



**Strategies For Managing
Complex Convergence Migration:**
The Role of Professional Services

By

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Business Requirements and Pressures

Between 2001 and the early part of 2004 corporations rationalized their operations in an effort to reduce cost and become more profitable following the bursting of the dot com bubble, telecom crash and subsequent global economic recession. Recent economic data published in the Wall Street Journal and The Economist magazine suggest that this retrenchment period has run its course as corporate productivity continues to grow unabated while employment has also finally picked up steam with hundreds of thousands of new jobs created over the last two quarters of 2004. With the world economy growing again and operation rationalization mostly behind them, Chief Executive Officers (CEOs) and their Boards are now focusing resources and developing strategies for both top line revenue growth and increased corporate productivity. In short, revenue and productivity growth has again become job number one across the world economy.

There are many growth strategies being explored in boardrooms today. Customer loyalty and increasing customer value have become essential to any number of growth strategies on the table. The greater customer value is, the higher a competitive barrier of entry and, in theory, the greater wallet share enjoyed by the company. Better products, services and an excellent customer life cycle experience create customer value. For manufacturers customer value is added through product acquisition, operations, support and upgrade. In short, throughout the entire product life cycle and customer contact there are opportunities to create superior customer value.

IT Departments Struggle To Deliver On Existing Commitments

IT departments play a large role in creating customer value by building systems such as contact centers, computer networks, databases, web sites, etc., that enhance the customer's life cycle experience. IP telephony and its various applications, such as unified messaging, instant messaging, desktop video, contact centers, collaboration tools, etc., can be put to work to materially contribute to reaching corporate goals and strategies. Many CIOs in fact expect that their IT projects will contribute a 5% or greater increase in corporate productivity. These same CIOs also expect that networking will account for half of the productivity improvement.

But IT departments shared in the rationalization plans of the past few years by experiencing a "reduction in force" just like other departments. Some firms have reduced IT spending by as much as 30%, leaving many of them frustrated and facing a long list of projects that need to be completed with less staff and budget, not to mention the maintenance of existing systems. Many CIOs continue to explore ways in which to further reduce cost and boost the corporate bottom line by replacing older communication systems with state of the art IP telephony solutions. But IP telephony is not just about cost savings and reduced TCO.

Fierce competition between IP telephony equipment suppliers and telecommunication service providers has successfully reduced the acquisition and operational cost of IP telephony. In fact, some corporations have been able to reduce their telecommunications spend by 30% or more after they have deployed IP telephony, creating a converged network of voice, video and data over a single IP network.

The entire enterprise voice market is under a tremendous shift and change from separate to a single converged IP network. Gone are the days when an enterprise voice system required PBXs and key systems to be deployed at every facility costing millions in capital dollars or huge annual lease expense. These PBXs and key systems were connected through expensive telecommunication services such as voice tie lines, private lines, or the public switched telephone network. Mobile devices such as cellular phones, PDAs and smartphones are on a separate voice network where cost is mostly buried deep within departmental budgets, hiding the true cost of mobility from the Chief Information and Chief Financial officers. Once mobile cost is tabulated, many CIOs and CFOs are shocked to find out that cellular cost can be between 50 and 100% of their voice telecommunication charges. Integrating mobile devices into an IP telephony framework offers another opportunity to control cost and provide deeper functionality and productivity.

IP Telephony and Convergence is Ready for Prime Time

IP networks made up of Ethernet switches, routers and their management have traditionally been another separate network where routers are connected through telecommunication service providers, private leased lines, frame relay services and, more and more, through MPLS or Multi-Protocol Label Switching. In the 1980s when data traffic was low relative to voice traffic the industry attempted to place data over a voice infrastructure in an effort to provide cost savings. But data traffic expanded exponentially in the 1990s with the adoption of IP and the Internet, reversing the conventional wisdom that voice should run over data and not the other way around. For perspective consider that every 10 years IP-based network bandwidth increases by a factor of ten; in other words, by an order of magnitude. In fact, the Internet is now nearly ten times larger than the public switched telephone network or PSTN. If this trend continues, by 2014 the PSTN will be just 1% as large as the Internet. IP's technical robustness and huge investments in bandwidth, including Local Area Networking or LANs, broadband, wireless and service provider core, make voice over IP or VoIP a technically sound and an economically viable reality today.

