IP Telephony Management

State-of-the-Market Report

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IP Telephony Management

State-of-the-Market Report

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IP Telephony Moves to a New Frontier

Executive Summary and Key Findings

The Webtorials Editorial/Analyst Division conducted a survey in June of 2008 and received over 800 responses. The findings of the survey were compiled into four individual papers as well as this consolidated paper which includes a summary written by the survey sponsor, PROGNOSIS.

The respondents were geographically diverse (only 45% North American) and were fairly evenly divided between end-users (44%) and service providers (37%), with some manufacturers also in the mix. End-users were asked to share their perspectives, while service providers and manufacturers were asked to respond with their perception of their customers' experiences.

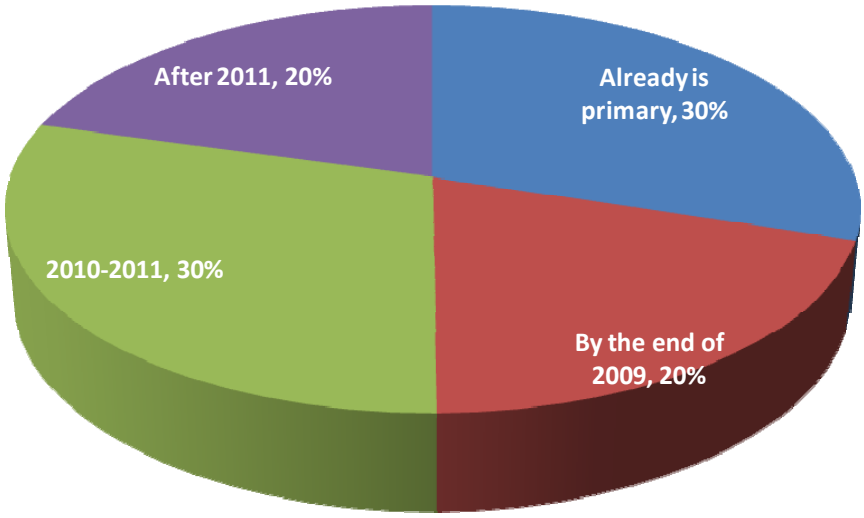
This survey differs from the majority of prior VoIP/IP telephony surveys by focusing primarily on companies' management of their IPT implementation and assuming that a sufficiently large IPT deployment already exists to necessitate that management. Survey-takers' responses to the question of when IPT would become the primary telephony technology justify that assumption (Figure 1). 80% of end-user respondents estimated that IPT would be their primary technology within a little over 2 years, and 50% reported that it would be primary in a little over one, so many IPT deployments are quite mature.

Since a grasp of the general findings of the survey is key to understanding the implications of each of the following chapters, this summary provides both a high-level overview and a basis for further discussion.

The most striking findings of this survey are as follows:

- 80% of respondents estimate that IPT would be their primary technology within a little over 2 years, and 50% reported that it would be primary in a little over one.
- Customers consider voice quality over the network, voice-related parameters, and bandwidth utilization to be the most important aspects of IPT to monitor.
- Most IPT users have not deployed any third-party management tools, but more than half already intend to do so, mostly in order to obtain better performance monitoring.

Figure 1. IPT Primacy



At what point do you expect IPT to become the PRIMARY telephony technology for your company?

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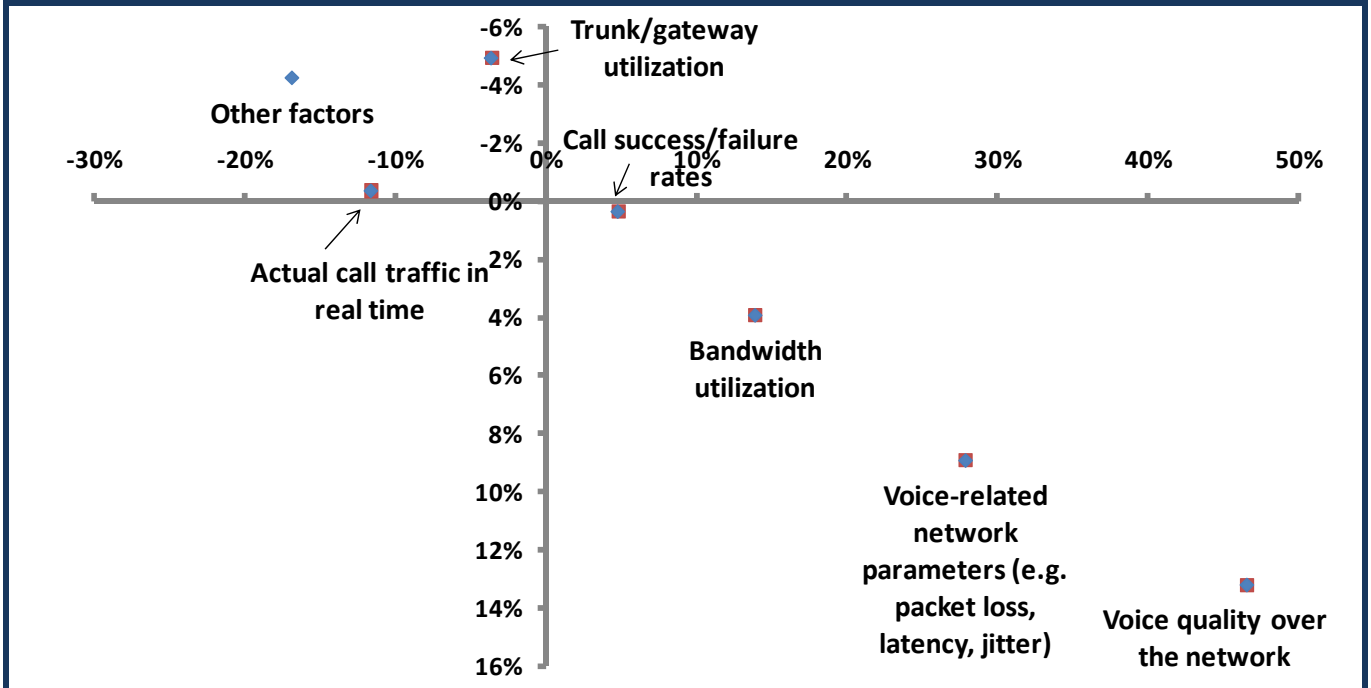
Additional demographic details and each individual chapter of the survey are available at http://webtorials.com/main/resource/papers/kubernan/webcast2.htm

Key Features and Satisfaction Levels

Survey-takers consistently ranked voice quality over the network, voice-related parameters, and bandwidth utilization as the most important features of IPT to be monitored, but also consistently expressed their dissatisfaction with their current management capabilities in those areas. This finding is shown graphically in **Figure 2**, using Webtorials' Total Customer Experience methodology,[1] which plots how far a feature's importance and dissatisfaction differ from an average percent importance or dissatisfaction with all features. Once again, in this case, only end-user responses are shown.

Strikingly, the more importance end-users place on an element of IPT, the more likely they are to be dissatisfied with their capability to manage it. Users are unhappy with their ability to monitor voice quality over the network in particular, and some of this frustration seems to carry over into their relatively high dissatisfaction with voice-related network parameters. The upper-left quadrant was crowded with many factors of low importance that users were relatively satisfied with, so their points were averaged and the resulting point labeled "other factors" and given a distinct coloration, for readability purposes and to avoid confusion with other data points. The full data set will be examined more closely in a later section.

Figure 2. Importance vs. Satisfaction with IPT Management Capabilities



"Which of the following are the THREE MOST IMPORTANT elements of IPT to be monitored/measured?" plotted versus "With which THREE of the following aspects are you LEAST SATISFIED with your current IPT monitoring/measuring capabilities?"

[1] For a complete description of this methodology, please see "Total Customer Experience (TCE) Importance/Satisfaction Methodology" at http://www.webtorials.com/main/eduweb/webtorials/index.shtml#TCE.

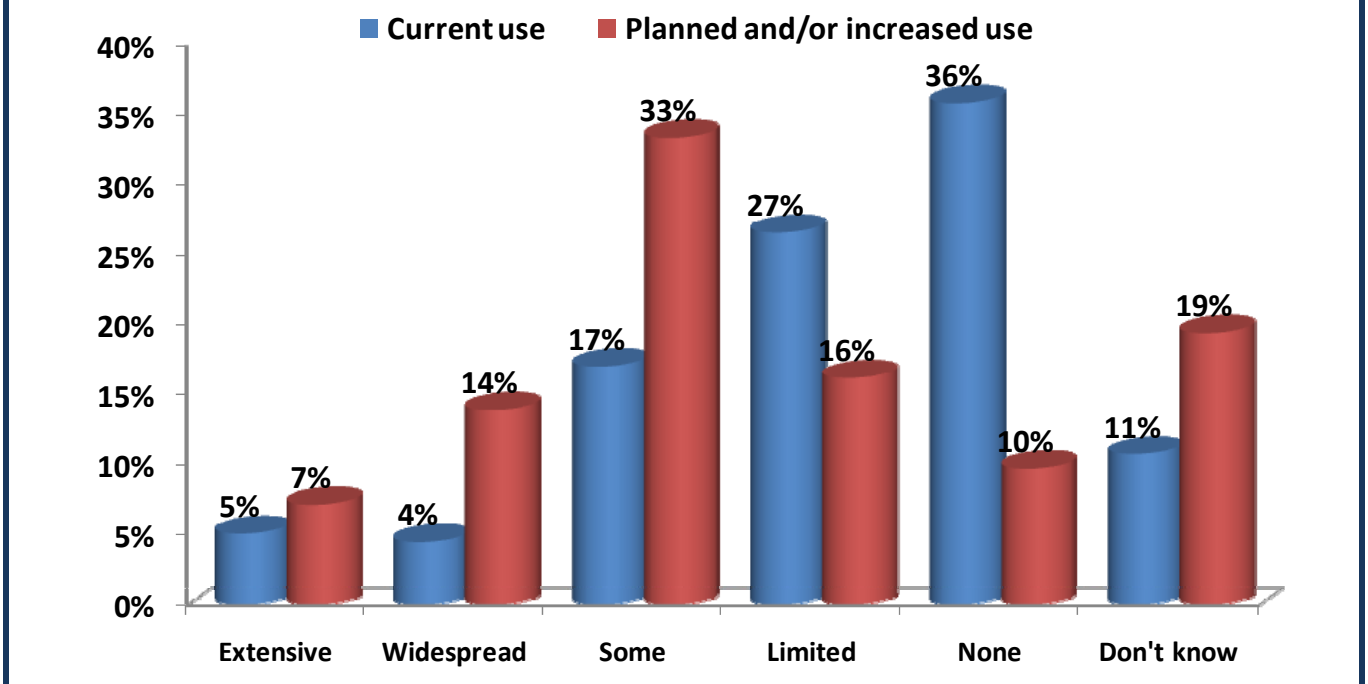
Third-party IPT Management Tool Use

However, end-users are not stoically enduring their dissatisfaction, but instead are responding to their displeasure by implementing third-party IPT management products or planning to make increased use of them in the future (**Figure 3**). The question asked about "planned and/or increased usage" in order to include both new and expanded deployments of IPT monitoring tools. This wording was chosen so that both companies planning new deployments and those with existing deployments with plans to increase their usage would be included in the question about future use. The vast majority of users have not been making any use of third-party IPT management tools at all, with only 9% of respondents describing their company's use of them as "widespread" or "extensive," and almost half of all survey-takers reporting that they either do not use third-party tools or are not sure whether they use them. However, when asked about their planned use of third-party tools, respondents overwhelmingly signaled an interest in employing them, with only 10% indicating that they had no plans at this time to utilize third-party tools to manage their telephony.

The respondents also indicate the possibility for explosive growth in the market for third-party IPT management products. The percentage of survey-takers reporting that they plan to make widespread or extensive use of third-party offerings more than doubles that of those who already do make such use of them, and 54% of respondents intend to make at least "some" use of such tools, more than double the number who already do. The market shows even more potential, however, as 19% of survey respondents were unsure what their plans were concerning future usage of third-party products.

