Converged Network Solutions

IP Multimedia Subsystem (IMS) - Any Service, Any Time, Any Where, Any Device

White Paper

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CONVERGED NETWORK SOLUTIONS

Introduction

There is tremendous interest in the new IP Multimedia Subsystem (IMS) standard. IMS is an exciting architectural framework that addresses the evolutionary needs of networks and its adoption is being driven by market forces like convergence of wireless and wireline services. IMS deployment has the potential to create a unique relationship with positive ROI for both service providers and enterprises.

This white paper includes discussion on the following topics:

- What is IMS
- IMS: A New Pathway
- Integration and Interaction of Services
- Presence
- IMS: Addressing Service Provider Needs
- It's the Enterprise that Counts
- What Mobile Professionals Need
- Remote User Benefits
- The Remote Office is Changing the Corporate Workplace
- Final Thoughts

As service providers find their traditional revenue streams becoming commoditized, IMS can enable them to rapidly deploy new points of differentiation. Enterprises are looking for service providers who can quickly combine services to meet their specific needs so they can gain competitive advantage. By adding control to the IP layer and managing the access, application, and controls layers separately, service providers will be able to quickly address enterprises demands.

Even with all of the positive aspects of IMS, service providers are being challenged on many fronts. The rapid proliferation of IP-based multimedia endpoints and the increasing mobility of end-users are dictating that services be available to users over a variety of disparate wireless and wireline connections. The market is demanding that services – which are the ultimate value to the user – cannot be held hostage by the underlying network. All services – whether voice, data, video or other content – must be economically delivered as if from a single network, and IP is the protocol technology of choice.

The confluence of a variety of factors is compelling the industry to move to IMS. From the enterprise end-users' perspective the proliferation of wired and wireless broadband capabilities while away from the office have been keys to making a wide-range of value-added advanced multimedia services both possible and usable. Examples of these services include wireless e-mail, Instant Messaging (IM), videoconferencing, and back office application access. To effectively deliver these services across multiple networks and to a multitude of devices is where IMS will show its true value.

IMS already has the attention of service providers and will soon have the attention of enterprises as they realize that with IMS, services can be offered to end-users any place, any time, on any device. Whether users are on the road, in the office, or at home, they will have access to the best possible ways of communicating. IMS meets enterprise needs for improving their remote workforce efficiency and productivity while also addressing their customer's requirements for more timely response to issues.

What is IMS

IMS was developed by the 3rd Generation Partnership Project (3GPP) to bridge the divide between traditional wireless telecommunications and Internet technologies. Content is converged on a single core IP based network, simplifying service interaction and integration and virtually erasing the boundaries between networks. And as such, trends suggest the rapid movement away from a world optimized for voice to one optimized for data.

3GPP developed the concept of the new services architecture that would enable the convergence of voice, data, and mobile network technology over an IP-based infrastructure. A virtuous circle has emerged as developments in the wireline environment with IP and SIP were picked up by 3G standards developers, refined and extended, and now are being fed back to the wireline community.

IMS: A New Pathway

The traditional approaches to network and service build out are not designed to handle rapid and targeted go-to-market requirements, or the evolving nature of next-generation applications and content. Existing networks are based on rather static and inflexible voice and bandwidth-centric network elements. The development of a new service offering is usually a relatively large investment with a rather long time-to-market dimension. IMS has the capability to shift this paradigm.

IMS replaces the typical vertical approach of a single service provider that offers many, but not all of the services enterprises would like. Once an IMS infrastructure is in place, new services are delivered much more quickly in the application layer. This is significant because the horizontal interworking is inherent in the IMS deployment, cutting down significantly the time to market. In addition, the standards should provide the necessary capability to deliver services spanning multiple operators and service provider domains – both fixed and mobile. Therefore, a wider range of services can be offered in significantly less time than is experienced by the enterprise today, through the use of third party providers in some cases.

