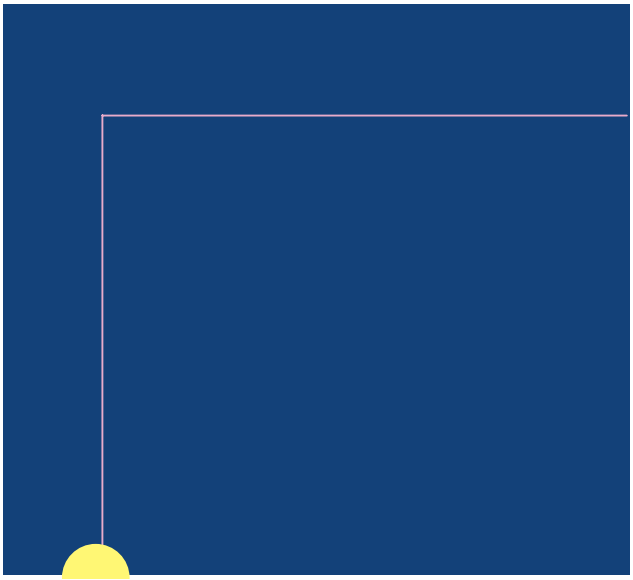
MOTOROLA

Motorola IP Multimedia Subsystem



WHITE PAPER

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The Search for Success—Service Sales

Technology convergence, regulatory changes, competitive pressures and maturing markets are changing the future for wireless telecommunication providers. Even though Minutes of Use (MOU) are increasing significantly, average revenues per user (ARPUs) from voice services continue their downward trend, driving network operators to seek new revenue streams to build long-term growth and profitability. The hunt is on for new products that can be introduced quickly and cost-effectively—services that will hold existing subscribers and help to reduce churn, as well as attract new users and support entry into previously untapped markets.

The most promising source of relief is found in multimedia services. Services delivered over IP-based packet switched technology can not only be rapidly deployed in undeveloped markets, but can also be readily overlaid on existing network infrastructures, reducing the capital expenditures and operating costs associated with new service introductions. More important, IP-based multimedia services are expected to deliver the rapid growth that network operators need and seek. Market analysts predict that by 2005, users of packet switched services will account for nearly half of the worldwide installed user base…and by 2008, will outnumber circuit switched (voice only) users by nearly four to one. *(Figure 1)*

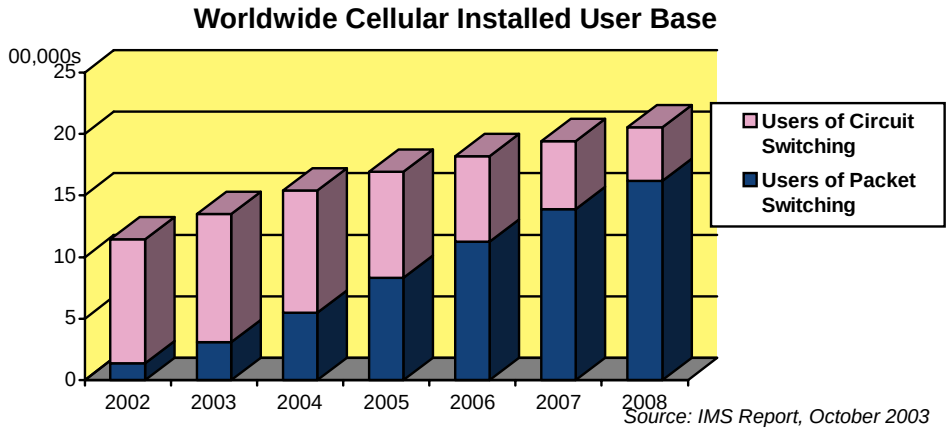

Figure 1: Within several years, packet switched data services will represent the majority of the wireless marketplace.

