2003 VoIP State of the Market Report

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by Steven Taylor
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Introduction

Users at Webtorials were asked during June of 2003 to share their perceptions of Voice over IP (VoIP) and their plans for implementing VoIP in their networks. This 2003 VoIP State of the Market Report is a summary of the findings from that survey and, where applicable, these results are contrasted with a similar report prepared in 2002.

From a very high level, there were few surprises in the data. This is reassuring, because drastic changes from the results in the prior year would indicate that there is considerable flux in the market space. The answers also showed remarkable consistency across demographic variables. There were few stark contrasts when the information was analyzed by size of company, geographic region of the world, or voice/data responsibilities.

Consequently, the bottom line is that VoIP is continuing to have broad acceptance, though several implementation concerns still exist. The majority of those implementing VoIP are pleased with the results, and the appropriate technical challenges are being addressed.

This paper is intended to give a snapshot of the results. As always, there are many ways that data may be interpreted, so your individual thoughts on the meaning of various results may vary legitimately from those of the author.

Demographic Overview

Before one can draw any conclusions from a survey, it's most important to understand the demographics of the respondents.

In this case, the survey was conducted by asking users of the Webtorials site to respond to an on-line questionnaire. As a rule, the Webtorials audience consists of networking professionals who are planning the next generation of networks for their companies. Even though the Webtorials audience in general

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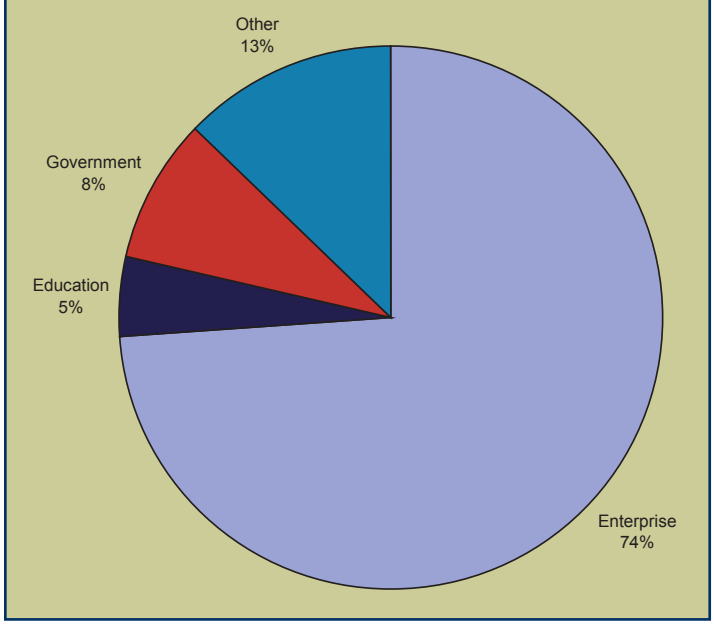
Figure 1

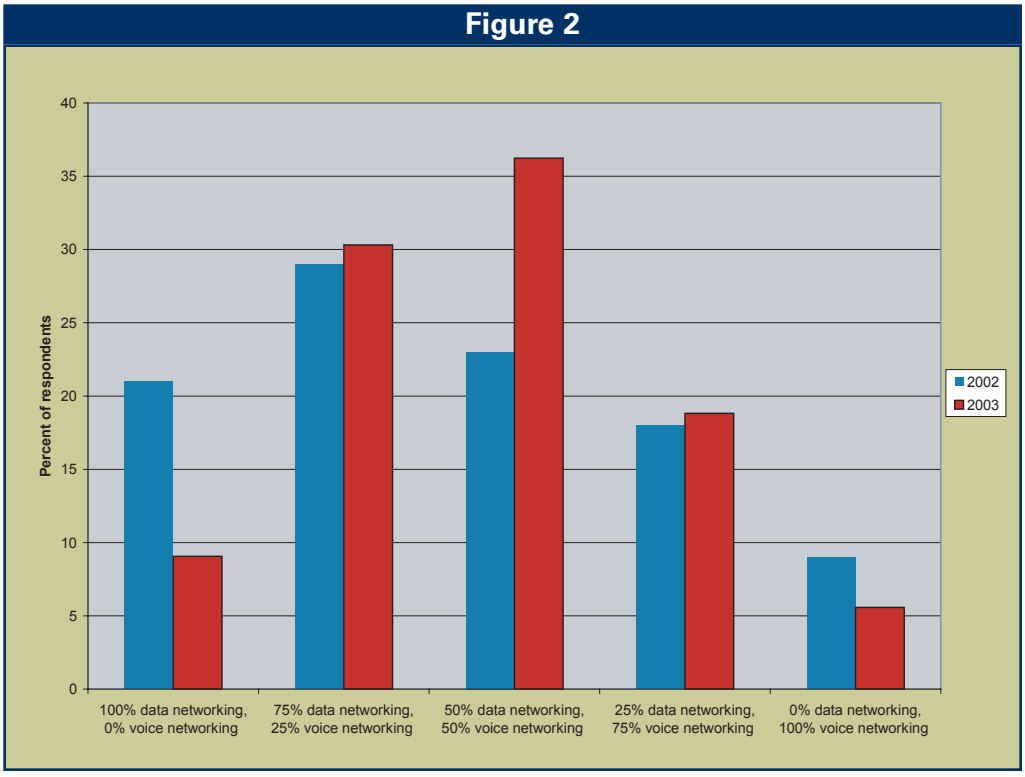


consists of end-users, service providers, and other various groups, the respondents in this case were, to the extent possible, limited to end-users. As shown in **Figure 1**, 74% of the respondents identified themselves as being Enterprise, 5% as Education, and 8% as Government. A review of those classifying themselves as "Other" consisted largely of consultants and other classifications that still fit within the realm of end-users. Any responses that indicated another demographic were excluded from this analysis.

Reflecting the Webtorials worldwide community, the responses came from around the globe. The majority of the responses, 55%, came from the US, with 5% from Canada. A significant percentage of the responses, 17%, came from Europe, and the remaining 23% were from a wide variety of other regions. When asked about the scope of their networks, there was a relatively even distribution from 22% local only, 24% national within the US, 19% national non-US, and 35% international.

One of the more interesting demographic questions that often affects the results of the survey is whether the respondent has primarily voice or primarily data responsibilities. As shown in **Figure 2**, an interesting shift occurred from 2002 to 2003. In 2002, there was a heavy emphasis on the "data" side. This year the voice side is much better represented, with a significant growth from 23% to 36% in the group that devotes roughly half of their time to each voice and data. There are at least two possible and plausible explanations here. First, a somewhat different population was surveyed – a web-based audience as opposed to seminar attendees. But secondly, we may actually be seeing a shift in the responsibilities of networking professionals and there may actually be more individuals with 50/50

Figure 2



voice/data responsibilities. Regardless of the reason, the shift itself is worth noting.

