

Thinking About

Enabling Convergence

A Four Point Framework

AT&T's Four Points of Convergence

The convergence of networking technologies today is creating powerful new methods to help enterprises strengthen their performance. The keys to convergence success are to understand what convergence can achieve for your organization, determine which convergence areas will provide the greatest benefit, and plan and implement the steps required to make convergence a success.

What is Convergence?

Convergence was once thought of simply as the ability to send digitized voice and data over a shared network. Today the picture is more comprehensive. Convergence can benefit virtually every enterprise activity. As you extend convergence across your organization, AT&T believes there is a clear Four Point Framework for Convergence, which your enterprise can employ simultaneously or in order of maximum benefit:

- Integrate your on-net options for mobile and fixed access
- Enable your networks with multi-protocol label switching (MPLS)
- Optimize your applications infrastructure
- Take advantage of VoIP and other Services over Internet Protocol

The Promise of Convergence

Convergence has the power to strengthen organizational performance and efficiency in several key dimensions.

First, a converged networking infrastructure can help enhance the operational efficiencies and productivity of your organization. Business applications, from straightforward Voice over Internet Protocol (VoIP) to sophisticated customer relationship management (CRM) and enterprise resource planning (ERP) systems, perform more reliably and deliver greater value after the divisions that separate legacy networks have been erased through convergence.

A second benefit is enhanced organizational agility. By integrating multiple communication channels and increasing the richness of communications, converged systems can move information to the people who need it – whether they are decision makers, distributors, sales people, service representatives, customers or suppliers – faster. Your organization can reach and implement decisions quicker, shorten time-to-market cycles and enhance workflow responsiveness to real business needs.

Converged systems also increase management's ability to control activities across the organization, identify changing circumstances and adjust network performance in response to those changes. This means the whole organization can adapt more effectively to changes in the operating environment.

A main concern about convergence has been security. In a 2005 global survey, more than two thirds of respondents rated security as the single most critical aspect of network performance, and almost as many (64 percent) cited security issues as a barrier to convergence. Without careful planning, the integration of fixed and wireless networks could make it even more difficult to protect mobile data.

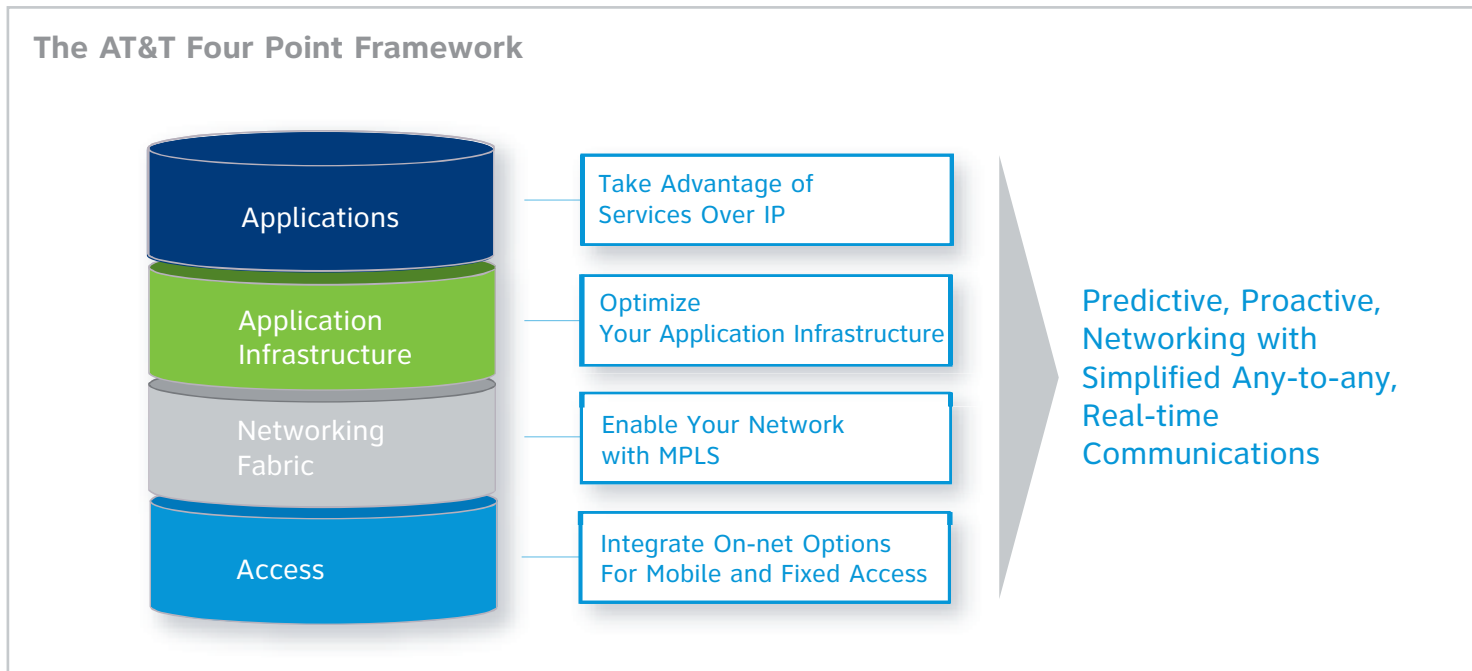
The answer is to integrate security plans and measures throughout the convergence process. Security for converged networks and services must be built in, not bolted on as an afterthought.

