

# The Converged IT Organization

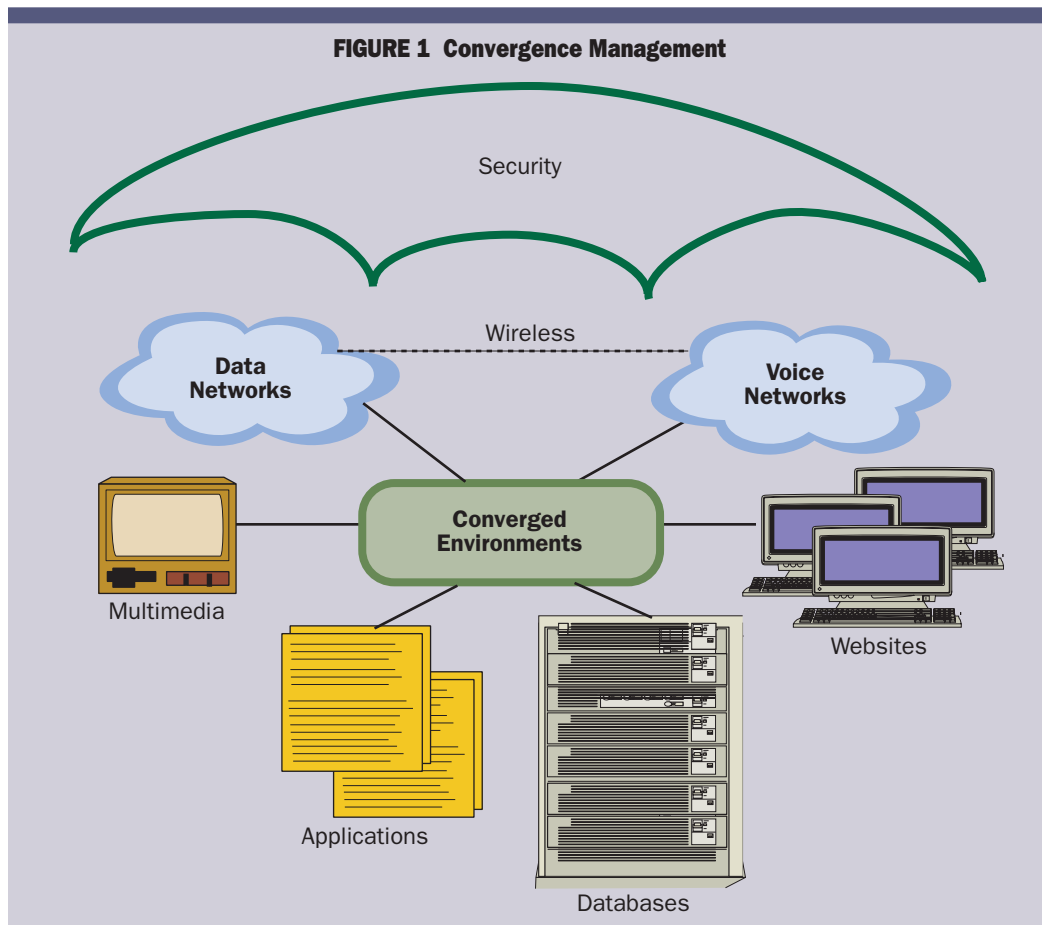
Gary Audin

**Your voice and data networks are coming together. How do you get the groups that run those networks to do the same?**

**C**onvergence confusion. Fragmented staff. Future-proofing. All these mean change. Convergence, especially the near term of voice over IP/IP-telephony (VOIP/IPT)