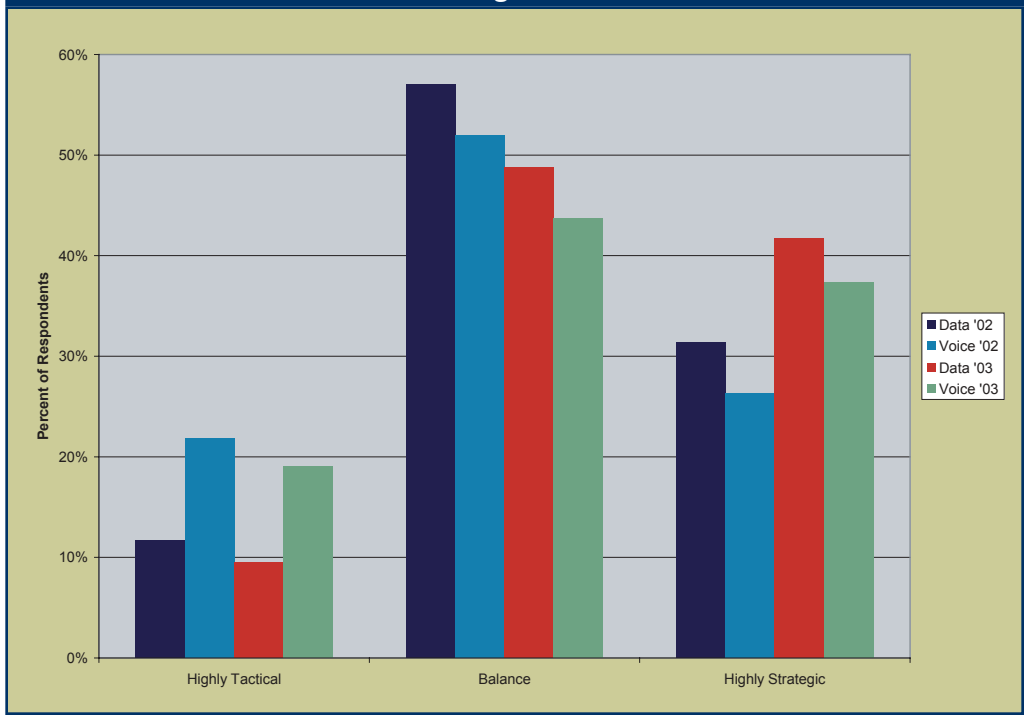
The size of the respondents' networks varied greatly. The average number of sites was 207 per network, with an average of about 14,400 desktops per network. However, when broken down a bit further, 26% had fewer than five sites per net, 14% had five to nine, 29% had ten to 49, 6% had 50 to 99, 15% had 100 to 499, and 10% had grater than 500. The number of desktops was similarly widely distributed, with 16% having fewer than 25, 22% with 25 to 249, 18% with 250 to 999, 16% with 1,000 to 4,999, 3% with 5,000 to 9,999, and 24% with more than 10,000. With the average number of desktops topping 14,000, it's obvious that many of the users in the latter category quite significantly topped 10,000 desktops.

Tactical or Strategic?

Over the past couple of years, there has been a widespread belief that VoIP should be moving from the tactical world of toll bypass and cost reduction to the strategic world of increased function and fundamentally changing work patterns. In an attempt to measure the view of voice networking in this respect, the survey asked respondents to use a scale where one extreme is "Purely tactical" and the other is "Purely strategic" to characterize their organization's view the both the data network and the voice network.

Figure 3 demonstrates the responses over the two years that this study has been conducted. The survey actually used a scale of 1 to 7 for these values. If either of the two most extreme selections were chosen, this is characterized as either highly tactical or highly strategic. The three choices in the middle are characterized as a balance between tactical and strategic.

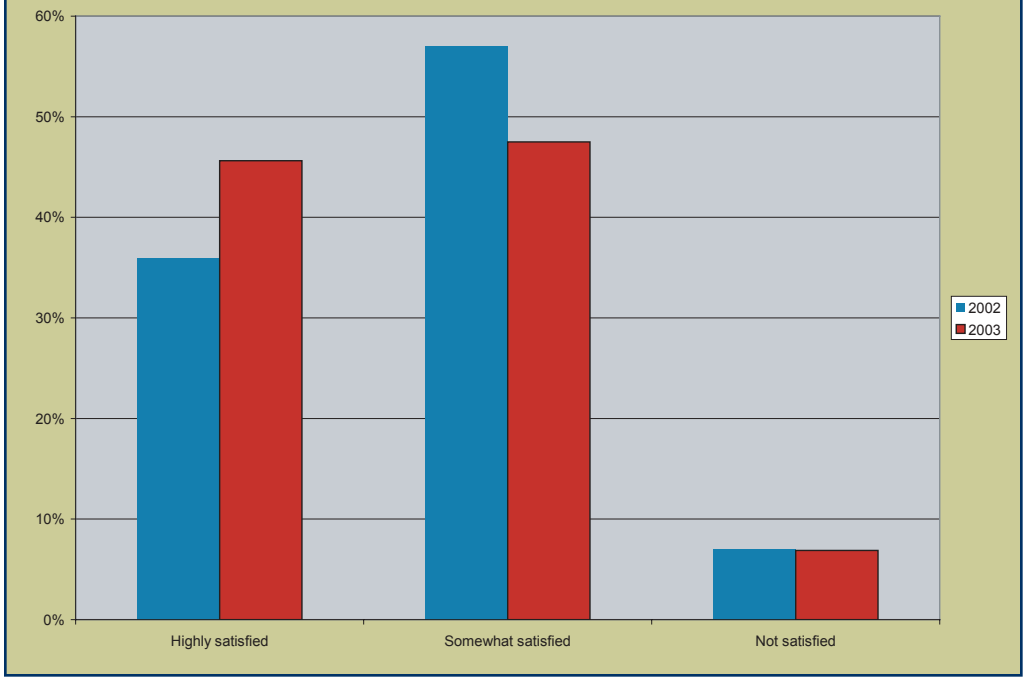
Figure 3



Clearly, voice networks are less tactical and more strategic than they were a year ago. But the interesting part is that data networks are also viewed as being less tactical and more strategic. In fact, the shift from tactical to strategic is uncannily similar. Overall, if one averages the "strategic emphasis" on a scale of one to seven, the voice networks shifted from 4.14 to 4.47, indicating that they are viewed as being more strategic. However, the data networks shifted by exactly the same amount, and the difference between the strategic emphasis of voice networks and data networks is constant with data networks being 0.42 points more strategic (on this seven-point scale) than voice networks for both years.

This is both good news and bad news. The good news is that voice networks are being viewed as a more

Figure 4



point scale, with 7 indicating "Extremely satisfied," the average satisfaction rose from 4.77 to 5.03. The number of respondents indicating either a 6 or 7 out of 7, which is characterized in Figure 4 as "Highly satisfied," rose from 36% to 46%. (In **Figure 4**, using the 7-point scale, 1 and 2 are "Not satisfied, 3, 4 and 5 are "Somewhat satisfied," and 6 and 7 are "Highly satisfied.")