Although moving to IP telephony is absolute in the next several years, companies need to identify and define the compelling event(s) that trigger budget and resource appropriation. That compelling event(s) is motivated by a business need. For example, current systems cannot provide the features, flexibility, business continuity, or disaster recovery that is needed for the corporation.

Enterprise Voice Is A Software and Services Industry

As a result of the above, the enterprise voice industry is quickly becoming a software- and services-based industry, reducing the barrier of entry for corporations to adopt this new network architecture. In short, the acquisition phase of an IP telephony network does not require the distribution of expensive devices such as PBXs across facilities, but this function has become centralized in a device called a connection manager. A connection manager is software that runs on a standard operating system within a general purpose computing platform rather than specially built hardware. This centralization of software functionality along with competition for IP end points is fundamentally altering the cost structure and pricing models of the enterprise voice market.

But IP telephony is not just about cost savings; it's about embedding communications deep into the network fabric and wrapping voice around business process and profit drivers to deliver increased customer value. IP telephony and IP communications applications enable entirely new business models and ways of serving customers. The metamorphosis that enterprise voice is undergoing, from a rigid, expensive hardware-based network to a flexible software-based business platform, enables voice to be molded and crafted around business strategy to deliver on corporate goals. In short, the replacement of TDM- or PBX-based enterprise voice networks with IP telephony has proven to provide significant cost savings while its IP communications applications can deliver increased corporate productivity. How much corporate productivity IP communications can contribute is difficult to calculate, but gross domestic product (GDP) and labor productivity growth are inextricably linked according to the Conference Board Performance 2004, and World Bank World Development Indicators 2004. Further, GDP, productivity and IT investment have shadowed each other linearly since 1990. Investment in IT drives productivity, which drives GDP. Finally, CIOs who are in the know expect that half of their productivity improvements will be derived from network investments including IP communications. If CIOs expect that they will contribute 5% to increased corporate productivity and that networking will make up half or 2.5% of that contribution, then IP communications could supply the bulk of the 2.5% gain.

A Complex Set of Constraints and Opportunities

CIOs expect that their networks will deliver productivity at the same time that they and their staff adjust to operating with fewer resources, both human and budgetary. CIOs also view IP telephony and communications as a means to both reduce cost and deliver productivity but they question if they have the right skill sets and resources to undertake such a complex project. CIOs also realize that IP telephony, if not managed, will occur on their networks thanks to the large vendor and service provider push currently underway. This unmanaged deployment could potentially drive cost up, not down. In this white paper we will explore strategies for managing complex convergence migration.

The Role of Professional Services

A professional services organization can add value independent of where a company is on its transition to a converged IP network. Professional services concerns can assist, whether it is to help understand the pace, option or choices to make as a company plans its converged network. Also, professional services organizations supplement a corporation's IT skill sets to ensure that a converged network is properly staffed. A professional services organization, with the right resources, can undertake the entire transition and migration to IP telephony.

There are two important aspects that professional services organizations bring to the IP telephony table. First, professional services organizations can deliver key competent integration and project management skill sets, mitigating the risks and complications of complexity. Second, professional services organizations can accelerate the productivity improvements sought by CIOs by allowing them to re-direct dedicated IT staff toward higher value IP communications applications rather than converged network infrastructure. Professional services can then reduce risk and help accelerate the real value of convergence, productivity improvement.