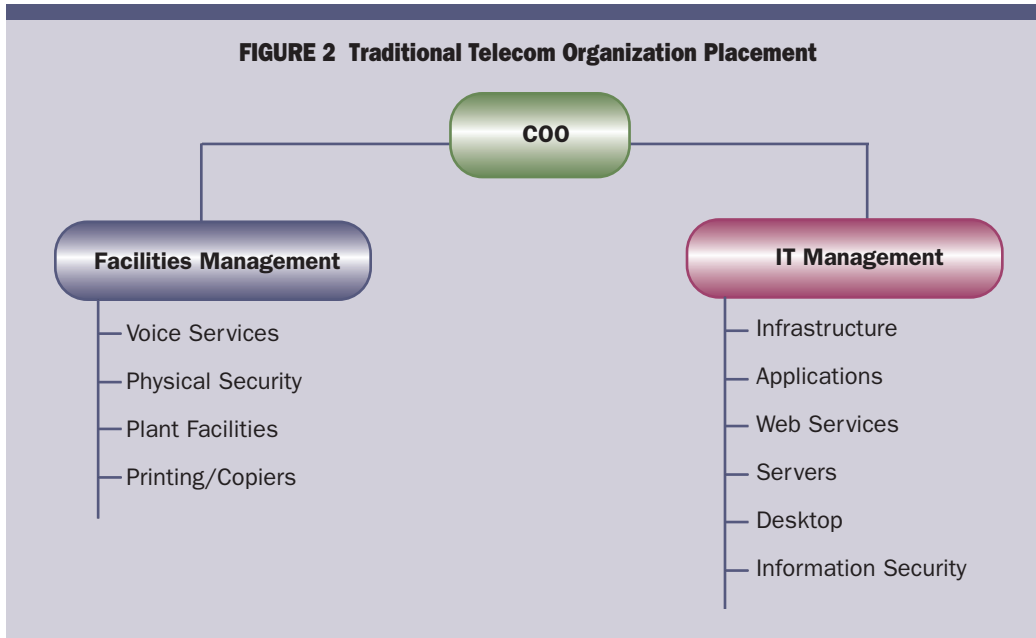
implementation, is a cultural change, not just a new way of building an IT environment. The rapid integration of what were separate technologies into a converged environment affects IT management and staff. How do you future-proof the IT organization? Can this even be done? Modified IT organizations, cross-training and knowledge transfer in multiple technologies have become the mandatory answers.

Deployment of converged networks is rapidly expanding into all enterprises and government. The organization structure and staffing necessary



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**FIGURE 2 Traditional Telecom Organization Placement**



**Because legacy voice works so well, CIOs underestimate how difficult it is to re-create with IP**

for successful implementation usually does not exist prior to the technology migration. Although existing organizational structures may have a common management point in the CIO, the staff is highly segregated by technology. Telecom/voice personnel know little about data networks, servers or applications. And aside from the phones on their own desks, data network personnel are generally unfamiliar with telecom technology. They also have little knowledge of the servers and applications running on their data networks (for conclusive evidence of this, see Peter Sevcik's column in this issue, pp. 10–13).

Likewise, applications and desktop personnel have limited knowledge of data networks and no knowledge of telecom/voice networks. Wireless networks only add to the complexity and skills requirements. And those responsible for security must understand all of these technologies.

Managing these segregated groups presents a challenge. Since most people in management are removed from the nuts and bolts of technology, they will have an even harder time adjusting to the major decisions and changes that occur with a converged environment.

In order to operate effectively, the segregated groups must be knowledgeable in each others' technologies, and management must step forward and be educated in the deployment of converged networks and applications. Defining the knowledge and skills necessary to fulfill this need requires considerable study and analysis. Personnel must be assessed (tested) with vendor-neutral certification in mind, rather than limiting themselves to product-focused certification.

A plan must be developed and implemented to help both management and technologists obtain the knowledge needed to make convergence function optimally. This plan should include organiza-

tional restructuring, training and certification programs to fulfill the need for convergence knowledge. Cross-training in convergence technologies will reduce the risk and speed up implementation. It will also reduce real costs by enabling employees to make proper choices and avoid mistakes. There will be financial as well as intrinsic value to a properly constructed convergence organization (a typical version of which is shown in Figure 1).

#### **It's All For The End User**

End user perceptions for voice service are based upon their experience with the public switched telephone network (PSTN). End users expect better service and higher reliability for their voice calls than for their experience with data applications. Voice service cannot be treated as just another application on the data network. Voice transmission is far less tolerant of data network impairments compared with data applications. Because legacy voice service works very well and requires a small staff to manage, data staff and many CIOs have underestimated what it takes to make IP-based voice networks successful. The move to VOIP/IPT is, in many ways, redesigning the wheel with new materials.