The degree of satisfaction was also examined by some of the possible demographic breakdowns. There was no significant difference in satisfaction noted by the size of the number of desktops in the organization or the number of company sites. However, as **Figure 5** demonstrates, some differences in satisfaction emerged according to other categories. Note that these

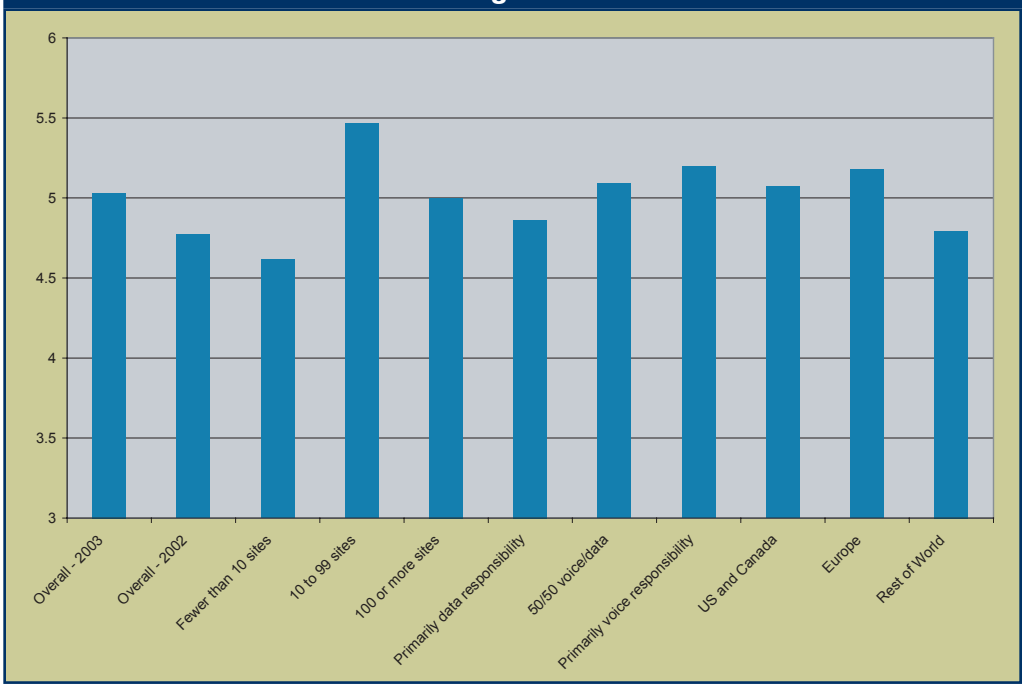
strategic resource. The bad news is that they are still viewed as being less strategic than data networks, and the gap between the two network types is not closing. For VoIP to reach its full potential, the strategic value of transitioning to a converged VoIP infrastructure must be fully embraced.

Satisfaction Rate Up

Just over half of the respondents, 54% indicated that they have already deployed VoIP in some form. This is in sharp contrast with last year, up from only 36%, resulting in a 50% increase.

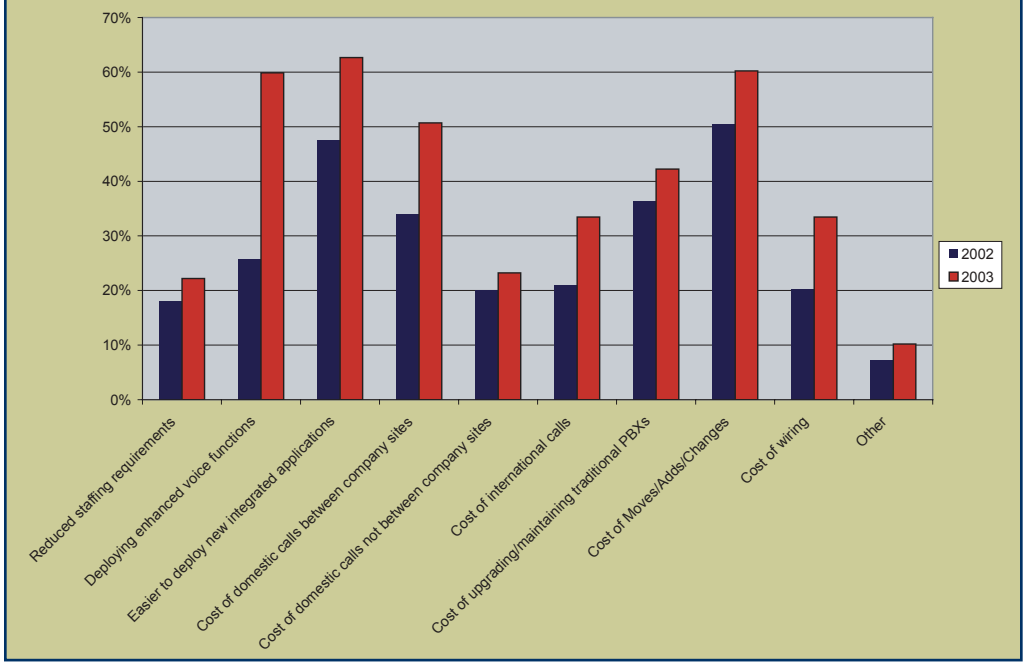
Overall, the users are quite pleased with their VoIP deployments, and the extent to which the users are pleased increased from last year. Using an overall 7-

Figure 5



differences are subtle, so they should not be considered overly significant. The vertical scale in Figure 5 is zoomed to show averages between 3 and 6 on the full 7-point scale.

Figure 6



Interestingly, even though the number of desktops was not a strong factor, the number of sites in the organization did seem to have an influence, with mid-sized organizations being the most pleased. Also, the more voice-oriented the respondents were, the more pleased they were with the implementation. This certainly refutes any notion that VoIP is "pretty good" but just a data person's kludge that a voice person wouldn't accept. Also, it seems that the European respondents were the most pleased with their implementations.

Expected Benefits

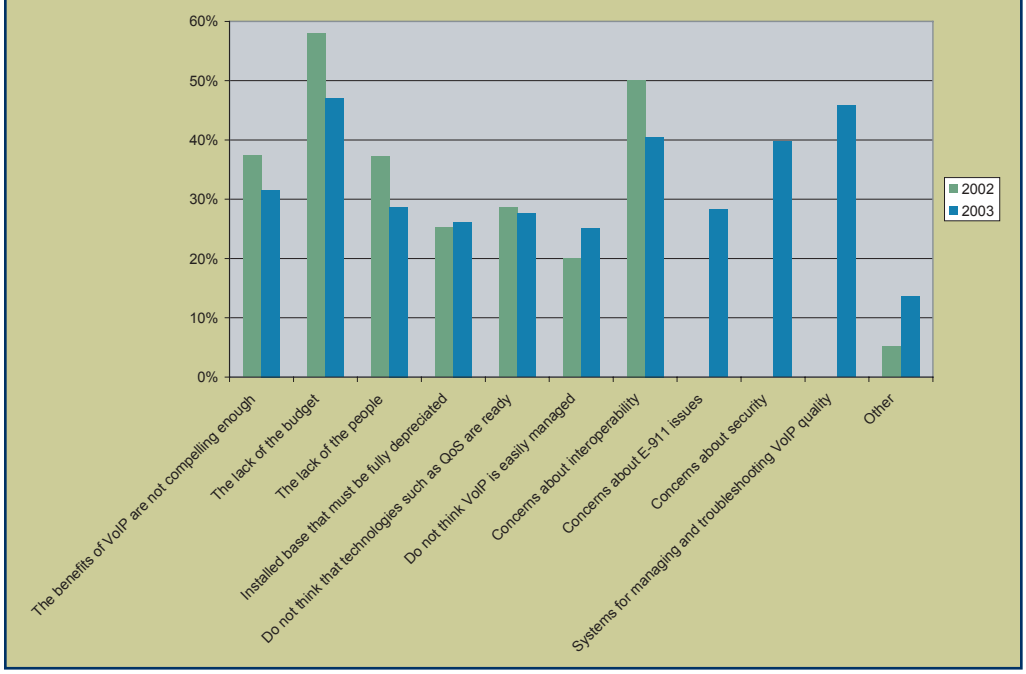
One of the major goals of this report is to track the evolution of the market's expected benefits from implementing VoIP and the challenges faced in doing so. **Figure 6** shows the percentage of respondents who denoted each of the possible responses as an expected benefit. Overall, there were no massive shifts between 2002 and 2003. All categories showed a stronger response in 2003 than in 2002. In part, at least, this is due to a difference in the questionnaire instructions. In 2002, respondents were asked to select up to three benefits, and the average number checked was 2.8. In 2003, the respondents were asked to check all that apply, and the average rose to 4.0.

