

The ROI of IP Telephony Management

*A compelling look at the hard numbers behind costs,
benefits of IPT monitoring & management*

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Executive Summary

Whether companies are just starting, continuing, or finished with their IP telephony deployments, one thing's for certain: They need to manage their newly converged networks. They must deliver voice traffic over the IP network in a way that is consistent and predictable, with sound quality on par with or better than TDM.

Many IT managers view that task as much easier than it actually is. As such, they don't spend enough time evaluating management and monitoring tools, nor do they budget appropriately—until they have had enough problems to force them into a quick purchase to solve an urgent problem.

In reviewing overall costs of IP telephony, Nemertes has found the financial figures behind buying IP telephony management/monitoring tools—or managed services that do the same—are very compelling. Nemertes has been tracking VOIP costs for four years and interviewed nearly 400 organizations during that time. This paper will review 2007 trends in VOIP costs and associated management/monitoring tools.

The Issue

Unlike its TDM predecessor, IP telephony is not a closed-network, single-application environment using its own network resources. Rather, IP telephony is part of an overall unified-communications infrastructure, where multiple applications compete for finite network resources. As a result, IP telephony implementations require new monitoring and management tools and skills. But is the cost of these IP telephony management tools worth the benefit? Nemertes Research has conducted an analysis evaluating the operational and capital costs of IP telephony, and has concluded that companies using IP telephony management tools demonstrate a compelling return on investment.

IP Telephony Cost Assessment

To fully understand IP telephony management/monitoring costs, it's important to have a baseline understanding of IP telephony in general. Nemertes measures the following:

- ⊕ **Operational start-up:** These costs include planning, installation and troubleshooting. We calculate the number of total hours spent on each function and multiply that by the average hourly rate of the staff involved. Also included are the outside consulting costs companies incur.
- ⊕ **Capital:** These costs include IP switches and phones. Nemertes gathers average costs of gateways, network upgrades related to the VOIP implementation, IP video and audio bridges, management tools, unified messaging, and traditional voicemail. But to keep data consistent year over year, we run analyses on phones and switches.
- ⊕ **Ongoing operations:** These costs cover the number of hours the network or telecom staff spend monitoring and managing the IP telephony system. We then translate that into dollars.

VOIP Users for Capital Assessment (Banded)	Operational Startup Per User	IP Switch/Phone Per User	Maintenance Per Unit
Fewer than 300 units	\$587.62	\$1,156.86	\$1,152.41
300-999 units	\$128.91	\$531.00	\$133.44
1000-4,999 units	\$227.37	\$727.76	\$156.56
More than 5,000 units	\$131.84	\$503.69	\$37.21

Table 1: Average VOIP Costs

Deployment Costs--Operational

On average, companies spend \$355 per IP telephony user or end station to get the technology up and running. Of course, the per-user costs vary based on the size of the rollout. Those with smaller rollouts, defined here as fewer than 300 end points, spend an average of \$588 per unit on operational startup costs, while those with more than 5,000 end stations spend only \$132 per unit. (Please see Table 1: Average VOIP Costs, Page 2.) IT staffs can leverage the work they must do to implement the switches across more users, so the per-user cost drops.

We found an increase in per-user costs among companies with 1,000-4,999 users for two reasons: In some cases, companies had implemented a large and expensive IP PBX with ultimate plans to support 10,000 or more users from that switch. Because they only have rolled out to, say, 3,000 users, the per-user cost is higher than it will be when the deployment is completed. In other cases, when companies increased the size of their rollout or had a few thousand employees, they needed to add to their IT staffs, which increased operational costs.

The type of vendor or carrier selected affects rollout costs. Most IP telephony vendors, including Alcatel, Avaya, Cisco and Nortel, offer branch-office products that aim to simplify the operational startup—and thus, the associated

costs--at remote sites. Other vendors, such as 3Com, Mitel, NEC and ShoreTel, focus on the small and midsize markets, or those with fewer than 1,000 end stations. Though they do serve larger rollouts, their products are aimed at simplifying smaller IP telephony deployment. Service providers and VARs offer hosted services that offload the start-up from the internal team and push it to the external team.

