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What the Alcatel/Lucent Merger Means

IMS MAGAZINE™

IP MULTIMEDIA SUBSYSTEM

VOLUME 1/NUMBER 2 APRIL 2006

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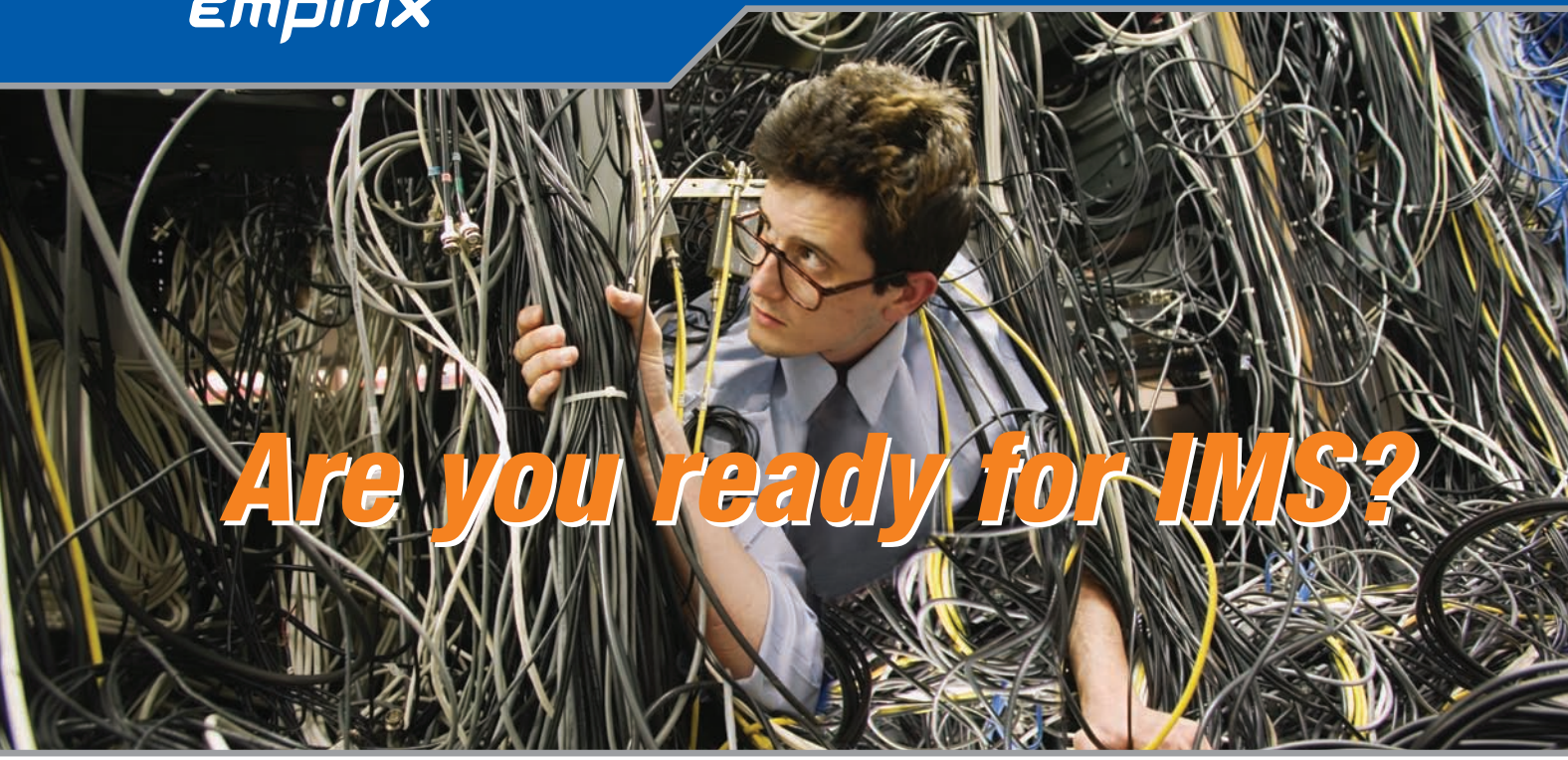

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Japan HQ | 1-10-11 Ebisunishi, Fujiwara Building 7F | Shibuya-ku, Tokyo 150-0021 | Japan | tel: +81 (3) 5457 2341 | fax: +81 (3) 5457 0541

editor's note

Mergers Are on the Menu

by Greg Galitzine

The recent news that Alcatel (news - alert) and Lucent (news - alert) are in advanced stages of merger talks should not in and of itself be a surprise. The companies after all came deliciously close to hooking up back in 2001. Now however, it seems the merger has a very real chance of coming to fruition, and that has market watchers salivating over the prospects of a potential telecom free for all, in which the predators at the top of the telephony food chain (Cisco, Nokia, Motorola, Nortel) may start to feast on the smaller, more easily digestible morsels (Juniper, Sonus, Tellabs, Ciena).

Some of the more intriguing possibilities call for more mega-mergers, with Cisco (quote - news - alert) perhaps buying Motorola, thus giving it instant credibility in the wireless space. I wonder what colors will be added to the Cisco RAZR line?

Recent rumors also had Siemens selling their communications division and Ericsson looking to buy Juniper.

I asked Joe McGarvey of Current Analysis for his thoughts on the potential of a telecom feeding frenzy and what it might mean to the IMS (define - news - alert) market.

"I think a logical alternative to a merger of equals, as Alcatel and Lucent are talking about," McGarvey told me,"is for a large supplier, such as Ericsson or Nortel to start picking up some of these smaller independent companies that play in the IMS space, near the periphery. I'm talking about policy control players or application server makers, etc. These are companies that have been around five or six years and are pretty much staying above water.

"These companies may be ripe for acquisition at a reasonable price in the future. Carriers are insisting on these players developing IMS-interfaces and other IMS-related artifacts in order to place them in trials. The problem is that these trials aren't likely to produce revenue for another year or more. That's a tough combination — added development costs and delayed revenue — for a small company to handle. It could be that some of these companies could be acquired — as the financial pressure mounts — for a reasonable price.

"It's certainly an alternative to a mega merger. While a supplier acquiring a smaller company isn't gaining any market footprint, it also isn't dealing with significant product overlap and integration headaches," McGarvey concluded.

One of the more circulated quotes making the rounds in the days following the Lucent/Alcatel news was attributed to Pip Coburn, chief strategist and principal at Coburn Ventures, a technology investment advisory firm, who said,"This (Lucent-Alcatel merger) could create a domino affect, and I hope it does."

Why Now?

The recent wave of consolidation in the service provider market should serve as a prequel to what we might expect to see in the equipment manufacturer space. Let's face it, for every carrier that gets acquired, that's one less potential customer for a gear maker to chase after. And with carriers increasingly looking to offer all types of services over all types of next-generation IMS-compliant infrastructure it makes sense for those who would be leaders in this space to flesh out their offerings — either through long development cycles, or strategic acquisitions — so they can service the service providers to the fullest.

I guess it remains to be seen what will come to pass. But suffice it to say that hungry eyes are currently focused on the telecom menu.

IMS MAGAZINE™
IP MULTIMEDIA SUBSYSTEM

Rich Tehrani, *Group Publisher and Editor-In-Chief* (rtehrani@tmcnet.com)

EDITORIAL
Greg Galitzine, *Editorial Director* (ggalitzine@tmcnet.com)
Erik Linask, *Associate Editor* (elinask@tmcnet.com)

TMC LABS
Tom Keating, *Executive Technology Editor/CTO/VP* (tkeating@tmcnet.com)

ART
Lisa D. Morris, *Senior Art Director*
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Editorial Offices: 203-852-6800 Customer Service: For all customer service matters, call 203-852-6800.

ADVERTISING SALES
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Anthony Graffeo, *Sr. Advertising Director - Eastern U.S.; Canada; Israel* (agraffeo@tmcnet.com), ext. 174
John Ioli, *Advertising Director - Midwest U.S.; Southwest U.S.; International* (jioli@tmcnet.com), ext. 120
Drew Thornley, *Business Development Director - Western U.S.* (dthornley@tmcnet.com), (480) 833-8836

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IMS Magazine™ is devoted to teaching the service provider community about the massive opportunities afforded them in the move to IP Multimedia Subsystem-based architectures. Each issue of *IMS Magazine™* will focus on the important news and events happening in the rapidly growing IMS space while focusing on case studies and deployments in the real world. In addition, it is our goal to make the editorial environment of this publication the source for targeted editorial enabling key executives to make better purchasing decisions.