In an interesting juxtaposition of strategic versus nuts-and-bolts tactical expectations, "The ease of deploying new applications" (highly strategic) and "Controlling the cost of moves, adds and changes" (highly tactical) remained the top two factors, although they swapped the top position. Interestingly, the ability to deploy new voice functions had a much stronger showing this year than last year, indicating that VoIP is viewed as more than just a replacement technology for traditional voice.

"Controlling the cost of on-net calls" came in fourth, indicating that toll bypass is still a strong factor, in spite of ever-eroding prices for minutes using the public switched telephone network (PSTN). Savings for off-net calls remains a weak driver, both domestically and internationally. On the nuts-and-bolts side again, both the cost of upgrading and maintaining the PBX and controlling the cost of wiring received an intermediate level of support.

Finally, "Reducing staffing requirements" (by combining voice and data functions) came in dead last for the second year in a row. Even though the respondents were invited to check all that apply – and this option appeared first in the list – only 22% viewed this as an anticipated benefit.

Figure 7



Deployment Impediments

If the respondents saw all of these benefits in deploying VoIP, why aren't they moving more quickly? **Figure 7** shows the primary impediments to deployment. In contrast with the benefits, all of the impediments showed a lower percentage than last year. Again, this can be explained by differences in the questions. For both years, the question requested that the respondent select all responses that apply. In 2002, the respondents selected an average of 2.6 impediments, while in 2003 they selected an average of 3.5. However, this year there were three additional responses available. Thus, it is impossible to determine whether the impediments were less important or whether they simply were checked less often because the respondents tended to check only a limited number of responses.

Not surprisingly, the lack of budget remains the primary impediment. The number two impediment from 2002, "Concerns about interoperability between vendors' equipment," remains the number two concern among the factors that were available choices for both years. This is most interesting, in that there is no major difference between the current interoperability of VoIP systems and the interoperability of traditional PBXes. Perhaps this response indicates that more interoperability would also be desired for traditional systems. Also, this could be driven in part by the higher degree of assumption of interoperability for data (as opposed to voice) networks.

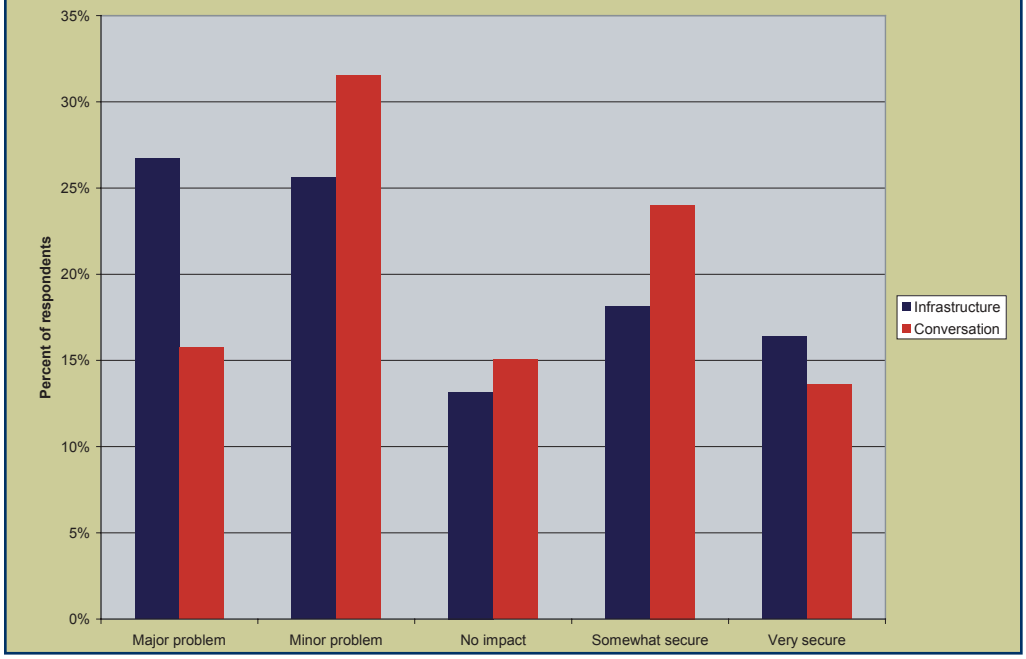
One of the additions to the responses, "Systems for managing and troubleshooting VoIP quality," ranked number two overall for this year. The emphasis on voice quality (as opposed to overall management) is interesting, especially since the selection "Do not think that a broad deployment of VoIP is easily managed" received a rather low response. (The "Voice quality" concern was selected by 46% of those responding, while the latter was selected by only 25%.

Another of the new options, "Concerns about security," was in a statistical dead heat with "Interoperability," tying for the number three spot overall. The security issue will be addressed in more detail later in this report.

The remaining options had about the same number of concerns expressed, with slightly more selecting "The benefits of VoIP are not compelling enough to deploy additional systems at this time." Interestingly, any concerns about Quality of Service (QoS) seem to have been relatively minor.

A final new option in this question dealt with concerns about E-911. This was ranked as a "primary impediment" by

Figure 8



28% of the respondents. This is completely consistent with a separate question on E-911 where 31% of the respondents ranked E-911 as a show-stopper (8%) or a major problem (23%). A slightly surprising 13% indicated that they didn't know whether E-911 was a problem, and the remainder indicated whether it was a minor problem (39%), not a problem (13%), or that the E-911 capabilities developed for VoIP actually enhanced standard E-911 and makes this an advantage (4%). Interestingly, in a separate question, 27% of the respondents indicated that they did not know whether there are E-911 (or the equivalent emergency response capabilities in countries other than the US) requirements in the locations where they are implementing (or considering implementing) VoIP.

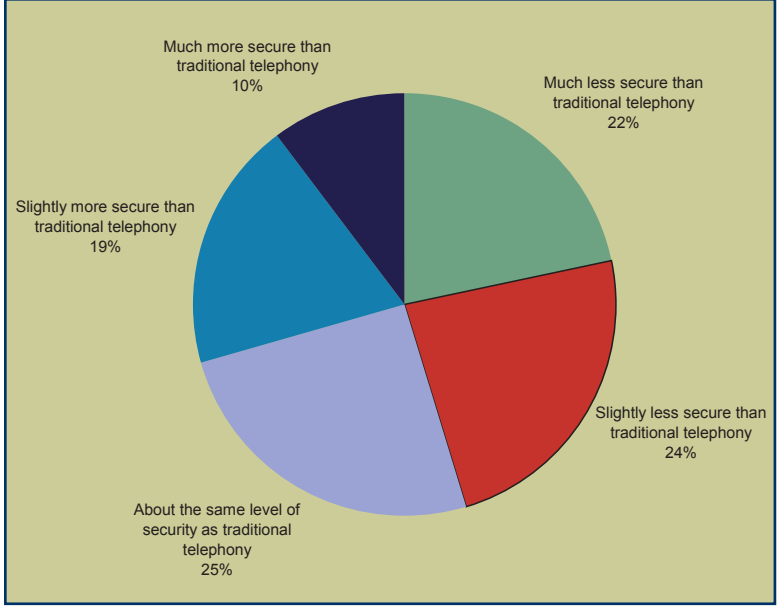
Details on Security Concerns

As noted above, roughly 40% of the respondents said that security was a major impediment to their deployment of VoIP. In starting to drill a bit deeper into the question of VoIP security, a necessary first determination is the relative concern about security of the voice/data network infrastructure versus the security of individual conversations. For instance, concern about Distributed Denial of Service (DDOS) attacks is a network infrastructure issue, while hacking a conversation via a LAN sniffer is a conversation security issue.