Enterprises are recognizing the promise of increased productivity through unified communications capabilities and ubiquitous access to important back office applications. In the future, enterprises will demand more services at faster rates of implementation to further enhance and exploit these rapidly evolving capabilities. Just as the Internet has demonstrated its value in customized messages to market segments and individuals, enterprises will expect new services tailored to their specific needs to be delivered first in months, and then in days. This is just one area where IMS will become a disruptive technology.

IMS will transform the communications process through the integration of services, the interaction of services, and presence. Unlike traditional telecom services that require a single channel for each service, IMS allows multiple services to be carried on a single channel. Users can establish communications using real-time and non-real-time services with multiple users and devices in a single session. For example, a user can send instant messages, video clips, or files while conducting a voice or video call to one or many persons. Or a user can establish a videoconference while browsing the web with a few mouse clicks.

Integration and Interaction of Services

Effectively, IMS provides a unified architecture that supports a wide range of IP-based services over both packet- and circuit-switched networks, employing a range of different wireless and fixed-access technologies. The whole point of IMS is the enablement of applications and services. The intent of IMS is for networks to be able to deliver applications and services faster at less expense. It does this through a set of standard devices, interfaces, and elements from which to build these applications and services. Rich and dynamic combinations are also possible because IMS allows telcos and service providers to setup, modify, or tear down sessions or services dynamically during a multimedia session or call, and to combine circuit-switched and packet-switched services in the same session.

By bridging the chasm between traditional telecommunications technologies and Internet technology, it allows mobile operators, and fixed-network providers to converge on the same basic platform. IMS increases the functionality of packet-switched mobile networks (such as 3G GSM) by supporting IP-based applications and services through the SIP protocol. However, the rapid spread of fixed-network broadband and the offering of services such as transactions, content distribution, and VoIP over all-IP networks have made IMS just as important to fixed operators.

In principle, IMS replaces the traditional walled-garden approach of a single wireless operator offering a limited range of services from a controlled network and opens up an almost limitless range of highly functional services that span multiple operator and service-provider domains – both fixed and mobile. IMS will enable a new telecom business model for both fixed and mobile networks.

As an example, mobile operators will be able to offer non-real-time services such as chat and Instant Messaging, and multi-user services such as multimedia conferencing and chat rooms. Server-to-user services such as dynamic push services and click-to-dial are also possible. The end-users will experience a set of services that are easy to use, transparent and seamless, over any device they might have including laptops, PDAs, smartphones and other devices.

Today's telephony and messaging services can be complimented by the next-generation of user-to-user or peer-to-peer applications that will make collaboration faster and easier because users will be able to share everything from documents and whiteboards to gaming directly.

Presence

Presence is proving to be a key benefit of IMS. Presence means the user has the ability to know the status and availability of other users as well as their preferred means of communication and whereabouts to determine the most effective means of connecting. It allows a group of users to be informed about the availability and means of communication to the other users in the group. IMS enables the awareness of what terminal devices a user can be reached on across both wireless and wireline networks. A single IMS presence-and-availability engine can track a user's presence and availability across mobile, fixed, and broadband networks, or a user could maintain a single integrated contact list for all types of communications.

Presence will drive substantial value for enterprises. As an example a sales manager needs an immediate update from his key sales reps on current business opportunities for a presentation to the executive group. Valuable time may be wasted just trying to reach each of the individuals to participate in a conference call by contacting them by voice mail and email without knowing whether the rep received the message. IMS would provide a simple means by which to know each persons availability and current primary mode of contact reducing time and increasing the probability of a successful outcome.

IMS: Addressing Service Provider Needs

Service providers have been seeking standard means to migrate their networks to IP-based systems. IMS is the answer. The driving rationale for this is two fold. First, a standards based IP-based infrastructure will be cheaper to deploy, maintain and upgrade. Secondly, it will enable much faster deployment of new services. An additional benefit, driven by customer demand, is that IMS enables a clear path to fixed/mobile convergence with acceptable and predictable Quality of Service (QoS) levels.