It will be offered below that in most cases IP telephony will reduce TCO, depending on starting conditions. Professional services can hasten the return on investment and lower the TCO of IP telephony operations. For example, professional services organizations who are experts in IP telephony migration do not have the learning curve to climb that many IT staff do when they approach IP telephony for the first time. Professional services can avoid the traps of poorly run projects which are the cause of many difficulties. Perhaps the most frustrating difficulty of all is troubleshooting new problems and those never encountered before, which are common in a converged network. Trouble-shooting problems is one of the largest contributors to cost overruns and project delays. Also, uncontrolled scope is a major cause of indefinite project delays, costly business disruptions and exposure to other risks and vulnerabilities. In a converged network where all communications are impacted by network problems, a poorly run integration project can undoubtedly reduce user productivity and create ill will through poor customer service and lost revenue. Competent professional services organizations can complete projects on time and on budget. Most importantly, good professional services organizations can escalate problems through management and expedite resources to address difficulties when and if they arise. In short, there is a safety net for the convergence project that the CIO can rely upon when professional services are engaged.

Professional services organizations can assist IT departments in developing the skills necessary to deploy applications around business process faster than if done on their own, and hasten returns, all while the network infrastructure is being built. This parallel network infrastructure built-out and IP communications application development process can close the gap between IT needs and available resources since so many IT organizations have more on their plate today than ever before with less resources available to them.

Converged Network Architecture

Converged network architecture is the result of implementing IP telephony or the layering of voice traffic over an IP network. The converged network supports voice, data and video traffic over a single IP network. The reduction in the number of networks to support corporate operations results in a decrease of IT operational cost. Every corporation is different in their constraints, vendor sets, number of sites, number of employees, scope of operations, customers, etc., making it difficult to predict general results for all corporations. But the simple fact remains: managing one system in steady state is less costly and complex than managing three. Every corporation will have a different pace toward convergence, but it's also clear that equipment suppliers, software vendors and telecommunications service providers are proving to be strong incentives to adopt converged network architecture.

What we find from early adopters of IP telephony is that their Total Cost of Network Ownership or TCO significantly changes for the good after implementation when the converged network is in steady state operational mode. For example, a recent study by Lippis Consulting in conjunction with Boston University professor Dr. Mark Gaynor shows that early adopters experienced a 30% reduction in TCO after the implementation of a converged network. Further, most corporations follow a three-phase process toward converged networking as illustrated in Figure 1.

The three-phase process toward converged networking starts with separate voice, video and data networks. Phase 2, "*Transition*," marks the beginning of a migration to

a converged infrastructure, with investments in IP telephony technology and services. Most corporations have already started making investments in IP telephony but do not recognize this fact.

The reason for this is that IP telephony features such as quality of service, Session Initiation Protocol (SIP) end points, prioritization, Virtual Local Area Networks (VLANs), and power over Ethernet are being bundled within operating systems and data network equipment with every new software upgrade or refresh of a data network. Phase 2 is the investment period necessary to transition to a converged network.

Transition investment in IP telephony varies both in time (length of investment) and the quantity of dollars spent, depending on the drivers and inherent constraints of business operations. The investment period or “bump” can be steep, shallow or even non-existent depending upon Phase 1 conditions, the rate of speed at which the organization wishes to migrate to a converged network, and the amount of risk the organization is willing to assume. Phase 3, “*Converged Network*,” is a full conversion to a converged network in which voice is another application riding on top of an IP network infrastructure. Based on the Lippis/Gaynor research, Phase 3 TCO spending can be up to 30% less than Phase 1 TCO spending.