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Circulation Director, Shirley Russo, ext. 157 (srusso@tmcnet.com)
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One Technology Plaza, Norwalk, CT 06854 U.S.A.
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ericsson.com/forward

What the Alcatel/Lucent Merger Means

by Rich Tehrani

Increased commoditization is another reason for this consolidation trend. As technology moves to the realm of IMS (IP Multimedia Subsystem), it will be easier than ever to mix and match equipment from disparate vendors. In such an environment commoditization will take hold and squeeze margins.

A good tactic in such an environment is an acquisition in order to help keep you as a dominant supplier in the market.

As we have seen in the computer space, an acquisition of Compaq by HP did little to improve the growth prospects of HP. Dell on the other hand was innovative and quick and outmarketed the competition at every turn.

Comparing the PC market to the IMS or service provider equipment market is not 100 percent appropriate as loyalty in the PC space is not as great as existing relationships are in the telecom space. Just like the PC market, however, the strongest marketer and company with the best relationships should do very well.

In general, consolidation at the top is not a good thing as it reduces innovation and competition. In this case however with the AT&T machine acquiring service provider after service provider, it is likely an appropriate response to a shrinking customer base.

A guaranteed outcome of this acquisition is that Alcatel will move more slowly and will work towards IMS enabling all of its service provider equipment, so that others can keep their infrastructure compliant with the applications service providers need.

This merger will also mark Lucent's return (as part of Alcatel) to the enterprise space. This pits lucent against Avaya (quote - news - alert) once again.

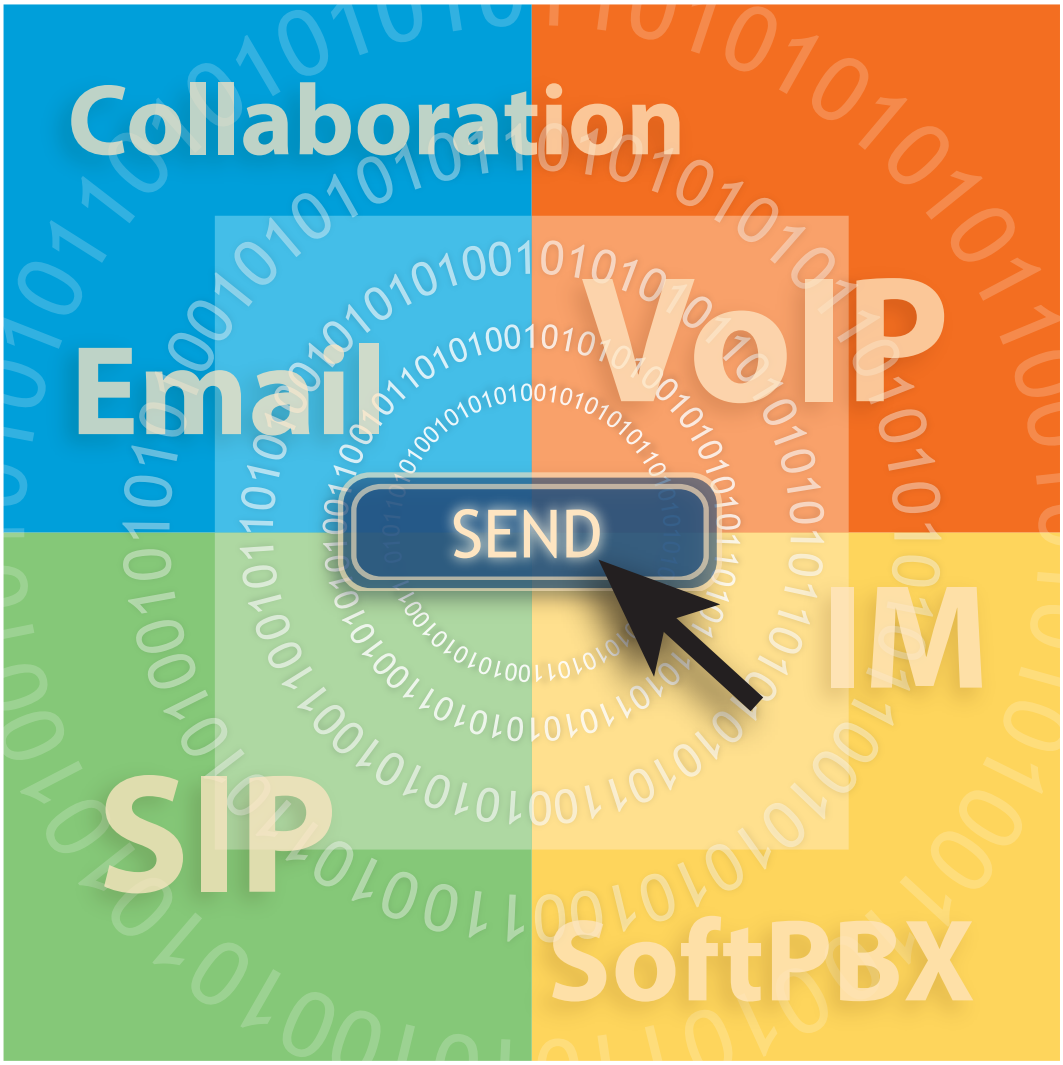
> In a world of consolidating service providers, the consolidation of equipment providers serving a shrinking customer base is a logical move. The future of the telecom market will consist of a few large hardware vendors and a slew of software/service companies providing services. These boutique companies will supply such things as games and conferencing services to niche — albeit some potentially large — markets.

Alcatel and Lucent will benefit from being able to roll out products and services across the enterprise/service provider wall meaning shared development costs for equipment used in both areas. For example, a softswitch can be used as the basis for an enterprise PBX. An ACD can be used as a hosted ACD solution for service providers, and so on.

The downside of this merger is lost jobs — and there will be thousands. Lost jobs are always a bad thing unless they are being lost to make a company stronger so others will have more job security. This is the case with this merger. The only potential downside to this merger is that the company will have so much mass that decision making will slow to a crawl. Also I am a bit concerned about joint French/American ownership as our cultures are not exactly the same.

Perhaps these problems can be smoothed out simply by shipping a box or two of croissants to New Jersey and some apple pies back to Paris?

In any case, as globalization takes hold in the telecom sector, it is taking place in the communications equipment market as well. For those fans of globalization, you will soon be able to use Francs (I mean Euros) to buy your Lucent Softswitch.



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SYSTEMS

TECORE Rolls Out IMS-Based Platform for MVNOs

By Laura Stotler

TECORE Wireless Systems (news - alert) has introduced its new core platform for the Mobile Virtual Network Operator (MVNO) market. The T-MVNO platform offers a modular architecture that supports a variety of MVNO business models and is based on the company's SoftMSC platform.

The new solution features TECORE's IMS architecture, which enables operators to design their services around GSM, CDMA or converged WiFi/WiMAX wireless technologies. The T-MVNO platform features core network components and application services, including a fully functional MSC/Gateway-MSC, integrated HLR, SMSC and SIP-based application servers. The platform's design includes edge gateways that can be used to provide localized call services and traffic aggregation over IP backbones.

Components of the platform can migrate to full IMS-based architectures as the MVNO subscriber base and market grow. The solution can support from a few thousand to over a million subscribers, and enables either a centralized integrated core network model or a distributed core networking model.

The solution addresses a number of challenges MVNOs face as they define their core network architectures, including the need to support a variety of operational models, the ability to handle multiple wireless technologies and the need to scale cost effectively. The new platform addresses these challenges, and incorporation of the SoftMSC platform also enables a range of multimedia services like voice, text messaging and video. All services may be carried via a variety of wireless technologies. Operators may use the SoftMSC platform as a standalone "one-box" solution or in an architecture that provides localized or distributed processes on dedicated systems as required for growing subscriber bases and new services.

http://www.tecore.com

Empirix Sets Sights on IMS

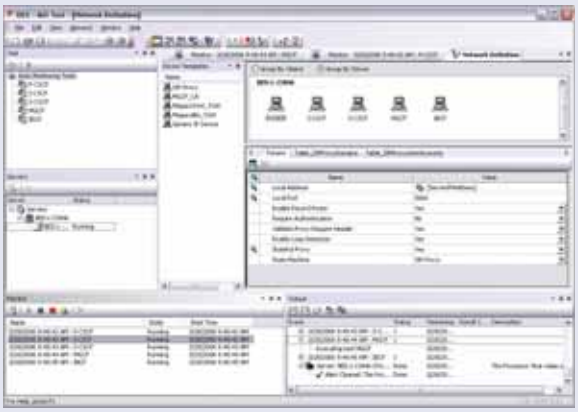
Empirix, Inc., (news - alert) has announced that its portfolio of Hammer products has been broadly extended to enable transitions to IMS in device and application development labs, pre-deployment system test labs, and field trials right through to operational networks.