The end user does not care whether the responsibility for delivering voice and data services belongs to the infrastructure or applications staff. The end user sees the IT organization as the service provider. When it comes to voice services, the end user is concerned about:

- **Dial tone**—It should be there, and the time to dial tone should be short.
- **Voice quality**—No garbled speech, noise or crosstalk; speaker recognition expected.
- **Call connect/flash/disconnect times**—These must not take too long.

**When IT absorbs the telecom function, IT must change**

- **Call drops**—These should rarely occur
- **High application reliability and availability**—This applies not just to telephone service, but to voice mail, directory assistance, etc.

**Convergence In The Enterprise**

For many, convergence is in the mind of the beholder. The data network group envisions converged transmission, independent of the application. To the server and desktop communities, convergence means having all the functions on a single platform. Wireless technologists consider convergence to be wired plus wireless networks. The voice staff sees convergence as moving voice transmission to a data network. All of these are correct but limited.

Usually, none of these groups is cross-trained in the others' technologies. Staff certifications are technology- and, to some degree, vendor-focused. Convergence is taught from a technology viewpoint, as a data goal or a wireless goal, etc. To the CIO, convergence can mean many complementary applications and media working with common endpoints, improving productivity, profit and market share. So even the benefits of convergence are viewed differently.

**Traditional Telecom Organizations**

Telecom management's goal is to ensure a reliable, stable and cost-controlled environment. Telecom is not technology driven, but service driven. In fact, the last major technology change occurred years ago, with the migration from electromechanical to electronic digital switching systems and telephones.

Because voice is viewed as a service, it was usually placed under the management of the facil-

ities manager and not IT (Figure 2). The telecom staff is small, but manages a large budget. The enterprise owns the PBX and phones or subscribes to Centrex service. All inter-site communications were carried by the PSTN or through tie lines, handled by a carrier.

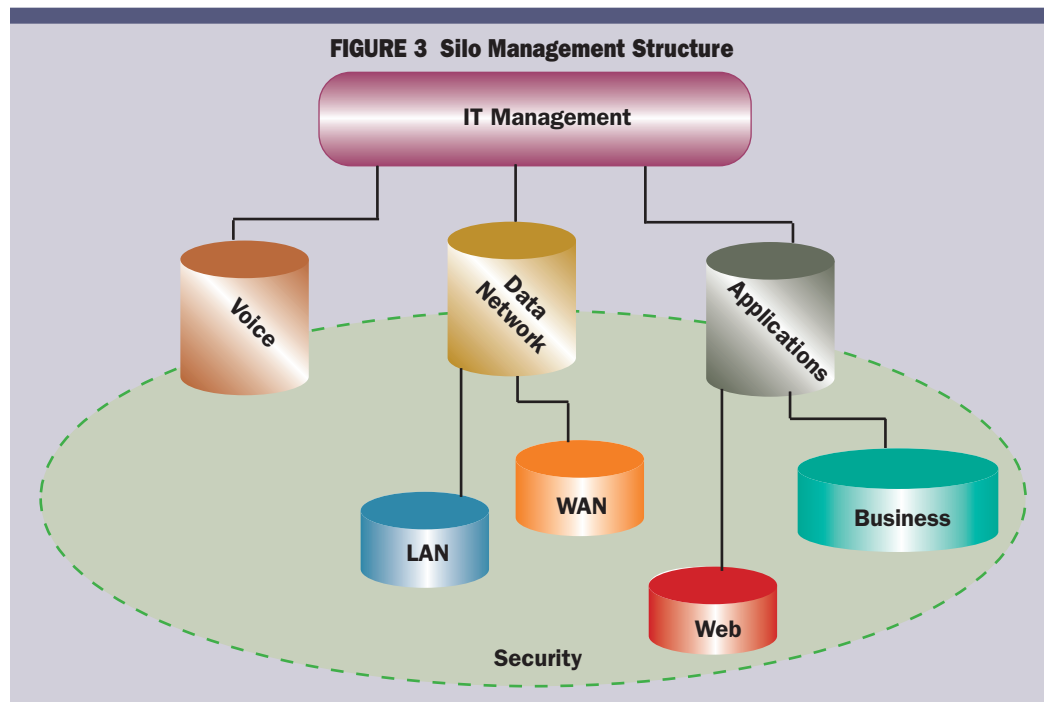
Much of the work was moves, adds and changes, traffic analysis, billing, cost review and call center management. The telecom staff was not technology-driven. There was not that much new technology to consider. The development of voice services and the technologies that supported voice occurred slowly, resulting in a reliable and stable service. The phones always worked, even when power was lost. Anything that worked this well can't be complicated and therefore was pretty simple. Right?