Today's consumers are already demanding a new level of mobility, with rising expectations of high quality voice and data access anywhere, and anytime. To hold their attention and also attract tomorrow's subscriber, operators must evolve their networks to bring all communication—voice and data, public hot spot and enterprise WLAN, entertainment and information, personal and workgroup interaction—together into an immersive, ubiquitous user experience.

IP-based packet switched technology will be the backbone of that experience. As a leader in mobile communication, Motorola supports IP Multimedia Subsystem (IMS) as the most direct path to operator success in the future.

The IP Multimedia Subsystem

IP-based systems offer network operators the opportunity to expand their services, integrating voice and multimedia communications and delivering them into new environments with new purposes. This is what the industry calls convergence, bringing multiple media, multiple points of access, and multiple modes of and purposes for communication together into a single network, and often, even into a single device. Developing and delivering convergence, though, will make a number of new demands on both the network and the operator.

First, to hold existing subscribers and attract new ones, carriers will need to offer a portfolio of services that is both broad-ranged and competitively differentiated. Inevitably, the increasing appetite for content will lead to a higher dependence on third parties to provide the needed variety of audio, video and multimedia applications. Next, since this third-party content must be extended through the network to end-users, operators will need mechanisms in place to deal with issues of access, server capacity and device compatibility, among others. Finally, to maximize the value of new revenue streams, capabilities must be in place to allow every stage of deployment and operations to be accomplished quickly and cost-effectively.

Successful execution, then, requires a network architecture that can support development, deployment and delivery over an IP backbone—the IP Multimedia Subsystem (IMS). IMS carries signaling and bearer traffic over the IP layer, functioning as an intelligent 'routing engine' that matches a user profile with an appropriate call handling server and switches the call control over to the designated handler. IMS includes the capability to add, modify or delete sessions in an existing multimedia call, and extends the IP network all the way to the user equipment, enabling the core network to remain access agnostic. Each end-user can have a personalized experience involving simultaneous voice, data, and multimedia sessions.

Capabilities and Benefits

The IP Multimedia Subsystem provides a flexible IP media management and session control platform that operators can layer over their current network infrastructure. As an overlay, the IMS allows operators to leverage long-term value of existing network equipment, reducing the capital investment associated with new service development and deployment. Through the IMS, access to network services can be secured through a web-friendly interface, enabling third-party developers, service providers and even subscribers to self-manage their service experience while the network operator retains control over network resources. Simplified, secure access for all parties means fewer network staff resources are needed to manage new services, which in turn reduces delivery and operations costs and offers higher pricing flexibility.

With the IP Multimedia Subsystem on the network, subscribers can control when and how they communicate. They can choose the most appropriate medium or combination of media—video, voice, text, images, or instant messages—all available simultaneously and in real time.

Over the IP backbone, operators can quickly bring new services to market, targeting new segments to attract new revenue streams. Third-party resources for application development and hosting can be managed more effectively and securely, providing a range of sophisticated services designed to attract high-volume users and help increase both Average Revenue Per User (ARPU) and MOU.

The Motorola IMS Solution

As an extension of our complete end-to-end solution portfolio for network operations, Motorola's IMS demonstrates the same technological innovation and applied experience that has made Motorola a leader in mobile communication. The Motorola IMS is a carrier-grade system, both GSM and CDMA capable, and based on the highly flexible and scaleable SoftSwitch technology. Featuring open standard technology with proven interoperability, the Motorola IMS is available with a variety of pre-tested applications to help ensure turnkey installations in virtually any setting.

Motorola's IMS solution offers the perfect solution to launch new and lucrative next generation services:

- New sources of increasing ARPU and MOU, and increased end-user stickiness by delivering converged voice and data services
- A platform that leverages MSC grade system – flexible, reliable, scalable – and with open interfaces to support SIP, Parlay/OSA and CAMEL applications
- Host value-added applications on the platform, with additional third party applications through the Motorola preferred partner program
- Seamless management environment that offers easier control and provisioning of applications through Motorola's Global Application Management Architecture (GAMA)

Service Creation Features

Applications and services have traditionally been considered the realm of the network operator, and simple mass-market and carrier class services have been, for the most part, built within the network using Intelligent Network (IN) technology. But as mobile applications, IP-based services, and the integration of third-party content and hosting become more important, most operators are finding that IN is not up to the challenge.