As detailed in **Figure 8**, 53% of the respondents considered security of the network infrastructure to be either a major or minor problem, and 48% considered conversation security to be either a major or minor problem. However, network infrastructure is considered to be a major problem by 25% of the respondents, while only 16% considered conversation security to be a major problem. Interestingly, almost as many (14% versus 16%) considered the conversations to be very secure, and 16% also considered the network infrastructure to be very secure.

The overall perception of security seems to be widely diverse. For instance, if one took the five possible answers shown in Figure 8, assigned a numeric value for security on a scale of 1 to 5 with a 1 for "Major problem" and a 5 for "Very secure," the network security gets an overall score of 2.72, while conversation security weighs in at 2.88. Additionally, it seems that the perception of network versus conversation security was often consistent when comparing the answers for each individual respondent. For instance, 59% of the respondents gave the same rating of security, regardless of that rating, to both network and conversation security. Of the remaining 41%, roughly two thirds (27%) gave a higher rating to conversation security while 14% gave a higher rating to network security.

Figure 9



In addition to asking about absolute security of VoIP, the respondents were also asked about their impression of security of VoIP versus traditional telephony. As demonstrated in **Figure 9**, the vast majority did not think there was a significant difference between the security of VoIP and the security of traditional voice. Over two-thirds of the respondents, 68%, thought that the security was either about the same, slightly more, or slightly less secure. Of the remaining 32%, 10% thought that VoIP was much more secure than traditional telephony, while 22% thought it was much less secure.

Figure 10 highlights the respondents' reaction to specific threats. Over 90% of the respondents checked at least one of the boxes when asked to check all that apply. Topping the list of concerns with over 60% (of those having a concern) was "Voice server or IP-PBX might be the target of a Distributed Denial of Service (DDOS) attack." Similar concerns, both with over a 50% response rate, were "Voice server or IP-PBX might be hacked" and "Voice server or IP-PBX might be a back-door to the corporate network."

Three other concerns had a much lower response, about one-third of the respondents for each. These concerned interception of conversations in the WAN, in the LAN, and on the Internet. Since there was only a spread of four percentage points among the three, it's not clear that there was more concern in one area than the other.

Finally, the proposed option, "Concerned that all LAN segments have access to all conversations," was added as a bit of a red herring. In reality, there are very few shared media LANs in existence, so this is seldom a problem at all because the only place that there is access on the LAN should be in the wiring closet. The

Figure 10

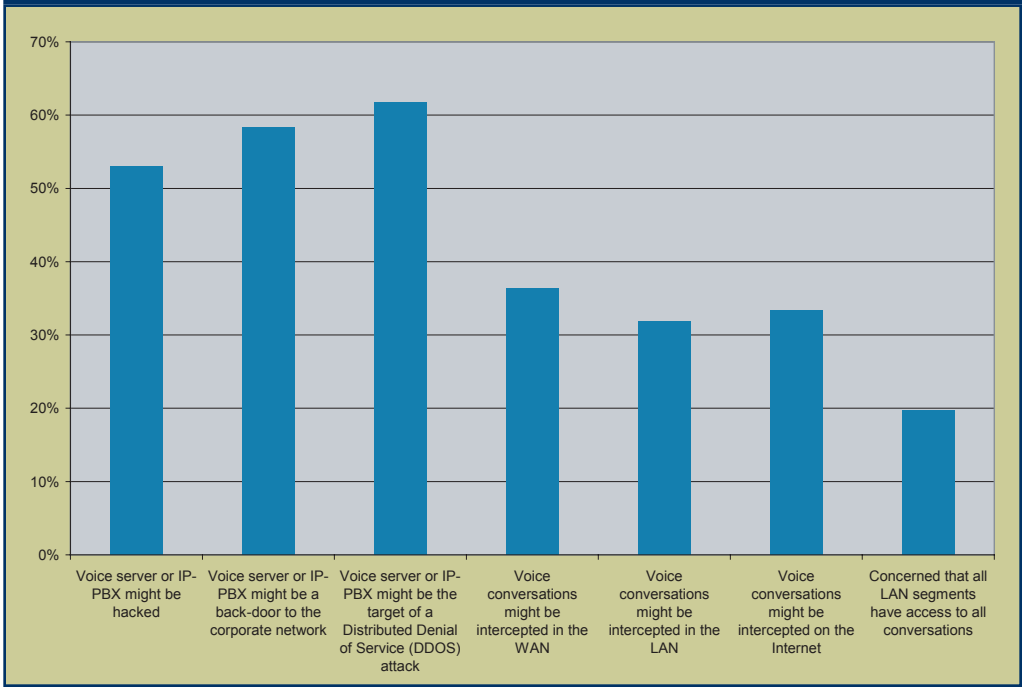
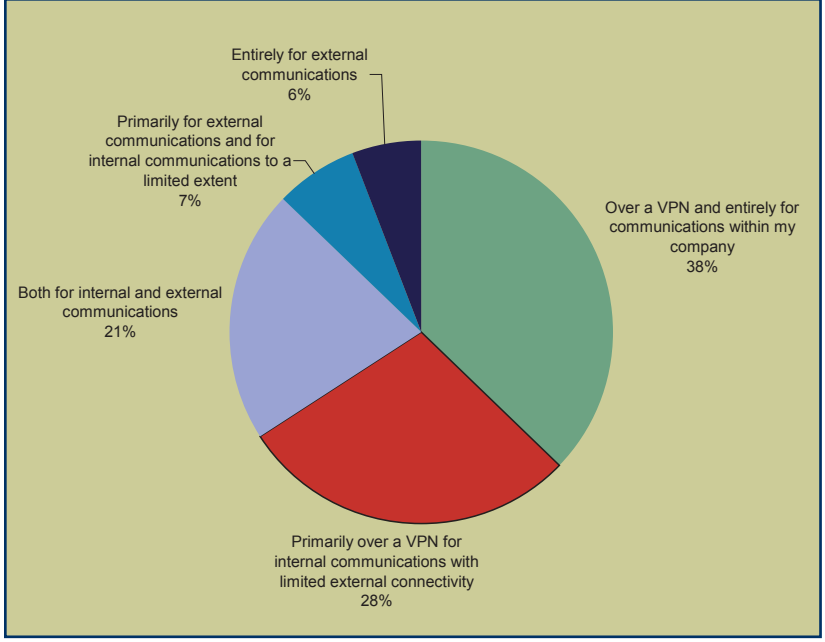


Figure 11



good news is that fewer than 20% of the respondents saw this as a problem. The bad news is that there are almost 20% of the respondents who believe that this is a problem even though it should not be a problem in a modern network.

VoIP and the Internet

One of the most persistent misconceptions about VoIP is that VoIP necessarily implies use of the public Internet. In reality, the planned use of the Internet is quite limited. When asked "To what extent would/does your VoIP implementation involve using the Internet for voice transport?" two-thirds (68%) answered that they would have either "Limited Internet usage" (39%) or "No Internet usage" (28%). Of the remaining third, a little over half answered "Moderate Internet usage," and only 14% answered "Extensive Internet usage."

The respondents were also asked in what manner they use (or would use) the Internet in support of a VoIP implementation. As demonstrated in **Figure 11**, the dominant Internet usage would be for transport using an Internet-based VPN, with 66% indicating that the usage would be "Over a VPN and entirely for communications within my company" (38%) or "Primarily over a VPN for internal communications with limited external connectivity" (28%). Another 21% indicated that there would be a balance of internal and external communications, and an aggregate of only 13% indicated that their VoIP implementation would involve extensive use of the Internet for external communications.