These two driving benefits afforded service providers by IMS will ensure enterprises will be able to pick and mix applications to create tailored services for specific customers and industries. Meeting the enterprise client's requirements for applications and services that deliver competitive advantage will become a reality.

It's the Enterprise That Counts

Enterprises should benefit from the competitive nature of the market as a broad range of service providers including wireless, wireline and cable operators will be planning to differentiate themselves from one another based on responsiveness to the enterprise's needs and other elements such as bandwidth, availability and location.

Wireless carriers will likely look to the consumer as the primary market for their initial IMS offerings, seeking to deliver services such as gaming coupled with voice services. They will, however, find the enterprise market will offer the greatest opportunity for incremental and consistent profits. It is for this reason that this paper will examine more closely how the enterprise will become the primary benefactor of IMS.

Enterprises historically spend more than consumers. As enterprises gain more experience in convergence, they will come to expect more from their service providers. And with new players entering the enterprise communications market, such as Mobile Virtual Network Operators (MVNO), higher levels of service customization and integration will become the differentiating factor. With IMS the opportunity exists to converge IT communications and business processes (over a common IMS infrastructure) to achieve better costs, productivity, and increased functionality. For example, solutions that offer integrated messaging, devices, contact management, and a platform for innovative converged data services will be compelling to the enterprise customer.

Enterprises have unique requirements. For example, enterprises want to have control and flexibility for moving, adding and changing user information. Interoperability with their legacy systems (telecom and IT) is needed to allow for the migration to IP-based functionalities like telephony, messaging, presence, conferencing, file sharing, and collaboration. Remote workers are an added dimension that will generate even greater demands on the enterprise's communications, applications and security needs.

What Mobile Professionals Need

Today's mobile professionals want their cellular, home and office telephony services integrated into the enterprise. With the advent of WiFi hot spots, remote workers have learned that they can get the "office experience" remotely. Productivity tools like Sales Force Automation actually become productive as its capabilities are truly driven to the end of the enterprise.

With wireless LANs becoming more prevalent in corporate and remote offices, virtual employees will increasingly utilize wireless connectivity because it provides reasonable bandwidth, is easy to use and is becoming fairly ubiquitous – a huge competitive advantage for those companies who are embracing the technology. They recognize that customer satisfaction increases when employees are closer to the customer, that real-time access to critical data increases customer responsiveness and that employee satisfaction with their job increases with the ease and speed of access.

The advantage of being wireless regardless of device is also compelling because remote-ness does not just apply to just those workers who are away from their corporate offices. Many enterprise headquarters are campuses of buildings, and many of those companies are equipping their employees with WiFi-enabled laptops so they can do business anywhere within the corporate campus. Forrester Research predicts that 64% of U.S. companies are upgrading or deploying wireless LANs in 2006.

With IMS, remote workers can redirect calls from their desktop to their mobile phones or elsewhere in the middle of a call. The dynamic nature of IMS means that this group will be able to call a person instead of a phone number – managing calls on multiple devices in real time. These enlightened users now expect any service, any place, any time, on any device. They want it to be easy to use and convenient. They want presence and location services, in-session "follow me," push-to-talk and push-to-see, multi-party conference and collaboration, shared video, unified messaging and integrated contacts – all at their fingertips, regardless of how it gets there and regardless of where "there" is.

Remote User Benefits

There are two main benefits to users of the IP-based person-to-person (one-to-one and one-to-many) IMS communications technology:

1. Users will be able to, on a real-time basis, mix and match a wide variety of IP-based services in any way they choose during a session. A session can include voice, data, video, and content sharing as well as presence in addition to adding or dropping services during the session. This is known as a rich call. For example, two or more people could be engaged in a gaming session while commenting during the game.

2. It won't matter what network each user subscribes to since all services will be available regardless of the access network. Users will have the ability to select the best access network based on price, based on time or place, based on access availability and based on available bandwidth.