The responses also support the anecdotal evidence that companies tend to purchase useful technologies first and then worry about management issues as their deployments mature. While this finding feels like common sense – there should exist a level of deployment worth the effort and cost of managing before

Figure 3. 3rd-Party IPT Management Usage



To what extent are you using and/or planning to use 3rd-Party IPT management products?

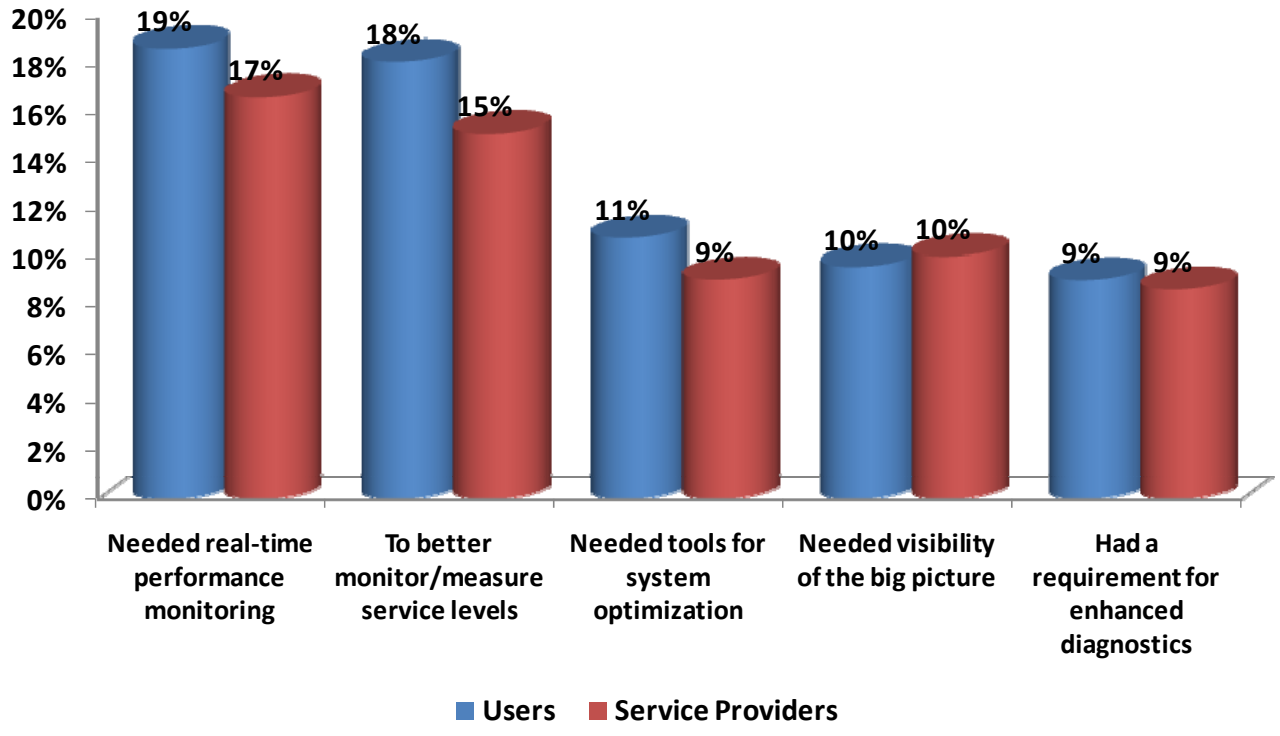
managing should begin – the level of dissatisfaction that consumers feel with their monitoring capabilities serves as a cautionary tale. Solutions do exist for management tasks, so end-users could consider carefully the growth in size and complexity of their telephony in order to head off potentially costly problems before they start.

Purchase Drivers

Survey-takers were also asked to name their top three drivers for purchasing third-party IPT management tools, actual or speculative (**Figure 4**). The top two responses, that consumers needed real-time performance monitoring or needed better monitoring of service levels, directly address the features of IPT management that were both most important and most frustrating to end-users. In this case, service providers seem to have a good idea of the reasons why their customers purchase their products.

Although this paper only presents the top five responses, there were several other options in the survey, including that third-party tools would eliminate finger-pointing between IT teams, were necessary for managing systems from multiple IPT systems, and that they were required for capacity planning. A fuller treatment of this data will appear in a forthcoming paper.

Figure 4. Top Purchase Drivers



What were (or would be) your top three drivers for purchasing/using third-party tools designed for IPT monitoring and management?

Conclusion

IPT deployments have grown to the point that many users are experiencing frustration with their current ability to manage them. Some companies have turned to third-party IPT management products to solve their problems, and many more intend to do the same. The primary reasons that consumers give for deploying these tools are closely related to their dissatisfaction with their monitoring capabilities.

Cost-effective management is a key to success, and it's time for the IP Telephony world to move their management capabilities to the next level.

Third-Party IPT Management Poised for Rapid Deployment

Introduction and Key Findings

The entire survey database for the 2008 IP Telephony (IPT) Management State-of-the Market Survey includes responses from end-users, service providers, and equipment manufacturers. This analysis, however, utilizes responses only from respondents who indicated they were an "End-User, including enterprise, government, education, etc., and I will be representing my own experiences." A detailed analysis of this group reveals that several sub-groups of end users exhibit trends that differ from those of end users as a whole.

The key findings of this more focused analysis are:

- Smaller companies tend to have IPT deployments that are more complete than larger companies.
- Large companies plan to make more significant use of third-party IPT management products in the future than small ones.
- Both IPT deployments and the use of third-party IPT management products are expected to grow rapidly over the next two years.[2]
- Organizations with more complete IPT deployments make greater use of third-party IPT management products, but all organizations plan to make increased use of them.

This is the second part of the **2008 IP Telephony Management Series**.

IPT and IPT Management Deployment

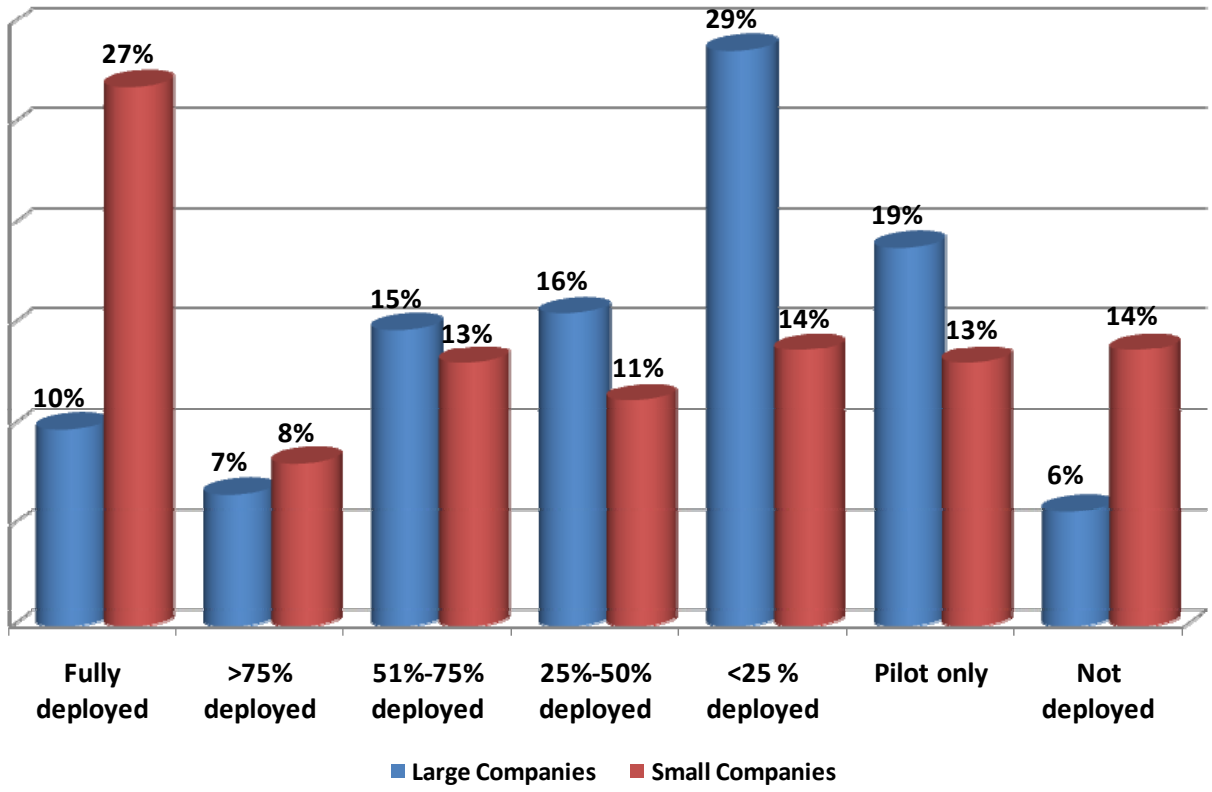
For the purposes of this discussion, a "large" company or organization is defined as one having 5,000 or more employees, and a "small" company or organization is one of less than 5,000 employees. This division splits our respondents essentially in half, with 57% being from "small" companies, and 43% identifying themselves as being from "large" ones. Organizations of such different sizes, unsurprisingly, show large differences in the extent to which they have deployed IPT systems (**Figure 1**). Large companies mostly follow a bell curve skewed toward a lack of full deployment, with the majority of organizations (54%) being less than 25% deployed, and the vast majority (70%) being less than half deployed. This result is to be expected because of the cost, complexity, and effort involved in deploying large IPT systems.

Small companies, on the other hand, show much more diversity in their IPT deployment completion, with 48% being more than half deployed. This is likely due, at least in part, to the diversity among small organizations themselves, as the difficulty in deploying IPT differs greatly between a company with a handful of employees and one with a few thousand.

[2] The worldwide economy is in a state of flux. The data was collected prior to the current situation, so the term "rapidly" is a relative term. Nevertheless, IPT and effective IPT management represent a method by which companies can operate more economically, so we still feel that the overall future for these products is relatively bright.

One of the more striking differences between large and small companies is the relatively high percentage of small companies that are fully deployed (27%), with roughly half as many (14%) showing no deployment. Clearly, this is because a smaller company is more likely to be in an "all or nothing" state simply due to the size of the organization.