Yeah, sure. The telecom staff unfortunately has underestimated what they have designed and delivered because they had years to perfect the voice operation. The improvements and changes were gradual and not disruptive.

**The Impact Of Convergence**

When IT absorbs the telecom function, IT must modify its structure. In a way, IT needs to audit what it does and categorize the work and corresponding knowledge and experience needed for successful operation. The present structure, as shown in Figure 3, needs to have the barriers among the technology silos softened and eventually removed. Even when the IT staff is small, there needs to be a method for analyzing the knowledge and skills required for the converged organization.

Fortunately, we're starting to see industry-wide efforts to address these needs. The sidebar,



## Where Do Skill Standards Fit?

Certifications should not be confused with skill standards. Skill standards are performance specifications that identify the knowledge and skills an individual needs to succeed in the workplace. They delineate what a person must know and be able to do in order to perform related work successfully at a specific job, within an occupational cluster or across an industry sector.

Quality certifications are *based* on skill standards, but they are not the skill standards *per se*. Instead, certifications provide formal documentation that an individual, by successfully passing an assessment (or a battery of assessments), has met the performance specifications identified in the skill standards.

However, just as there are standards bodies for technology, there are similar organizations that attempt to bring standardization to worker skill sets. Global Skills X-change (GSX, [www.gskillsxchange.com](http://www.gskillsxchange.com)), a successor to the National Skill Standards Board (NSSB), is charged with adopting and adapting the work of the NSSB to meet the needs of the knowledge-based economy. GSX designs and evaluates customized implementation strategies of standards-based tools and protocols that can be used to realize a “national” system of standards and certifications for convergence.

GSX currently provides technical leadership and assistance to the Information and Communications Technology (ICT) Voluntary Partnership in the completion of the ICT’s skill standards. This skill standards development project, started under the auspices of the NSSB, is divided into three phases. The first included reviewing hundreds of existing “job analyses” and “role delineation” studies, the results of which were verified using focus groups of industry thought leaders and senior subject matter experts. The project has identified seven concentrations of front-line work in this converged world:

- Database Development and Administration
- Web Development and Administration
- Technical Writing
- Network Devices
- Network Infrastructure
- Programming
- Digital Media

For each of these concentrations of work, the project has identified critical work functions (major roles and responsibilities), key activities (major tasks associated with the performance of each critical work function) and performance indicators (to provide evaluative information on how to determine when someone is performing each key activity

competently). In total, there are 37 critical work functions and 250 key activities. Each key activity includes, on average, six to eight performance indicators.

Enterprises can use this information to fully define the knowledge and skill requirements of targeted jobs. The enterprise can use the critical work function information to define the jobs, and once defined, the database can automatically provide enterprises with information about the knowledge and skills required to perform those critical work functions.

The database can also be used to determine the level of knowledge and skills that individuals will need to perform the critical work functions in a competent manner. This is important because, instead of focusing on the different technologies (such as voice vs. data) as the defining characteristics of their work force, enterprises should focus on the work that needs to be done.