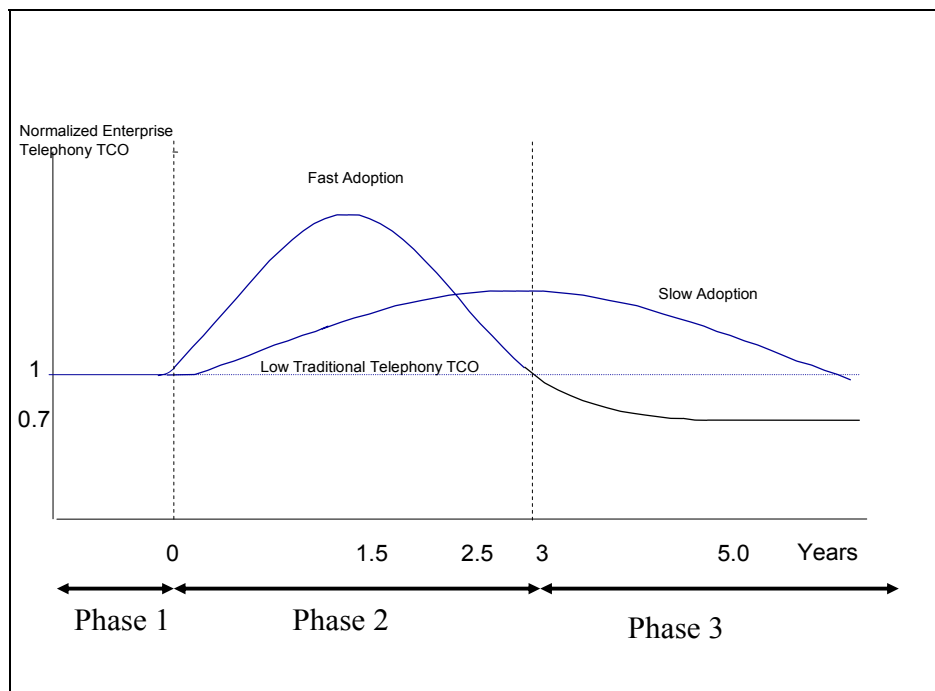


Figure 1: The Three-phase Process Toward Converged Networking

Traditionally, the total cost of ownership (TCO) for data networks consists of Ethernet switches, IP routers, network interface cards, management, operations and wide area communications. The data budget falls into three categories: 1) Capital costs for hardware and software represent approximately 30% of the TCO budget; 2) Operational costs, including staff to design and maintain operations represent a large share of TCO, at 40%; and 3) Facilities costs, which include wide area network charges, maintenance, floor space, power, air conditioning and wiring, comprise the remaining 30% of TCO. In traditional Time Division Multiplexing (TDM) or Private

Branch Exchange (PBX)-based voice networks, TCO is characterized similarly; however, the distribution of cost is different. In enterprise voice networks, capital, operational and facilities costs are estimated to represent 10%, 40% and 50% of the budget, respectively (Figure 2). The difference in TCO between data networking and traditional telephony is due to the fact that traditional telephony is an older technology with limited capital being deployed, large wide area/toll cost, and staff to maintain. For most corporations this is the starting point or Phase 1 of the three-phase process toward converged networking, which we call "Separate Networks." A corporation's transition toward converged networking will positively and significantly alter its TCO.

