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Converged Business Networks: Simplifying Network Complexity

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Melanie Posey
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INTRODUCTION

Today’s companies operate in complex and rapidly changing business environments and must constantly plan, implement, and execute strategies to grow revenue, improve operational efficiencies, and reduce costs. To achieve these objectives, they are centralizing, automating, IP enabling, and internetworking processes and applications to streamline and integrate the operational aspects of the business. At the same time, employees are more dispersed, working in remote offices, telecommuting, or on the road. These two trends, IT consolidation and highly distributed workforces, require a different approach to voice and data networking — one that fully leverages the inherent cost, manageability, and flexibility benefits of IP-based networks.

By consolidating voice and data communications and applications onto converged IP-based networks, companies can build their businesses upon scalable, secure platforms and reap the multiple benefits of convergence — seamless integration of voice, data, and multimedia applications; simplified network management; improved network efficiency; and expanded options for advanced services.

DEFINING CONVERGENCE

Simply put, convergence refers to the integration of multiple types of communications traffic (voice, data, and video) onto a single physical transport network. Or, looked at from the end-user point of view, convergence is the ability to access multiple communications services through a single port or circuit. More broadly, convergence also describes a service delivery model in which data transport, voice communications, content, and business applications all come together on one network, provided by one provider, on one bill, and through one single pipe to the home or office.

The key technology foundation of convergence is the combination of standardized IP-based transport networks and multiprotocol label switching (MPLS). MPLS, as the name suggests, supports a wide range of existing technologies, such as traditional circuit-based voice and private line services and legacy Layer 2 packet networks, as well as a diverse array of access technologies. MPLS platforms enable service providers to collapse specialized legacy networks onto a centralized core with any-to-any connectivity to support larger, more heterogeneous network configurations. However, different types of traffic have different requirements with regard to delay sensitivity and overall mission criticality. As a result, network convergence would diminish network performance if not for the comprehensive traffic engineering capabilities of MPLS that improve upon conventional IP routing. MPLS class of service (CoS) assigns different priority to various
Traffic streams. For example, real-time voice or video applications can be assigned a higher priority over file transfer or Web browsing. Similarly, business-critical point-of-sale or financial transactions can be given priority over less critical applications such as email.

Traffic prioritization, along with the ability to dynamically allocate bandwidth among the different CoS assignments, allows MPLS-enabled converged IP networks to transport voice and diverse types of data traffic on the same network. Session Initiation Protocol (SIP) is also a key technology enabler of convergence and builds upon IP by using SIP trunking to set up and tear down real-time voice communications sessions over IP networks.

These capabilities are the technological underpinnings of converged business networks, which yield cost and management efficiencies for service providers that can then pass along these savings to business customers.

**MARKET DRIVERS: WHAT BUSINESS ISSUES DO CONVERGED NETWORKS ADDRESS?**

Businesses face a constantly changing array of technology and business requirements such as the impact of datacenter consolidation on network capacity and quality of service (QoS), the growth of network-dependent business applications, managing IP voice and video traffic to the wide area network (WAN), accommodating shifting volumes of end users and remote sites, and providing comprehensive network security. Figure 1 presents IDC survey data highlighting key business network initiatives.
Converged networks can help companies get a better handle on managing, maintaining, and evolving their networking environments. Specific benefits include the following:

- **Cost savings.** By moving to a unified core network environment, businesses can reduce or eliminate costs associated with maintaining equipment and managing bandwidth requirements for separate voice and data networks. In addition, consolidation of services onto a single access connection eliminates the expense of separate ISDN voice trunks. Furthermore, IP telephony allows organizations to run intracompany calls on the WAN at no extra cost.

- **Simplified network management.** IP converged networks reduce the complexity of maintaining discrete infrastructure on a per-service basis, thus freeing up internal IT resources to perform other more business-critical functions.
**More efficient use of bandwidth.** Converged networks leverage the CoS and traffic engineering functions of MPLS to guarantee bandwidth to mission-critical and/or delay-sensitive applications. Dynamic resource allocation based on QoS routing allows "spare" capacity to be used on an as-needed basis to handle spikes in voice/data traffic or increases in the number of users.

**Access network flexibility.** Running business applications over a common IP network means that companies can provide cost-effective access for various location/user profiles: from low-speed TDM at small branch offices to Fast Ethernet connections for larger centralized locations.

**Robust platform for new business applications.** Converged IP networks provide businesses with a single platform over which interoperable devices and systems can be run and managed. Communications applications such as IP telephony, videoconferencing, and unified messaging/collaboration can be integrated with IP-enabled business applications such as Web-enabled call centers, customer relationship management, and enterprise resource planning to automate and streamline key business processes. The any-to-any connectivity features of IP and the QoS enablement inherent in MPLS provide businesses with future-proof networking to meet the requirements of emerging IP-enabled services and applications. Figure 2 presents survey data on some of the new technologies/services being used in business environments.