The IMS architecture requires a set of tools that enable feature verification of new converged applications, enable multi-vendor device interoperability, emulate real-world network environments, and accelerate time-to-market for IMS device vendors and time-to-revenue for service providers. Empirix's Hammer portfolio is focused on providing best-of-breed device development test, pre-deployment system test, and operational-network monitoring solutions spanning legacy PSTN, NGN, and converged fixed/mobile and multimedia IMS architectures.

Sonus Networks, Inc., was among the first network equipment manufacturers (NEMs) to leverage Empirix solutions for pre-deployment IMS testing.

"With IMS protocols continuing to evolve, leveraging the experience of a company like Empirix for pre-deployment testing is a tremendous asset to us, and by extension, our customers," said Chuba Udokwu, Vice President, Worldwide Engineering, Sonus Networks. "Empirix test equipment enables us to perform comprehensive element and load testing in our system labs before our solutions are shipped to our valued customers who depend on us for reliable, scalable, carrier-class IMS solutions."

http://www.empirix.com



Sonus Enables my people wholesale VoBB Service

Sonus Networks, Inc., (news - alert) and *my people wholesale*, (news - alert) a provider of Voice over Broadband (VoBB), announced the deployment of the Sonus-certified consumer Voice over Broadband (c-VoBB) solution to power *my people wholesale's* VoBB Network. The recently launched Sonus-certified c-VoBB Solution is the first in a series of integrated IP Multimedia Subsystem (IMS)-ready solutions designed to enable the rapid deployment of next-generation services. *my people wholesale* is using the Sonus platform to support a host of personalized services and applications.

my people wholesale administers private label VoBB services for independent cable operators and other resellers throughout the U.S. *my people wholesale* has launched its VoBB product offering, which during testing successfully demonstrated the solutions' robustness and appeal to end-users.

"With Sonus, service providers like *my people wholesale* are able to simultaneously deliver high-quality telephony service and enriched communication applications. The Sonus VoBB solution also allows service providers to seamlessly and cost effectively comply with developing IMS standards, maximizing their network investment," explained Patrick Toomey, director of wholesale services for *my people*.

my people wholesale is committed to being a compelling choice for independent cable operators who service between 2,000 and 100,000 customers.

http://www.mypeoplewholesale.com
http://www.sonusnet.com

BEA, Cantata to Advance IMS Service Creation

BEA Systems (news - alert)announced it has expanded its partnership with Cantata Technology (news - alert) (formerly Brooktrout and Excel Switching Corporation).
The two companies have completed interoperability testing for Cantata's SnowShore IP Media Server and BEA WebLogic SIP Server. The combined products are designed to allow Web application developers to rapidly build applications for VoIP and IMS networks such as voice/video messaging, video ring back clips, voice/video conferencing and IVR.

BEA WebLogic SIP Server is the converged J2EE and SIP Servlet (JSR 116) based application server component of the BEA WebLogic Communications Platform. The product is designed to help telecommunications network operators accelerate the deployment of next-generation network architectures based on SIP and IMS and increase revenue by more readily capitalizing on IMS and next-generation service delivery opportunities.

Cantata's SnowShore IP Media Server is a software-based, carrier-grade IP media server supported by a wide range of industry standard hardware platforms running on Red Hat Linux. It leverages the simplicity, openness, and flexibility of SIP, VoiceXML, and MSCML to provide a cost-effective and scalable IP media server solution, powering a broad range of voice and video services for next-generation wireline, wireless and broadband networks including the 3GPP/3GPP2 IP Multimedia Subsystem (IMS) network architecture.

A special two-port license of Cantata's SnowShore IP Media Server supporting BEA WebLogic SIP Server is now available to developers free of charge.

http://www.cantata.com
http://www.bea.com

Nokia in Fixed/Mobile Deals with Euro Carriers

Deutsche Telekom Group (news - alert) announced T-One, an integrated dual-mode telephony solution combining the benefits of fixed line and mobile communications, which is being piloted on Nokia N80 and Nokia E60 devices. T-One will offer customers a simple and convenient way to access both fixed line and mobile data services on the aforementioned Nokia devices. Using the WLAN enabled Nokia N80 and Nokia E60 devices, customers will be able to use the same data and voice services from home or on the go through a T-Com HotSpot.

Together, Nokia and T-Com, a division of Deutsche Telekom Group, are testing Internet Protocol (IP) convergence solutions on the Nokia N80 and Nokia E60 devices.

In a separate announcement, Nokia (quote - news - alert) and Telenor (news - alert) R&D revealed that they are trialing services for fixed and mobile environments using Fixed-Mobile Convergence technologies. The results of the research and development collaboration include the ability to deliver IMS services over Nokia's D500 DSLAM multiservice broadband platform; VoIP calls between mobile and fixed SIP (Session Initiation Protocol) clients; and establishing test capabilities for gaming and video sharing on a converged platform.

Nokia and Telenor began this project last year by seeking to assess how different IP services can be delivered over multiple access technologies like WLAN/DSL, GSM and WCDMA to a multiradio device such as the Nokia E60. The Fixed-Mobile Convergence architecture is based on SIP technology and the Nokia IMS system.

"The shift towards IP convergence over the next few years is clear to Telenor. Introducing an IMS-based architecture is central to this development," said Hans-Christian Haugli, CEO Telenor R&D. "Taking a proactive role in the development positions us well to offer IP-based multimedia services to our customers."

www.t-com.de
www.telenor.com
www.nokia.com

Optimus Selects Ericsson for IMS

By Laura Stotler

Ericsson's (news - alert) IMS solution has been chosen by Optimus, a mobile operator within the Portuguese Sonaecom group, to deliver new multimedia services. The Optimus 3G network will also be enhanced by Ericsson's mobile softswitch and HSDPA solutions.

The Ericsson IMS solution will enable Optimus to deliver a variety of new multimedia and converged services like weShare, which enables users to share different media like pictures and video clips during a voice call. Implementation of the solution will also reduce the costs of network ownership while shortening the time-to-market for new Optimus services.

The addition of HSDPA in the Optimus network will enable the operator to provide high-speed mobile broadband to customers. It will also double its system capacity, as well as shorten response times for interactive services. Ericsson will be the sole supplier for the Optimus core network and IMS infrastructure, and will act as the main supplier for the service provider's radio network infrastructure.