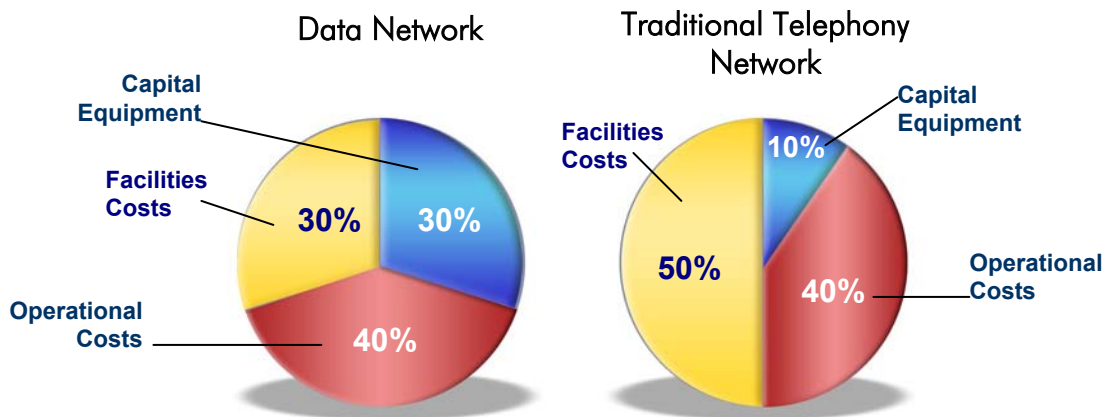


Figure 2: Traditional Non-Converged Data and Telephony Spending

Source: Lippis Consulting, Boston University TCO Study

From Figure 2, it's clear that operational cost is either the first or second largest cost component in TCO. (Note that the above average cost data is based upon the study of network costs for five large firms and may not be representative of all IT infrastructure cost). As mentioned above, for many corporations the budget and staff cuts of the past few years along with the continued need to support existing systems and IT requests have left IT departments ill equipped to study and implement a converged network. Since IP telephony is just entering prime time in our industry, many CIOs have maintained their existing focus on infrastructure when it comes to networking. The voice department maintains the enterprise voice systems and manages vendors while the data group does the same. The data group is more hands on, since IP networking is newer than traditional voice and requires increased levels of optimization and tweaking. Many have combined the voice and data groups since a converged network requires overlapping voice, data and video skill sets. But the simple fact remains: most IT departments are focused on infrastructure and the building of a converged network, and not yet on the applications.

The more time an IT staff focuses on infrastructure the less time it has to deliver on the real value to its corporation, which is increased productivity. IT departments have the opportunity to increase customer experience and value, revenue, share value and

ultimately profitability by shifting its dedicated resources toward IP communications rather than infrastructure.

A converged network will reduce operational and facilities cost. Figure 3 illustrates the findings of the Lippis Consulting and Boston University study where cost is redistributed as a company transitions from a separate to a converged network (Phase 3). During Phase 3, a fully converged network, the TCO components differ significantly from Figure 2. The overall TCO effect of a converged network operating in steady state is close to a 30% reduction in spending. The largest spending reduction is in operational cost because fewer resources are needed to manage a less complex network. This is true when the legacy TDM/PBX system is fully retired and decommissioned. Capital cost in a converged network is nearly identical to data network TCO and is primarily comprised of funds for refreshing the existing IP network and end points. Facilities cost is reduced as intra-company voice traffic is transported over the IP network. In summary, a converged network TCO is dominated by operational and facilities cost.

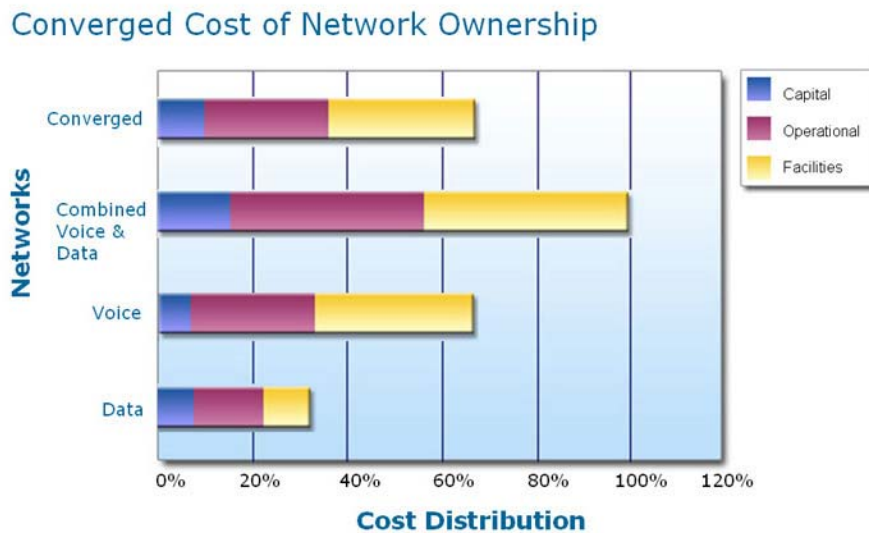


Figure 3: Converged Cost of Network Ownership

But while there is a strong potential for TCO reduction by implementing a converged network, the largest value to be received from convergence is increased corporate performance. IP communications leverages an IP telephony investment by wrapping IP communications applications around business process, increasing revenues, customer loyalty and profitability. New business models are enabled with IP telephony and new ways to serve the customer and add value. Communication applications, which automate new business process, contribute to delivering efficiency and profitability. IP communications such as contact centers, unified and instant messaging, desktop video, collaboration and unified communications become a business platform which IT departments can use to deliver corporate strategic initiatives.