Year over year, per-user operational costs have increased among all vendors for a couple of reasons. First, many organizations are hiring Managed Service Providers (MSPs) to help with engineering or installation, and that increases the operational costs. Second, many larger enterprises started their VOIP projects within the past two years, and they are spending significant time up front to launch large projects, but they cannot divide that time among the potential user base—again, resulting in larger per-user costs.

Organizations spend a median of \$29,000 on consulting costs related to their VOIP implementation, an increase from last year's figure of \$23,125. The range, though, is wide--from \$500 to \$2 million.

Deployment Costs—Capital (IP Switch & Phone)

Capital costs have stayed fairly constant year over year. Average spend is \$843 per user for IP phones and the IP PBX. Like operational startup-costs, the per-unit price for capital is higher for small rollouts (\$1,157) and lower for large rollouts (\$504). (Please see Table 1: Average VOIP Costs, Page 2.)

Companies spend an average of \$309 on each IP phone. The range is \$204 (Avaya) to \$416 ("Other" vendors, which is a compilation of IP telephony vendors, including Alcatel, Siemens, NEC, 3Com and others, that didn't have enough statistical response to be counted individually.) The reason there is such disparity between vendors' handset costs is because of diverse customer requirements and large product portfolios. Most IP telephony vendors offer handsets that span quite a price range (\$100-\$450), depending on what features customers want, who uses the handset, and the anticipated lifespan of the device. As a result, the range in average prices varies accordingly.

Ongoing Operational Costs

Nemertes also tracks how much companies spend to operate, maintain and manage their IP telephony implementations. Naturally, these costs vary based on the size of the rollout, which vendor(s) they use, whether they use management tools and if so, what type, and what other applications are integrated in with IP telephony. In general, though, we find that the more users on the system, the more each IT staff member handles. In other words, the per-user cost generally drops drastically when the rollout size increases.

Companies spend an average of \$473 per unit per year to operate IP telephony systems. This figure takes into account the number of people hours spent maintaining and managing the system internally, multiplied by the average hourly rate of those people. Additionally, it includes the cost of third-party management services. Those costs combined, divided by the number of end units on the system, provides the per-unit cost.

For small rollouts with fewer than 300 users on the system, the per-unit cost is \$1,152. It drops drastically for those with greater than 5,000 units online. Those organizations only spend \$37 per unit. (Please see Table 1: Average VOIP Costs, Page 2.) The ratio of IT/telecom staff member to end unit increases. Most of the work required is at the switch or the management/monitoring system. So there is not a proportional correlation of IT staff member:employee as the number of employees on the system increases.

Companies also spend between 12% and 17% of the original capital cost on maintenance, which includes software or firmware upgrades on equipment and associated software.

IP Telephony Management Trends

As stated, managing IP telephony is more complex and involves more moving parts than TDM telephony. That's why IT decision-makers increasingly are evaluating monitoring and management tools specifically designed for IP telephony. These tools go beyond traditional network management products by delving into the IP telephony application and providing data points such as latency, packet loss, mean opinion score (MOS), and completed calls.

Companies typically deploy these tools within 12-24 months following an IP telephony deployment (with some exceptions). Initially, they implement IP telephony believing their existing network-management tools, coupled with the often-rudimentary monitoring features that come with the IP PBX, will be sufficient in maintaining solid voice performance. Typically, when the rollouts exceed five locations and after some time has passed (statistically, as stated, that time frame is 12-24 months), the IT managers realize they do not have enough information to effectively detect and prevent problems, analyze the cause of performance slow-downs, or resolve issues.

