White paper:

Multi-vendor IP telephony management: challenges and solutions

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An increasing number of enterprises are faced with the challenge of supporting and maintaining IP telephony systems from multiple IP-PBX vendors.

This paper examines the increasing occurrence of these environments and the present day challenges of using multiple tools to manage them.

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Executive summary

With the pervasiveness of IP communications, an increasing number of enterprises are faced with the challenge of supporting and maintaining IP telephony systems from multiple IP-PBX vendors, such as Cisco, Avaya and Nortel.

These companies have a variety of reasons for their mixed vendor environment—some by accident and some by design. For example, large and widely-distributed organizations often have branch or subsidiary operations with autonomy to select and support their own telephony systems. Other companies have adopted a multi-vendor IP telephony strategy in order to maintain vendor independence.

More commonly, mergers and acquisitions are the cause, whereby companies inherit different IP telephony systems—along with separate management tools and support teams.

For large enterprises, the multiplicity of tools and teams required to maintain, monitor and manage the multi-vendor IP telephony environment creates the biggest challenge. Ultimately, it comes down to efficiency and economics.

With separate management tools provided by each different IP-PBX vendor, it's impossible to gain an efficient, unified view across their disparate IP telephony platforms. From an economical perspective, it is far more expensive to procure, maintain and to train operations staff on multiple management tools than for a single management solution that supports different IP telephony systems.

Few third-party vendors have developed management tools and solutions to monitor, alert and diagnose these multi-vendor enterprise IP telephony environments—and only a small number of these successfully meet other critical criteria such as scalability, interoperability and broad support for differing APIs that enterprises need to consider alongside the management of the entire IP telephony ecosystem.

This paper examines the increasing occurrence of multi-vendor IP telephony environments and the present day challenges of using multiple tools to manage them. It offers a strategy for evaluating management solutions and concludes with the overarching benefits of a single management tool for multi-vendor IP telephony environments.

Proliferation of multi-vendor IP telephony environments

In the recent issue paper *Third-Party VoIP Management on the Rise*, industry analyst Robin Gareiss of Nemertes Research explains the multi-vendor phenomenon: "Multi-vendor IP telephony environments are becoming more common, increasing from 10% to 20% year over year. As time goes on, we expect to see more companies with more than one IP-PBX vendor, driven by merger and acquisition or demand for new features."

A recent global survey of IT professionals, conducted by Integrated Research, suggests the percentage of enterprises with multiple IP-PBX systems could be even higher. Among several-dozen questions in the *2007 Global IP Telephony Market Survey*, the respondents were asked to identify which IP telephony systems they had in their enterprise. In examining the answers from 242 enterprises (having more than 2,500 phones), the survey revealed 33% as having multi-vendor IP telephony systems:

Table 1: Occurrence of multi-vendor IP telephony environments

Number of IP telephony platforms	Number of companies	Percent of companies
One	163	67%
More than two	79	33%
Totals	242	100%

Source: 2007 Global IP Telephony Market Survey, Integrated Research

There are a number of reasons why enterprises, particularly large and widely-distributed ones, end up with multiple IP telephony systems. These include:

- **A decentralized decision-making process:** In some organizations, the decision to purchase and deploy the IP telephony system may have been made at a regional or branch level.

- **Specialty applications:** Irrespective of an organization's primary IP telephony vendor, specialty applications such as call centers often mean solutions from other vendors were used as well.

- **Fit for purpose:** Some IP telephony vendors may have offered a more appropriate solution for an organization's small branch offices than the primary, head-office system.

- **Geography:** Many large enterprises developed a multi-vendor environment due to growth into foreign territories where the local IP-PBX manufacturer dominated sales and support channels, for example Siemens in Germany, Alcatel in France or NEC in Japan.

- **Leverage and vendor independence:** Some organizations may have leveraged two or more vendors for strategic reasons, to take advantage of new features, or to avoid excessive dependence on a single vendor.

- **Mergers and acquisitions:** Industry consolidation and strategic growth through mergers and acquisitions are perhaps the most common reasons for the occurrence of multi-vendor IP telephony.

Whether enterprises have multi-vendor IP telephony deployments by accident or design, the challenge of effectively and efficiently managing these disparate systems is consistent and must be addressed.

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Multi-vendor IP telephony management challenges

Most enterprises that have deployed IP telephony recognize the fundamental role specialized management tools play in their ability to provide reliable, high quality telephony services to the business and its customers. Adding technology from multiple IP-PBX vendors however, significantly increases the cost and complexity of delivering these services and creates unique challenges, such as:

- **Can I manage these unrelated IP telephony systems efficiently?**
  Although there are specialized solutions available from IP-PBX vendors and from third-party software providers, these tools generally support only one IP telephony platform. While these solutions may perform sufficiently in isolation, their use in a multi-vendor environment creates separate domains of management – a very inefficient approach that results in different methods and standards of managing each IP-PBX vendor's equipment. This approach does not allow correlation of performance, usage and capacity data across the IP telephony system and makes it extremely difficult to establish standard SLAs.