http://www.ericsson.com

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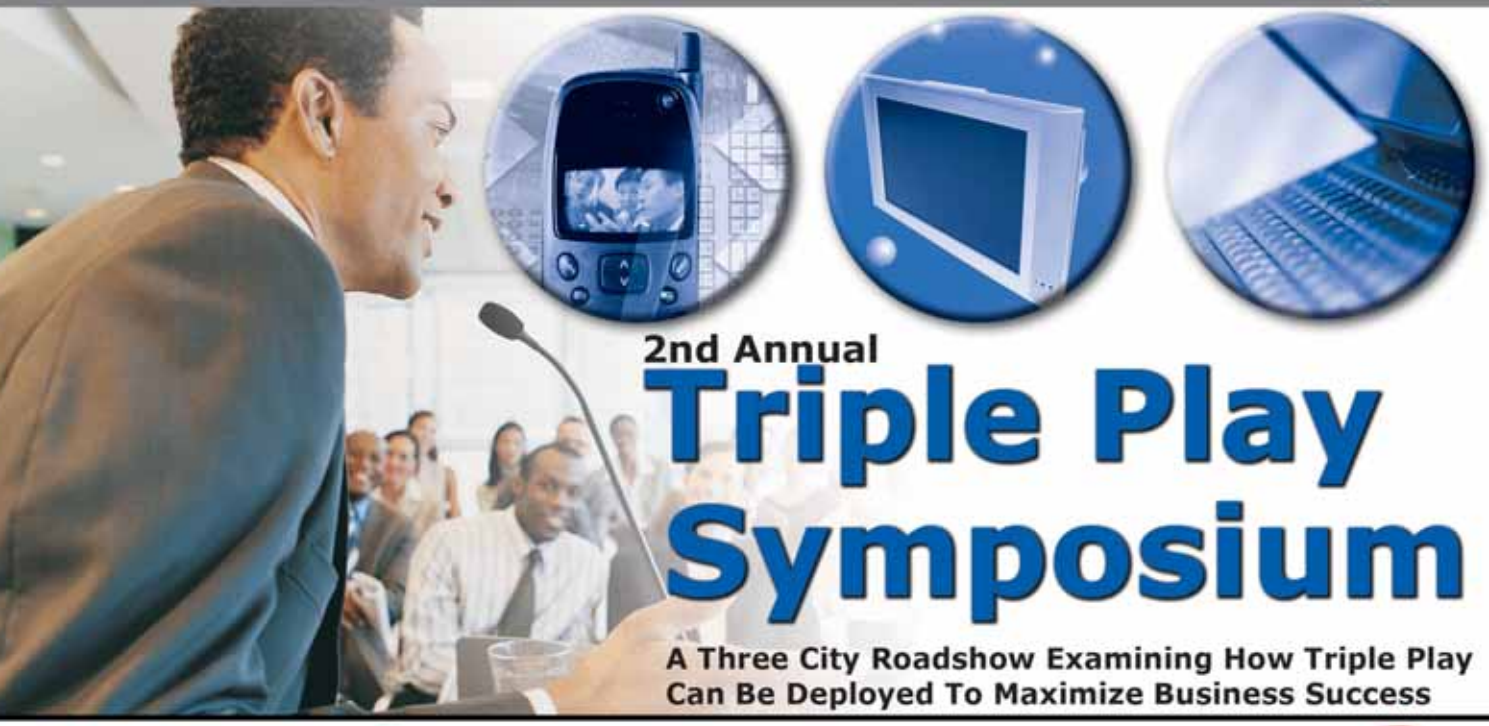

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Minerva, Nortel Announce Joint IPTV Development

Minerva Networks (news - alert) and Nortel (quote - news - alert) have announced the joint development and release of an Application Interface (API) designed to enable the integration of real-time IPTV services with Minerva's iTVManager software. Nortel is using this jointly developed interface as a first step to bring together Minerva's IPTV middleware platform with Nortel's IMS solution to make content available to users anywhere, anytime, on any device.

Using SIP, the new API gives developers and service providers the tools needed to enable real-time applications such as voice mail access and callback functionality over the television set. This innovative development environment also provides service providers with investment protection through support for legacy non-SIP systems including Caller ID and instant messaging as well as well providing a foundation for future IMS services.

The API enables several communications features such as click-to-call, network address book, buddy lists, mobile-to-TV text and picture messaging, and the ability to configure communications services directly through the set-top box (STB). The Minerva iTVManager platform has been enhanced to leverage a broad range of capabilities in Nortel's standards compliant SIP solutions.

The iTVManager platform is targeted to support Nortel's SIP and IMS infrastructure.

http://www.minervanetworks.com
http://www.nortel.com

Broadsoft Announces IMS-Ready MRF

BroadSoft, Inc., (news - alert) recently announced the availability of a new Media Resource Function Server (MRF) for IMS environments. The first in a series of next generation enhancements to the BroadWorks Media Server, the new MRF builds on core features by enhancing them with IMS capability, permitting interoperability with other application servers and allowing service providers to quickly deploy a range of audio and video functions over an IP network to enhance existing voice applications.

As a fully IMS-compliant media server, the MRF links the control and transport layers of the network, processing requests for media services from the application server. The MRF is designed to enable multiple media capabilities in the enterprise including audio and video IVR functions (i.e., record and playback), audio conferencing with ad-hoc and group calling, fax reception and forwarding and streaming (audio and video broadcast).

With no deployment location pre-requisites, the standalone format of the enhanced MRF means that it can be installed anywhere in the network to make full use of traffic characteristics. More cost-effective to service providers than hardware-based solutions, the software-based standalone MRF server preserves scalability, performance and reliability while offering service providers increased freedom to configure network infrastructure across business units and according to individual company needs.

"Now decoupled from the platform, the MRF offers the flexibility to derive maximum benefit from an IMS (define - news - alert) network by its ability to be deployed centrally. Where it excels however, is in processing capabilities that an isolated application server would never hope to achieve." said Scott Hoffpauir, chief technology officer for BroadSoft.

Network applications that can be built by using the MRF include:

- Video Mail and messaging
- Auto Attendant
- Video advertisement in call center queues
- Play tones

The MRF is generally available now.

http://www.broadsoft.com

Convedia Expands Media Server Family for IMS Services

Convedia (news - alert) announced two new products - the CMS-9000 and the CMS-3000 media servers. The carrier-class CMS-9000 and entry-level CMS-3000 encompass new hardware and technology improvements, along with Convedia's new eXtended Media Processing (eXMP) technology for media-intensive IMS services.

The CMS-9000 incorporates both new shelf control cards (SCC-III) and media processing cards (MPC-III). The new MPC-III cards are also 100 percent backwards compatible with existing CMS-6000 equipment shelves deployed worldwide, allowing existing Convedia customers to benefit from Convedia's latest hardware advancements while protecting their investment.

The CMS-3000 media server, targeted for enterprise customers or smaller service providers, incorporates the new media processing technology in a 1RU network appliance packaging.

Both products are designed around Convedia's new eXtended Media Processing (eXMP) technology, a media processing software architecture that will provide a common foundation for a growing family of software media server, blade server, and purpose-built hardware media server products. eXMP will form the technical foundation to extend Convedia's proven carrier-class media processing expertise to cover the entire range of media processing requirements, from small enterprise customer point solutions up to the largest carrier-class IMS multi-service deployments.

Noted Grant Henderson, Convedia's Executive Vice President of Marketing and Strategy, "Convedia's new CMS-9000 and CMS-3000 media servers consolidate our expertise into an evolutionary modular product architecture with numerous technical and performance improvements, resulting in improved capacity at a lower price point for all IP audio and video media processing applications, while ensuring 100 percent investment protection for our existing customers."

Both the Convedia CMS-9000 and CMS-3000 media servers will be available for Beta trials with customers in late Q2 2006, with volume shipments scheduled to begin before the end of the year.

http://www.convedia.com

Emergent Adds New IP Capabilities to ENTICE 2.4

Emergent Network Solutions, Inc., (news - alert) announced ENTICE 2.4, a significant new release of the company's call control platform. Among the additions and upgrades in Version 2.4, announced are support for SOAP-based Web services, a new traffic monitoring and reporting module and dynamic least-cost routing. As part of Emergent's continued progression towards IMS compliance, ENTICE has been enhanced with advanced mobility features for roaming SIP endpoints and new security features enabled by the addition of p-header support.

Among the new capabilities in ENTICE 2.4 is its support of SOAP (Simple Object Access Protocol), for the creation of new Web-based services. This technology, along with a customer facing Web portal is designed to minimize the provider's investment in programming and enables secure value-added services to be added with a minimum of effort and cost.

ENTICE 2.4's new traffic reporting and monitoring module enables service providers to set and monitor limits on important parameters such as ASR and call duration. This enables the more effective management of the network and minimizes the affect of upstream or downstream problems. Additionally, with the use of Emergent's billing system, dynamic, least-cost routing can be deployed to maximize profitability. The billing system has also been upgraded to include buy/sell rates, separate reseller rates, configurable levels of administrative control, and profitability reporting, and other tools of value to wholesale providers.

http://www.emergent-netsolutions.com

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Level (3) COMMUNICATIONS

Assessing Current IMS Business Models

by Mikael Stromquist

The Walled Garden

Some operators have created their own "walled garden," in which the strategy is to deploy IMS as a means to deliver high-demand, differentiated services on their existing network. Ultimately, their goal is to create a self-sustaining universe in which subscribers are allowed in to enjoy all the services and content the operator offers, in a fully secure environment and with an assured user experience and quality of service. By providing new services themselves, these operators can ensure that they will remain the provider of choice to subscribers who desire multimedia content. Further, operators can ensure that the user experience is consistent from application to application, with a uniform user interface, and with the ability to support managed clients and devices.