So how can operators ensure a continuous supply of winning applications for these venues? One way is by using a new, more advanced set of tools for in-house development, such as SIP, CAMEL and OSA Parlay. The other is by involving third-party developers (who may not have deep telecom expertise) by introducing a common service delivery platform that makes it easier for them to interface with the network.

Motorola's IMS supports both pathways. Our advanced toolset provides operators with all they need to facilitate easier creation and faster deployment of innovative, network-agnostic applications, both in-house and by third parties.

Session Initiated Protocol or SIP is a text-based client-server protocol, similar to HTTP and SMTP, that initiates call setup, routing, authentication and other feature messages to endpoints within an IP domain. Motorola's IMS can use SIP to establish, modify and terminate multimedia sessions or calls, enabling the protocol to be the basis of applications incorporating voice, video, chat, interactive games, and more.

For operators of networks within the GSM airline family (GPRS/EDGE/UMTS), Motorola's IMS incorporates CAMEL (Customized Application for Mobile network Enhanced Logic), a service creation platform that makes it possible to support worldwide operator specific services. Using standard IN interfaces, CAMEL provides access into the switch platforms, registers and billing systems of the GSM network, making it possible for third parties to create IN services. CAMEL also supports call screening and supervision services, number translation services, enhanced call forwarding (time and location dependent), and fraud information gathering services.

Motorola's IMS also complies with Parlay/OSA specifications for network independent Application Protocol Interfaces (APIs). APIs standardize and simplify access to core network functionality, allowing developers to concentrate on application quality rather than on the intricacies of network-specific integration. Developed with standardized APIs, applications become portable and the investment in their creation becomes leverageable; they can be migrated more easily from one network technology to the next, rather than be recreated from the ground up.

To further speed and simplify the creation and deployment of new services, operators can turn to Motorola's Global Applications Management Architecture (GAMA), a seamless management environment that offers easier, more consistent control over every stage of data services development, deployment and operations. Motorola GAMA is both device and network-bearer independent, enabling the development and launch of new services with existing infrastructure and end user devices enabled with JAVA™ and WAP. In addition, our IMS Application Partner Program will be an ongoing source of new, tested and proven applications for the Motorola IMS.

Services through the Motorola IMS Solution

In addition to advanced tools for creating new applications, the Motorola IMS Solution offers a portfolio of fully tested services to enable operators to quickly reap the benefits of IMS deployment.

Access Independence

The principle of convergence offers the opportunity to deliver the best features and benefits from various networks, while providing transparent, contiguous voice and data communication across environments. Access Independence through Motorola IMS enables operators to deliver terminal, personal, session, and service mobility across networks —CDMA, GPRS, 802.11, etc.—all based on the commonality of the IP backbone. Operators can design mobility applications tailored to the needs of enterprise customers, offer business users begin a data session at a WiFi hot spot and continue it over the cellular infrastructure, or design highly tailored access-independent services for target consumer groups. Subscribers get the benefit of ubiquitous, network-agnostic mobile communication, while operators reap the revenue benefits.

Converged Push-To-Talk over Cellular (Converged PoC)

Using a telecommunication grade server totally independent of the existing radio and core network, Converged PoC is implemented on the IP backbone, over any of today's and tomorrow's radio technologies including CDMA2000 1X, GPRS, UMTS and WLAN. The service readily scales from small installations (in the 1000's) to very high subscriber configurations of more than 10 million subscribers.

Converged PoC offers the subscriber all the benefits of two-way radio, across the country or around the world. Users can self-provision their own call groups, making changes and updates at any time. Converged Presence and Directory Services tell the user which call group members are available for instant PoC contact, and make one-button communication with family members or workgroups fast and easy.