Closely related to security is the issue of business continuity – the ability to remain productive in spite of disruptive events. Converged communication systems can be set up to provide diverse communication channels and access options that can enable employees to remain mobile, stay in touch and work productively from almost anywhere.

More than just delivering lower capital and operational expenditures, network convergence should be focused on creating the next generation of services that will enable your customers or partners to increase value.

The promise is proving persuasive for business leaders. In a 2005 global survey, 60 percent of executives said they will have deployed converged networks across most or all of their organizations by 2008. Almost half (45 percent) said they consider convergence important or critical to achieving their strategic IT and business objectives.





AT&T's Four Points of Convergence

AT&T has worked through the convergence process with thousands of enterprise customers. We believe organizations can best implement converged networking by focusing on four interrelated yet distinct areas. Each of these focal points promises significant benefits, and in each, managers have key issues to take into account as they plan for and implement their convergence strategies. It is important to view these as opportunity areas, not sequential steps. Each organization will want to analyze its individual needs before deciding to pursue one, several or all four.

Integrate Mobile and Fixed Access Options

The multiple access options available today – including cellular, fixed wireless, wireline and several broadband technologies – are highly capable. Enterprises have grown to depend on a proliferation of access devices, media, transmission protocols and technologies to keep employees connected to customers, suppliers and each other. Access reduces the operational impact of distance and location, enabling people to be productive and collaborate even as they move to customer sites, home offices, hotels, vehicles and across the corporate campus.

In the past, access was often viewed as something outside the scope of the corporate network, a costly and even bothersome “add on” instead of a core capability. Today that view has changed, and enterprises are managing access as an integral component of the corporate communications infrastructure.

Instead of considering access as connecting to their networks, businesses are managing access as part of their networks. In this way, they can achieve the price-performance levels they need to run their businesses.

Access today integrates every user and every end-point into the heart of the networking environment, delivering consistent performance and a uniform user experience, globally. Emerging capabilities such as

“presence awareness” let the network and its users know if other users are available, and the best access method to reach them. Another new technology, Worldwide Interoperability for Microwave Access (WiMAX) is expected to offer high-bandwidth wireless transmissions over a range up to 5 miles, while employing the security of wireline connectivity.

Is it time to integrate access into your corporate network? Take the “more-better-less” test: Does your business require more coverage to better serve customers? Do your users need better features, functions, capabilities, Service Level Agreements (SLAs), to do their jobs effectively? Do you want to see less complexity and cost in your network?

If your answers are yes, begin with an inventory of your endpoints, including any employee, location, server or device that connects to your corporate network. Then consider the applications required by each user group. What performance do they need, in terms of speed, applications, services and access methods? With this information in hand, you can establish criteria for SLAs, prices and security levels – and access integration can proceed.

Enable Your Network with MPLS

In the past, enterprises set up multiple special-purpose networks to provide data transport, voice communication, video communication, data storage and other services. Often these disparate networks were incompatible, making it impossible to integrate the applications and services they supported. The networks did their jobs, but were hardly optimized.

Today, much more is possible. Companies are replacing single-purpose networks by converging multiple functions onto MPLS-based multi-service networks. MPLS networks are the secure and reliable workhorses of the networking age, capable of handling virtually any kind of traffic on a single network infrastructure.

MPLS enables service providers to offer simpler, higher caliber services that are easier to manage. Now it is business needs, not the limitations of networks, which set the IT agenda. Network-based, end-to-end Class of Service traffic management ensures high quality for such applications as VoIP and IP television. Using MPLS networks as the base for Virtual Private Networks ensures communication privacy and security.

Enterprises will increasingly turn to MPLS as carriers merge and provide larger, more stable IP/MPLS networks as foundations for valuable services such as network-based VoIP.³

Robert Whitely, Forrester Research, Inc.

According to Robert Whitely of Forrester Research, “Enterprises will increasingly turn to MPLS as carriers merge and provide larger, more stable IP/MPLS networks as foundations for valuable services such as network-based VoIP.”

Future MPLS networks will use “traffic shaping” technologies to dynamically adjust capacity and prioritize specific applications, as demands on the network change. Network-based application intelligence will make the network itself “aware” of the kinds of applications moving across the network. The network will then automatically adjust its behavior to optimize application performance.

Planning for your MPLS network begins with a detailed analysis of which applications will use the network, how much bandwidth they will require and the usage patterns and enterprise locations the network must accommodate.

Consider too your need for redundancy and business continuity and the kinds of edge devices and access technologies you will use. Multinational enterprises must also consider the higher cost of international bandwidth and how to manage the sometimes inconsistent standards and protocols in use by local service providers.