An additional benefit of the walled garden is the assurance that subscribers won't ever have to browse for content or services outside the garden, and therefore, all revenue generated goes directly back to the operator. However, at times operators will find that services offered by third parties may provide specialized services, early services, or bring a strong brand that the operator's subscribers rely on. As a result, some subscribers will leave the walled garden and move on to other providers who offer similar or enhanced, personalized services.

It is clear IMS has moved beyond an architecture slide to a solid approach that will serve as the foundation for network operators migrating to all-IP-based fixed and mobile networks, and an enabler for a dynamic ecosystem of content providers and developers. As operators and the vendor community are working together to examine a host of multimedia applications and revenue-generating services that are viable for subscribers in the near- and long-term, there are three business models taking shape.

To enable this, some operators have partially opened up their walled gardens by providing subscribers with connectivity to selected third-party content and service providers. But without IMS capability, fixed and mobile operators have no control over their IP networks. Without this control, they run the risk of being reduced to mere bit pipes, unable to assure that their subscribers receive a quality and secure service. Fortunately, IMS gives operators control over their bit pipes and enables them to support a business model that converts the bit pipe to a smart pipe, which is the second model being explored.

The Smart Pipe

Enabled by IMS, (news - alert) the smart pipe approach essentially builds an expressway for the operator to support their own services, partner services, and other service providers with

a differentiated, QoS-enabled capability, rather than a best effort crowded highway. The smart pipe — characterized by location, presence, security, quality of service, and billing policy and enforcement — enables operators to better deliver targeted advertisement and revenue flow, and this information flow has real value to service providers. Essentially, these value-added services begin to open up a revenue sharing relationship between both network and service providers. For example, because IMS provides multi-device awareness, it also creates seamless mobility for subscribers who are using any device that can move from access A to access B. This opens up a tremendous opportunity to network and service operators, by providing them with the ability to offer bundled services.

Federated IMS

Essentially a combination of the walled garden and smart pipe models, a federated IMS model offers the best of both worlds to network operators and service providers. The strategy of this model is for network operators to offer their subscribers value-added services and content from third-party providers through syndication or a federated IMS function.

Through syndication, subscribers stay within the network operator's walled garden, but they enjoy the freedom to choose content and services from a variety of third-party providers. At the same time, IMS provides service integration across mobile and fixed networks and also ensures that both network and service/content providers get their fair share of subscriber revenue through revenue sharing.

The Optimal IMS Business Model?

Whether a walled garden strategy, the smart pipe, or a federated IMS model, the fact that these three approaches are being considered by mobile and fixed line operators represents a significant change in thinking and philosophies for operators. IMS has allowed for this change to occur. And as it becomes more difficult to hold subscribers inside a walled garden, operators recognize they must adapt their approach and this is where the true value of IMS resides.

IMS will enable network operators to retain or in some cases increase their revenue while offering their subscribers greater variety and choice.

IMS will enable network operators to retain or in some cases increase their revenue while offering their subscribers greater variety and choice – and third-party providers will have greater access to subscribers as well as the opportunity to continue creating new services consumers want — and will pay for. The ecosystem enabled by IMS continues to evolve, and undoubtedly additional models will emerge. Ultimately, the industry will gain from the continued advances in IMS, and the consumer will reap the greatest rewards.

Mikael Stromquist is executive vice president, Strategy, for Ericsson North America. (news - alert) *For more information, please visit the company online at http://www.ericsson.com.*

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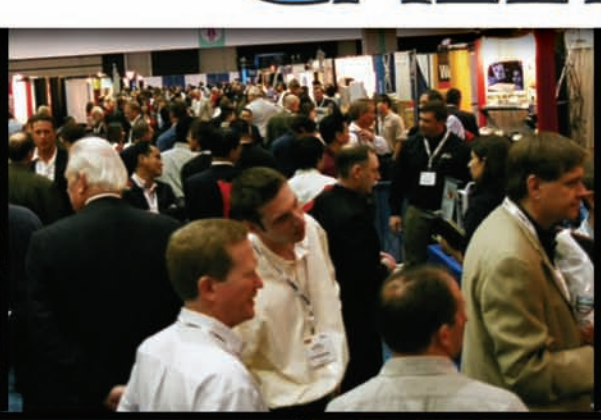




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The Evolution of IMS: Beyond SIP and VoIP

by Grant F. Lenahan

So, it's not just me. IMS is widely viewed as the avenue to VoIP, (define - news - alert) using the SIP protocol. And that, in my opinion is far too narrow a focus. Don't get me wrong; VoIP will be a very important service on IMS, and SIP is without a doubt the VoIP protocol of choice. Yet, if in several years we suddenly wake up and find IMS networks successfully delivering VoIP using SIP — but little else — IMS will have been a failure.

I can't help but think about what that definition emphasizes: technology. It says, in effect, "…we'll offer exactly the same commoditized service, but use cool new technology." That's a worry.

Replacing circuit switched voice with VoIP, and replacing SS7 with SIP does absolutely nothing to fix the underlying ills and threats to our industry. It doesn't generate new services, new revenues, differentiation, or faster time to market. In some cases, such as broadband fixed networks, VoIP offers a significant benefit in the form of lower facilities maintenance costs, so we can expect cable, DSL, FTTx, and other broadband players to migrate to VoIP for bundled "double play" and "triple play" offers, where there are significant economies of scope for the second and third service to ride on a common IP facility. Yet in others, such as cellular networks, it will likely raise costs through VoIP's inherent spectral inefficiency. And in cellular networks, spectrum costs matter. A lot.

The value of IMS can be summed up, or at least grouped, into a few main benefits:

1. Richer, more personalized services.
2. Faster time-to-market for new services.
3. Multimedia or "blended" services that transcend the simple voice model.
4. Network convergence — allowing seamless mobility across heterogeneous networks such as fixed, mobile, broadband, etc.
5. Support for third-party content and services — and, therefore, a vastly expanded universe of potential revenue streams.

I've often felt that IMS is pigeon-holed as just another iteration of Next Generation Networks (NGNs), driven by VoIP. But that's just my impression, so I decided to look up the definition of IMS in Wikipedia:

> *"The IP Multimedia Subsystem (IMS) is a standardized Next Generation Networking (NGN) architecture for telecom operators that want to provide mobile and fixed multimedia services. It uses a Voice-over-IP (VoIP) implementation based on a 3GPP standardized implementation of SIP, and runs over the standard Internet Protocol (IP). Existing phone systems (both packet-switched and circuit-switched) are supported."*
>
> *– Wikipedia, 18th March, 2006*

These five "macro benefits" all contribute to the real value of IMS — generating new sources of revenue from new, compelling, and differentiated services. We're already seeing the commoditization of voice. Next, as higher speed DSL, FTTx, and wireless build out, HSD and video will increasingly come under price competition as well. This makes it essential for IMS to deliver more services, and for it to deliver differentiation at the service level, thus minimizing pure price competition.

Fortunately, market numbers tell an optimistic story if we look beyond VoIP. While traditional operators rely on call/connection and other fees for nearly 100 percent of their revenues, new-era service providers such as Google and Yahoo! do not. Cannacord Capital, for instance, estimates that fees account for only 24 percent of these "new era" players' revenues, with marketing and digital merchandising (e.g., digital content) representing the other 76 percent. So there's huge upside for the communications industry, as long as we set our sights broadly. Furthermore, research by Yankee Group and Vodafone (UK) reinforce the economic value of content and advanced services by documenting that:

1. Most consumers want to buy more services than they are typically offered; and
2. When they purchase multiple services from any single operator, net out-churn decreases.

Simply put, operators can grow their revenues AND maintain better market share AND reduce customer acquisition costs by innovating and providing their subscriber base an ever growing array of new, personalized, and unique services and content.

IMS is well positioned to deliver these services. Setting aside technical protocols, the basic concept of IMS is to replace "stovepipe" service creation with open, modular, multimedia "service building blocks" that add value and allow rapid development of new services. Examples include building blocks for charging, presence, session control, shared subscriber data, policy, mobility, authorization/authentication, and myriad others. In this sense the value of IMS is in its modular building blocks, in its focus on intelligence and value for IP networks, and in the fact that it is standardized.

Digital content is one of the fastest growing revenue opportunities in mobile and broadband telecoms today.