For the operator, Converged PoC is a service with high appeal to both business users and consumers. Compliance with all industry PoC standards specifications for PTT and Converged Presence and Directory Services ensure trouble-free installation and operation.

Presence Server

The Motorola IMS Presence Server allows users to know when others are willing or able to communicate, as well as where and with which media type they prefer to be in touch. Just by looking up a contact's name in the handset directory (Presence in Phonebook), a user can quickly see if the contact is available for a voice call or text message. The IMS Presence Server can route calls in the preferred medium not only to individual users, but to services and places, as well.

To the subscriber, the Presence Server means faster, easier communication, in the medium their contacts prefer, with fewer "no-answers." For the operator, it means more efficient use of radio resources, since the Presence Server can obtain presence from the IMS core as well as circuit code, HSS, and location servers.

Unified Messaging

Unified Messaging makes it possible for the subscriber to access messages of various media types (including voicemail, fax or e-mail) from a single mailbox. Unified Messaging allows the user access with a variety of devices, including wireless or wireline phone, or a PDA or PC through a web interface. The convenience of a single mailbox is a major selling point to end-users, and a differentiating service for network operators.

Interactive Voice Response (IVR)

For many applications, no interface can be faster, more efficient or more intuitive than Interactive Voice Response. Users appreciate the easy access to applications, while operators appreciate the easy manipulation of bearer paths made possible by the use of SIP in Motorola's IMS. Bearer resources can be optimized once the IVR portion of a session has completed, preserving capacity and reducing associated service costs.

Enhanced Voice Mail

With the support of Motorola IMS, operators can enhance the standard voice mail experience with a friendlier web-based interface, allowing easy setup of sophisticated voice mail features, such as personalized greetings, message forwarding, and more. The benefit to the operator is the ability to offer a more tailored experience that is self-customized by the end-user, without operator intervention or maintenance.

Instant Messaging

Desktop-based Instant Messaging first became popular among teen Internet users, but these quick, text-based dialogues are already being embraced by workgroups, enterprises and family/social groups. Motorola IMS enables operators to expand the value of a well-known and appreciated service. Instant Messaging is enhanced in IMS so that messages can be associated with existing sessions.

Web/Audio/Video Conferencing

Motorola IMS enables network operators to combine web, audio, and video in sophisticated conferencing solutions. With Motorola's Web/Audio/Video Conferencing, conference participants can view presentation materials while listening to the audio of a conference, hold simultaneous private text conversations, all while a conference moderator controls addition, deletion and mute status of participants.

Full Duplex Video Telephony

With the advent of multimedia sessions running over IP, Motorola IMS makes it possible to create true, full duplex video telephony sessions on handsets. For businesses and geographically dispersed families, this means there can finally be a videophone solution that does not depend on proprietary networks and equipment…and is mobile. Operators can profit from the ability to offer a cost-effective solution for which demand has never been satisfied effectively by past solutions.

The Motorola IMS Application Partner Program

To ensure that our customers continue to have access to innovative services and high quality applications, Motorola is working with ISVs and third party application providers to certify compatible applications and services that work with Motorola IMS. Carriers can then choose among 'best-of-breed' application platforms from other vendors without fear of losing significant time and resources in solving interoperability issues.

The Motorola IMS Architecture

The Motorola IMS is based on Motorola's advanced SoftSwitch technology, a flexible, open computing platform that decouples call control from bearer traffic functions. The open architecture of the Motorola IMS delivers exceptional scalability and high capacity, all in a modular structure that simplifies deployment and eases integration. The Motorola IMS is compliant with 3GPP and 3GPP2 standards for IP Multimedia Subsystems, and supports a variety of 2.5G and 3G wireless access networks, including GPRS, EDGE, UMTS, and CDMA, as well as emerging systems such as IEEE 802.11 WiFi, wireline and enterprise networks. It takes advantage of the network independence of IP to create core applications that are agnostic to radio access technologies and that can seamlessly bring new services and applications to wireless networks. Multimedia applications built on the IMS architecture are portable, traveling with enabled devices as subscribers roam across country or around the world.

