



Preparing Your Organization for VoIP

Executive Summary

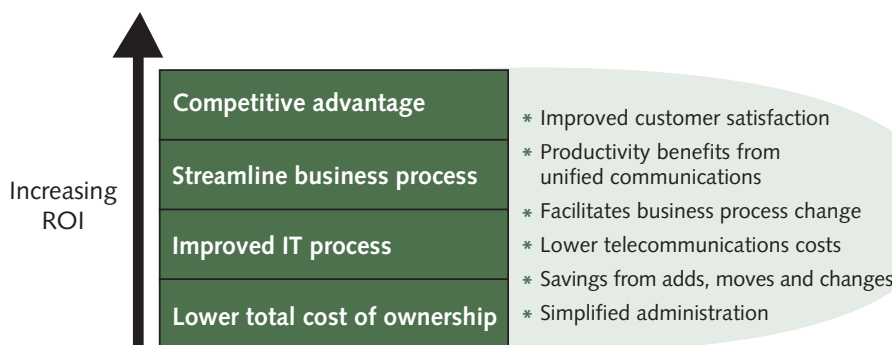
The best business case for VoIP weighs several factors (see Exhibit 1), including:

- **Employee productivity:** VoIP makes it easier for a large number of employees to access and integrate enterprise communications and collaboration applications.
- **IT administration:** VoIP can be managed centrally with familiar resource management tools and interfaces.
- **Cost of ownership:** VoIP can lower telecommunications costs.

To improve in all three areas, VoIP solutions must be reliable and broadly based.

Creating a life-cycle technology plan and working with service providers and suppliers to help implement your VoIP solutions will enable you to roll out and extend a high-quality, reliable VoIP solution across the entire enterprise.

Exhibit 1
The VoIP Business Case
Source: The Yankee Group, 2004



This custom report reviews the benefits of VoIP, provides a checklist of implementation and technology life-cycle issues for CIOs to consider, and offers recommendations for next steps.

Table of Contents

I. Delivering a Balanced Business Case.	3
From LAN to WAN: Telephony Becomes an Application Anywhere on the Network.	4
II. The Complexities and Challenges of VoIP	5
III. Adopting Continuous Performance Monitoring and Management	6
IV. Conclusions and Next Steps	7

I. Delivering a Balanced Business Case

The business case for VoIP includes lower telecommunications costs, more efficient administration and management, and improved productivity.

Network and IT management costs can be reduced because VoIP brings voice and data networks and resources together. For example:

- **VoIP reduces the cost of long-distance and local telephone connections** by running voice calls over the data network.
- **VoIP simplifies and lowers the cost of moves and changes** because users can move and plug in phones without any adjustments to cables and system configurations.
- **VoIP lowers system maintenance costs** compared to legacy PBX networks because it requires less space and hardware.
- **VoIP helps to streamline IT administration** because network managers can centralize and manage communications applications and resources anywhere on the network.

Harder to measure but equally important are gains in productivity. VoIP can improve the way employees, customers and partners work and communicate. For example:

- **VoIP reduces the time and effort to retrieve voice mail and e-mail messages** by providing users with one common unified messaging interface.

VoIP yields broad-based productivity improvements:

Picture yourself in a hotel room accessing voice mail and e-mail from your laptop with the same interface and procedures you use in your office.

Now, imagine every employee in your company with the same capability.

VoIP enables integrated voice and data applications, and delivers them to potentially every employee, customer and business partner on the enterprise network.

- **VoIP reduces communications errors and mistakes** by providing users with common and uniform interfaces to all communications functions and systems such as corporate directories and conferencing resources from anywhere on the network.
- **VoIP simplifies teleworker and mobile worker communications** by providing remote users with secure access to communications applications as if they were in the office.
- **VoIP improves workgroup collaboration and information exchange** by enabling integrated voice and data applications from any IP-enabled point on the network.
- **VoIP reduces training and help desk calls** because users are provided with a common, uniform interface at every point on the network.
- **VoIP improves the security of audio- and video-conferences** by controlling access to conference calls.
- **VoIP enables e-commerce customers to securely and reliably speak to call center agents** without changing applications or interfaces.
- **VoIP provides Web-based access to communications resources and services.**

A key point in all of these is that network managers can drive these benefits down to potentially every user who has a phone or PC, including teleworkers, laptop users and home-based users. As mobile networks migrate to IP-based technologies, you can expand VoIP's capabilities to PDAs, BlackBerry devices and cellphones.

Ultimately, VoIP will create a platform from which you will enable any device to access communications tools, resources and applications anywhere at any time, no matter where they reside on the network.