A few examples can illustrate the benefits of IMS service enablers:

Digital Content

Digital content is one of the fastest growing revenue opportunities in mobile and broadband telecoms today and is expected to accelerate over the next few years. A well-conceived IMS implementation provides both policy/authorization building blocks and a very sophisticated Online Charging Function that enable operators to participate in the value chain, and to add new content, prices, and promotions easily.

Fixed Mobile Convergence

Customers and enterprises have responded very favorably to the latest proposals to provide fixed-mobile convergence using IMS to deliver a seamless mobility experience across broadband (often WiFi)

and cellular networks. Some proposals utilize a dual-mode phone, while others allow a call to be transferred to a broadband SIP client (e.g., a PC, a dedicated SIP phone). These schemes provide an attractive combination of better coverage, lower costs and prices, and potentially better quality — and allow for market share gains as well as reduced churn. IMS provides several building blocks for this service, including the Call Continuity Control Function (CCCF), as well as VoIP and QoS functions.

Personalization

In primary market research, consumers and enterprises consistently indicate demand for services that simplify their communications experience by personalizing when, how and in what format calls and messages are delivered. This can involve presence-driven re-routing; black and white lists, content filtering, parental control of usage, in-network PIMs that synchronize across devices, and authorization/authentication that eliminate unique passwords and logins for various networks and services. Many of these are enabled relatively simply (compared to yesterday's stovepipe services) using IMS service building blocks.

The success of IMS then, should be measured against its ability to deliver new services; personalized services; to enable access to and sale of third-party content; and to offer these services across a range of networks (including the nearly ubiquitous "legacy" cellular network). Only then can operators progressively generate more revenue, more loyalty and derive more customer AND shareholder value from the expensive investments they have made in 3G, broadband and other modern IP and CS networks.

So my advice is this: Don't think technology. Don't think voice. Think rich, ubiquitous, personalized services. Then we can all think about happy customers and shareholders, and that would be pretty nice to think about for a change!

Grant Lenahan is vice president and strategist, IMS Service Delivery Solutions at Telcordia Technologies, Inc. (news - alert) *For more information, visit http://www.telcordia.com.*

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Building the IMS Business Case: Tactical and Strategic Considerations

by Ronald Gruia

This result is intuitively obvious, given that the services allow the carrier to generate revenues and the faster they are introduced, the sooner the operators can start monetizing their IMS network infrastructure. However, the benefits of deploying more applications go above and beyond earlier revenue accretion.

> In pitching IMS solutions to service providers, many telecom equipment vendors typically state (as part of their business cases) that the ROI for IMS is stronger when deploying multiple applications. In other words, deploying five to six IMS services will yield a shorter payback period than implementing two to three apps.

OPEX Savings

For instance, in terms of OPEX, the savings also increase with the number of deployed applications. In the traditional stovepipe environment, the rollout of new point solutions is a rather complex process, given the multiple integrations that are necessary. In the IMS architecture, given that common elements are reused in a horizontal fashion, the systems integration is a lot simpler. For example, in terms of customer provisioning, since the data is stored in one centralized database (the HSS or Home Subscriber Server), the time required by a field technician to perform a subscriber activation or deactivation is not dependent on the number of applications. The savings in terms of operational expenditures can be substantial, since whenever a new subscriber is added or deleted, the amount of time required for an operator staff member to enter the data is fixed, instead of being dependent on the number of applications.

Furthermore, since everything is now stored in one place, the IT staff only has to manage one single platform rather multiple platforms, freeing up scarce and expensive engineering resources. The savings again are significant, since every database server typically requires one person-day per month from an IT perspective. So for an operator having five applications and two databases for each, the resulting IT cost would be 10 person-days per month, which can be collapsed into one person-day per month for a single database.

Another benefit is reduced churn, since the blending of services that is enabled by IMS will enhance subscriber stickiness, making it less likely for end-users to switch to another service provider. The reduction in churn is directly proportional to the number of applications that a customers subscribers to (the higher the number of services, the lower the attrition rate). It would be reasonable to estimate that a bundle of five IMS applications can reduce the churn rate for an operator by as much as 15 percent compared to the churn for services deployed in a point solution architecture. The ramifications of a lower rate of attrition can be significant considering the high CPGA (Cost Per Gross Addition) of some operators, which are usually in the vicinity of $300.

All of these factors are summarized, in a scenario for a sample European mobile operator. The case assumes certain IMS take rates, churn reduction, time per IMS subscriber addition and deletion, as well as a discount rate (taken to be seven percent) and number of IMS applications

(five). The OPEX savings due to IMS adoption are significant, with an NPV (from 2006 through 2011) of roughly $50.3 million (for a total subscriber base of 16.2 million subs in 2011 and an IMS base of 4.3 million subs in that same year). The apportioning of savings depicted in the simple example does not include other factors such as lower maintenance, training/ documentation, footprint, and electricity costs.

The IMS Decision: Tactical or Strategic?

Having covered OPEX savings and the argument that the ROI for an IMS solution is more attractive with a higher number of applications initially deployed, the next question is how are carriers responding to this message? In other words, how would an operator "decode" the message that IMS makes sense from many considerations (new opportunities for higher ARPU, a more "distributed" CAPEX in "cap-and-grow" style rather than a big, single monolithic investment, lower OPEX), however that the payback period can be made shorter with a higher number of services initially deployed? Is the tipping point of a service provider's decision to deploy IMS due to tactical or strategic considerations?

Is the tipping point of a service provider's decision to deploy IMS due to tactical or strategic considerations?

A quick carrier survey reveals an entire gamut of answers to the above questions. Some operators, such as Vodafone, are more focused on the longer-term strategic picture of IMS. *(Vodafone announced at 3GSM that it chose Ericsson and Nokia as its preferred IMS vendors, which means that all of its companies opting to embrace IMS will have to decide between these two players.)* As such, these early adopters are not typically concerned with decisions such as what will be the first five or six IMS applications that they will deploy once they wrap up their IMS infrastructure rollout. They might just know that maybe the first app will be push-to-x (talk, video, etc.) and the second one a presence and location-based service. Others will definitely follow in the future, but they are not concerned with these decisions right now, and regard IMS as a key and strategic core network infrastructure investment, with a payback period in the vicinity of three years.

At the other end of the spectrum, other service providers are more concerned with the first five applications to be deployed within the new framework, should they consider embracing IMS. For these operators, the IMS pitch really becomes the individual business cases for five or six IMS apps, which typically have a much shorter payback period associated with them (typically a six–12 month horizon as opposed to three years). This group of carriers might typically remain sidelined and choose to wait until further issues such as handsets, bandwidth and QoS are resolved, or new IMS applications are born, since they find it more difficult to cost-justify the investment based on stricter timelines.

Conclusion

Network equipment vendors should highlight all the benefits that IMS can deliver, but emphasize the key strategic benefits due to an IMS deployment. Some of these can be realized in the shorter term, while others are more forward-looking, however NPV calculations and other simulation tools can play an instrumental role in further convincing the carriers to make a commitment to the technology. The number of apps initially deployed will impact the ROI calculations, but this point should be ideally highlighted later in the sales process, as the business case should be strategic (i.e., more advanced core networking infrastructure) as opposed to tactical (i.e., number and type of applications initially deployed).

Ronald Gruia is Program Leader and Senior Strategic Analyst at Frost & Sullivan covering Emerging Communications Solutions. (news - alert) *For more information, please visit http://www.frost.com.*

IMS Service Creation: The Value of a Converged Approach

by Mike McHugh

Telecom network operators are facing constant pressures to improve their financial performance, while keeping their competitors at bay. Due to the rapid adoption of Internet and Web technologies such as SIP and Java, non-telecom service providers are increasingly able to blend communications capabilities into predominantly IP-based applications, thereby launching new and innovative, real-time, multimedia consumer and enterprise services. A strategic advantage of these new entrants is their ability to launch new services rapidly using existing Internet and Java-based service creation and execution models.

To address this threat, the telecom industry is looking towards the adoption of IMS, which ostensibly will decrease operational costs of existing infrastructure and, more importantly, enable new revenue streams with enhanced service offerings. As service providers consider how best to architect and implement IMS-based solutions, it is important to understand how different approaches can enable flexible and easy service creation both for the service providers and third party application developers.

Although there are several service creation paradigms, including programmable APIs, scripting languages and graphical Service Creation Environments (SCEs), I will focus on specific development models relevant to the "convergence" of proven Internet development models, including SIP Servlets and Web services that enable flexible and easy service creation.