Complex Convergence Migration

But with all this promise of convergence the largest barrier of entry is the lack of skill sets to evaluate, design, implement and manage a converged network. The more complex the system is, the more demanding the integration requirements are. While the benefits of converged networks are both economic and business, these projects can be very complex.

Linking older TDM/PBX-based systems and sharing feature sets across analog, digital, IP and mobile end points can be daunting and wrought with poor performance and frustrated users. Before a converged network can be deployed the existing IP network infrastructure needs to be assessed for its ability to support voice traffic and flows. The IP network infrastructure also needs to be secure as all IP communications will use this infrastructure to deliver collaboration, e-mail, calendaring, audio conferencing, web applications, video-on-demand, voice messaging, instant messaging, contact centers and basic dial tone telephony. Not only does the IP network infrastructure need to be locked down, its ability to be agile in the case of disaster and deliver business continuity also needs to be assessed. In short, before a converged network can be deployed its vulnerabilities need to be identified and closed, its ability to deliver business continuity needs to be assured, and its capacity, resources and performance need to be tabulated and assessed for their ability to support IP telephony.

Unfortunately, IP telephony integration is an art, a black art with very few practitioners. Large traditional system integrators and service providers offering IP telephony integration have not been able to turn IP telephony deployment into a science from its current black art status. In many respects IP telephony is in the same skill set status as routers were back in 1995, when there were very few IT professionals with the skills to integrate, deploy and manage routed networks.

That is why many corporations are turning to professional services organizations with deep convergence planning, design, integration and operational experience. The integration and deployment phase of IP telephony comes with large consequences if not implemented correctly and professionally. In a converged network, problems on the IP network will now impact voice, video and data services. A voice problem could impact data transport and vice versa. Troubleshooting a data transport problem on a router could then impact voice quality and performance. Voice, video and data are inextricably correlated, with the performance of one service potentially impacting the performance of another. Integration is the most difficult aspect of a convergence project. Integration requires key skill sets of mixed vendor support for products such as PBXs, communication managers, routers, switches, service providers, as well as the ability to conduct a Voice over IP (VoIP) performance test for an IP telephony deployment to be successful.

Business Strategy + Convergence Architecture = Evolution

The job of IT is to understand business requirements and apply IT to meet business goals. Excellent CIOs understand the absolute business need and vision and use this as an IT project filter so that the proper technology can be identified and deployed. Many companies find that business communications consulting which aligns business and technology is an effective and useful exercise. This is especially important when a CIO understands the business strategy but cannot map it into technology investment to support the vision. Professional services organizations can help link business and IT strategy.

A key strategy in managing complex convergence migration is the development of a business driven converged network architecture and evolution plan. Complexity can be mitigated through good planning. In the development of converged network architecture, business requirements need to be gathered. Business requirements are usually obtained by interviewing business managers, heads of departments/divisions and executive management. The first phase of network architecture development is called obtaining "Business Objectives". Examples of business objectives and strategic initiatives are plans to grow organically and through selective acquisitions, expansion internationally, a shift toward more client focus and "deliver anytime – anywhere" service excellence, lower cost structure to effectively compete, compliance with government regulations, etc. Business objectives are as diverse as the economy in general. Capturing your business objectives and mapping them into a set of network requirements which drive converged network architecture will ensure that the network and business are aligned. During Phase 1 the existing network needs to be assessed for security and business continuity vulnerabilities, performance and its cost in capital, operations and facilities across voice, video and data, and all information captured and tabulated.

Phase 2 of our strategy of managing complex convergence migration through network architecture is to develop architecture alternatives that meet the network requirements obtained in Phase 1. Examples of network requirements are increased bandwidth to domestic and international offices, an increase in communications flexibility and traffic forms, integration of mobile devices into a converged network, delivering real time collaboration tools, enhanced security and ensuring business continuity. These network requirements are then used to explore and prioritize various options available to meet converged network requirements. During Phase 2 architecture approaches such as hybrid vs. pure IP telephony are explored, as well as mobile smartphone integration options, contact center resource placement, communication end point alternatives; all are explored and filtered through network and business requirements. Various technologies such as SIP, WLANs, IPSec, MPLS, Communications Managers, and applications are reviewed for their viability in the converged network architecture. In short Phase 2 is the development of a blue print or a roadmap that will be the basis for building the next generation enterprise networks. After alternatives and options are sorted and the target architecture is developed, a budget can be formulated and presented to executive management for their approval. At this point the business requirements, network architecture and budget can be communicated in a cost and benefits format.