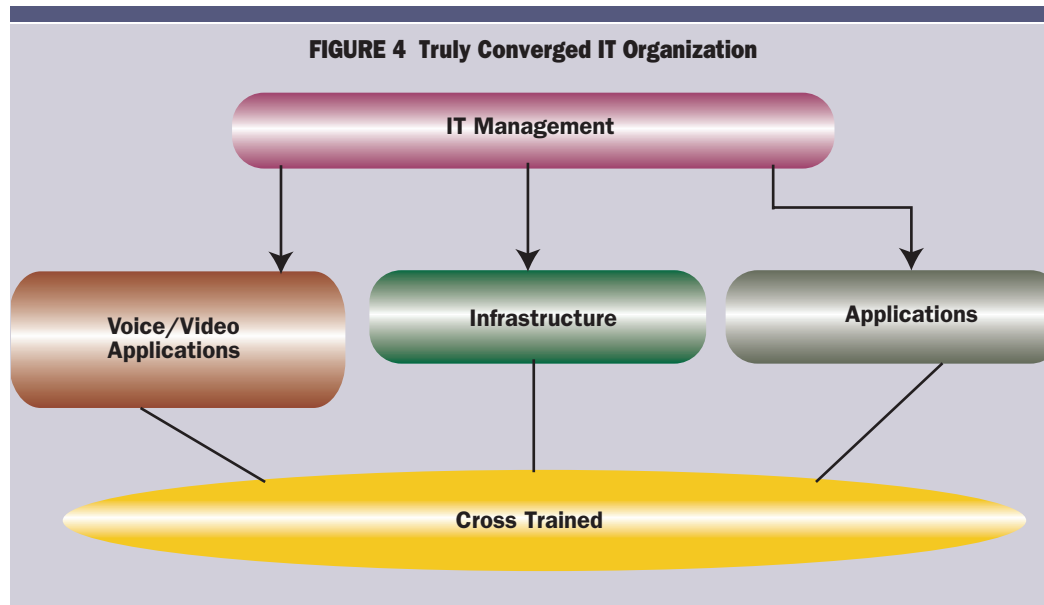
Once defined, the ICT skill standards can provide information about the knowledge and skills required to perform that work in a converged world. Although this will mean potential cross-training of the work force, it can prevent enterprises from having two or more distinct work forces performing overlapping functions, or who compete for jobs and resources.

The second phase of the GSX skills standards development project consisted of further verifying the initial results of its study through four sets of regional focus groups with ICT subject matter experts. It also included enumeration of the “worker” component of the skill standards.

The project has identified 68 categories of technical knowledge and skills relevant to the converged world. These 68 categories consist of knowledge and skills (a total of 557 specific and relevant to the converged world) as defined in the seven concentrations of work listed above.

The third GSX phase consists of further verification of this information using survey methodology. Participants are being asked to verify both the “work-” and “worker-” oriented components of the skill standards. Once completed, this phase of the project will result in a database that links specific knowledge and skills (including NSSB’s list of 17 academic and employable knowledge and skills) to critical work functions. It will represent the first enumeration of front-line work and relevant knowledge and skills associated with the converged world□

**In one enterprise, data staff resisted putting voice on “their” network**



“Where Do Skill Standards Fit?” describes one such effort.

The differences between how telecom and IT approach their respective operations and responsibilities can be significant. There are cultural, mind-set, budgetary and personal issues to overcome before a successful converged organization can be established. But there are also benefits to the converged organization:

- Reduced finger-pointing.
- Better business and technology planning.
- Knowledge transfer among staff members.
- Reduced conflict for resources.
- More thorough and comprehensive project management.
- Better approach to business problems through solutions that reflect a wider range of experience

As with any change that involves people and personalities, there will be difficulties for convergence, including:

- Different budgeting mind sets.
- The new requirement for the data network to deliver quality of service (QOS).
- Cultural and history differences.
- More expensive IT staff members doing the work of less expensive telecom staff.
- More servers and IP endpoints to manage.
- More operating systems—as many as four, including Linux and VxWorks—that may be unfamiliar to the IT staff.
- Modified network design.
- Need for network assessment with regard to performance delivery (a process that must be repeated frequently).
- New application platforms designed for connection to the VOIP/IPT systems, such as Microsoft’s Live Communications Server.

Size does matter when it comes to the staff knowledge and distribution of authority and responsibilities. The smaller the staff, the more

hats each member has to wear; the advantage here is that there is greater knowledge and appreciation of the other members’ work. As the staff size increases, members become more focused on a smaller range of technology. The silo groups see new technologies not generated by them as a disruption, not a business value, and may push back, resisting the new technology.

Examples of these kinds of dynamics: One enterprise found the operator of the DHCP would not allow IP phones and devices to use the DHCP to obtain IP addresses before registration. Another enterprise found that the data staff was resisting any VOIP traffic and devices on “their” data network because they did not want to share the risk of VOIP implementation.

#### **New IT Responsibilities**

The IT organization and management will inherit many responsibilities that had been exclusively supported by the telecom staff. IT will now have to provide and manage PBX and other telephony services. Non-telephony applications will be generated that would not have existed before VOIP/IPT implementation.