Figure 1. IPT Deployment Completion For Large- and Small-Company Respondents

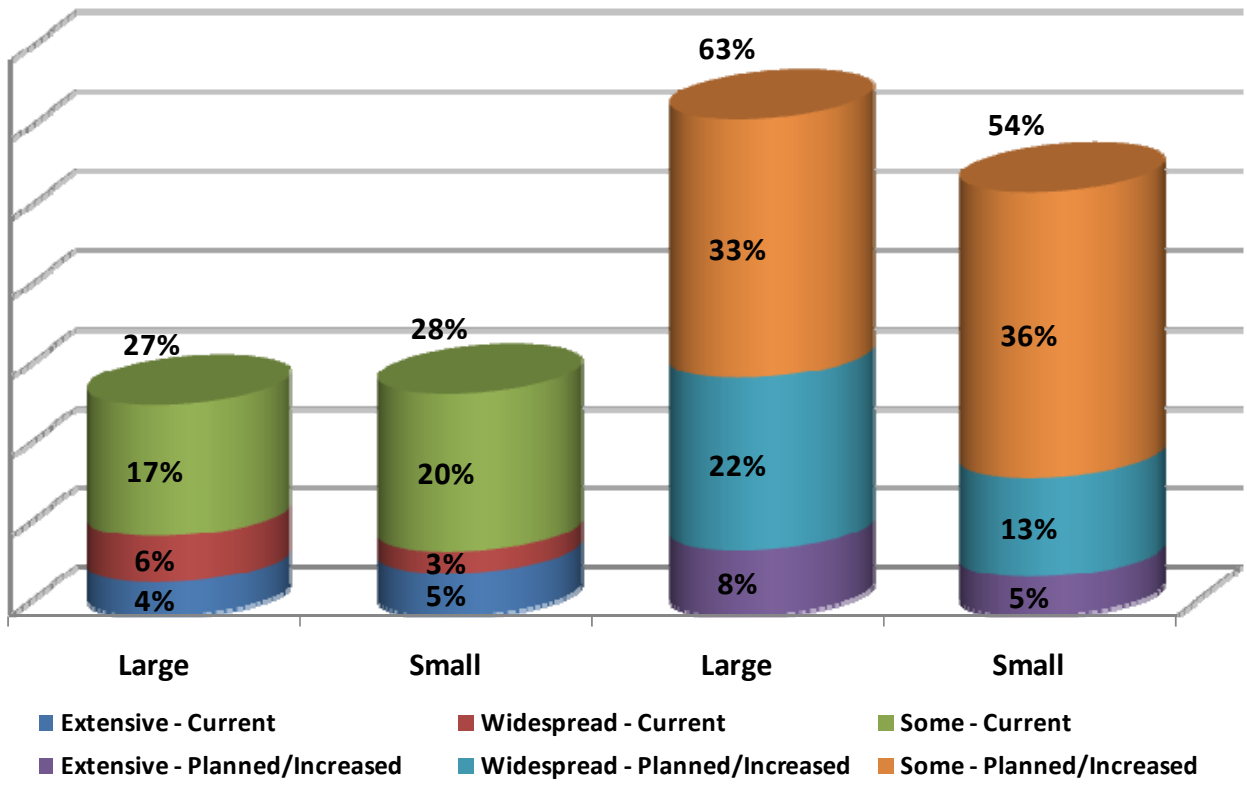


Many organizations have complete IPT deployments, with small companies leading the way.

It is also noteworthy that few respondents from both large and small organizations reported that they were more than 75% deployed, rather than fully deployed. This deviation from the bell curve (also present in the general trends for end users as a whole) suggests that companies of all sizes that reach such a degree of IPT deployment finish that deployment rapidly, rather than leave it sitting so close to completion, or that IPT deployments start slowly before reaching some critical level. A company might, for example, begin a relatively small IPT program in order to avoid major business disruptions due to difficulties with either deployment itself or IPT management, and then swiftly complete the IPT rollout once the initial difficulties have been resolved.

Large companies currently make use of third-party IPT management products at a similar rate to small ones, but plan to make greater use of them in the future (**Figure 2**). 27% of respondents from large organizations report at least "some" current use of IPT management products, compared to 28% from small organizations.

Figure 2. Use of Third-party IPT Management Products, Current and Planned/Increased



A large majority of organizations of all kinds are planning to make significant use of third-party IPT management products.

While not shown in Figure 2, the responses indicated that small companies are most likely to make no use of these tools (41%), while large companies are nearly equally likely to make no use (32%) or only limited use of them (33%). These differences are probably due to both the size of even incomplete deployments of large companies and the finding that large companies are almost twice as likely to use IPT systems from more than one supplier (41% for large; 26% for small), making it more likely that these companies will find a need for more sophisticated IPT management solutions.

Unsurprisingly, then, respondents from large organizations report much higher planned or increased use of third party IPT management products generally (63% report at least some planned use; 54% for small), and in particular are far more likely to report extensive or widespread planned use of them (30% for large, 18% for small). Moreover, the percentage of respondents from small companies that plan to make widespread use of third party IPT management products is identical to the percentage that already use them at that level, whereas the number of large companies planning widespread use doubles. Since small companies tend to have more complete IPT deployments than large ones, it is possible that nearly all those who need to use third party IPT management tools extensively already have a mature IPT deployment, complete with sufficient management tools.

Third party IPT management products will become an increasingly important aspect of IPT, as only a small percentage of respondents plan to make no use of them in the future; the vast majority of

organizations are looking to third party tools to manage their increasingly complex IPT deployments. Interestingly, significant percentages of respondents do not yet know their future plans (14% from large companies, 17%from small ones), so in order for these organizations to make use of third-party IPT management tools, some education may be necessary.

Deployment Stage and Use of IPT Management Tools

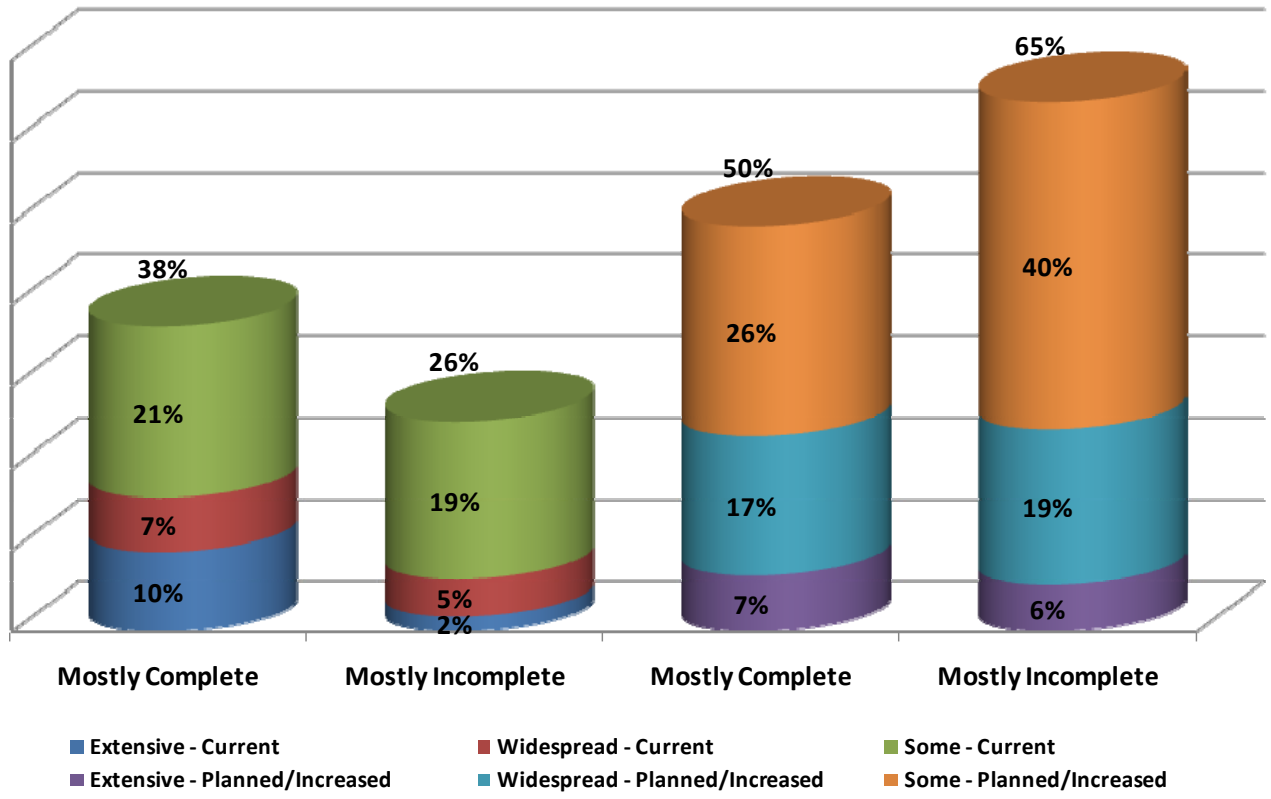
Like survey-takers from large and small companies, respondents from organizations with mostly complete IPT deployments (defined as >50% deployed) show interesting differences from those from organizations with mostly incomplete deployments (50% or less deployed). As one might expect, respondents who report that their IPT deployment is mostly complete expect IPT to be their primary telephony technology much sooner than their mostly incomplete counterparts. In fact, 63% say that IPT already is their primary telephony, with an additional 11% expecting IPT to be their primary telephony technology by the end of 2009. By contrast, 61% of respondents from organizations with mostly incomplete deployments expect IPT to be their primary telephony technology during 2010-2011 (36%) or later (25%).

When asked to rate their familiarity with third party IPT management tools from 1 to 5, with 5 being "extremely familiar" and 1 being "never heard of them," survey-takers from organizations with mostly complete deployments averaged a familiarity of 2.93, while those from organizations with mostly incomplete deployments averaged 2.72. When viewed by company size, the respondents from small companies indicated a familiarity of 2.76, and those from larger companies averaged an almost equal 2.81. While one might expect the larger companies with more complete deployments to be more aware of these products, this near-parity is quite understandable based on the survey base, which consisted primarily of the Webtorials user base (which tends to be representative of "thought leaders" in the industry) and users who had previously been contacted by PROGNOSIS (the survey sponsor). Nevertheless, the fact that all of these averages are still below 4.0 indicates that there is still a significant educational challenge, and this report series is in part dedicated to meeting that need.

Overall, respondents from companies with mostly complete deployments report higher levels of current usage of third party IPT management products, but survey-takers from companies with mostly incomplete deployments indicate that their planned usage of them will catch up (**Figure 3**). This seems self-evident, but it is interesting to note that a greater number of companies with mostly incomplete deployments intend to make at least some use of third party IPT management products in the future (65%) compared to those with mostly complete deployments (50%). This finding is probably closely related to the above finding that large companies are likely to have a less complete IPT deployment because of their size.

It is also noteworthy that a significant percentage of respondents from organizations with mostly incomplete IPT deployments (41%) are currently making no use of third party IPT management tools, and another 29% are making only limited use of them. This data seems to support the theory that organizations make the decision to begin deploying IPT technologies either without giving thought to management solutions, or simply wait until they become more necessary, such as when a major problem occurs.

Figure 3. Use of Third-party IPT Management Products, Current and Planned/Increased



Organizations increasingly see the need for third-party management tools as their IPT deployments grow.

Common Ground

No matter how the subgroups were broken out, the vast majority of companies manage IPT mostly on their own. Of those respondents indicating their use of in-house versus managed services, 60% of respondents indicated that their organization did so entirely in house. An additional 21% replied that their company employed limited external management, for a total of 81% of companies mostly managing their own deployments. This is consistent, by the way, with most survey results from the rather do-it-yourself-minded Webtorials community.

IPT deployments, as we have seen above, are expected to grow rapidly in coming years. It is quite possible that as this market matures and IPT deployments grow in size and complexity, more organizations may turn to managed services. In looking at the current data from the "half-full" managed-services perspective, 40% are currently using these services to some extent.[3]

[3] Again, as noted above, the impact of the current worldwide economic conditions are unknown. If managed services are offered in a way that they are more cost-effective than in-house management, this could have a significant impact. Clearly, this is a question that will be tracked in future iterations of this report series.

Conclusion

In today's IPT and third party IPT management product markets, great diversity exists, as companies of all kinds are drawn to IPT's benefits. Large companies lag behind smaller ones in completing their IPT deployments, but are equally likely to be using third-party IPT management products. Organizations of all sizes, however, plan to expand both their IPT deployments and their use of third-party management tools, with large companies intending to use third-party IPT management products more extensively than small ones. The bottom line is that regardless of the current stage of deployment and all of the myriad factors discussed above, the users recognize an eventual need for robust third-party IPT management tools to support their fully deployed network, and are overwhelmingly planning to make significant use of them. In light of this recognition, it is important for organizations to learn from others' experiences and make plans to implement these IPT management tools before some crisis mandates them.

Drivers for Third-Party IPT Management

Introduction and Key Findings

The survey database for the 2008 IP Telephony (IPT) Management State-of-the Market Survey includes responses from end-users, service providers, and equipment manufacturers, but discussion has so far focused on end-user responses. This analysis, however, uses responses from both end-users representing their own experiences and service providers representing their impression of their customers' experience.