Recommended Management Budget			
Description	Number of Locations	Number of Users	Budget
Very Small	Fewer than 5	Fewer than 50	Freeware, IP PBX tools, carrier tools sufficient
Small	5 to 20	51-200	\$25,000-\$50,000
Midsize	21 to 250	201-2,000	\$75,000
Large	251 to 400	2,001-10,000	\$100,000
Enterprise	More than 400	More than 10,000	\$100,000+ (Depends on the configuration and requires consultation)

Table 2: IP Telephony Management Budgets

The cost of IP telephony monitoring and management varies. The IP PBX vendors include some basic features as part of the cost of the equipment, and some, such as Avaya and Cisco, offer enhanced tools for an extra charge. IP telephony specialty vendors and MSPs typically charge per user, with steep discounts for large rollouts or long-term engagements. Actual dollar-spend on IP telephony management is displayed in Table 2: IP Telephony Management Budgets, Page 4. Costs can range from \$25,000 for small companies, to \$50,000

for midsize companies, to several hundred thousand dollars for large companies and as much as \$2 million for global enterprises. It's imperative to get this line item into the request for proposal right away—and to use these tools during the configuration and implementation. As our research demonstrates, companies with IP telephony management and monitoring tools spend significantly less on ongoing operational costs than those without such tools.

Identifying Management Options

There are several options for monitoring and managing IP telephony, including buying and using tools from IP telephony switch vendors, network-management vendors, manager-of-manager product vendors, and IP telephony specialty tools.

IP telephony switch vendors, including Alcatel, Avaya, Cisco, Mitel, NEC, Nortel, ShoreTel, Siemens, and others provide varying levels of IP telephony monitoring and management. The largest percentage of enterprises relies upon their IP telephony switch vendors to monitor their voice performance.

Other IT managers rely upon their network-management tools (either alone or in combination with other types of products). Vendors in this space include Alcatel-Lucent, CA/Concord, EMC, Fluke Networks and NetQOS, among many others. Manager of managers (MoMs) also play a role in IP telephony management by pulling performance data from multiple tools and presenting that information in an integrated interface. CA, EMC, HP and Tivoli are vendors in this space. IP telephony specialty tools are made from the ground up to monitor, manage, and troubleshoot IP telephony as an application. Vendors in this space include Brix Networks, Infovista, Integrated Research (better known by its product name, Prognosis), and NetIQ, and most recently, EMC through a partnership with Integrated Research to use its Prognosis products.

The most effective way to manage IP telephony is with a combination of tools that monitor both network and application performance. Combining these tools with a MoM provides IT staffs an integrated view of network performance, such as quality-of-service parameters, as well as IP sound quality and performance metrics.

IT staffs must choose between managing the network internally or externally, through relationships with Managed Service Providers (MSPs). A growing number of companies are leaning toward MSPs to get 24 x 7 oversight of their IP telephony performance using the latest tools available. On the positive side, this frees internal staff to work on more strategic projects, gives the company round-the-clock monitoring of IP telephony, and leverages the expertise of third parties who manage VOIP for a living. On the negative side, as with most outsourced relationships, it limits internal control over IP telephony performance and may cost more than handling it internally.

ROI Assessment

Given the costs and time involved with VOIP projects, it's imperative to understand the return on investment. Although savings do exist, there are some cost increases, as well. One of those increases is in the amount of time it takes to isolate and repair an outage or performance degradation in the IP world.

Determining the root cause of a problem--whether another application contending for bandwidth, QOS issues, the IP PBX, a handset, a switch/router and so on—can be very time-consuming and difficult.

Consequently, IT managers say it takes one to four times longer to isolate and resolve VOIP problems as it does with TDM. What that equates to is difficult to quantify in a statistically meaningful way because there are so many variables within each company. For example, the time it takes to resolve a TDM problem varies widely depending on the nature of the problem, and the cost to resolve that problem also varies widely depending on whether a company's internal telecom staff or external vendor resolves the problem.

Nemertes has conducted an analysis of IP telephony costs and how they vary based on the type of management tool companies use. We have found a correlation among companies that pay attention to IP telephony management and lower operational costs. When companies use no management/monitoring tools for their VOIP network, their annual operating cost per unit is \$1,262. If they use an IP PBX tool, that cost drops to \$405. When they use specialty IP telephony monitoring tools, the per-unit cost drops even further to \$113.