The IT staff will also have the added workload of installing more software versions, releases and patches for the VOIP/IPT systems. This becomes a major issue when multiple sites need software changes. The coordination of the software installation may hinder interoperability among the systems while the software is installed in phases. This will require well planned and disciplined software changes so that voice service is not compromised.

IT will also have new work to perform and new responsibilities that it may not be prepared to assume successfully. Some new areas that IT will have to deal with include:

- Competitive voice carrier proposal solicitations.
- Carrier voice contracts.

- Carrier invoices and billing verification.
- Chargeback structures and operation for voice services.
- Toll fraud.
- Integrated voice/data help desk.
- Different maintenance considerations.
- Regulatory compliance.
- New management systems.
- New security issues overlapping with physical security issues.
- Multiple forms of wireless.

For an overall view of a converged organization, see Figure 4.

### **Reorganize: Do It Now (Better) Or Do It Later (Suffer)**

At VoiceCon Spring 2006 in Orlando, I moderated a panel on “Organizing for Convergence.” It was one of the better attended presentations, and the audience was ready to hear users’ recommendations for organizational changes as they moved to a VOIP/IPT environment. The panelists were Debra Naderhoff, director, communication technologies at Sentara Healthcare; Scott Kincaid, CIO at Butler University; and David Stever, manager, communications technologies at PPL Corp.

Naderhoff made the following points that she felt helped her organization make the transition to a converged staff:

- All staff members must appreciate and understand each technology.
- All staff members must talk the same language.
- There will be different responsibilities.
- Remember the customer.
- One area must lead.
- Set expectations right at the beginning of the project.
- Provide incentives, recognition and rewards.

Scott Kincaid was dealing with divided responsibilities at Butler University—a voice camp and a data camp. He wanted to avoid a turf war. He had the following suggestions from his own experience that avoided the turf problem, especially with the facilities staff:

- Treat the facilities staff with respect.
- Involve them throughout the project.
- Ensure that the facilities staff knows the facts and industry trends.
- At Butler, the facilities staff spearheaded the wiring and cabling improvements and documentation.
- No job security was threatened, because the facilities staff was overloaded.

He went on to provide convergence tips for a successful VOIP/IPT implementation:

- Form a blended team early with voice + data + users + consultant.
- Create an interdependent team.
- Retain an independent consultant for the term of the project.
- Admit that the data network does not match legacy voice in quality or reliability.

Use a formal systems acquisition process for the needs analysis, RFP preparation and vendor scoring methodology.

- Focus on business needs.
- Redefine IP as “infinitely personal.”
- Arrange informal education and unstructured time for the staff and ideas to converge.
- Attend a conference as a team
- Go to other customer sites together.
- Attend lengthy vendor briefings together.
- Invest in formal education.
- Include testing and network assessment in the project.
- Select an implementation firm with voice and data skills.
- Appoint a project manager with telecom and networking skills and knowledge. Move the MAC (move/add/change) function from facilities to IT.
- Upgrades to the data network for voice traffic to benefit all.
- Keep the team well fed (and happy).

David Stever of PPL, a Pennsylvania-based utility, viewed the reorganization as tactical issues with strategic consequences. He presented five key strategies that he learned as PPL moved to a converged environment:

- Focus on service orientation and functional boundaries as opposed to device affinities. This creates a model that is sustainable and extensible. The strategy can be applied to both development and operations.
- Leverage existing technical and soft skills whenever possible instead of replacing them elsewhere in the organization.
- Acknowledge the existence of different mind sets, for example system orientation vs. device orientation. Skills can be taught and changed. Mind sets are harder to change because they are often ingrained.
- Communicate and socialize the potential of applications and telephony integration early and often, particularly with the applications development group. Start with a small proof-of-concept pilot implementation that will help people understand the potential.
- Consider the comparative value of in-house vs. outsourced services. Be careful to not tie your hands with regard to potential future changes. Managed services are becoming more viable, but be careful of “bundled” solutions which prevent functions from being returned to in-house operation.

All three panelists viewed the reorganization as the primary reason for their implementation success. Each panelist started in a different place as they entered the VOIP/IPT world. They all concluded that the success was due to the way they managed their staffs and re-organization, more than the vendors they selected □



**Successful convergence implementations were driven more by internal reorganizations than by vendor selection**