This part explores what the purchase drivers are for third-party IPT management tools, going into more detail than the series-opening webcast. The key findings of this analysis are:

- The biggest reasons that users purchase third-party IPT management tools are to monitor performance in real time and to obtain improved capabilities to measure service levels.
- Few users recognize the need for third-party IPT management tools from the beginning of their IPT deployment.
- Few users predict that they will deploy an additional vendor's IPT system in the next five years.
- The reasons users think they might deploy an additional vendor's IPT system differ significantly from the reasons given by users that have already deployed additional IPT systems.
- Service providers perceive their customers as having somewhat different priorities than those that their customers report.

This is the third chapter in the 5-part **2008 IP Telephony Management Series.** Additional publications including documents, a webcast, demographics, and background information are available at **http://webtorials.com/abstracts/2008-IPT-Management.htm**.

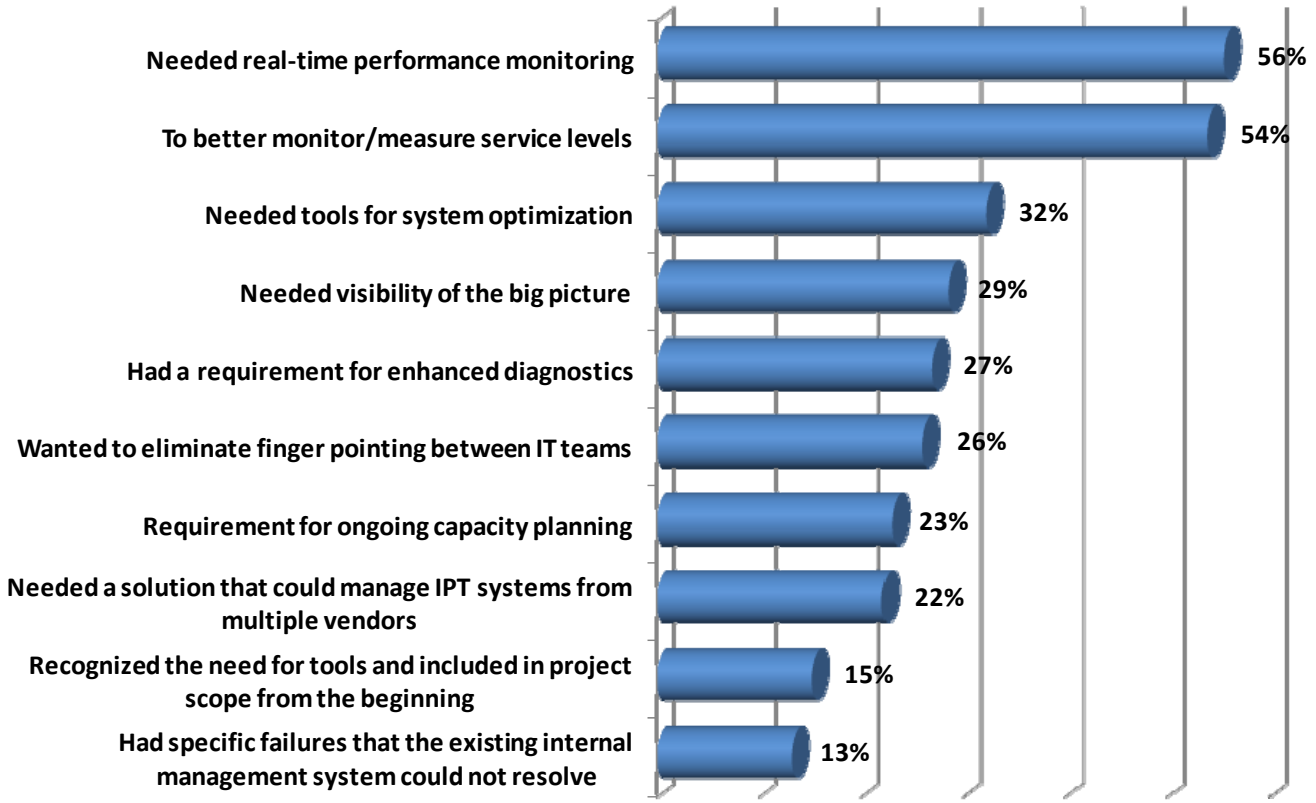
End User Purchase Drivers

Survey-takers were asked to indicate what were (or would be) their top three drivers for purchasing third-party tools specifically designed for IPT monitoring and management. Respondents were allowed to select exactly three reasons, so their responses are presented as a percentage of respondents who chose each reason (**Figure 1**).

End-users are overwhelmingly interested in purchasing third-party IPT management products for real-time performance monitoring (56%) and better monitoring or management of service levels (54%). Indeed, the top five reported actual or potential purchase drivers are in some way related to the goal of providing high quality IPT service. This makes a lot of sense in light of the finding discussed in the webcast (and examined more closely in an upcoming paper) that end-users are most dissatisfied with their current IPT management capabilities in precisely this area. It's no surprise that the most end-users were drawn to the ability to monitor performance in real-time since the cause of interruptions in IPT service can be difficult to find and diagnose after the fact. Similarly, better monitoring and management of service levels is essential for IPT management because telephony is less tolerant of delay – especially jitter - than other applications that don't require real time transmission of voice data.

IPT managers absolutely must be able to get high quality, high precision data about service levels because of the critical dependence telephony has on networks and high expectations people have of it.

Figure 1: Purchase Drivers of Third-Party IPT Management Products for End-Users



What were (or would be) your TOP THREE drivers for purchasing/using third-party tools specifically designed for IPT monitoring and management?

The next three most popular third-party IPT management product purchase drivers, "needed tools for system optimization" (32%), "needed visibility of the big picture" (29%), and "had a requirement for enhanced diagnostics" (27%) all likewise relate to the management goal of providing good service for the users of IPT. System optimization and big picture visibility are important for proactive, rather than reactive, management of an IPT deployment. Enhanced capabilities for meeting these goals are an obvious draw for IPT managers who would rather not spend all their time fighting performance difficulties. Enhanced diagnostics likewise allow for more efficient use of time and a better idea of where service-impacting problems occur, saving IPT managers countless headaches.

Some of the less popular choices are also service-related. End-users who sought out third-party IPT management products for assistance with ongoing capacity planning (23%) were wise to acquire the needed tools to avoid problems like those experienced by the majority of respondents. A similar percentage of respondents needed to manage IPT systems from multiple vendors (22%), and without purchasing a third-party IPT management product would need to use each vendor's own management tools and thereby lack a unified view. A need to manage their entire network similarly drove those who had specific failures their existing management system could not resolve (13%). Rather than live with these failures (indeed, they might not have been able to), they chose a third-party IPT management product to help monitor their network.

Nevertheless, a significant number of end-users were interested in third-party IPT management products for non-service reasons as well. Wanting to eliminate finger-pointing between IT teams was the sixth most popular driver for purchase of such products (26%). The compartmentalized nature of many IT departments due to lingering historical divisions is the root cause here, as the lack of a unified view results in each group seeing different aspects of the problem, preventing anyone from pinpointing the exact difficulty. A comprehensive view of the entire network is essential for efficient, quality troubleshooting.

Also noteworthy is the small percentage of respondents who reported that their organization recognized the eventual need for third-party IPT management products and included them from the beginning of the project (15%). IPT deployments are a significant and complicated undertaking, and telephony, as noted above, can be difficult to manage because of its unique demands on a network. End-users should be aware of the costs that poor service and extra time spent on management tasks incur. Consequently, they need to seek the right level of third-party support to help them manage their network properly from the beginning. This will help avert the service-related problems that inevitably crop up, and they will have the best possible proactive management from the beginning rather than waiting and turning to third-party IPT management tools reactively.

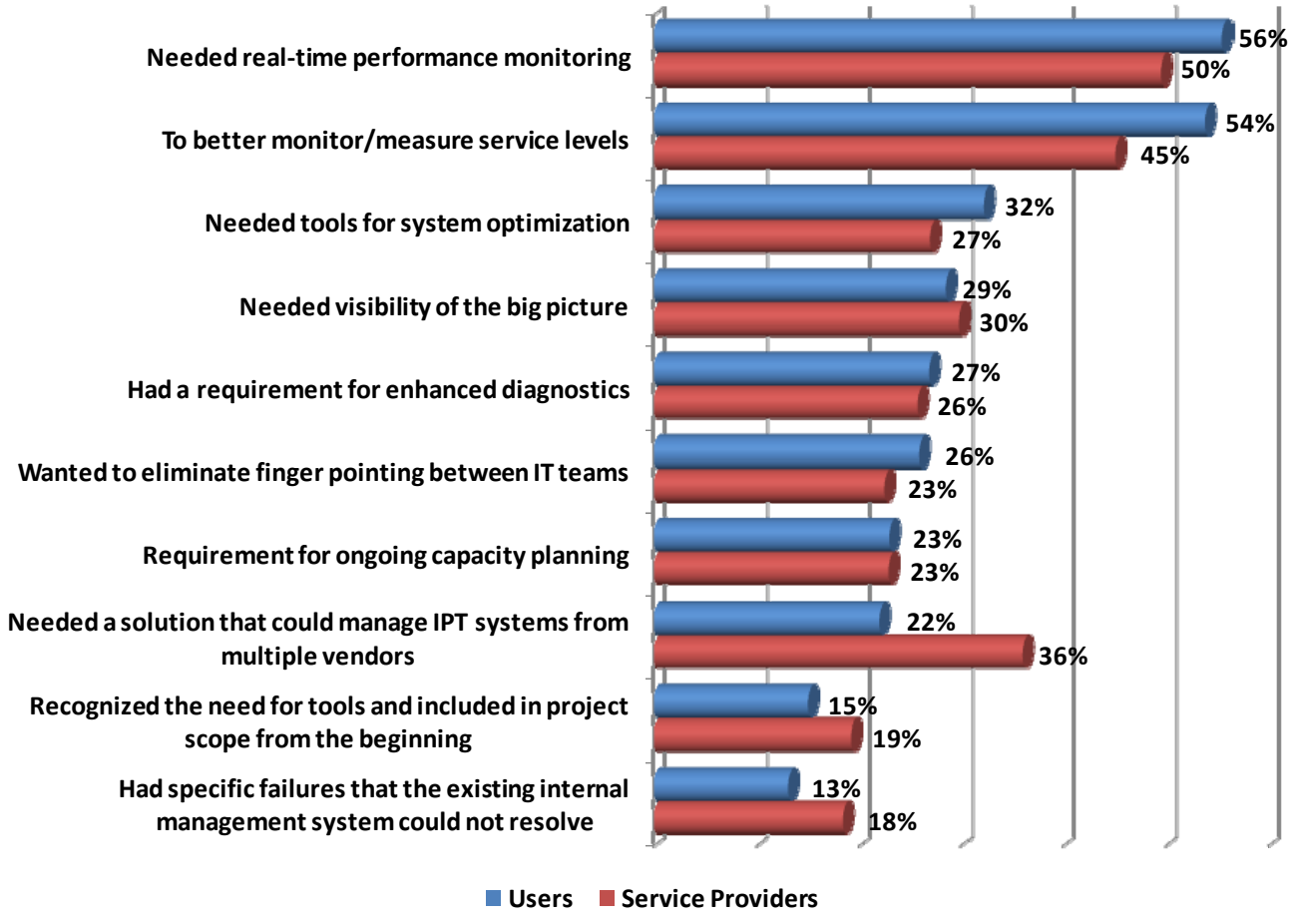
The Service Provider Perspective

There were also several interesting results from survey-takers who were service providers representing a best estimate of their customers' experiences (**Figure 2**).

The most dramatic difference between service providers' perceptions and end-users' reported third-party IPT management purchase drivers is that service providers think customers are more drawn by their multi-platform capabilities than their customers report (36% vs. 22%). While multi-platform capabilities are important (crucially so to multi-platform users), responses to this survey have indicated that the majority of end-users (69%) do not yet make use of more than one IPT platform and also consider it unlikely that they will make use of more than one platform in the future (see below for more discussion). There is no doubt that the capability to manage IPT systems from multiple vendors is an important one, and one that may grow even more important in today's uncertain economic times.