In Phase 3 the existing network has been assessed, the converged network architecture defined and an evolution plan put in place. Evolution may be regulated by an event based or a large scale roll-out. Economics and business benefits usually regulate the pace of convergence migration. With an evolution plan in place the

converged architecture is now put into a Request For Quote (RFQ) format with the vendor selection process underway. This leads to implementation and integration with existing systems. It is also useful to assess IT skill resources at the end of Phase 2 so that IT management can properly plan for implementation.

Phase 4 is steady state operations and management of the converged network. The four-phase process can take between one to three years depending on the size of the organization. It's through the four phase converged network architecture process that complexity is mitigated through professional planning.

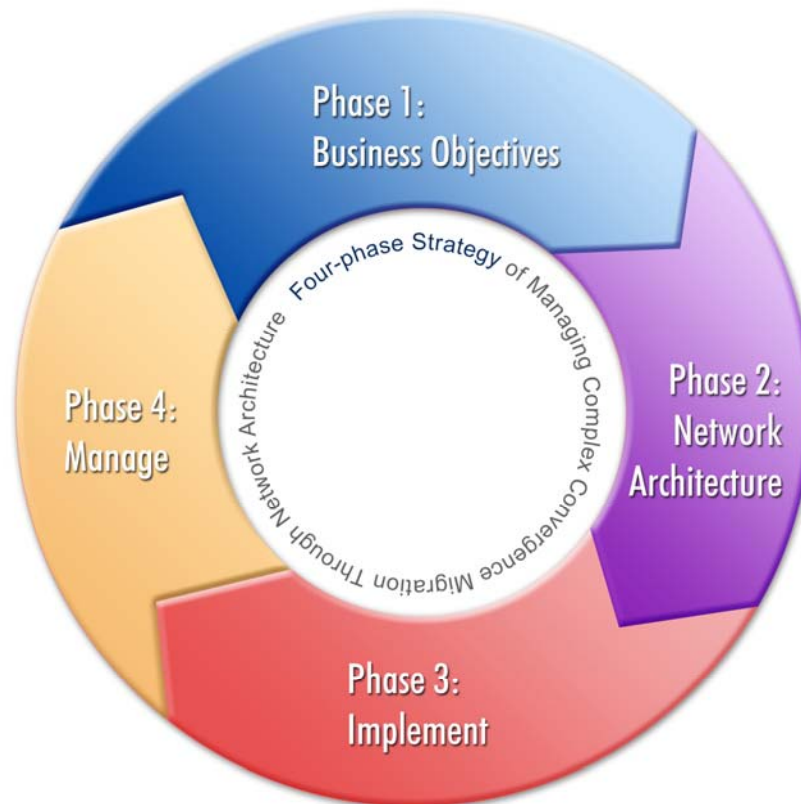


Figure 4: Four-phase Strategy of Managing Complex Convergence Migration Through Network Architecture

There is a role for professional services throughout the entire four phases of converged network architecture planning. In fact, most IT staff is focused on the delivery of services and management of existing systems. Unlike IP telephony and IP communication skill sets, this planning process is often not a skill set found in many IT departments. Note when shopping for assistance there are also large differences in professional services providers.

How to Compare Professional Services providers

The following will help in determining how to compare, evaluate and select a professional services provider who will assist in the development and operations of a converged network. Professional services organizations are as good as the people

they employ, the processes they perfect and the tools available to staff allowing them to deliver excellence.

In comparing professional services organizations, the depth and competence of an organization is one of the key attributes which differentiate them. For example, program and project manager skills keep the CIO informed of progress on a regular basis while managing resources through various project phases. Their job is to deliver the converged network on time and on budget. Project managers manage technical competences of support staff by applying them to appropriate tasks. The key question is does the professional services organization possess the technical skills required to deliver a converged network? These include skills in software, Internet Protocol suite, network integration, call center specialist, telephony, routing, IP telephony, IP communications and its various applications including voice messaging and collaboration. These skill sets are a must if the professional services group is to deliver a converged network.