Therefore, VoIP's ability to yield significant gains in productivity and efficiency—at every edge of the network—helps to sustain VoIP's business case and yield a compelling ROI. VoIP will transform the way your business works and communicates.

From LAN to WAN: Telephony Becomes an Application Anywhere on the Network

Exhibit 2 shows the different ways VoIP can be implemented. It illustrates three key themes:

- **VoIP resides anywhere.** VoIP applications and services, such as user class of service, can be distributed across multiple locations or centralized in one building. Furthermore, because VoIP applications reside on servers, they can sit anywhere on the network. They can reside on a LAN, as with an IP PBX; on a WAN, as with a hosted VoIP service; or a combination of both.
- **Users access VoIP from anywhere using uniform interfaces.** Users launch VoIP applications from software clients embedded in laptops, phones and other devices. A key benefit is the uniformity of the user experience and interface regardless of location or device. For example, traveling executives can log on via their laptops and have access to all the communications, collaboration and messaging resources they are accustomed to using from their office PC and phone.

- **VoIP solutions interoperate with legacy telephone networks.** Although complex, existing PBXs can be integrated to work with VoIP solutions. This is helpful for organizations that have many locations and need to transition toward VoIP. Furthermore, your VoIP solution can include calling to and from the PSTN. Most service providers offer managed off-net services, which ensure all of your non-VoIP calls are completed appropriately.

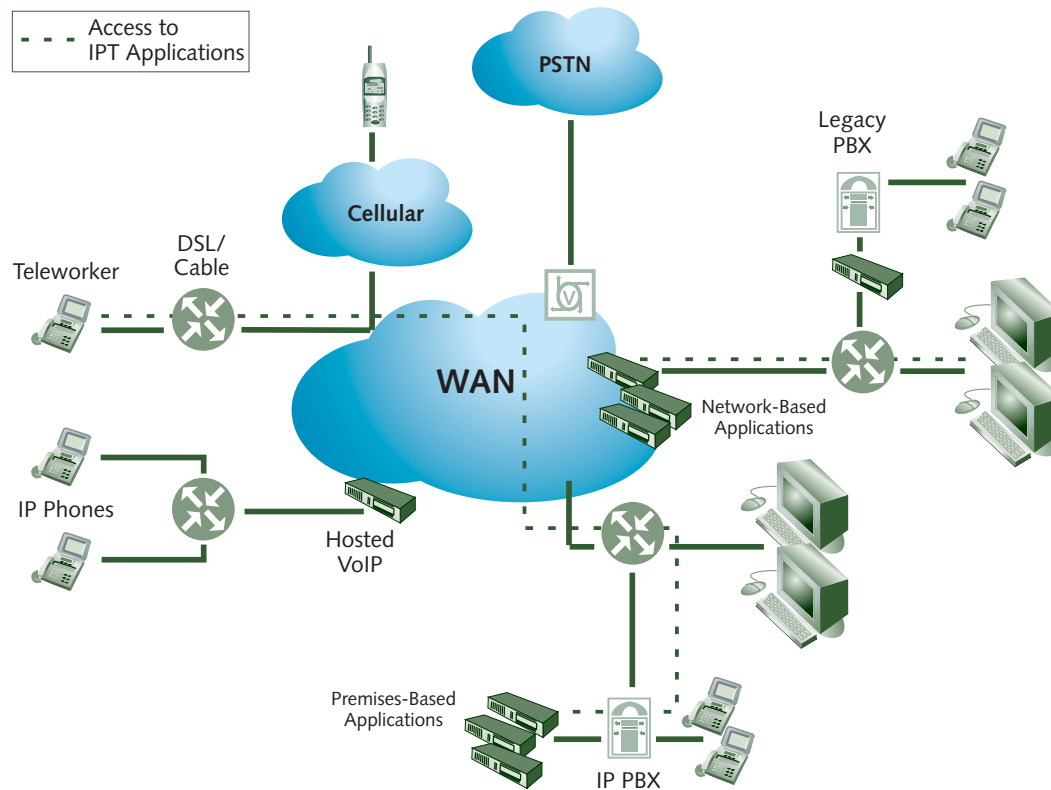
Like e-mail and Internet access, VoIP applications and services become accessible from anywhere and from any device. But unlike these data applications, VoIP requires uninterrupted service and top-notch quality.

The next section highlights some of the challenges and complexities managers must address to ensure VoIP's performance and stability.