Optimize Your Application Infrastructure

Business applications such as data storage and retrieval, enterprise resource planning (ERP), Voice over Internet Protocol (VoIP), messaging, Internet protocol television (IPTV), supply chain management (SCM), bridging-based collaboration services such as video and audio conferencing, and others run and depend on a high performance infrastructure.

Increasingly, enterprises are replacing legacy infrastructures, characterized by separate network elements, systems and applications, with a converged, unified and dynamic application infrastructure. The converged infrastructure supports on-demand and automated business applications with full interoperability, stability and centrally managed SLAs, including dynamic cross-application network policies.

A dynamic network unites these diverse systems, increasing application reliability and performance, and simplifying the job of making applications work together. And new capabilities are emerging.

Networks will soon deliver such features as application-sensitive performance levels, location-awareness for mobile applications, and personalized applications customized for the needs of each end-user. Intelligence built into the network will respond automatically to changing conditions. For example, when a high-bandwidth, high-quality application like IPTV comes online, the network will automatically allocate the needed bandwidth and apply Class of Service controls to ensure quality. When broadcast time is over, the network will return to business as usual.

To get started in optimizing the applications infrastructure in your enterprise, think through these questions:

- What applications are essential to your operations today, and what new applications will you be using in the future?
- Who uses these applications and how do they access them? How can you deliver consistent levels of performance to users in all your locations?
- To what extent must your various applications interact and exchange information with each other?
- Do you have the resources to accomplish the job? And even if you have the resources in house, is this how you want to use them? In essence, this is a build versus buy decision. Service providers offer hosting and outsourcing options that range from simple floor space in a secure data center, to full management of your applications infrastructure, to management of the applications themselves.

Take Advantage of Services Over Internet Protocol

Instead of using separate voice, video, conferencing and messaging services, businesses can gain efficiencies and new capabilities by integrating these services into a seamless communications environment. Internet protocol (IP) is the unifying technology that makes possible an extraordinary level of convergence and interoperability among communications systems, applications and devices.

VoIP, the best known IP-based service today, is revolutionizing the telecommunications market and challenging traditional circuit-switched services that travel over the public network. But other IP services are emerging. For example, instead of purchasing and maintaining a PBX on site, enterprises can buy IP-based telephony services, which are sophisticated call processing capabilities sold as an end-to-end managed service. IP Television, conferencing and messaging services are similarly coming to market.

Future services over IP will include click-to-call capability in any network device. Presence-awareness will help callers know whether the person they're trying to reach is available, and over which device. Thus callers can avoid communication “side tracks” like voice mail, and increase their percentage of “direct hits” that reach the person they are calling.

To prepare for the transition to Services over IP, you should consider:

- Creating an inventory to assess call flows and feature functionality requirements

Convergence and the DHL Network

Network convergence isn't an option for DHL Express, the overnight delivery arm of Deutsche Poste. It's a necessity. Operating in 220 countries, the DHL global IP network is run from three primary data centers in Arizona, Malaysia and the Czech Republic.

Every eight hours, command and control for all of the company's global IP-based voice, data and video services passes from one data center to another. Each center has the same tools for operating the network in terms of managing trouble tickets, as well as tracking the flow of millions of packages every day through numerous endpoints (around 300,000) and a highly mobile workforce.

Tracking and tracing packages through the IP network is more than a matter of simply ensuring that a customer can look up the status of their order on the web. For the express delivery business, being able to exchange information and communications while packages are in transit is crucial for meeting delivery cut-off dates. For example, DHL uses information from its network to clear over 90% of its European packages with U.S. authorities while the cargo plane is still in the air.

Even so, digital information can only go so far. Authorities can ask the company to produce a physical package for inspection at any time. Given the fact that a transatlantic cargo jet typically carries about 90,000 lbs of packages with an average weight of 2-4 lbs, being able to track and find a particular package quickly is no trivial matter.

"If you don't have the capability to know where that one package is, it can take hours and we only have about 2-3 hours to get material off a plane, sort it and re-route it to its final destination," says Mr. Bandrowczak. "So information is extremely critical."

- Consider the level of interoperability that exists across your existing communications infrastructure – and how much you may need to expand interoperability to deliver services over IP
- Developing a multi-year IP communications evolution plan to align your technology capabilities with your business objectives and deliver consistent global performance
- How much of the job you wish to take on within your organization, and how much you can purchase as a managed service from an outside provider

Convergence in Your Organization

The enhanced integration and interoperation made possible by convergence are very much worth the effort. Convergence today is a fundamental strategic concept for IT leaders. As you plan your organization's convergence strategy, consider these four convergence focal points. These are not sequential steps. Rather they are compass points of opportunity. We hope that they will help you direct your organization toward the opportunities of the future.

This is one in a series of five papers AT&T has developed to help enterprises with their convergence decisions – to provide insight into the "how to" of convergence and examine the practical issues your organization must overcome as you integrate converged communications into your business operations.

References

1. "Competing through Convergence," survey by Economist Intelligence Unit and AT&T, p. 5. ©2005 AT&T.
2. Ibid., p. 1.
3. 2005 Enterprise VPN Adoption Trends, Oct 11, 2005 Forrester Research