The success of the Internet and World Wide Web can be attributed to numerous factors, one of which is that modern servers are easily programmable. Web servers can host a variety of applications that can be updated and managed independently of Web browsers. SIP Servlets, developed under the Java Community Process (JCP), exploit the aforementioned World Wide Web's simple programming model for next generation SIP-based networks. Service providers and third-party developers can use SIP servlets to build multimedia applications explicit to the SIP protocol and that leverage Web-based programming models. The Servlet programming model simplifies application development by embedding standardized message processing in a "servlet container." This simplifies the programming model for the developer, provides a consistent environment, and removes potential programming problem areas.

Hypertext Transfer Protocol (HTTP) Servlets are widely used to build and maintain Web pages. SIP Servlets leverage the highly efficient, reliable HTTP Servlet model by exposing SIP capabilities to the application developer while hiding the protocol details. This not only produces a high-performing scalable SIP engine, but also provides a platform for converging

IT processing with network signaling, while significantly reducing the time to development for most applications. Furthermore, the simplicity of the model broadens the developer community available to build new services.

For telecom network operators there are significant advantages to running both HTTP Servlets and SIP Servlets within the same platform. Applications running in a converged platform combine both HTTP-based Web application components and SIP application components and the sharing of information among those components. Services have native access to all APIs and capabilities. This integrated environment enables applications to combine the effects of the APIs; for example a SIP event could trigger an HTTP action, and an HTTP event could trigger a SIP action within the same platform — a distinct performance advantage. This converged SIP and HTTP platform is most commonly provided within a SIP application server, sitting at the service layer of the IMS framework.

Any discussion of service creation within IMS must reflect the growing industry interest and commitment to the collection of standards and technologies broadly defined as "Web Services." Web Services is gaining significant momentum as a platform for the future development of Web-based applications. Although not strictly an "IMS service" today, the telecommunications industry is trending towards inter-working between Web services and IMS services.

The main goal of Web services is the realization of an interoperable network of services focused mainly on service reuse and it is suitable both to interact with third-party applications and to export services by a service provider. As a result, Web Services creates an application and services layer that facilitates the rapid creation, deployment, and customization of mobile voice and data applications through standards-based, Java technologies such as Parlay X. In addition, technologies supported by the IMS framework, including SIP and SOAP, utilize XML, one of the key components of Web services. These common paradigms give service providers a greater set of options to deploy application servers and services themselves or with third parties.

Although Web Services is not formally related to IMS, it represents a trend that should be considered by service providers planning on providing IMS services — both to the consumer and enterprise segments. Enterprises are already adopting a Web Services approach to achieve similar advantages as IMS — less complexity for network management and to users. When available, IMS services will need to integrate into existing network environments that are at least partially designed using Web services concepts.

The SIP Servlet and Web Services service models are designed to isolate application logic from the details of external protocol interfaces and network elements, and from the operational concerns of resource management, fault tolerance, scalability, management, and security of network systems. The end result is a significant reduction on development and maintenance costs as well as the costs associated with application faults. In addition, there is a wide development community that has extensive knowledge of these Java and Java programming models, giving service providers a wealth of resources within the community with which to utilize in these enhanced service offerings. Using these technologies, service providers end up reducing the total cost of ownership of deploying and managing new services. Ultimately, the goal of IMS will be best realized through the proliferation of new and innovative services, which leverage the best capabilities and network features offered by both Internet and telecom networks.

Mike McHugh is vice president and general manager, BEA WebLogic Communications Platform, at BEA Systems. (news - alert) *For more information, please visit the company online at http://www.bea.com.*

Siemens' Harald Braun

Rich Tehrani's Executive Suite is a monthly feature in which leading executives in the industry discuss their company's latest developments with TMC president Rich Tehrani as well as providing analysis on industry news and trends.

by Rich Tehrani

As President of the Networks Division of Siemens Communications (news - alert) in the United States, Harald Braun leads operations for the following product groups: wireless networks, broadband solutions, photonics, next generation switching products and solutions, and digital home. In addition, he is helping to drive the company's strategy for deployment of Internet Protocol-based Multimedia Subsystem (IMS) technology and is also responsible for overall management of the division's sales, marketing, and service and support functions. Braun has led the Networks Division since September, 2005. Prior to this, he was President of the Carrier Networks Division since 2002.

Of all the people I have spoken with about IMS there is a single individual I put on a pedestal as being able to talk about real-world applications of IMS that will change lives. It is great to talk about theory and all the things that are possible — but this person was able to explain what is happening today and what we will we see soon.

Harald Braun — the President of Siemens Communications Networks Division — spent some time talking with me about IMS and more in a recent part-telephone, part-live interview. Harald is very animated and his passion for IMS comes through when he speaks with you. It is worth mentioning that Siemens has combined the Mobile, Carrier and Wireless divisions together to come up with the Networks division. This is where they saw the market going with IP being the standard and SIP being the protocol making communications happens. They are further moving the Mobile Group into the realm of IMS.

Harald says it is all about people and allowing the end-user to have more choice and making their lives easier. IMS requires the devices to have good interfaces in order to be able to use the applications. Also IMS will give us the ability to have more features, allowing you, for example, to invite others on a mobile or fixed-line conference call to share movie previews. Once you have agreement on a specific movie you can even buy your tickets with the same device. This sort of functionality is made possible with SIP sessions and currently works in the Siemens' lab.

At this juncture it is worth noting a few things. The first of which is that most of the IMS applications coming to market are in the lab for now. Few are in production. It is also important to note that IMS is not needed to do many of the things it will be used for.

While this may sound strange, what IMS does do is make the next generation intelligent network possible. In the 1990s for example I witnessed the advent of Web-based telephony dashboards for things like call control. Incumbent service providers were able to give this innovation to their customers but chose not to. Vonage is credited with bringing a Web-

based telephony interface to the masses — at least in the U.S. You don't need VoIP to use a Web-based control panel but once you go IP you tend to go all the way. So think of IMS as a mindset. An architecture that gets service providers thinking how the next-generation network should look and what it should do.

So IMS is an architecture, framework, and an enabler. It will enable applications to be rolled out more rapidly and it will allow providers and developers to experiment with applications more rapidly and with less risk. It turns service providers into Internet companies.

Getting back to the interview… I probed Harald more about applications and this is the response I got:

"Gaming is coming to be a big application. You can play games with many different people. Currently it is a very huge technology challenge to make games real-time. Concurrent or real-time gaming with people all over the country or world is the future of mobile gaming. People don't stop gaming — many people play all weekend."

Another consumer application is picture sharing allowing you to invite others to view the photos on your phone.

Siemens has brought their medical division into the picture and has integrated medical IMS applications. One application allows you to put your finger into a device on a toilet, which takes a sample of your blood and sends the information to your doctor. Apparently, according to Siemens, about 70 percent of the time when people go to the doctor because they don't feel well, there is nothing wrong. This application reduces costs considerably while still catching that 30 percent. Oh, and in case you're wondering — the toilet is not required, but this is a real-word application and as Harald explains it, in Japan, many of the toilets are already computerized. And to think, my wife finds it excessive when I bring a laptop into the kitchen.

IMS is an architecture, framework, and an enabler. It will enable applications to be rolled out more rapidly and it will allow providers and developers to experiment with applications more rapidly and with less risk. It turns service providers into Internet companies.

A further extension of this application allows various parameters about your health to be sent to a hospital in real-time and you can subsequently be advised of the corresponding medications you need to take. A wireless monitor can be placed on the body to keep in constant touch with medical practitioners if needed.

Harald continues to tell me that the medical field has many applications that can be transmitted via IMS. "For simple things, you may not have to go to hospital," he said.

Other interesting applications are security-based allowing you to see things that are happening on a mobile device based on triggers such as movement by a camera. Push to talk is not new but is yet another application we will see on IMS-based networks.

They are further integrating their middleware into IPTV allowing integrated IMS so an SMS message can be received and responded to on a TV screen with

a remote control. This is a great trend for those of us who long to see our weekend e-mail spam while the ball game has a commercial.

Other exciting applications will make TV more interactive allowing users to open up instant message sessions.

The end-game for Siemens is to create an ecosystem enabling a killer development environment. This is the company's passion as when you develop a killer environment you allow small creative companies to develop killer applications.

The end-game for Siemens is to create an ecosystem enabling a killer development environment.