Multiple IPT Systems and Multiple IPT System Drivers

Figure 2. End-User Purchase Drivers and Service Providers' Perceptions of Purchase Drivers

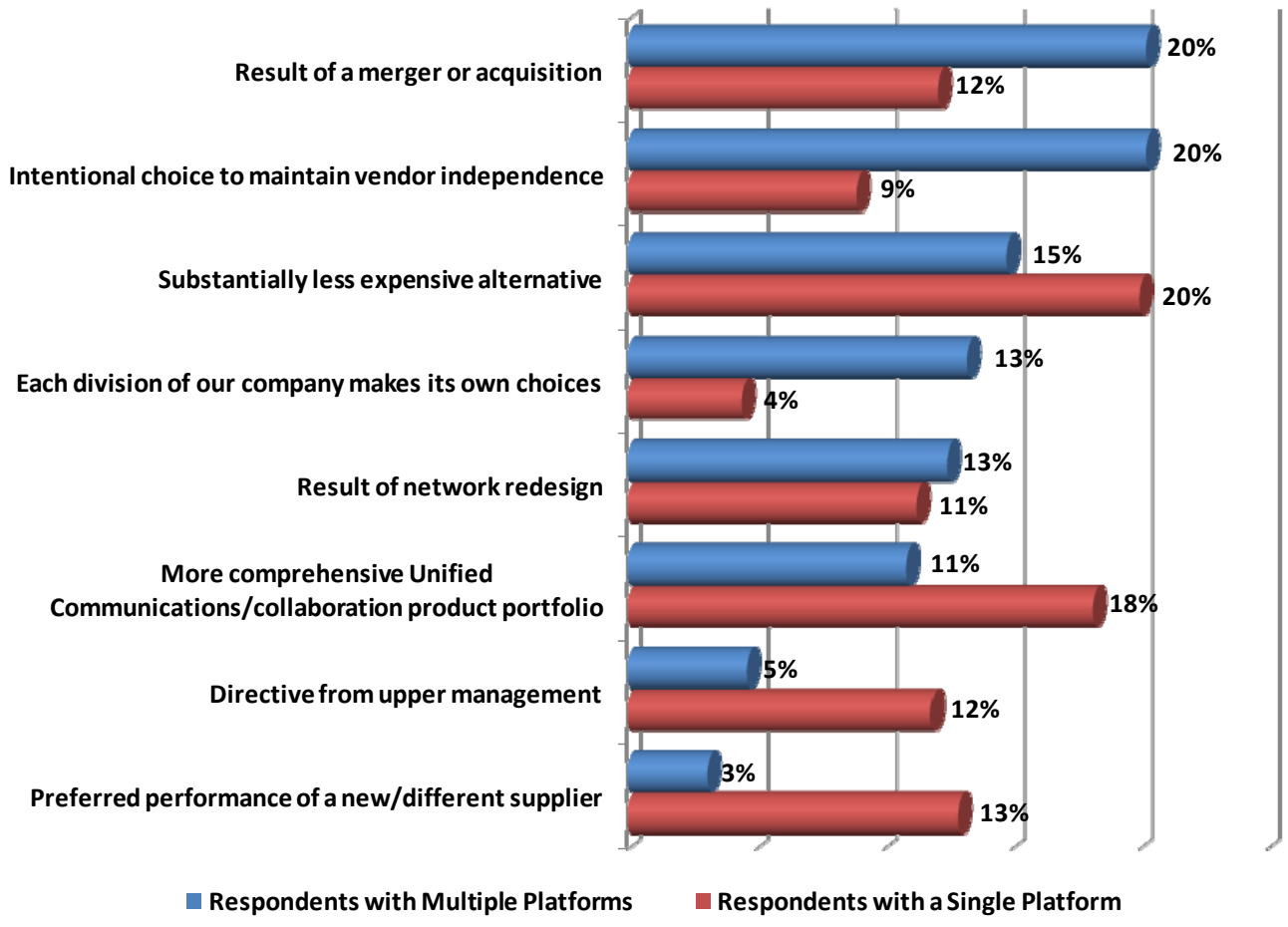


What do you perceive to be the TOP THREE drivers for purchasing/using third-party tools specifically designed for IPT monitoring and management?

As noted above, 31% of users already employ multiple IPT platforms, which is somewhat surprising considering the relative youth of IP Telephony as a mainstream solution. Survey-takers who reported that they did employ multiple IPT platforms were asked the primary reasons for having more than one platform, and survey-takers who reported that they did not were asked the primary reasons they might eventually have more than one platform. Since respondents were asked to check all that applied, their responses are presented as a percentage of the total responses, to balance the influence of respondents who chose differing numbers of answer choices (**Figure 3**).

Respondents with a single platform are understandably focused on cost; "substantially less expensive alternative" accounted for 20% of the total responses. Interestingly, "more comprehensive Unified Communications/collaboration product portfolio" was also a huge draw, accounting for 18% of the total responses. This result speaks to the growing importance and use of UC technologies for enterprise customers. The third most popular potential purchase driver, "preferred performance of a new/different supplier" (13%), is also no surprise, but it is significant that performance netted far fewer responses than the top two purchase drivers. Changing or adding IPT platforms can incur significant costs in time and money, and employees may need to be trained to use and manage the new systems. Respondents seem to be indicating that a substantial improvement in performance would be necessary to outweigh cost or UC product availability.

Figure 3: Actual versus Anticipated Multiple IPT System Use Drivers



What are the primary reasons that you have (or would have) more than one system/platform?

The most illuminating results, however, come from comparison of single IPT platform users' responses with those of users respondents with multiple platforms. For multiple IPT platform users, the top two reasons that they did decide to employ multiple platforms were "result of a merger or acquisition" and "intentional choice to maintain vendor independence" (both 20% of total responses), in stark contrast with single platform users' expectations. It is worth noting that this survey was taken in June, before the instability in the global economy was totally apparent. Mergers and acquisitions are a reality of the market in even the best of times, and it is quite possible that the current market disquiet will lead to more consolidation, resulting in even more mixed IPT deployments. The fourth most popular multiple IPT platform user response, "each division of our company makes its own choices" (13%) may also stem from the prevalence of mergers and acquisitions. This trend will be interesting to watch in future surveys.

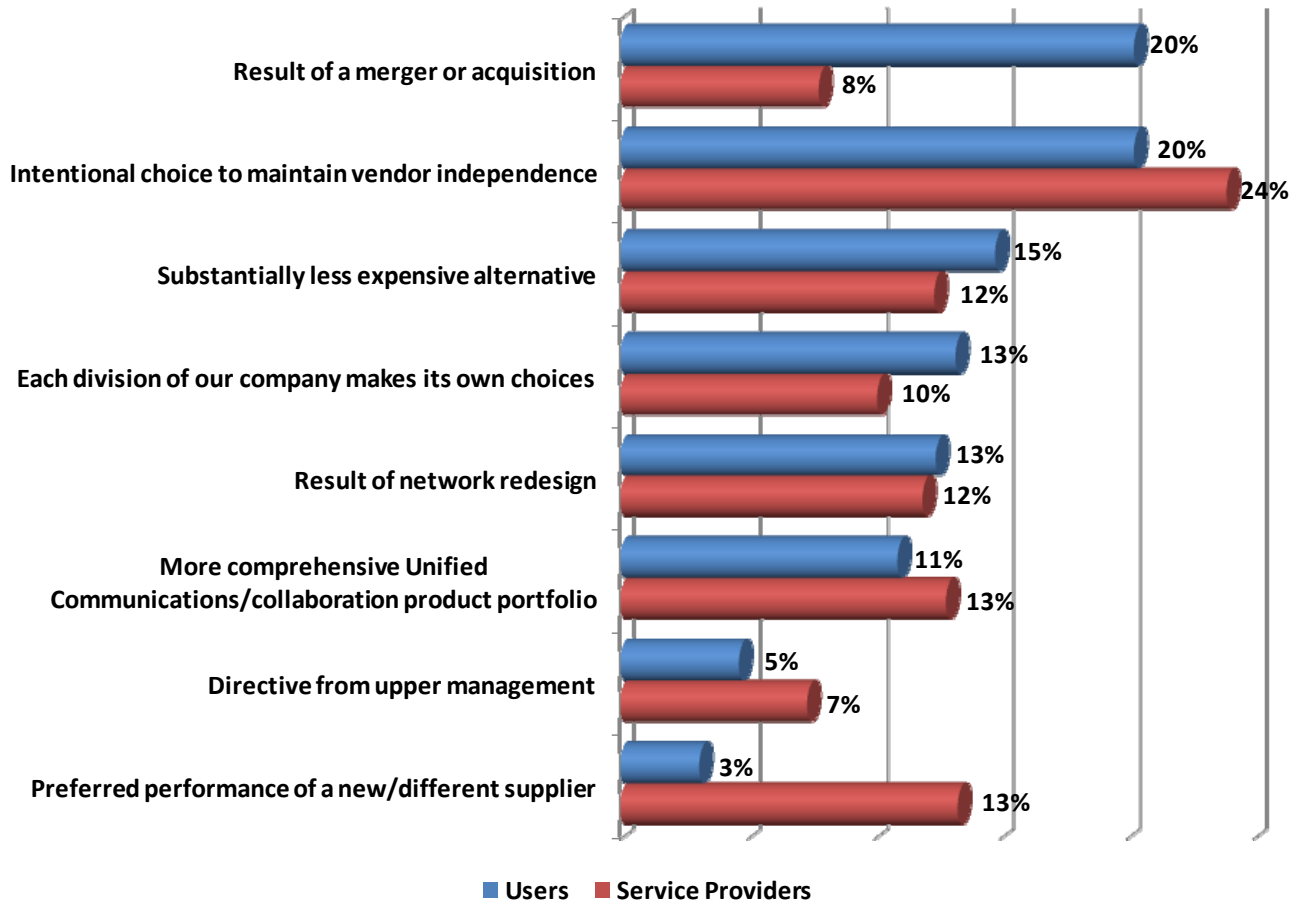
Overall, single platform users' answers are product-oriented, anticipating product-related reasons they might become multiple IPT platform users, while multiple platform users' answers indicate that the most significant reasons for using multiple IPT platforms are business-related. A potential explanation consistent with these results is that most organizations do not choose to deploy more than one IPT platform because the product-related reasons do not distinguish significantly between IPT platforms after the initial decision to deploy IPT has been made, but that acquisitions disturb this equilibrium by uniting different IPT systems.

Similar interesting divisions exist between multiple IPT platform users and their service providers (**Figure 4**). While service providers of multiple platform users have picked up on their customers' choices to maintain vendor independence (20% user vs. 24% service provider), they also underestimate the importance of mergers and acquisitions (20% user, 8% service provider), while overstating the importance of the preferred performance of the new or different supplier (3% user, 13% service provider).

Conclusion

The benefits of third-party IPT management products are drawing many users to employ them. Service-related reasons are the top purchase drivers for such products, with real-time performance monitoring and better monitoring/measuring of service levels gaining the most attention. Interestingly, business-related reasons dominate among those users who employ multiple IPT platforms, while product-related reasons dominate among single-system users considering why they might purchase an additional system. End-users would be well advised to consider implementing third-party IPT management tools from the beginning to avoid critical service level issues and plan better for the future of their IPT deployment. As IPT deployments become more common and more complex, they will naturally become more important, and the success of these deployments depends on having the right management tools for this specialized job.

Figure 4: Multiple IPT Platform Users' Purchase Drivers and Service Providers' Perceptions



What are the primary reasons that you have (or would have) more than one system/platform?