- **How do I minimize the cost of managing these disparate IP telephony systems?**
  There are significant costs associated with managing an IP telephony environment built around technology from multiple IP-PBX vendors. These include purchasing and maintaining separate management tools to gain insight into the health and performance of each vendor's equipment, as well as soft costs such as resource-intensive evaluation and purchasing processes for each system.

- **Is there a way to reduce support and training costs?**
  Managing an IP telephony environment is a complex task that demands specialized expertise to support the network, telephony and business applications. Developing proficient operations, administrative and helpdesk staff to manage, maintain and support these environments can require considerable training. In an environment with multiple IP-PBX vendor equipment, the process of training these people to support and use multiple tools and differing methodologies is extremely costly and time consuming. It is also conceivable that the enterprise may need to employ separate staff for each vendor's telephony system, in order to obtain the best return on investment for each system.

Based on these challenges, the ultimate question any enterprise with a multi-vendor IP telephony environment should ask is, "Can I get rid of all these different management tools and simply use a single, consolidated solution?" The answer is a resounding, "Yes!"

There are now tools on the market that manage multi-vendor IP telephony environments. While these currently only support major IP-PBX vendor systems, they do offer significant value to organizations with these multiple technologies in place. Using a single tool to manage the entire IP telephony ecosystem would deliver the following benefits:

- Provide operations staff with a consistent and consolidated view of performance, usage and capacity information across the entire IP telephony ecosystem

- Eliminate the need to procure and maintain multiple vendor-specific management tools – and the associated hard and soft costs

- Allow the organization to set and measure standard and consistent SLAs

- Reduce the time and expense involved in training network operations staff to use different management solutions

Any enterprise with a multi-vendor IP telephony environment that uses tools designed specifically to manage it is best placed to achieve significant financial and operational benefits. When evaluating these tools, however, there are key criteria that should be considered.

Evaluating multi-vendor IP telephony management solutions

Enterprises considering the use of an IP telephony management solution for a large, multi-vendor environment can use the following criteria to identify and evaluate the most appropriate solution for their individual requirements.

Support for core issues such as quality and performance across the management lifecycle

At its most basic, an IP telephony management solution must provide core capabilities to monitor call and voice quality, measure system performance, and diagnose the root cause of issues that can impair reliability—before, during and after the systems are deployed. The ability of the solution to span the standard "plan, design, implement and operate" lifecycle for telephony deployments must also be considered. For example, the solution should offer capabilities to perform pre-deployment network assessment and ongoing network testing to assist in the design and implementation phases. During and after deployment, the solution will need to provide alerts when problems arise and offer deep diagnostics to uncover the cause of these issues. Once IP telephony is fully operational, the solution will need to provide reporting on day-to-day operations, service level breaches, emerging system capacity considerations and so on.

Support for the entire telephony ecosystem

IP telephony management means more than simply monitoring the PBX or a specific aspect of the system, such as phone availability or individual call quality. For enterprises, a management solution must take a holistic view of the entire environment, covering a broad range of ecosystem components such as call processing, IP phone availability, dial plans, call routes, trunk groups, gateways, circuits and channels. Ancillary applications such as voicemail, unified messaging, call centers and collaborative communications should also be included as part of the management solution.

Support for vendor-specific metrics and application protocol interfaces

Naturally enough, different IP telephony vendors use different naming conventions and their systems produce varying types of performance metrics. To eliminate confusion for IT operations staff, a suitable management solution must provide an awareness of these differences in terminology, and where appropriate, provide some form of correlation between the various vendor's metrics. Multi-vendor management solutions must also support a variety of APIs into the various platforms and elements. While SNMP is a commonly supported protocol, more advanced management tools also support a wide variety of protocols such as SOAP, RTP, RTCP, HTTP, SCCP, SIP and SAT.

Scalability

A large enterprise may need a management tool to meet the needs of an organization with tens of thousands of phones. When evaluating a management tool for this type of environment, its ability to readily scale to these volumes and monitor thousands of devices simultaneously must be established. As the enterprise IP telephony system will generate lots of data – potentially from multiple locations, the management solution will need to accommodate the collection, correlation, storage and retrieval of this data efficiently and quickly, with minimal impact on the underlying network.

As the primary goal is to select a single management tool for multiple IP telephony systems and a large user population, be sure to make scalability one of the key evaluation criteria. It should be based on the ultimate size of the rollout and not the current or even short-term size of the deployment.

Distributable architecture

There are several criteria a management solution must meet to operate effectively in a distributed environment. Beyond the need to support hundreds of distinct locations and tens of thousands of phones, the following criteria to provide flexible management processes and eliminate points of failure should be considered:

- An enterprise is likely to have a hierarchy of office locations where some offices are key regional centers with large user populations and major telephony systems, possibly one each for the United States , Europe and Asia Pacific. These regional headquarters (HQs) may then have multiple, smaller offices that essentially report into their respective HQs but also share operations staff as well as telephony management and back-up. A suitable multi-vendor solution must provide a consolidated view of such a distributed hierarchy with the ability to drill down into individual locations.