Users will have customized interfaces delivered to them based on the device they are using during the session. One may be using a wireless smartphone on a wide area network, another may be on a land line connected to a desktop computer, and yet another on a laptop in a WiFi hot spot. It is easy to see why fixed/mobile convergence (FMC) is gaining so much attention. Here are but a few examples of mobile applications:

- Multimedia messaging services (MMS) – MMS will transform business communications by enabling the instant delivery of rich, personalized messages that may include sound, images, and other rich content, which can be sent and received via smartphone, PDA, or PC.
- Mobile PBX services – PBX functionality can be extended to mobile phone users. For example, 4-digit dialing, calendar based presence, group conferencing and even push-to-talk capabilities can be configured among specific groups of employees to enable very rapid one-to-one and one-to-many call set up.

- **Location-based services – The ability to customize information and content based on an end-user's location opens up enormous possibilities for businesses subscribers, who can track and support their field personnel more effectively.**

The Remote Office Is Changing the Corporate Workplace

It was not long ago that the Remote Office concept established itself in the enterprise world. As wireless broadband hot spots emerged, remote workers found they could finally utilize Sales Force Automation and Field Force Automation applications to actually become productive. No more slow dial-up connections and wasted time.

Corporations are demanding organic growth which is why they are moving more of their workers into the "virtual workplace." According to Nemertes Research, a virtual workplace can save enterprises money while increasing "enterprise agility," the ability to adapt quickly to changing business conditions. Today, 58 percent of an enterprise's employees do not work at headquarters and many who do don't spend much of their workday in the company buildings.

Employees no longer need to reside in the same geographical area as the corporate headquarters to be effective. They can work from anywhere at any time – reducing facilities costs and enabling organic growth. Workers can work across countries and time zones to collaborate more effectively.

The requirement for employee relocation will be reduced and will enhance the ability to attract and retain top producing employees who are not interested in relocating to a different locale. Substantial cost savings of roughly $40,000 per relocated employee are possible. The bottom line is: The virtual workplace can reduce facilities and personnel costs, improve customer responsiveness, and enable companies to react faster to business drivers.

Some Final Thoughts

IMS heralds an age of true communications convergence. It brings the genuine inter-working of IP-based services and enables those services to span long-standing boundaries across traditional and next-generation networks including cable, wireline and wireless domains.

It can be seen that the confluence of technologies and enterprise needs will drive IMS. As fixed and wireless networks converge – with the help of the IMS architecture – the productivity promised by applications like Field and Sales Force Automation will be delivered in even more powerful ways than initially imagined. In the past, face-to-face meetings were important to generating group interaction, relationship building, and decision-making and consensus-building. With the increase in remote offices and remote workers, IMS promises to deliver the needed technologies to sustain the positive benefits of enterprise collaboration, and more. Some of the key attractions of IMS are:

- **Access independence — IMS should work on virtually any network – fixed or wireless. Services and calls from different networks can be mixed.**
- **Different network architectures — Access can be just the operator's network or can employ a third-party IP network as an intermediary. IMS has the ability to add, modify, or delete services during a multimedia session or traditional PSTN call. Examples include simultaneous voice, data, or multimedia sessions.**
- **Presence — End-users can manage their identities and methods of contact and interaction on a dynamic basis from any terminal.**
- **Extensive IP-based services — IMS should make it easier to offer just about any IP-based service – VoIP, video/audio conferencing, content sharing and other services**

With services continually in reach and ready to be mixed, matched, and tailored to the customer, service providers can generate increasing revenues while limiting churn, and enterprises can gain the applications that will improve their competitiveness. These potential gains for both the service provider and the enterprise explain why there is such a buzz surrounding IMS. As a key enabler of network convergence and the multimedia services revolution, IMS has the potential to enable revenue-rich, access-agnostic multimedia services over fixed or wireless networks, with seamless hand-off in between.

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