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**FIGURE 2**

*Current/Planned Use of Emerging Technologies by U.S. Businesses*

![Chart showing current and planned use of emerging technologies](chart.png)

- **Unified communications**
- **Immersive videoconferencing or telepresence**
- **Cloud computing used for IT infrastructure (infrastructure as a service)**
- **Cloud computing used for software applications (software as a service)**

% of respondents:

- Currently
- Within one year

n = 703
Source: IDC's *WAN Manager Survey*, 2010
WHAT CAN CONVERGED NETWORKS DO FOR YOU?

With converged networks, companies can begin to reap the advantages of business transformation through integration of network access, communications applications, and core business applications. In today's business environments, technology (i.e., network and IT platforms) serves as an important engine of business process transformation and agility. The network plays a pivotal role in connecting all of the players and processes in the business operations chain and provides the transmission medium for mission-critical data and business-enabling communications. The flexibility, scalability, and manageability of IP/MPLS technologies allow companies to move more confidently in developing innovative, transformational applications and business models. As networks become more intelligent and can provide bandwidth dynamically among multiple applications, seamless integration of communications capabilities and business processes can be achieved, resulting in increased employee productivity and improved business agility.

Converged networks also simplify the process of procuring and deploying telecommunications services and resources. As networks become increasingly multipurpose in nature, it makes sense for businesses to consider further simplifying their communications environments by using a single carrier to ensure consistency of the service features delivered over the converged network. Furthermore, working with one service provider (to the extent possible) allows businesses to take advantage of service bundles with attractive pricing for combined offerings such as data access and transport, remote access capabilities, calling features, and off-net voice minutes of use. In addition, using a single service provider facilitates integration of other value-added services the provider may offer, such as contact center solutions, security services, and device management capabilities.

Implementation of converged network architectures requires a thorough assessment of application, end-user, and total bandwidth requirements at each business location. Companies can then consolidate capacity requirements across all services rather than buy separate connections for each service. This eliminates the inefficient use of individual connections that may be underutilized except during peak load times. Since network convergence aggregates all traffic onto one connection, overall bandwidth requirements may be smaller, given that bandwidth can be shared among services and that peak network loads for specific services and end users are unlikely to occur at the same time. However, companies may want to consider bigger pipes to support additional network-based capabilities. The increasingly widespread availability of cost-effective Ethernet services with more attractive price/MBps yields not only cost savings and improved network efficiency but also network capacity to enable new video and collaboration services.

CONCLUSION: WHAT TO LOOK FOR IN A CONVERGED NETWORK SERVICE PROVIDER

Converged networks can help companies reduce the overall cost of network operations and provide a flexible, scalable platform for new capabilities that improve employee productivity, simplify network management, and optimize business processes. However, choosing the right service provider is vital to achieving these objectives.
A key service provider selection factor is network reach and depth (i.e., national/global and local/metro presence) to provide adequate access and transport coverage for business requirements. Next, businesses must take into account the provider’s experience, track record, and skill set related to building and operating a large-scale IP/MPLS network, as well as strategies for upgrading network capabilities. The networking skill set should also include deep understanding and innovative deployment of SIP technology — preferably in the core of the network. Similarly, security must be embedded in the provider’s core network architecture and integrated into the converged network solution to ensure the separation and integrity of public Internet and private WAN traffic.

The provider’s ability to facilitate diverse and cost-effective access infrastructure is also important, as is the availability of a portfolio that supports legacy technologies as well as next-generation Ethernet access. This offers business customers the ability to leverage convergence for headquarters locations, datacenters, small branch offices, and remote/mobile users. Service providers’ relationships with SIP-certified vendors of PBXs and other convergence-enabling systems should also be a key selection criterion in order to ensure a broad range of technology choices.

However, network management and engineering skills are only part of the story. Converged network service providers must also be able to combine individual services such as IP/MPLS VPNs, SIP trunking, Internet access, and value-added unified communications solutions into comprehensive solution bundles with integrated billing and visibility into service and account management via portal-based performance reporting. Simple, yet flexible pricing structures are also an important service provider attribute. Quite often, converged business service pricing is confusing or so laden with conditions and caveats that the benefits of combining traffic onto a single network platform become less appealing.

For most businesses, the journey toward converged networks will be a gradual transition. However, companies need service provider partners to help with this migration, given other business priorities that require time, capital, personnel, and management attention. Relying on a service provider’s scale, operational expertise, and ability to deliver comprehensive bundled solutions liberates internal IT resources to develop applications and strategies that take full advantage of next-generation converged networks.

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