Exhibit 2

VoIP Architectures: From LAN to WAN

Source: The Yankee Group, 2004



II. The Complexities and Challenges of VoIP

VoIP is unlike any other application on the enterprise network: It is a real-time application that demands uninterrupted service. Although users may tolerate intermittent e-mail performance, they expect dialtone quality all the time.

To ensure a high level of service and address the complexities of converged networks, network managers face several implementation issues:

- **Interference with other applications:** VoIP applications contend with other business applications for use of network resources. To ensure acceptable performance for every application and real-time performance for voice services, network planners should develop an applications road map of current and future network needs.
- **Ensuring toll-quality service.** Voice communications require low latency and minimal packet loss to ensure toll-quality performance end-to-end. Network managers should implement and monitor QoS solutions across LANs, access circuits and the WAN.
- **Monitoring and measuring performance:** Unlike legacy telephone networks that require adjustments every few months or even years, VoIP applications require continuous performance monitoring and management.
- **Adequate cabling, power and UPS systems:** VoIP operates over CAT5 Ethernet cable and requires fail-safe power systems. If the current cabling and power are inadequate, you may have to install new (and expensive) LAN cable and redundant power supplies.
- **Monitoring LAN capacity:** Having adequate QoS and capacity on your LAN is vital to VoIP performance. Network managers should conduct regular performance audits of LAN switches and routers.
- **Ensuring survivability:** Network designs should consider options such as access to the PSTN, redundant call control architectures and power backup.

- **Ensuring interoperability:** VoIP applications will require access to the PSTN for many years; legacy PBXs and phone systems will coexist with VoIP systems for most companies; and VoIP has many variants (e.g., SIP and H.323). Even greenfield deployments may require interoperability between varying IOS and software versions. Interoperability will be vital in a heterogeneous environment.
- **Ensuring technology refresh:** VoIP technology is relatively new. Network planners should consider options that ensure technology refresh and license updates.
- **Ensuring network perimeter security:** Because VoIP is an open architecture, you must secure your VoIP solutions and install firewalls to protect them from denial-of-service attacks, viruses and other nuisance threats. Using appropriate IP addressing schemes, implementing non-public IP bandwidth (e.g., peerless backbones) and providing other forms of security are vital to mitigating unauthorized access.

VoIP requires continuous performance monitoring and management.

Traditional voice networks may require adjustments every few months or even years.

Converged networks may require monthly or even daily adjustments.

Finally, VoIP highlights cultural and organizational issues. For example, your telecom team understands the nuances and complexities of managing telecommunications solutions, while your IT team understands how to manage IT infrastructure and applications. Organizing and integrating these two disciplines into an effective operational support team is vital. A key goal is to recognize VoIP as a voice *and* data solution—and as a telecom *and* IT application.

These items suggest that VoIP can be complex, particularly for large, dispersed organizations. We believe that partnering with suppliers and adopting a life-cycle approach is important to addressing these complexities and ensuring VoIP's stability and quality.

III. Adopting Continuous Performance Monitoring and Management

VoIP is an always-on, real-time application that is highly sensitive to network performance and availability. Your company’s IT operations and service management processes should reflect this key point by adopting tools or engaging partners to provide continuous performance monitoring and management.

For example, because network performance can fluctuate from hour to hour, network managers need confidence that performance problems can be identified and resolved more quickly and effectively than ever before. In addition to traditional LAN and WAN management systems, network managers need VoIP management tools that provide end-to-end visibility of VoIP call performance, security and SLAs.

Change management also will become more important. Although legacy voice systems and networks may require adjustments every few months or even years, converged networking may require daily or even hourly adjustments, including license management, software/IOS version control and configuration file authorization.

Exhibit 3 shows a VoIP management taxonomy. It suggests that continuous life-cycle planning, design and management are necessary to VoIP’s reliability and performance.

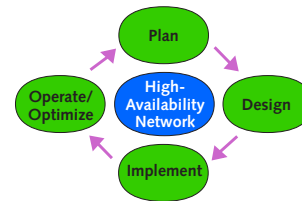
It also reflects several key concepts:

- **VoIP requires interoperability and integration.** Greenfield installations aside, VoIP installations must interoperate with legacy PBXs and the PSTN for many years. Furthermore, some implementations—particularly those that use systems from different suppliers—will require integration between disparate IP PBXs or VoIP software. Therefore, a life-cycle approach should include plans for internetworking and managing VoIP across legacy and IP networks, and testing and certification of different vendors.
- **VoIP applications transcend traditional LAN/WAN and office/mobile boundaries.** The VoIP management domain should reach across traditional service, location and supplier boundaries to provide real-time visibility into application performance.