IPT Monitoring and Management Total Customer Experience

Introduction and Key Findings

This analysis examines end-user responses from the survey database for the 2008 IP Telephony (IPT) Management State-of-the Market Survey and illustrates what end-users consider the most important elements of IPT monitoring and management, as well as how satisfied they are with their IPT monitoring and management capabilities. In presenting these findings, this paper employs the Webtorials Total Customer Experience (TCE) Methodology[4]. The purpose of the TCE Methodology is to make emphasize which areas are most in need of attention by plotting importance on one axis and dissatisfaction on the other.

The key findings of this analysis are:

- Users consider voice quality over the network, voice-related network parameters, and bandwidth utilization the three most important aspects of IPT to monitor.
- Users consider troubleshooting and diagnostics, monitoring voice quality, and the overall network the three most important IPT management tasks.
- Users tend to be most dissatisfied with their IPT monitoring and management capabilities for the tasks they consider most important.
- Third-party IPT management tools exist to provide additional capabilities, and significantly higher levels of satisfaction can be achieved by implementation of these tools.

This is the fourth chapter in the 5-part **2008 IP Telephony Management Series**. The first chapter includes both a webcast and an executive summary, while the second delves into the size and completion of respondents' IPT deployments and explores their third-party management product use. The third examines the purchase drivers for third-party IPT management tools.

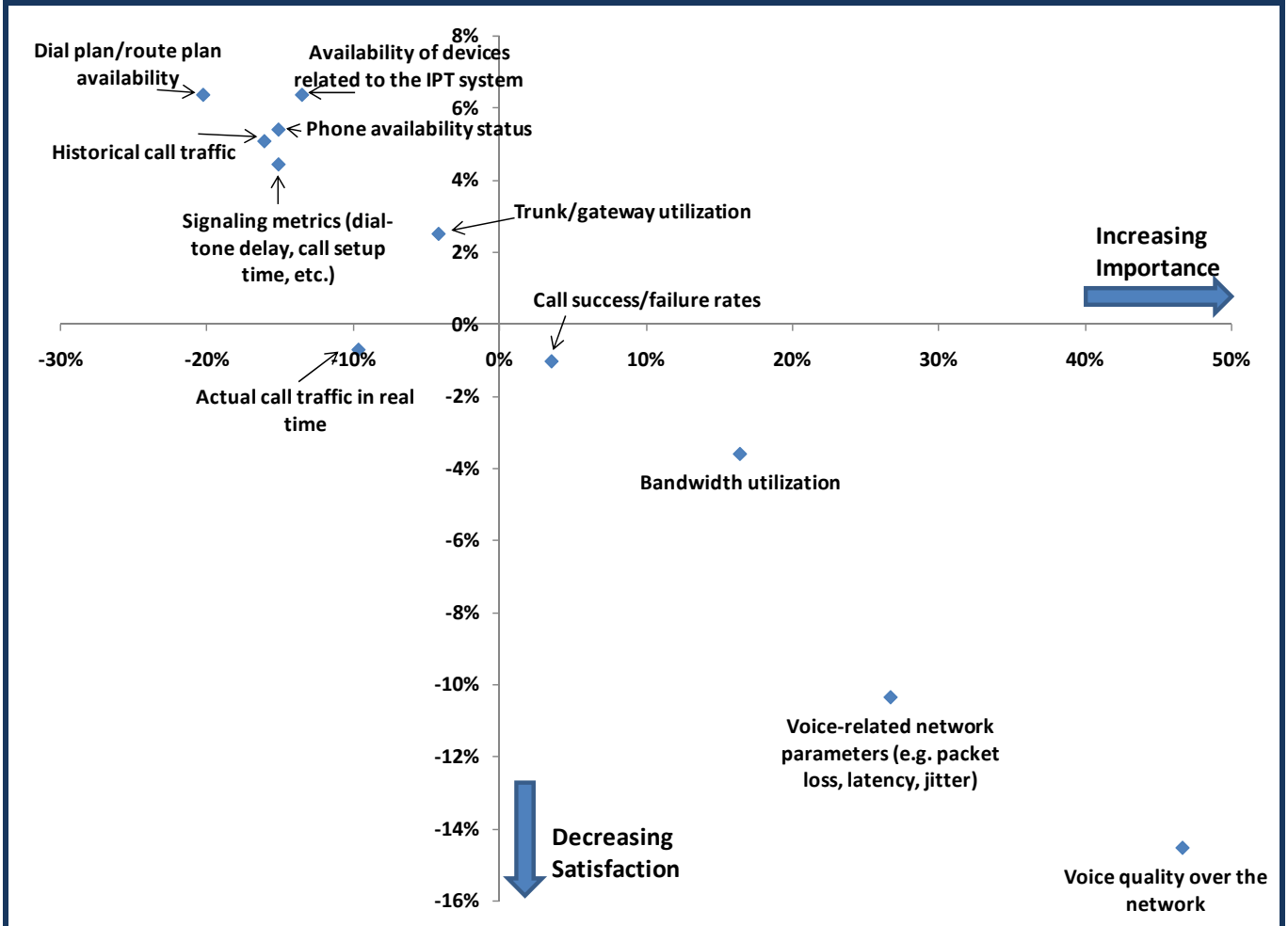
[4] For a complete description of this methodology, please see "Total Customer Experience (TCE) Importance/Satisfaction Methodology" at http://webtorials.com/main/resource/papers/kubernan/TCE-Overview.pdf

IPT Monitoring/Measurement Capabilities

Survey-takers were asked to choose the three most important elements of IPT to be monitored/measured. Then, from their current IPT monitoring/measuring capabilities they were asked to pick the three elements they were least satisfied with. It is important to note that the survey asked for dissatisfaction based on the belief that it is both easier and more meaningful for individuals to identify areas with which they are dissatisfied than those with which they are satisfied. In each case, the average levels of importance and dissatisfaction are calculated, and then the difference from that average is plotted. As such, the bottom right quadrant of the graph is most important because it contains those elements users considered both important and in need of improvement.

It is striking that there is an almost linear correlation between an IPT element's importance and users' dissatisfaction with their current monitoring capabilities; i.e., the more important users consider the ability to monitor, the more dissatisfied they are with their ability to monitor (**Figure 1**). This is in stark contrast to some other studies that have a relatively even distribution of factors in all four quadrants of the graph.

Figure 1: End-users' Relative Importance of vs. Relative Dissatisfaction with IPT Monitoring Capabilities



Generally, as importance to monitor/measure increases, dissatisfaction with capabilities also increases.

Survey takers considered their ability to monitor voice quality over the network most important (47% over average importance), but users were also most dissatisfied with their capability to monitor voice quality (15% over average dissatisfaction).

Voice quality is more difficult to measure with IPT than with traditional telephony, primarily because the path the voice data takes may be different for each call, and may indeed change during a call. Because the main way of measuring voice quality is checking voice-related parameters, it's unsurprising that the ability to measure packet loss, latency and jitter was second for users in both importance and dissatisfaction (27% importance, 10% dissatisfaction). Some packet loss is assumed by the algorithms handling voice data because IPT mainly uses User Datagram Protocol (UDP) (as opposed to TCP) on top of the IP layer for the conversation transmission, which does not attempt to verify that all packets have been received and to resend any missing information. It is important, however, to be able to measure whether the packet loss occurs in bursts or in a relatively regular manner, as it is much more difficult to recover from the loss of a burst of packets.

Similarly, IPT systems are built to accommodate latency – packet delay – so long as it remains below a certain threshold. Absolute latency as such is primarily a function of network design and a certain degree of latency is unavoidable. Jitter – variation in latency – is also a thorny problem for IPT network managers. The VoIP equipment employs a jitter buffer to hold packets for a short time before passing them on in order to provide time for smooth playback, even though the packets may arrive somewhat randomly. However, if there is excessive jitter, some packets may arrive too late to be useful.

Monitoring bandwidth utilization, the third most important element, and likewise the third biggest source of dissatisfaction (16% importance, 4% dissatisfaction), also is more complicated for IPT. In traditional telephony, a call is allotted a set amount of bandwidth, usually 64 kbps, for the call's duration. However, in IPT the network resources are shared among all users, and there is no dedicated bandwidth for any given call[5]. It is important, then, to make sure that enough bandwidth is available in order to prevent packet loss from having too many concurrent calls, thus degrading voice quality. Moreover, end-users understandably want to avoid paying for bandwidth that they don't actually use. The capability to monitor bandwidth utilization accurately prevents both problems.

These three aspects of IPT to be monitored (voice quality over the network, voice-related parameters, and bandwidth utilization) were the only ones that, in respondents' estimations, fell squarely within the quadrant of the TCE graph where both importance and dissatisfaction are high. Call success/failure rates (4% importance, 1% dissatisfaction) is on the edge of this same area, but could easily move to any of the others as respondents' experiences change. Survey takers seem to be relatively pleased with their capabilities to measure any other element of IPT of consequence.

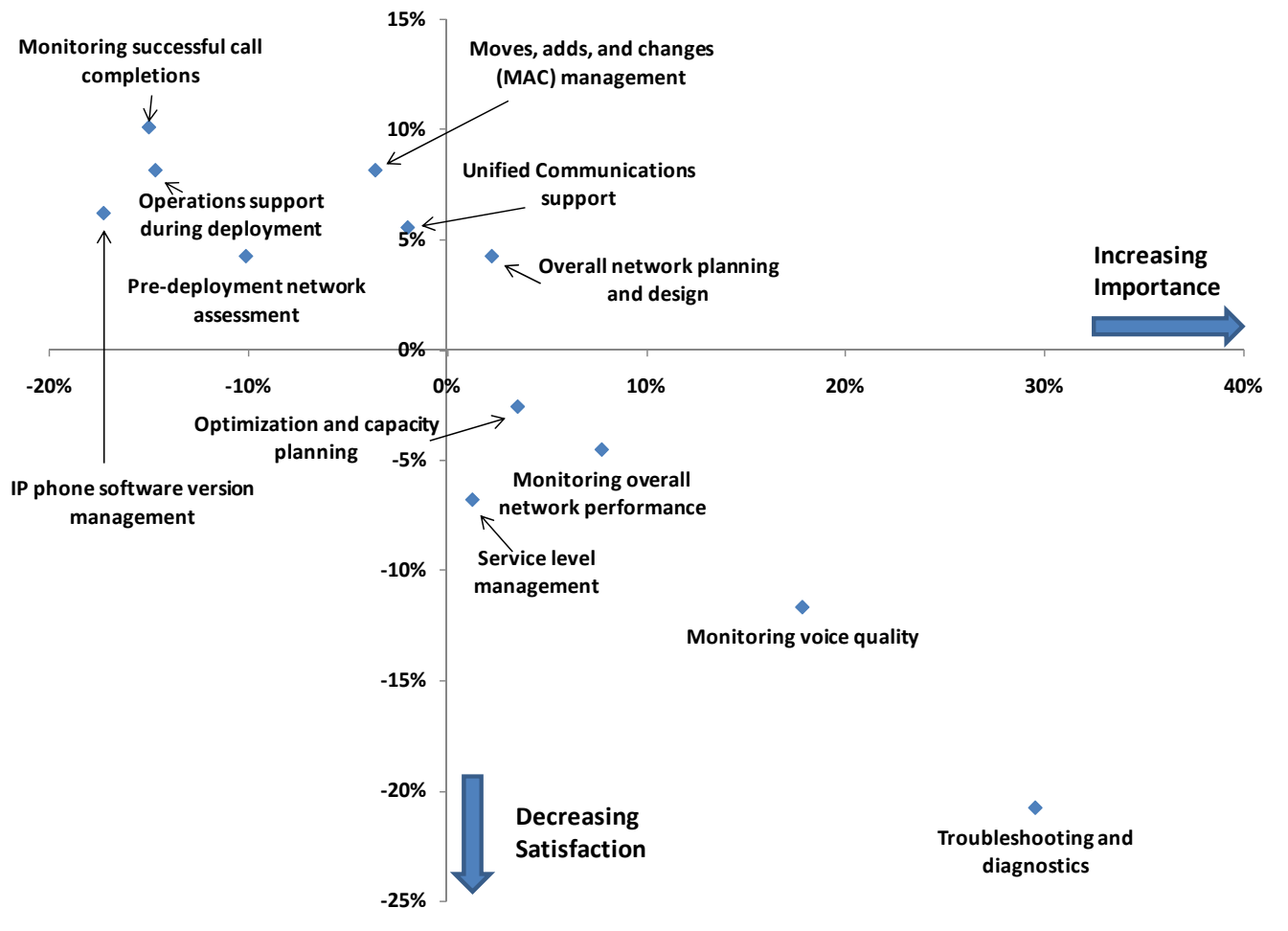
[5] Certain protocols, such as RSVP, may be used to dedicate bandwidth to a call, but this in large part defeats the reason of using on-demand bandwidth for IP telephony. However, sophisticated prioritization schemes exist for giving voice bandwidth priority over other types of information. Nevertheless, there is no reasonable way to prioritize multiple voice calls.