The trend here is clear. VoIP implementations – at least among this sample population – are primarily for intra-company communications. Further, communications to external partners via the Internet is still in its infancy.

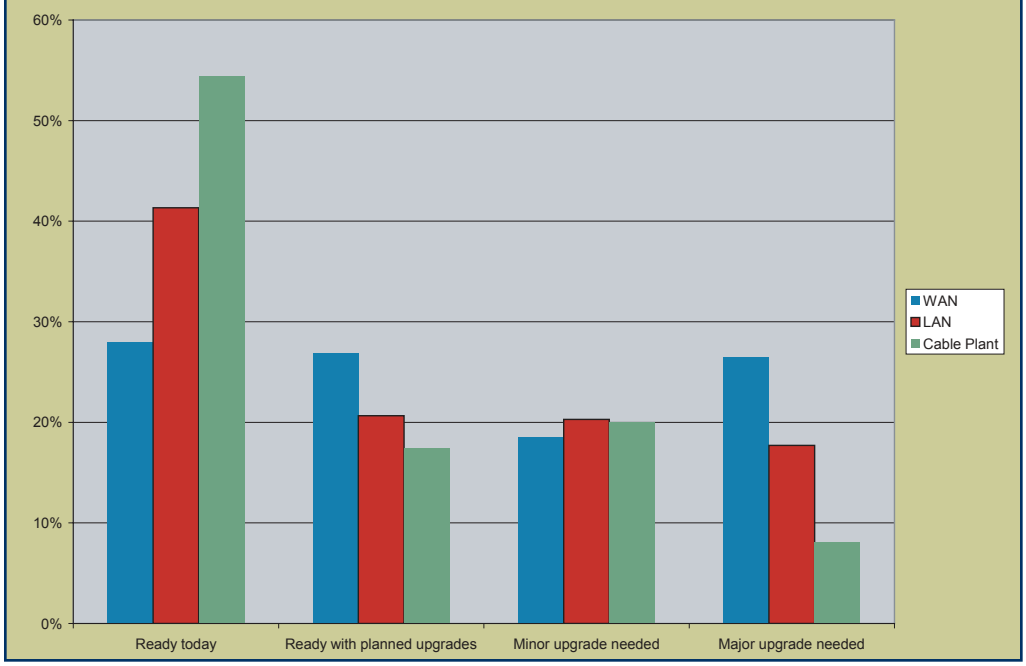
Performance and Infrastructure

In response to recent concerns about the impact of VoIP on other applications – especially due to bandwidth requirements – the respondents were asked whether they were concerned about the impact that implementing VoIP would have on the performance of existing data applications on the LAN and/or WAN. Separate responses were requested for the LAN and WAN.

In a nutshell, there was significant concern about VoIP having a negative impact on the performance of other applications on the WAN, but only limited concern about application impact on the LAN. Of course, this is consistent with the reality that LAN bandwidth is abundant, while WAN bandwidth continues typically to consist of a relatively small fraction of the LAN bandwidth.

In response to the question, 76% of the respondents have little or no concern about performance of other applications on the LAN, with 41% indicating "Not concerned at all" and 35% indicating that they were "Slightly concerned." In reality, that fact that 24% indicated that they

Figure 12



were "Very concerned" is bit surprising with the near ubiquity of switched connections at 100 Mbps and above.

The WAN picture was essentially a mirror image. In this case, 42% indicated that they were "Very concerned," 40% indicated "Slightly concerned," and only 18% were "Not concerned."

In addition to being asked about performance concerns, the respondents were asked whether they felt their current infrastructure for the LAN, for the WAN, and for the cable plant was ready for VoIP. As shown in **Figure 12**, the cable plant is felt to be the most ready, with over half reporting that the it was ready now, and 92% reporting the it was ready or would be ready with planned or minor upgrades. By contrast, only 73% put their WAN at the same state of readiness, with 27% indicating that they felt they needed major upgrades to their WAN infrastructure. Not surprisingly, the LAN fell between the WAN and the cable plant in terms of readiness. 41% felt that their LAN was ready now, but 18% felt that major upgrades are needed. The remaining indicated that planned or minor upgrades were needed.

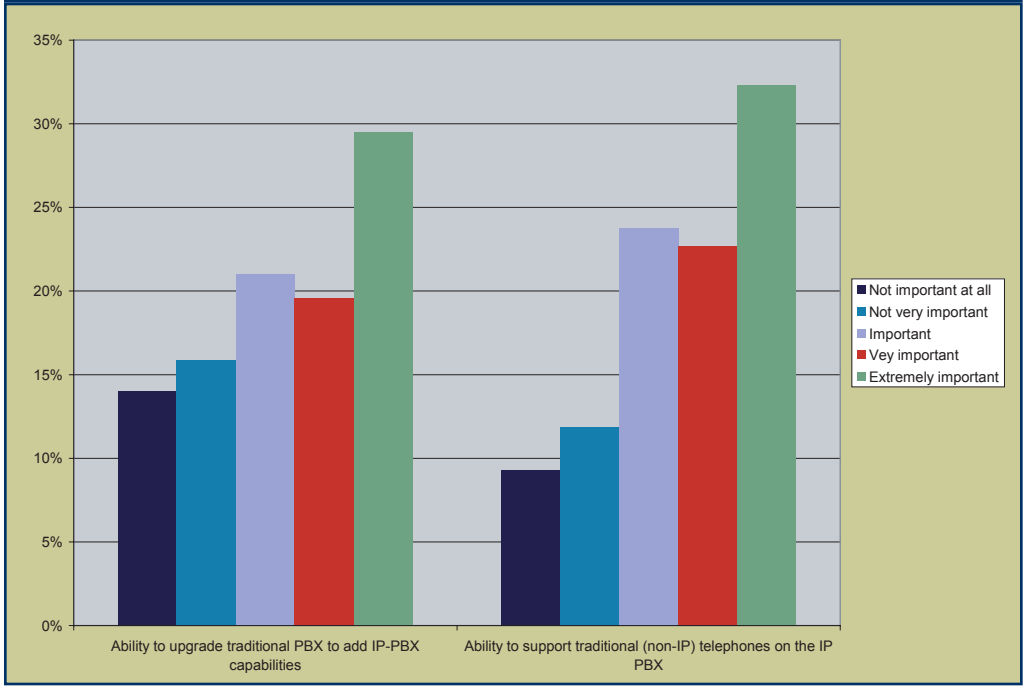
Migration Plans

For most companies, the question is not whether they will eventually adopt a VoIP strategy. Rather, the question is how to get from where they are currently, which for the most part assumes the existence of a traditional PBX, to the world of VoIP.

For one view of this problem, the respondents were asked which of several possible responses best described their plans to deploy IP-PBXes. Overall, 22% of the respondents were in the most aggressive category, responding that they plan to replace existing traditional (TDM) PBXes with IP-PBXes in both new and existing locations. The largest group, representing 34%, selected the option to upgrade existing traditional (TDM) PBXes to IP-PBXes in existing locations and install IP-PBXes in new locations. This reflects an aggressive strategy, but also indicates a desire to retain the value of the existing equipment. The less aggressive but second largest group overall, representing 29% of the respondents, is ready to move forward with VoIP with new installations, but will not attempt to upgrade the installed TDM base. This group chose the selection that they would retain existing traditional (TDM) PBXes in existing locations until replacement is required but install IP-PBXes in new locations. Finally, a somewhat surprising 15% indicated that they do not plan to install IP-PBXes. Nevertheless, even though 15% indicates plans not to install IP-PBXes, the converse is that 85% of the respondents indicate plans to install IP-PBXes.