Motorola not only believes in, but leads in interoperability, so every component of the Motorola IMS meets industry-defined interoperability standards and specifications that we have helped to develop and prove. The result is an exceptionally reliable system that meets the highest standards for availability and performance. Together with its flexible service creation environment, the Motorola IMS gives carriers the platform, protocols and processes they need to offer tailored, revenue-rich data services to their customers.

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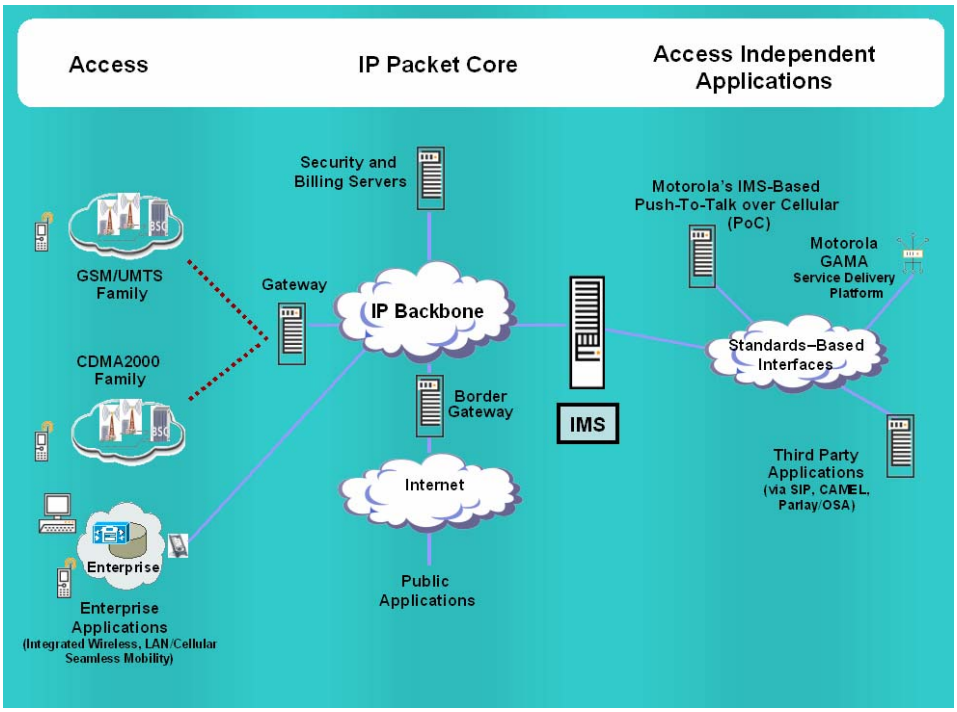

Figure 2— Motorola IMS Architecture

Support Services

Motorola not only supplies the materials and applications, but also the integration, training and support needed to derive maximum performance and usability out of our customer's investments.

Moving Forward

The IP Multimedia Subsystem is a key advance towards VoIP SIP-based service, and the next logical step in the evolution of the core network. Motorola IMS delivers a new level of capability for operators seeking to meet the demands of their end-users for fresh applications, innovative services, multimedia experiences, enhanced mobility, broad access, and more ubiquitous communication.

Motorola believes IMS not only represents a step forward for evolving networks, but a giant leap toward operator success in an increasingly competitive marketplace. We have made significant investment in the core network infrastructure business, from handsets, to RANs, to core network components, and finally to service delivery and support structure. We have led the industry in developing interoperability standards and open architectures, all with the aim of addressing the needs of our network operator customers, end-to-end, development through delivery.

All that experience is brought to fruit in the Motorola IMS, a solution that delivers the reliability, capacity, and flexibility operators will need to take their networks to the next level.

For further information visit:

www.motorola.com/networkoperators

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