IPT Management Capabilities

Survey-takers were also asked to choose the three most important IPT management tasks, and were then asked to pick the three areas that they were least satisfied with in managing their IPT implementation currently. As before, there is a strong linear correlation between increased importance of an IPT management task and increased end-user dissatisfaction with their capabilities to carry out that task (**Figure 2**).

Troubleshooting and diagnostics was the first choice in importance, and it also attracted the highest levels of dissatisfaction (30% importance, 21% dissatisfaction). This result is unsurprising, given our findings on third-party IPT management tool purchase drivers[6]. Most respondents are interested in third-party

Figure 2: End-users' Relative Importance of vs. Relative Dissatisfaction with IPT Management Capabilities



Another mostly linear trend, with dissatisfaction increasing even faster versus importance than for IPT monitoring capabilities.

management tools for real-time performance monitoring or to better monitor service levels. Both of these tasks are directly related to IPT troubleshooting.

[6] For a full examination of third-party IPT management tool purchase drivers, see the third chapter in the series

Monitoring voice quality (18% importance, 12% dissatisfaction) and monitoring overall network performance (8% importance, 5% dissatisfaction) round out the top three, complementing our results above demonstrating more specific concerns with the ability to monitor voice-related network parameters and bandwidth utilization. These results show a notable bright spot. Users are relatively happy with their management capabilities with respect to overall network planning and design - an important management task.

The survey responses do contain a couple of surprises. For one, end-users are relatively pleased with their capabilities in IP phone software version management and moves, adds, and changes (MACs) management - both potential areas for trouble in IPT deployments. Indeed, software management ranked lowest in importance relative to the other IPT management tasks, indicating that IPT users and system providers have worked together to make it a non-issue.

It is a cause for concern that pre-deployment network assessment ranked so low in importance (10% below the average importance), especially since good pre-deployment assessment could alleviate or prevent many of the other monitoring and management difficulties. Its low importance is especially puzzling when compared with optimization and capacity planning generally, which respondents ranked much higher (2% importance).

The most potentially interesting data point to watch will be end-users' perceptions of the importance of Unified Communications support, along with their dissatisfaction (2% below the average importance, 6% in the positive direction on satisfaction). As Unified Communications technologies continue to be deployed, support for them will naturally increase in importance. Will end-users' frustrations with Unified Communications support capabilities likewise increase, as seems to have happened with other elements of IPT monitoring and management? Much may depend on both the providers' ability to deliver and market new products and the end-users' ability to foresee and address potential difficulties.

Conclusion

End-users are deeply dissatisfied with their capabilities to monitor and manage the aspects of IPT that they consider most important, such as monitoring voice quality or voice-related parameters, or troubleshooting difficulties and managing network performance. The trend for dissatisfaction to increase along with importance is most dramatic in end-users' experience trying to use their current capabilities to manage their IPT deployment.

While seemingly a bleak picture, the good news is that third-party products and services already exist to address these areas of frustration, and end-users are beginning to deploy them more widely in response to their dissatisfaction. As more and more users purchase third-party IPT management tools, their satisfaction should increase dramatically.

Real-World Solutions for Enhanced IP Telephony Management

Introduction

This is the final chapter in the five part **2008 IT Telephony Management Series.** The Webtorials Editorial/Analyst division conducted a survey in June of 2008 asking about IP telephony (IPT) deployment and management and received over 800 responses. The respondents were geographically diverse (only 45% North American) and were fairly evenly divided between end-users (44%) and service providers (37%), with some manufacturers also in the mix. End-users were asked to share their perspectives, while service providers and manufacturers were asked to respond with their perception of their customers' experiences.

As demonstrated in the previous four chapters, analysis of the survey responses produced many interesting findings, for example:

- The large number of survey responses validated our assumption that enough IPT deployments of sufficient size exist to ask questions about IPT management. Indeed, IPT seems poised to become the dominant form of telephony among enterprise users, as 80% of our respondents expected IPT to become their primary telephony technology within two years.
- End-users consider voice quality over the network, voice-related parameters, and bandwidth utilization to be the most important aspects of IPT to monitor. While many IPT users have yet to deploy third-party IPT management products, more than half already plan to do so to obtain the better performance monitoring they seek. In fact, users are the least satisfied with their capability to manage the aspects of IPT they consider most important, such as managing voice quality over the network. Users typically do not anticipate the need for third-party IPT management tools when they begin deploying IPT, but begin deploying them in response to network difficulties.
- IPT management tools also have high utility in managing multiple IPT platforms on the same network – which can result from a merger of two companies using different IPT systems or a desire to maintain vendor independence.

In this final installment of the series, we've invited PROGNOSIS, a leading IP telephony management vendor, to provide a real-world overview of their experiences and how their solutions can significantly enhance the overall reliability and effectiveness of IP telephony.

Other publications including additional documents, a webcast, demographics, and background information are available at **http://webtorials.com/abstracts/2008-IPT-Management.htm**.

PROGNOSIS vital for enhancing IP telephony effectiveness

As a leading IP telephony (IPT) management vendor since 2000, PROGNOSIS has more than one and a half million phones under management around the world. We help large organizations and service providers optimize IPT delivery, resolve problems and significantly increase user satisfaction.

Our intent with this paper is to share some experiences of how organizations use PROGNOSIS to enhance the reliability and cost effectiveness of delivering IPT as a business service.

Quality IPT service delivery doesn't just happen; it needs careful planning and management. We've found that customers who use PROGNOSIS gain the insight needed to identify and resolve issues before they impact the business or its customers.

An interesting and concerning result of the survey is that many customers underestimate the importance of pre-deployment testing. Responses indicate its low importance ranking (-10%)[7] but this changes once service delivery problems occur. Typically, these companies will find fixing problems in a production environment much more expensive than troubleshooting in pre-production[8]. Actively testing the service, voice quality and equipment in the early stages of deployment can save a great deal of headaches, and downtime.

As a specialized management solution, PROGNOSIS is designed to monitor the performance of IP telephony as a business service. Using PROGNOSIS, companies will realize very tangible benefits, such as:

- **A global view of the environment, not just a detailed view of a problem:** A specialized IPT monitoring solution like PROGNOSIS provides a unified view of all IPT networks across multiple vendor platforms and locations.
- **Proactive vs. reactive management:** Specialized IPT management means that potential problems can be anticipated and averted.
- **Ensuring delivery promises are delivered:** Real-time performance monitoring together with operational and management level reports validate availability and performance and enable capacity planning so that delivery promises can be kept.
- **Reducing management time relating to performance issues:** Specialized IPT management allows telephony support personnel to identify issues more quickly and reduce mean time to repair.

We'll now examine each of these points in more detail to find out how companies are using PROGNOSIS to deliver these benefits.

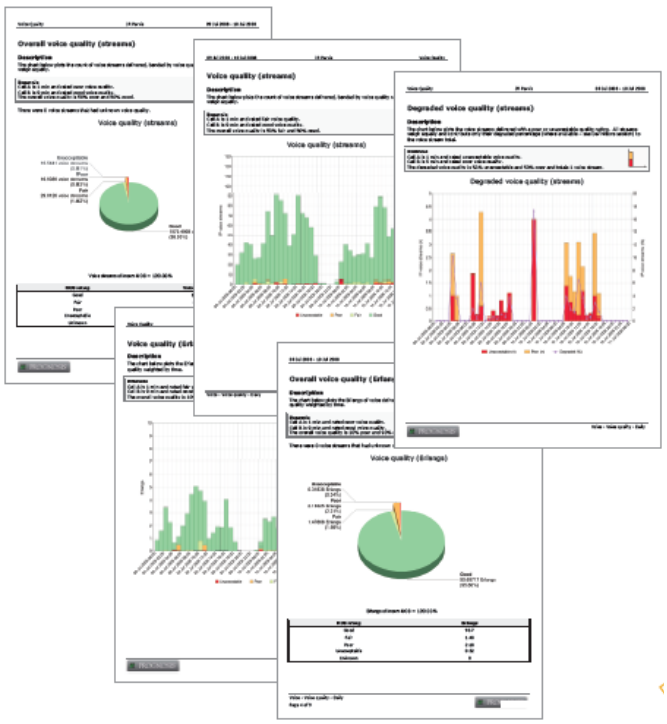
[7] IPT monitoring and management total customer experience, Page 23
[8] Executive overview, Page 4

A global view of the environment, not just a detailed view of a problem

As IPT exists today in many shapes and forms, administrators need a global management view – irrespective of their IP telephony design. Furthermore, the global nature of most large organizations means that the sites they're managing are likely to be extremely dispersed and may incorporate platforms from multiple IPT vendors. An interesting result from the survey was that 31% of respondents already employ multiple IPT platforms. This has come about mainly due to merger and acquisition activity or through an intentional choice to main vendor independence[9].

Changing or adding IPT platforms can incur significant costs in time, money and training. PROGNOSIS allows companies with multiple platforms to receive alerts from a single engine, so they don't have to switch between multiple management tools to manage diverse locations and multi-vendor platforms.

Figure 1: Detailed voice quality reports across multi-vendor IP telephony platforms



PROGNOSIS not only provides management for these environments from a single login, it also meets the individual needs of administrators, delivering highly customized views for monitoring and reporting on overall voice quality, performance, availability and resource utilization.

The majority of organizations and service providers already possess network and event management products, so integration with existing NOC processes and other management tools is also an important consideration. PROGNOSIS is extremely flexible in this regard and many of our customers have integrated PROGNOSIS as part of their overall management toolkit.

This gives them the choice to receive email alerts directly from PROGNOSIS if there's a problem, or for their helpdesk to be notified through their enterprise management system. If necessary, support staff can then drill down with PROGNOSIS to access the deep IPT specific detail it provides.

This approach allows these organizations to fill the management gap that exists between event monitoring solutions, dedicated network management and the unique demands of IP telephony. The benefit for them is they gain a comprehensive view of the entire network, which is essential for efficient, quality troubleshooting.

[9] Drivers for third-party management, Page 17

Proactive vs. reactive management

In an ideal world you'd design the fix before the fault arrives. As companies tend to implement useful technologies like voice first, and then worry about management issues later, they are likely to find that its inclusion in the network will have a negative impact. Voice can cause congestion and affect other applications that have the potential to impact operation of the business as a whole.

A vital step when including voice in a data network is pre-deployment assessment. Many have underestimated the importance of testing and ongoing monitoring, only to pay for it later by having to fix problems in a production environment. This is because the real-time requirements of voice are very different from other applications and for some organizations it's been a challenge to provision the network to cater to these very specific needs.

In fact as the survey reveals, the biggest reasons users purchase IPT management tools are to monitor voice quality in real time and to obtain improved capabilities to measure service levels[10]. PROGNOSIS provides these vital insights together with the visibility administrators need, enabling voice quality to be assessed accurately while avoiding the need to purchase additional hardware or bandwidth without really knowing whether it will solve the problem.