- **Simple things can trip up a project.** Cable-readiness tests, infrastructure audits, change-management processes and other simple steps can help you plan effectively and yield superior results.
- **Life-cycle management should focus on the user experience.** Telephone networks have been among the most stable systems ever built; your employees, partners and customers expect the same level of service.
- **VoIP is about voice and data applications.** VoIP’s greatest benefit is enabling users to communicate and manage information more effectively through integrated applications. The life-cycle management of VoIP should be as much about managing applications as it is about managing infrastructure—or more.

Exhibit 3
Life-Cycle Approach to VoIP

Source: The Yankee Group, 2004



Deployment			Maintenance	Operational Support
Plan	Design	Implement	Operate	Optimize
Site Surveys	Low-Level Network Design	Network Staging	Technical Support	Ongoing Software Release Assessment
WAN Analysis	Proof of Concepts Testing	Customer Acceptance Criteria	Online Account	Ongoing Design Support
Project Requirements Workshop	Network Modeling	Installation Integration and Configuration	Hardware Replacement	Knowledge Transfer
Hardware Readiness Assessment	Solution Review and Acceptance	Acceptance Testing	Configuration Backups	Performance Analysis and Recommendation
Bandwidth Modeling/Voice Capacity Requirements	Floor Plan and Cutover Sheets	Create Documentation	Moves, Adds, Changes	Network Tuning
Security Policy Development	System Interoperability	Cutover Support	Network Monitoring	Network Reliability Improvement Analysis
Change Management Process Development		Operational Handoff Training	Applications Monitoring	Security Audits and Assessments
Fault Management Process Development		Customer Administration and End-User Training	Problem Determination Resolution	
Availability Benchmarking		Interoperability Testing	Configuration Management	
			Availability and Service-Level Reporting	
			LAN and PSTN Management	

IV. Conclusions and Next Steps

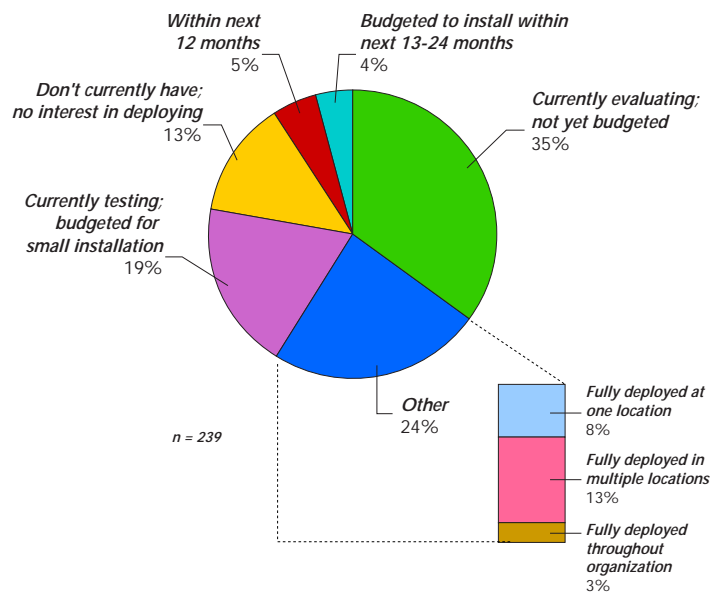
VoIP yields benefits, involves risk and requires new management tools:

- **VoIP's business case is a combination of lower costs, easier operations and improved user productivity.** It can be driven to every user with a laptop, PDA, tablet, mobile phone and desktop PC along every edge of the network. Therefore, CIOs measure its impact in terms of productivity and business efficiency as well as lower TCO.
- **VoIP is complex and requires careful operational, implementation and management changes.** A life-cycle approach that implements continuous monitoring and control can address key requirements, such as interoperability planning and testing, change management, VoIP performance monitoring and security management.

As CIOs become more aware of its benefits—and as service providers and suppliers demonstrate their ability to deliver and manage reliable, secure and high-quality solutions—VoIP adoption will accelerate. Indeed, a recent Yankee Group survey demonstrates that 3 percent of large businesses already have deployed VoIP throughout their organization, 21 percent have implemented smaller scale solutions, and another 63 percent expect either to trial or implement VoIP in the future (see Exhibit 4).

Exhibit 4
2004 IPT Deployment Plans

Source: The Yankee Group, 2004



Ultimately, VoIP will transform the way in which businesses communicate along every point of the extended enterprise.