Since the migratory route seems to be of great importance, the respondents were also asked about the importance of being able to upgrade and/or re-use their existing equipment. In particular, they were asked about the importance of the ability to upgrade traditional PBX to add IP-PBX capabilities (as opposed to installing new IP-PBXes to gain these capabilities) and the importance of the ability to support traditional (non-IP) telephones on the IP PBX. As demonstrated in **Figure 13**, both capabilities are quite important, and the ability to re-use phones is slightly more important than the ability to upgrade the PBX.

Figure 13



Digging into these numbers in a bit more detail, 70% of the respondents ranked the ability to upgrade the existing PBX as important, very important, or extremely important. In fact, 49% ranked this capability as either very important or extremely important, and extremely important got the highest overall ranking with 30% of the respondents.

And if these results are impressive, the results for the ability to support non-IP phones are even more impressive. In this case, 79% gave a rating of important, very important, or extremely important to these capabilities, and over half (55%) ranked this capability as "very important" or "extremely important."

So far as individual ratings are concerned for the importance of the ability to upgrade the IP-PBX versus the ability to use traditional phones, the majority of the respondents, 56% gave the same level of importance – regardless of what that level was – to each category. 15% placed more emphasis on the upgrading the IP-PBX, while 29% placed more emphasis on the ability to use traditional phones.

Perhaps the most striking result from this question is that over half of the respondents chose the most extreme selection – Very Important – as their answer for at least one of the questions. One might expect a more moderate approach in general to any question.

The Bottom Line?

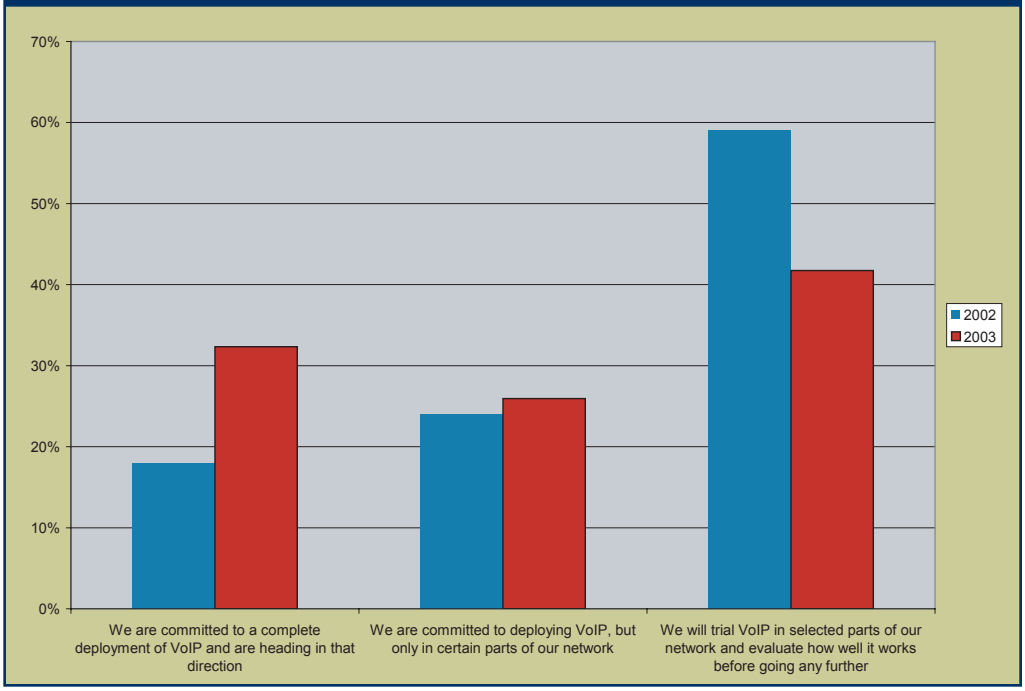
The 2002 report ended with the statement that there was a clear direction of moving ahead with some caution, and we could expect the deployments to pick up as the major impediments – budgets and interoperability – are resolved.

This ultimate message was summed up with the responses to the final question for both years, which was which of the following best describes your company's current approach to deploying VoIP? The choices were:

- We are committed to a complete deployment of VoIP and are heading in that direction
- We are committed to deploying VoIP, but only in certain parts of our network
- We will trial VoIP in selected parts of our network and evaluate how well it works before going any further

Figure 14 shows the comparative responses for the two years. Note that for both years, there was an "Other" box for those who were not yet committed. However, the year-to-year variation in the survey methodology makes this choice difficult to compare. Consequently, the choice is omitted for both years. However, it is notable that for 2003, only 4% of the respondents checked the "Other" box.

Figure 14



Perhaps the most striking aspect of this chart is the fact that the number of respondents selecting the option for being committed to a complete deployment almost doubled over the course of the year, from 18% in 2002 to 32% in 2003. The "partial commitment" selection stayed essentially constant, with an overall value of 25% in 2003 and 26% in 2003. The major movement to total commitment came from the trial group, with the number of respondents who were in the trial phase dropping from 59% to 42%.

The direction is clear. The respondents are moving from trial to deployment, and, overall, the future for VoIP continues to look quite bright.

Steven Taylor *- consultant and broadband packet evangelist, is President of Distributed Networking Associates and Publisher of Webtorials.Com. An independent consultant, planner, author, and teacher since 1984, Mr. Taylor is frequently quoted in the trade press and is one of the industry's most published authors and lecturers on high bandwidth networking techniques. He has served as a Contributing Editor for Data Communications magazine, publishes articles in both Business Communications Review and Network World, and co-authors two newsletters Convergence and Wide Area Networking - distributed by Network World Fusion. Augmenting his skill as a teacher and consultant, Mr. Taylor's background in actually planning, implementing, and running an extensive network for the University of North Carolina brings a unique, real-world perspective to his work.*

Reviewing the Results

A conversation with the sponsors

Steven Taylor, Principal, Distributed Networking Associates, Inc.: I'm here with Greg Merritt, Vice-President, Enterprise Marketing, at Nortel Networks and Vicki Warker, Vice-President, Marketing, at Sprint. Vicki and Greg, you've reviewed the major findings of the VoIP State of the Market report, and I'm curious about your reaction. What do you personally think is going to drive convergence? Do the results here coincide with your thoughts?

Greg Merritt, Vice President, Enterprise Marketing, Nortel Networks: Creating a seamless and consistent experience for customers, partners, employees, and suppliers is key to fostering loyalty. Businesses today are moving from tactical to strategic business drivers, and in doing so are looking more to how the applications drive overall business success. Today we're all being asked to do more with less, to save on operational costs, to increase the productivity of our organizations, to get the right business case before making investments, and to ensure short paybacks in those investments. Nortel Networks answers the call here with products and applications that drive improvements in productivity, total cost of ownership, revenue generation, and competitive responsiveness. The enterprise drive to convergence is going to be based on the need to maximize their investments in applications that drive business success, and we're fully positioned to meet that need.

Vicki Warker, Vice-President, Marketing, Sprint: Sprint sees an evolving value proposition for the adoption of VoIP - one that expands well beyond bypass savings. The focus is shifting to longer-term benefits, such as the efficiencies that come from deploying IP telephony in the LAN environment and collapsing the telecom and data infrastructure. Our customers also view VoIP as a way of making unified communications and other enhanced voice/data applications a practical reality. Bottom line, our customers are migrating to VoIP because it can lower cost of network ownership as well as boost employee productivity.