Field support and technicians who are certified in the equipment and services deployed within the converged network are important so that the professional services organization can seamlessly handoff, to a post implementation group, maintenance and managed services. Professionals certified in mixed vendor support across different equipment suppliers and telecommunications providers are of high value, since nearly every corporation's voice, video and data network is built with many suppliers. This ease of transition and handoff is a major benefit to maintaining the designed architecture after implementation. Also technical instructors and writers who can provide user training are paramount to the CIO's goal of contributing 2.5% to corporate productivity. Because so many IT projects are implemented without proper thought and resources allocated to user training, the results are often lack luster productivity improvements.

Summary

Many CFOs, CEOs and CIOs are still skeptical about the marketing claims made by the IT industry after being burnt with hyped up value proposition during the late 1990s. To battle this skepticism executive management found comfort in rigorous financial analysis and budget planning for new IT projects with tight controls and after project assessments. Out of this industry wide analysis, IP telephony has proven to be an IT project with hard return on investment and potential productivity upside improvements. Two points dampen this excitement, however. First, migrating toward a converged network is complex. The second dilemma facing many IT departments is necessary skill sets or lack thereof for designing, implementing and managing a converged network and its associated IP communication applications. Network architecture planning is a strategy to overcome these two obstacles of implementation which allows CIOs to gain the benefits of reduced cost and increased productivity. To hasten the benefits and mitigate risk associated with a converged network, professional services organizations can be employed. In selecting a professional services concern, skill set competencies in converged network products, software, process, technical support across multiple vendors and tools available to employees are the basis of competition.

About Nick Lippis



Nicholas J. Lippis III is a world-renowned authority on advanced IP networks, communications and their benefits to business objectives. He is currently working with clients developing converged network architecture, which includes IP telephony, secure networks, wireless LANs, internet data centers and storage area networking. He is the chairman and host of the Enterprise IP Communications 2005 Symposium, a conference where corporate network architects and designers learn and share industry best practices. Mr. Lippis hosted thirty-seven sponsors and four hundred and sixty delegates during his Enterprise Networks 2004 conference in Boston.

He has advised numerous Global 2000 firms on network architecture, design, implementation, vendor selection and budgeting, with clients including Barclays Bank, Microsoft, Kaiser Permanente, Sprint, Worldcom, Cigitel, Cisco Systems, Nortel Networks, Lucent Technologies, 3Com, Avaya, Eastman Kodak Company, Federal Deposit Insurance Corporation (FDIC), Hughes Aerospace, Liberty Mutual, Schering-Plough and many others. He works exclusively with CIOs and their direct reports. Mr. Lippis possesses a unique perspective of market forces and trends occurring within the computer networking industry derived from his experience with both supply and demand side clients.

Mr. Lippis founded Strategic Networks Consulting, Inc., a well-respected and influential computer networking industry-consulting concern, which was purchased by Softbank/Ziff-Davis in 1996. Mr. Lippis was named one of the top 40 most powerful and influential people in the networking industry by Network World. For nine years Mr. Lippis reached over 120,000 purchasers of networking equipment and services through his monthly column "Lippis on Internetworking" published in Data Communications magazine. He was a contributing editor and columnist for Tele.Com magazine reaching over 80,000 service provider professionals monthly. He currently writes the "Lippis on IP Communications" column for Network World reaching 180,000 in print and 850,000 online. He publishes The Lippis Report, which is distributed to over 360,000 senior IT executives around the world. Mr. Lippis' reach exceeds 1,400,000 readers. He is a frequent keynote speaker at industry events and is widely quoted in the business and industry press.

Mr. Lippis received his Bachelor of Science in Electrical Engineering and his Master of Science in Systems Engineering from Boston University. His Masters' thesis work included selected technical courses and advisors from Massachusetts Institute of Technology on optical communications and computing.