When preparing your organization, we offer the following recommendations:

- **Don't go it alone.** Suppliers and service providers have developed invaluable "state of the street" experience in recent years. Leverage this experience by engaging the help of third-party suppliers and service providers in three key areas:
 - Network design, interoperability, integration and testing
 - VoIP performance management and monitoring
 - Security, change and configuration management
- **Conduct network-readiness audits** with your suppliers to profile and assess the readiness of your LAN, WAN and power systems.
- **Develop an applications road map** to project and forecast bandwidth, infrastructure capacity and QoS needs.
- **Profile the needs of mobile users and teleworkers** so you can extend your VoIP applications to the edge of the network.
- **Demand realistic but comprehensive cost-of-ownership models from your service providers** that reflect operational, financial and productivity costs and benefits.

The Yankee Group

World Headquarters

31 St. James Avenue

BOSTON, MASSACHUSETTS 02116-4114

T 617.956.5000

F 617.956.5005

info@yankeegroup.com

Regional Headquarters

North America

31 St. James Avenue

BOSTON, MASSACHUSETTS 02116-4114

T 617.956.5000

F 617.956.5005

info@yankeegroup.com

951 Mariner's Island Boulevard, Suite 260

SAN MATEO, CALIFORNIA 94404-5023

T 650.522.3600

F 650.522.3666

info@yankeegroup.com

EMEA

55 Russell Square

LONDON WC1B 4HP

UNITED KINGDOM

T 44.20.7307.1050

F 44.20.7323.3747

euroinfo@yankeegroup.com

For More Information

T 617.956.5000

F 617.956.5005

E-mail: info@yankeegroup.com

Web site: www.yankeegroup.com

Advisory Services

Yankee Group advisory service annual memberships offer clients access to research and one-to-one expert guidance.

Advisory services represent our best value for clients. The services help our members understand industry, regulatory, competitive and market-demand influences, as well as opportunities and risks to their current strategies.

Membership includes an invaluable in-person strategy session with Yankee Group analysts, direct access to a team of analysts, research reports, forecasts, research notes and regular audioconferences on relevant topics.

We offer advisory services on almost 30 selected topics in Telecommunications; Wireless/Mobile Communications; Consumers, Media & Entertainment; and Information Technology Hardware, Software & Services.

Decision Instruments

The Yankee Group offers a full portfolio of technology and market forecasts, trackers, surveys, and total cost of ownership (TCO), return on investment (ROI), selection and migration tools. Decision instruments provide our clients the data required to compare, evaluate or justify strategic and tactical decisions—a hands-on perspective of yesterday, today and tomorrow—shaped and delivered through original research, in-depth market knowledge and the unparalleled insight of a Yankee Group analyst.

Trackers

Trackers enable accurate, up-to-date tactical comparison and strategic analysis of industry-specific metrics. This detailed and highly segmented tool provides discrete proprietary and performance data, as well as blended metrics interpreted and normalized by Yankee Group analysts.

Surveys

Surveys take the pulse of current attitudes, preferences and practices across the marketplace, including supply, delivery and demand. These powerful tools enable clients to understand their target customers, technology demand and shifting market dynamics.

Forecasts

Forecasts provide a basis for sound business planning. These market indicators are a distillation of continuing Yankee Group research, interpreted by our analysts and delivered from the pragmatic stance our clients have trusted for decades.

Signature Events

The Yankee Group's signature events provide a real-time opportunity to connect with the technologies, companies and visionaries that are transforming Telecommunications; Wireless/Mobile Communications; Consumers, Media & Entertainment; and Information Technology Hardware, Software & Services.

Our exclusive interactive forums are the ideal setting for Yankee Group analysts and other industry leaders to discuss and define the future of conversable technologies, business models and strategies.

Consulting Services

The Yankee Group's integrated model blends quantitative research, qualitative analysis and consulting. This approach maximizes the value of our solution and the return on our clients' consulting investment.

Each consulting project defines and follows research objectives, methodology, desired deliverables and project schedule. Many Yankee Group clients combine advisory service memberships with a custom-consulting project, enabling them to augment our ongoing research with proprietary studies.

Thousands of clients across the globe have engaged the Yankee Group for consulting services in order to hone their corporate strategies and maximize overall return.

www.yankeegroup.com

The Yankee Group believes the statements contained in this publication are based on accurate and reliable information. However, because our information is provided from various sources, including third parties, we cannot warrant that this publication is complete and error-free. The Yankee Group disclaims all implied warranties, including, without limitation, warranties of merchantability or fitness for a particular purpose. The Yankee Group shall have no liability for any direct, incidental, special, or consequential damages or lost profits. This publication was prepared by the Yankee Group for use by our clients.

Sponsored by AT&T

Copyright 2004, the Yankee Group. All rights reserved.