- To avoid a single point of failure, the management solution should ideally employ an architecture with the ability to distribute some of its core functionality beyond the central datacenter. While it may be preferable to have a central management location, caution must be taken on the reliance of multiple external links to remote locations. In cases where a link to a key remote location goes down, the management solution should be able to continue operating in other remote locations and then have the downed location re-synchronize once the outage is fixed.

- A management tool should also accommodate administrator logins that only have the appropriate regional view thus isolating the region from other regions and the entire system. Additionally, the management tool should have the ability for the regional locations to selectively send important data back to the overall corporate datacenter for higher level of enterprise-wide monitoring, alerting and reporting.

Flexible SLAs

Large enterprise IT organizations often have service level agreements with the various business units that the group supports. Similar to how an enterprise might have an SLA with its Internet Service Provider or telecom carrier(s), the internal-enterprise SLA or operational agreement is used to measure the performance that IT is providing for key business services to the desktop, over the LAN, over the WAN, and with the telephony system.

The IP telephony management solution must offer the ability to measure the telephony service at various points, providing alerts when certain thresholds indicate the desired SLA is either threatened or missed, and producing reports that summarize the performance against the SLA at the desired time periods.

A single SLA is unlikely to serve the needs of a large, widely distributed enterprise. Thus, the IP telephony management solution should provide a hierarchy of SLAs so that the central location can have perhaps both an enterprise-wide SLA as well as a 'regional HQ' SLA, while the other 'regional HQs' have region-wide SLAs and perhaps even branch-office SLAs for the smaller locations it supports. Another type of hierarchy might be by business unit, where the call center has a different SLA to another part of the business.

Not all management tools provide this level of hierarchical options for SLA management and it should be an important consideration during evaluation.

Customizable views

Generally speaking, all management tools provide graphical user interfaces or dashboard views to display the information the tool is collecting and monitoring. The dashboard typically offers high-level screens that show a broad view of the entire system, i.e. all the PBXs being monitored, as well as other screens that combine a variety of views into other critical components of a specific PBX. The tool administrator can go from these high level views and drill down multiple levels to display very granular details.

There is a major difference between tools that allow the administrator to customize these screens or even build entirely new ones, to tools that don't. While fixed screens and displays can serve the needs of some users, the ability to customize allows the enterprise to focus on specific aspects of a business process, a portion of the system/network, or a troublesome aspect of an SLA with a particular business unit.

Interoperability with higher level management tools

Large enterprises typically have incumbent network management and event management tools in place and often attempt to rely on these tools for initial IP telephony management. These tools have a valuable role to play in the overall IT infrastructure management, but are not designed to manage voice and other collaborative or unified communications.

What is of critical importance, however, is that the IP telephony management solution must interoperate in the broader management strategy for the enterprise. The ideal relationship between the Manager of Managers (MOM) and the IP telephony management is bi-directional in nature. Simple, one-way integration generally isn't sufficient.

The IP telephony management solution should have the ability to transform problem conditions it detects into SNMP alerts that it issues to the MOM. The integration should accommodate the processing of IP telephony events in the MOM, as well as provide the mechanisms to launch the IP telephony management solution and enable drilling down into the issue from the MOM's console.

Conclusion

Occurrence of multi-vendor IP telephony environments is on the increase
Nemertes Research has recently found that the number of enterprises with multi-vendor IP telephony environments has doubled year after year to 20% from 10% and, independently, Integrated Research has found the percentage could be even higher. No doubt, the occurrence is large and on the rise.

Multi-vendor IP telephony management challenges stand out
Whether an enterprise has a multi-vendor environment by accident or design, there are a number of challenges that enterprises will face if they don't unify their IP telephony management with a single tool:

- Multiple IP telephony vendor tools cannot be unified into a single management display
- Procuring and maintaining multiple IP telephony management tools is expensive
- Training network operations staff is time-consuming and expensive

Solutions to these challenges do exist in multi-vendor management tools, but they need to be carefully evaluated.

Strategy for evaluating multi-vendor IP telephony management solutions
There are a number of tools that offer some form of multi-vendor IP telephony management, but there are only a few that currently provide a holistic solution. In evaluating these solutions, an organization should give priority to tools that meet the following criteria:

- Support for core issues across the management lifecycle
- Support for the entire telephony ecosystem
- Support for vendor specific metrics and application protocol interfaces
- Scalability
- Distributable architecture
- Flexible SLAs
- Customizable views
- Interoperability with higher level management tools

Benefits of a single tool for managing multi-vendor IP telephony environments
Organizations with a multi-vendor IP telephony environment are best served with a single, specialized IP telephony management solution that provides a unified view across their entire voice infrastructure, including systems from multiple vendors. A single solution will have a significant and favorable impact on total cost of ownership, and deliver the following benefits:

- Provide operations staff with a unified view across disparate IP telephony environments
- Eliminate the need to procure and maintain multiple management tools
- Reduce the time and expense involved in training staff to use different management solutions

Additional reading:

1. *2007 Global Market IP Telephony Study (by Integrated Research)*
2. *Third-Party VoIP Management on the Rise (by Nemertes Research)*

These documents (and additional papers covering IP telephony management) are available at
www.prognosis.com

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