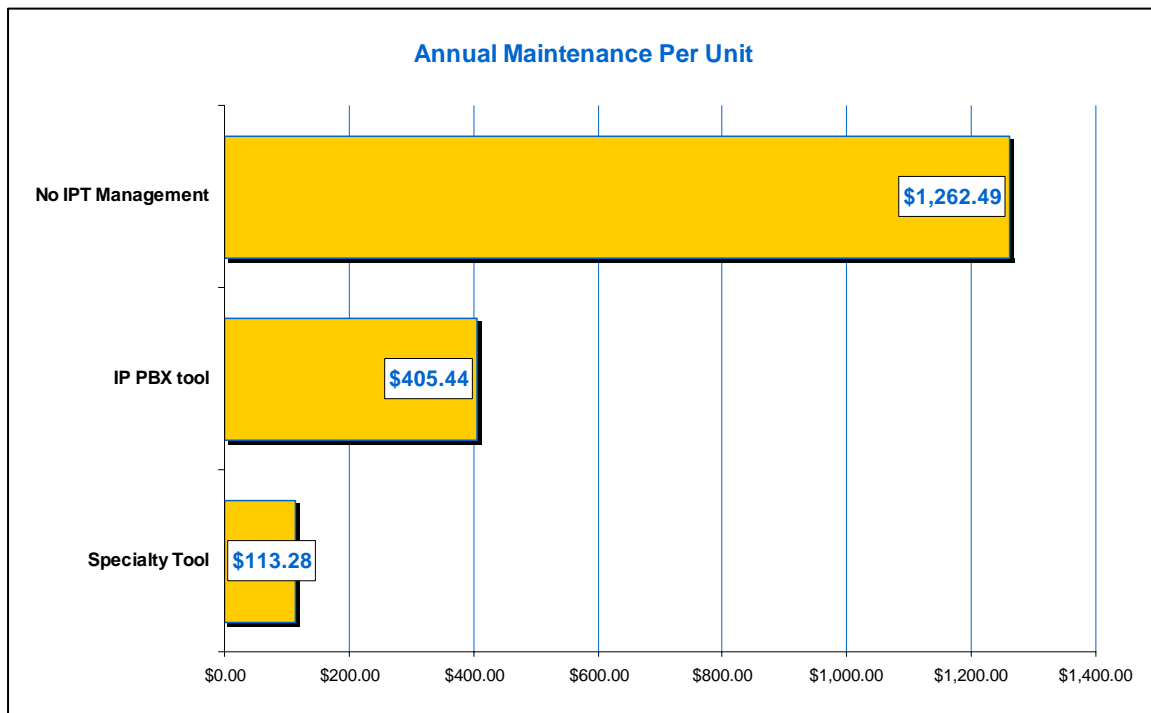


Figure 1: Annual Operating Costs Based on Management Tools

Overall, organizations spend roughly 5% to 8% of their IP telephony capital budget on monitoring and management. Monitoring and management costs typically run between \$40 and \$65 per user for capital and \$4 to \$6 per user to implement specialty management tools.

IP telephony operational costs per unit drop dramatically when using specialty monitoring tools. In crunching the numbers, we find the payback period for the tools (capital and operational) is three to four months.

Conclusions & Recommendations

Based on the cost data and the requirements of IT staffs to offer a reliable, high-performance converged network, we recommend project teams conduct a thorough evaluation of their management and monitoring options *prior to* deploying IP telephony. All too many companies implement their VOIP network without factoring in time for an analysis or budget to purchase the tools they need.

By implementing IP telephony specialty management tools or services, companies actually save on the ongoing operational costs compared to using no tools or those provided by the IP PBX vendor.

About Nemertes Research: Founded in 2002, Nemertes Research specializes in analyzing the business value of emerging technologies for IT executives, vendors, and venture capitalists. Recent and upcoming research topics include security and information protection, mobility and collaboration technologies, and outsourcing.