In the early stages of deployment, the root causes of voice quality problems are usually found in the network. PROGNOSIS allows administrators to accurately measure call patterns, gateway usage and busy hour activity to determine what capacity is required before adding more bandwidth.

Even after the system goes live, ongoing network assessment can be used to measure capacity and ensure your ability to accommodate future upgrades and expansions. This is a useful practice to adopt so that bandwidth related problems don't occur at peak times and impact service delivery. Another important reason to monitor bandwidth utilization is to avoid paying for bandwidth that's not required.

Once a network has been optimized, it's still likely to change. When organizations expand and applications get added to the network, there comes a time when network capacity must be increased. Being able to forecast capacity requirements means you can accurately anticipate budget requirements and ensure your expansion has minimal impact on users.

Ensuring delivery promises are delivered

Whether it's reducing carrier, infrastructure and network management costs, improving communications between branch offices, or taking advantage of advanced calling and mobility features, the initial promises of IPT are enticing.

As an example, some customers are moving towards 'virtualizing' their IPT environment by taking advantage of calling and mobility features. One of these features, extension mobility, allows anyone to use any phone at any location. Because users are assigned their extension number when they log on, they can experience access problems.

PROGNOSIS helps IPT managers resolve these problems in two ways. Firstly, it helps track and resolve access related issues that may be specific to a particular phone, group, or even an entire location. Secondly, by providing reports on call load, successful call completions, and calls by extension, it can help measure the success of the virtualization strategy.

[10] Drivers for third-party management, Page 13

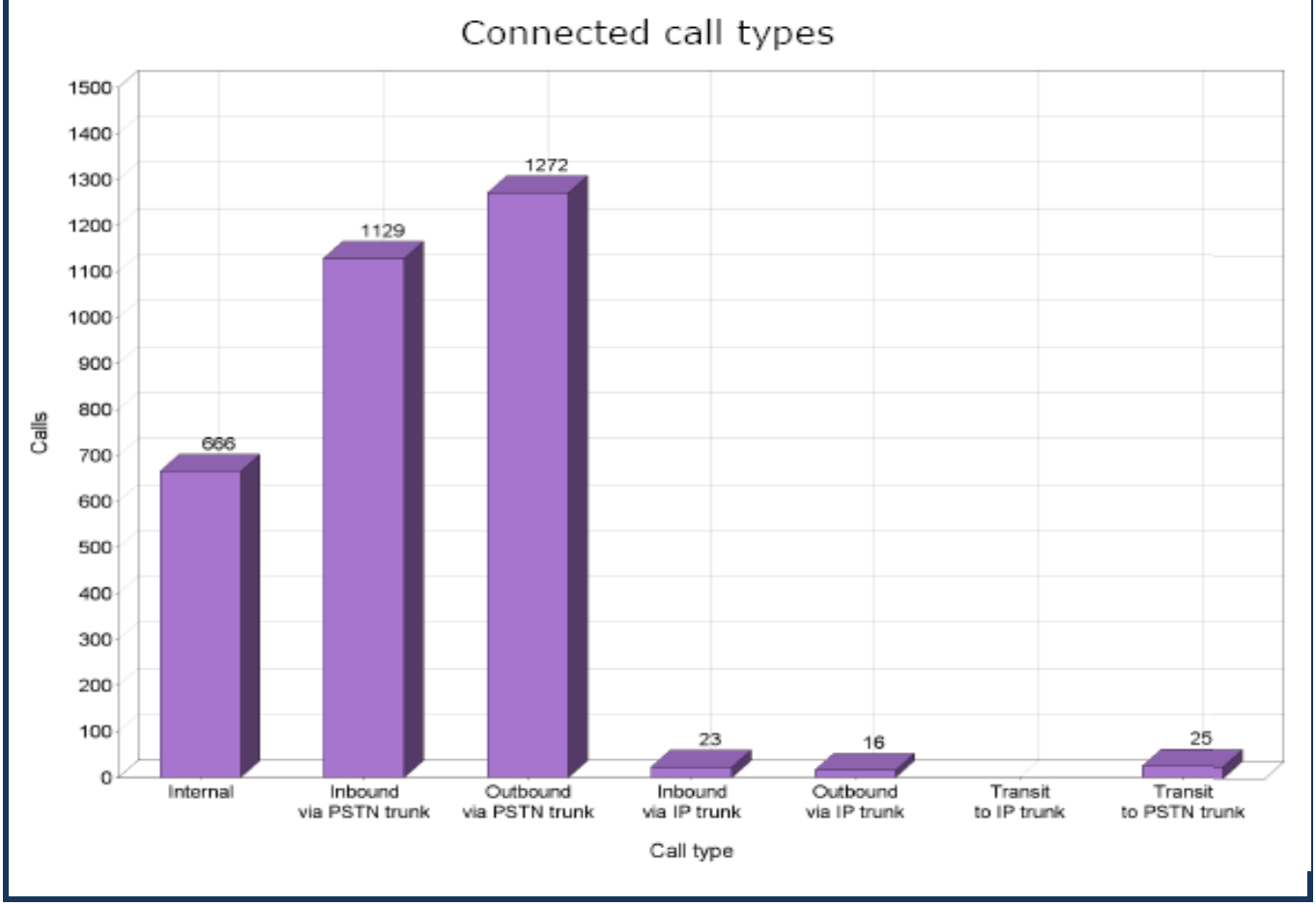
Reports can also uncover where problems are occurring, allowing administrators to address their causes and to anticipate and avert future issues. This visibility enables you to focus on user satisfaction and validate that service delivery promises have been met.

For example, customized reports such as in Figure 2 below can validate that cost reduction to carriers has occurred because many calls are now routed across the WAN rather than via a carrier. However, this report also highlights an area to be investigated because there are still a large number of outbound calls using the PSTN. Investigating the cause for this will assist in comparing infrastructure improvement costs with carrier costs to route more calls via the WAN.

Reducing management time relating to performance issues

As the size and complexity of deployments increase, we've seen specialized IPT management become even more integral to achieving high quality service delivery. This is simply because proactive IPT management dramatically reduces the time it takes to identify and resolve problems.

Figure 2: Example call routing report used to validate lower cost routing or to identify opportunities for further cost savings



Key findings in the survey indicate that users consider troubleshooting and diagnostics amongst the top three IPT management tasks. However, without a specialist tool they also indicate that they have a high level of dissatisfaction with their capabilities to carry out these tasks[11].

Our customers tell us that PROGNOSIS helps them reduce management time relating to performance issues by offering features such as alerting administrators to phones de-registering. This could foreshadow network problems that may lead to further issues. If an alert is triggered by a low number of phones de-registering then troubleshooting can start before too many users are affected.

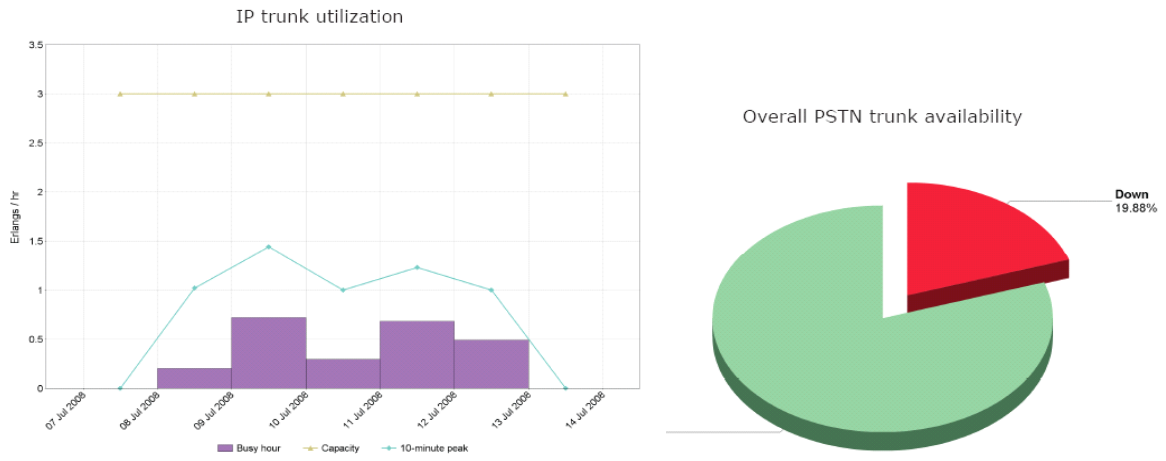
Neighboring port information provided by PROGNOSIS identifies which port an IP phone is plugged into on the switch that it's connected to. This significantly reduces the time the administrator has to take to troubleshoot that phone, because they can go directly to the appropriate switch and start analyzing the problem from there. Without PROGNOSIS, the administrator would only be aware there was a problem with the phone.

Neighboring port information cuts down the time to resolve the problem because once support staff know which switch the phone is connected to, they can analyze and check that the switch is working properly, then trace that path from the switch to the call signaling server and analyze the data path.

Other areas where PROGNOSIS helps companies reduce management time are gateway utilization and service level reporting. Firstly, having insight to the performance, availability, and utilization of gateways means that IPT staff can have confidence that calls will maintain good quality to the edge of the network.

Secondly, reporting on gateway performance allows administrators to see whether they can decommission gateway capacity or in fact, need to add more. Customized IPT management reporting allows administrators to create custom reporting trunks to combine physical gateways. The reports then show if the combined capacity of those gateways is sufficient.

Figure 3: Example reports of gateway utilization and availability used to ensure sufficient headroom or reduce excess capacity.



[11] IPT monitoring and management total customer experience, Page 23

A large US university gained visibility of call flow across a custom reporting trunk they created specifically for this purpose. The report revealed they were using about 15 percent of the capacity during non-peak university time. Without the reports and the ability to create a custom reporting trunk they had no idea when they were going to hit maximum capacity. PROGNOSIS gave them the necessary insights to confirm they had sufficient headroom to accommodate demand for the foreseeable future.

Conclusion

The top five actual or potential purchase drivers for third party IPT management tools reported in the survey are inextricably linked to providing high quality IP telephony.[12] As a specialized management solution designed to monitor the performance of IP telephony, PROGNOSIS provides an in-depth, unified view across Cisco, Avaya and Nortel IP telephony environments.

Survey respondents were drawn to the ability to monitor performance in real time since the cause of interruptions in IPT service can be difficult to find and diagnose after the fact.[13] PROGNOSIS helps with the entire IP telephony lifecycle, providing pre-deployment assessment, real-time performance monitoring and executive and operational level reporting.

One of the compelling findings of the survey was that many users are dissatisfied with their ability to manage the tasks they consider most important[14]. Receiving high quality, high precision data from PROGNOSIS means that as more users invest in IPT management solutions their satisfaction should increase dramatically.

It is critical for organizations and service providers to successfully manage the performance of voice as a business service over an IP network. This provides the insights needed to identify and resolve issues before they impact the business or its customers.

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[12] Drivers for third-party IPT management, Figure 1, Page 14
[13] Drivers for third-party IPT management, Page 13
[14] IPT monitoring and management total customer experience, Page 20

A Word from the Sponsor - PROGNOSIS

PROGNOSIS is a specialized management solution designed to monitor the performance of IP telephony as a business service - providing the insights needed to identify and resolve issues before they impact the business or its customers.

Through intelligent alerting, access to thousands of IP telephony specific metrics, deep diagnostics and comprehensive reporting, PROGNOSIS helps ensure the highest possible call quality and reliability.

PROGNOSIS provides a single, unified view across Cisco, Avaya and Nortel IP telephony environments and has been proven to manage hundreds of IP-PBXs and hundreds of thousands of phones. Its scalability, flexible deployment options and customizable design make it the ideal solution for large enterprises and service providers. Integrating into organizations' management frameworks, business processes, team structures and toolkits, PROGNOSIS is the product of choice for managing IP telephony.

For more information, visit **http://www.prognosis.com/**.

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