT service, the top criteria they will judge them by are their technical capabilities, support capabilities, and the reliability of their service. Service providers that can't pass these three tests are unlikely to win much business, as there is a significant drop off from these criteria to the next most important.

Respondent Demographics

Just a little over half (52%) of respondents are located in North America, while Asia (15 percent), Europe (17 percent), and South or Central America (9 percent) account for most of the remaining respondents. The "Other" category includes respondents from Australia, South Africa, and Israel.

Survey respondents represent a fairly broad cross section of industries, led strongly by telecommunications/ computer services providers, which represent approximately one-third of respondents. Other well-represented industries include telecommunications/ computer hardware and software manufacturers (12 percent), retailers/wholesalers (11 percent), government/education/nonprofit organizations (11 percent), and financial services/insurance/legal firms (7 percent).

Respondents' Locations



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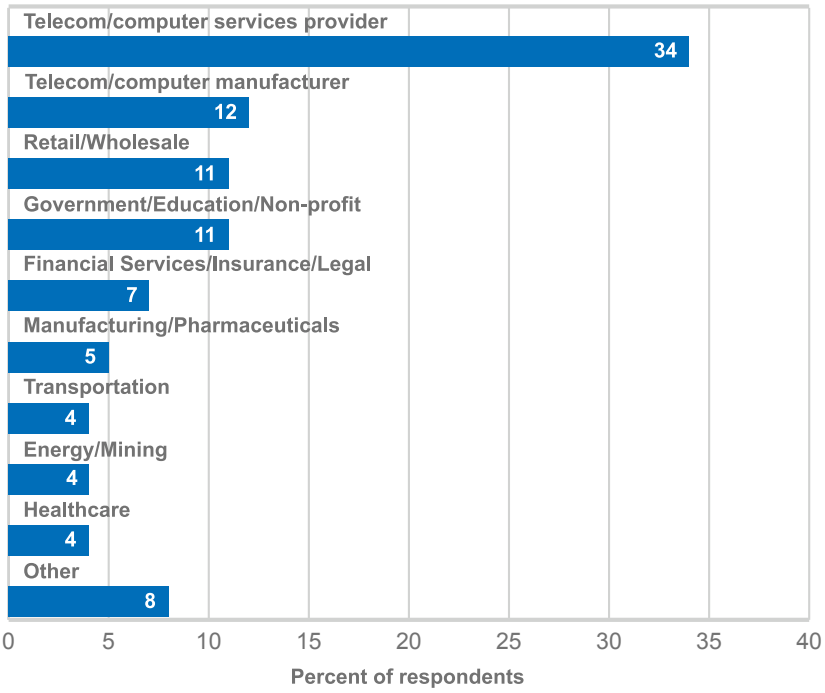
Respondents' Industries



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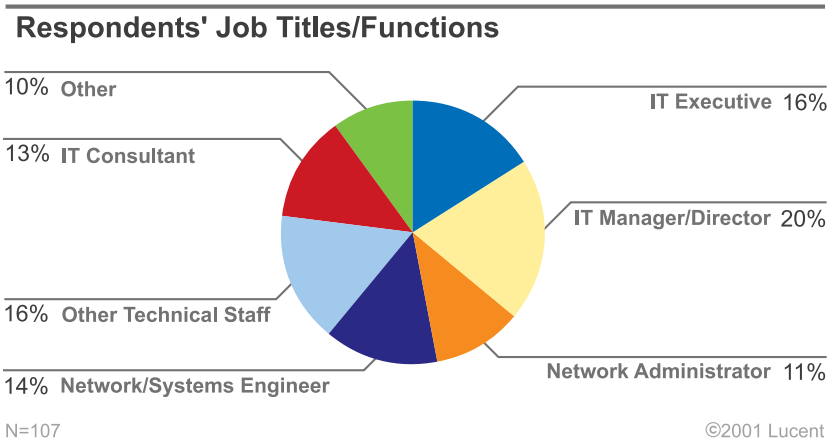

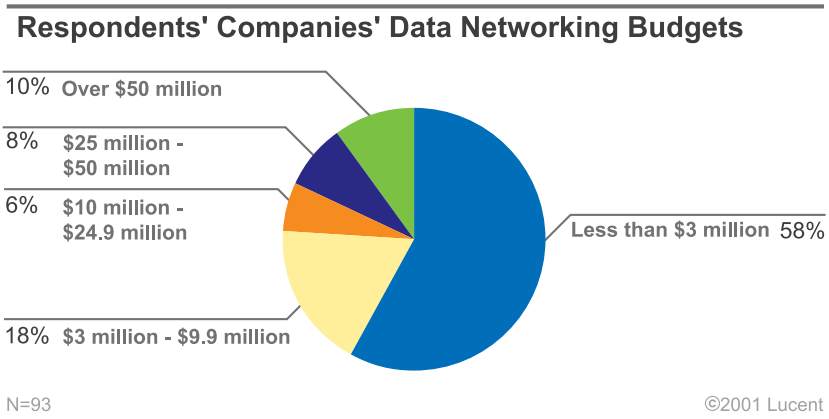

The highest percentage job title/function category is IT manager/director (20 percent), followed by IT executive (16 percent), other technical staff (16 percent), and network/systems engineer (14 percent).

At the high end, 10 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.

Respondent Comments

- *It isn't a technology game anymore - the watchword is services. Failure to recognize that will result in a lot of pain on the part of the players.*
- *Say anything but, this is fact: "The future is IP." Nobody can beat it.*
- *(Convergence is) too expensive to implement right now. Also poor quality and not very serious vendors.*
- *The United Arab Emirates to date has a single PTT that performs the function of an ISP. VoAT is not a solution that is encouraged at the moment as it is believed to directly affect their revenue.*
- *Cost and regulatory delays are the biggest issues in Australia.*

Methodology

This survey was conducted over the World Wide Web from July 12, 2001 – August 31, 2001 at: **http://www.lucent.com/contact/current_survey.html**
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.

For additional information, please contact your Lucent Technologies Sales Representative or your Lucent Advantage Reseller. You can also visit our web site at www.lucentservices.com or call 1-888-4 LUCENT.

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