Taylor: There still seem to be some apprehensions from some enterprises about implementing IP Telephony, especially in the areas of security and interoperability. How do you view these - and other - hurdles that must be overcome, and what are you doing to help customers meet these challenges?

Merritt: Enterprise customers are looking for reassurance that they can have all their business communications applications running flawlessly over a converged infrastructure. They know that a prerequisite to success in an IP world is having a finely tuned, QoS-capable network infrastructure. In order to achieve optimal network performance, enterprises must be able to tap into their equipment vendors' expertise in providing networking solutions. We must deliver reliable support and network resilience from the physical layer to the application layer for mission-critical applications and data. For example, at Nortel Networks we do that by deploying advanced services in our switching portfolio, such as session persistence, load balancing advanced Ethernet switching technologies, acceleration methods, and optical technologies.

Warker: The concerns of prospective users tend to center around quality of service. They're concerned about latency and jitter and how well their network will support real-time applications like voice. At Sprint we work closely with our customers to engineer solutions that can address their bandwidth and scalability requirements.

Taylor: Sometimes VoIP is described as a revolution, and at

other times as an evolution. How do you view this evolution versus revolution question?

Warker: Sprint recognizes that most companies are not prepared to take a forklift approach to deploying VoIP. With our robust IP voice services portfolio, we focus on solutions that can help preserve a customer's infrastructure investment and ease the transition to a new technology. Sprint can provide flexible options for incrementally migrating to a VoIP solution. To make the transition virtually pain-free, we can offer managed network solutions.

Merritt: When you're talking about communications convergence, Evolution is Revolution - it's just revolution at a pace that makes sense for each individual enterprise. Revolutionizing how business is done…anticipating customer needs, supporting seamless collaboration with customers, suppliers and employees, offering personalized communications services…doesn't have to mean using a cookie-cutter approach that assumes a single technology will be able to address all needs. We offer customers an approach that allows use of the right technology and protocols - TDM, IP, wireless LAN, H.323, SIP, or whatever the case may be - that are appropriate for the application, based on what's right for the business. That can mean an implementation that fully deploys IP Telephony, it can mean a hybrid approach - mixing traditional analog and digital client devices and infrastructure as appropriate for users' needs - or it can mean a traditional PBX implementation. Whatever a customer chooses, we offer them an investment-protected path to the latest technology…revolution, at their own pace.

Taylor: The network seems to becoming more complex. Assuming the applications will drive the value, what will help enterprises manage the complexity?

Merritt: Providing a simplified management experience and driving lower cost of ownership is key component of our IP Telephony management strategy. We are continuing to make significant investments in our Optivity network management portfolio to ensure that our customers have the ability to proactively monitor voice quality and service performance of their converged networks. Another key aspect of our management strategy is to provide a streamlined Web services management architecture that operates seamlessly across our portfolio of engaged business applications. This integrated approach will allow enterprises to utilize a consistent management workflow that is accessible from any location, simplifying the complexity of managing an application-rich network.

Warker: For many companies, outsourcing management of a VoIP network to a carrier like Sprint can make good business sense. Sprint, for example, offers a managed IP Telephony solution that can start with design and implementation and provide on-going router management, maintenance and troubleshooting. Sprint management can lower total cost of network

Raytown Quality Schools Implements Voice-over-IP Solution

Raytown Quality Schools, based in Raytown, Missouri, has implemented a voice-over-IP solution, placing the voice and data communications services for the Missouri school district's 14 schools and administrative offices on the same network. Using Nortel Networks equipment, Sprint is providing each school in the district with telephones with messaging capability in each classroom. This gives teachers increased security, the ability to leave important information such as homework assignments for students, and better communication tools for the administration and parents.

"Technology is a vital component of education today," said Dr. Lee Updike, director of technology for Raytown Quality Schools. "It provides a foundation that allows schools to improve communication to the community, parents and staff, while also providing the tools needed to maintain a safe learning environment."

"By converging their voice and data onto one network, schools can reduce operating costs, increase their available bandwidth and have a system that provides a solid foundation for future network growth," said Thomas Patchin, Sprint director of sales for education. "VoIP technology also allows schools to have telephones with messaging capability in every classroom, giving teachers increased security and the ability to leave important information such as homework assignments for students. For these reasons, many schools across the country are pursuing VoIP systems and Raytown Quality Schools should be commended for its wise decision to implement this technology."

ownership because it minimizes internal expenses associated with network administration, training and certifications and network management platforms.

Taylor: One of the concerns of convergence is security. How is your company addressing this concern?

Warker: Having been one of the pioneers in commercial Internet service, Sprint can bring some solid security experience to the table. We offer an array of data protection services to our customers - everything from CPE-based and network-based firewalls to intrusion detection and managed security services. We're also capable of providing security assessments and ongoing virus scanning and content filtering.

Merritt: At Nortel, we have a philosophy that "Security is in the DNA," which means that we are building security into our products across the portfolio. We offer our customers the Unified Security Architecture - a "blueprint" of how to approach network security holistically - to help our customers make the appropriate security choices regardless of their network infrastructure. We have developed the Secure Telephony Solution framework that will help our customers secure the new boundary-less world of communications, particularly as they converge their TDM telephony with IP. In addition, we are evolving our portfolio to secure our customers' IP Telephony networks, from our firewalls to support IP Telephony protocols to the security of telephony management traffic.

Taylor: The number one challenge that businesses cited concerning implementing VoIP was the lack of budget. With businesses today being faced with tightened IT spending, how important is a business case for convergence?

Merritt: I can state without hesitation that decisions regarding the adoption of IT proposals are more about business than about technology. Consider convergence: the true measure of its worth is "what can it do for my business?" So, the real question is not about IP, TDM, SIP, H.323, or any other protocol or architectural issue; it's about business value; and, therefore, it is about a good business case. When you are spending scarce resources, it is paramount that business value is real, measurable, and attainable. Nortel Networks has resources available to help our partners and customers develop a specific business case for an organization's unique path to convergence. We do not advocate a "one-size-fits-all" approach to convergence or to the business case for convergence.

Warker: A solid business case with demonstrated return on investment can certainly be made for a converged voice and data platform. With a Sprint-Nortel Networks Managed IP Telephony solution, businesses can experience savings in bandwidth, toll charges, network administration and the time and cost of moves, adds and changes. With Sprint management of the VoIP network, businesses can focus their internal technical resources on other projects that are strategic to the business.

Taylor: Any final words of wisdom for enterprises embarking on convergence strategy?

Warker: My advice is to go with a carrier you can trust with your critical IP applications. You will want to look for a carrier like Sprint that adheres to a well-defined, well-articulated broadband network strategy and one that has a demonstrated history of meeting customers' needs for integrated voice, video, data and Internet services. With Sprint, you can trust our networks, our products and our services.

Merritt: Steve, my advice is really all about approaching convergence as a strategic path forward - not just as an IT project that you implement and, presto, you're a converged network. Of primary importance is the fact that in order for convergence to work, the converged IP network has to be engineered for the real-time requirements of telephony, the extreme reliability of the PBX, and the highly integrated features and applications like call center and messaging that make business communications more effective and productive. In the entire communications industry, Nortel Networks has a unique understanding of these requirements; we have built many of the world's most reliable networks; and we can deliver rich, highly reliable, seamlessly extensible functionality that offers a smooth transition from the current environment to new high-impact capabilities - lowering total cost of ownership.