Siemens thinks the network should allow people to code applications and then allow anyone to get to them. Harald goes on to say that the Googles, eBays, and Vonages are creative in coming up with ideas, meaning that these sorts of companies can potentially benefit greatly from IMS.

"I feel the application server in IMS is the most strategic portion," he says. "The goal is to put applications on the server and make them available throughout the network."

"This is a difficult thing to digest as applications typically range in the one to two month development time range while voice has an 18-month cycle." He continued, "That is the challenge and it can be done."

Harald tells me that Siemens has up to 16 divisions depending on the country. Some of these divisions are medical, power generation, building technology, etc. They further have a program called Siemens One and it goes across the divisions allowing them to be sold as a packaged solution and offered to clients. They are always looking to combine software into telephony.

Another notable quote is, "There should be no distinction if I switch my computer at home or the office." The same goes for the PDA.

He feels that applications and content are king and voice is just a very small portion in the future of telecommunications.

"Applications have to act in real time. Partners can be anywhere while connected to a gaming session."

Other comments worth mentioning are as follows: Routers were not created with carrier-class reliability but applications need to be real-time. Today people are used to 99.999% reliability so the backbone needs to improve.

"Telecom companies have to make their business model for IMS work. On the other hand, cable companies have content but need a mobility partner."

In addition the company has done extensive surveying of customers with the goal being to determine what customers are willing to pay for. This is being done to help service providers understand where the IMS ROI is.

The surveys were done around the world, and in the U.S., some of the most popular applications in order of popularity are mobile e-mail, music, TV, enriched voice calls, gaming, group communications, and file sharing.

I asked what he thinks about comments referring to IMS as walled gardens.

He replied that customers will just see applications. GPS becomes the telephone, etc. They don't care

about this; they just care about applications. Applications are king; Verizon, AT&T and the MSOs have to make this happen.

New entrants like eBay, Vonage, and Skype will create new telephony behavior and they may be the new telecom companies of the future.

He can't disclose what Google is working on but he says it is mind-boggling.

"How will enterprise be affected," I asked?

Siemens is creating the mobile enterprise allowing the enterprise to be part of the telephony network. With OpenScape you can create a buddy list he says so your companion knows if you are available on your cell, home phone, etc.

Open Scape is telephony, IM, presence, and collaboration and it makes workflow and business much more effective.

I asked, you don't need IMS for this right?

"Every product we create is IMS ready to use throughout the telecom environment. These applications have to be compliant with open standards such as SIP."

From there we went into a discussion about the state of wireless and the different networks such as WiMAX, CDMA, GSM, etc. According to Harald, "all the networks are coming together and need to interact with one another. IMS is going to collapse or converge this into one network."

This interview was very exciting for me as it showed some real-world examples of what IMS will bring the world. IMS may not be perfect but it is certainly a framework that will allow application developers to get applications into the hands of customers rapidly.

This is not unlike the promise of the communications ASP from years past. It is obvious that service providers can't bring out every application themselves, which is why it is exciting to see that there will be ways for the small developers of the world to come out with cutting-edge applications and rapidly roll them out and more importantly get paid for them.

I don't mean to oversimplify or overhype this technology but IP Multimedia Subsystem solutions remind me of the advent of the personal computer. In other words, a platform that can run all sorts of applications. The draw of developing applications for the PC platform is the ubiquity of the PC. Imagine a new platform that has the ability to reach all TV users, Internet users, and mobile device users. Furthermore it can tie these different devices together seamlessly. Developers will be able to reach not millions, but billions of devices more rapidly than ever before.

Developers will be able to reach not millions, but billions of devices more rapidly than ever before.

What can drive a market and ROI faster than opportunities this huge?

This is part of the promise of IMS... It is the opportunity to generate revenue on a massive scale. Therein lies the reason the IMS market will continue to grow and benefit consumers, service providers, and everyone else in the mix.

The Role of SIP in IMS

by Sanjeev Sawai

SIP Background

SIP is a text-based, client/server protocol that resembles the HTTP and SMTP protocols; SIP is used to create sessions in an IP network. SIP has proven to be extremely flexible. SIP can create sessions as diverse as a simple two-way telephone conversation or as complex as a multimedia conference involving many participants.

In a simple session, for example a two-way telephone conversation, two SIP user agents (UAs), each with a unique address or uniform resource indicator (URI), are connected so that information can be passed between the UAs. A session is created through a straightforward set of requests and responses. One UA (the caller, in our example) initiates a session by sending a request with the SIP URI of the other UA (the called party in our example). If the IP address of the called party is known, the request can be sent directly to that address. If the IP address isn't known, the request is sent through one or more proxy servers, which attempt to locate the called party and forward the SIP message. Once the called party is located, the SIP message, which carries text information and describes the type of session being established, is delivered. At this point, the called party can send back an acknowledgement and a session between the caller and the called party will begin.

IMS promises access to all the rich services available on the Internet, including Web, e-mail, instant messaging, VoIP, and IPTV, on handheld devices via ubiquitous wireless networks. IMS provides a set of standards that enable the convergence of the Internet and cellular networks and a unified platform for creating and running these multimedia services regardless of the network or device used to deliver them. The key call control (and session control) protocol for IMS is SIP. The evolution of SIP has become the focal point of the VoIP revolution, driving advances in VoIP services. Its advances and acceptance in the VoIP world should provide a significant boost to the number of services available on IMS architectures.

SIP Within IMS

The IMS architecture separates the signaling plane from the media plane. SIP has been selected as the protocol used by the signaling plane. SIP signaling packets within IMS are normally processed by a collection of SIP servers or proxies, collectively referred to as the Call Session Control Function (CSCF). The CSCF includes:

- P-CSCF (Proxy-CSCF) — a SIP proxy that is the initial interface in a visited network. It provides security, authorization, and translation services.
- S-CSCF (Serving-CSCF) — a SIP server within the IMS signaling plane that controls sessions, deals with registration, and triggers and executes services.
- I-CSCF (Interrogating-CSCF) — a SIP proxy that deals with registration, routing and forwarding of SIP messages and charging.

SIP is currently used as the basis of session control for myriad Internet services such as VoIP, conferencing, video calls and video conferencing, presence management, instant messaging, collaboration and location-based services. Since the goal of IMS is to provide ubiquitous access to all existing and future Internet services, adopting SIP as the control protocol for IMS brings immediate access to some of today's most popular and fastest growing Internet services.

Adopting SIP as the control protocol for IMS brings immediate access to some of today's most popular and fastest growing Internet services.

Innovation and investment in the SIP standard and SIP-based services is expected to continue, or even accelerate. Currently, the standards community is active in creating new standards or protocols based on SIP to enable various kinds of services such as instant messaging and presence management (e.g., SIMPLE and IMPP). It is clear that SIP is the protocol of choice for session-based Internet services in the future. The presence of SIP in IMS will not only allow IMS users to benefit from these additional services, but will also allow IMS users the flexibility to combine multiple services from different vendors to form entirely new services.

With its flexibility, simplicity, and broad adoption, SIP provides IMS with solid call/session control capabilities. Continued innovations in SIP and SIP-based applications will allow IMS users to introduce a wide range of innovative, multi-media services to their customers.

Sanjeev Sawai is vice president of research and development at Envox Worldwide. (news - alert) *For more information, please visit the company online at http://www.envox.com.*

IMS: The Importance of Testing

by Chad Hart

The IP Multimedia Subsystem (IMS) is steadily progressing from concept to reality. Despite these advances, interoperability, performance, scaling and security remain major challenges. Testing is not optional — it is absolutely crucial for success in IMS.

All major equipment providers have committed to the IMS architecture and are implementing parts of it — not to mention a selection of major IT vendors and a variety of specialists. Many vendors and carriers now tout IMS as the single most significant technology change of the decade. A host of new product announcements, reports, newsletters, and articles are continually appearing. Yet it's already clear that the conformance, interoperability, and performance challenges with IMS will be huge. How can vendors and service providers navigate these challenges as quickly and economically as possible, and realize the promise of IMS?

The Premise and Promise of IMS

IMS enables network convergence by utilizing a common IP-based core infrastructure to deliver a combination of new, content-rich multimedia services and legacy services to a variety of access networks, including both fixed and wireless. The basic idea behind IMS is to shift from "silos" to "layers" in delivering services across different access networks. There are a few premises in IMS that are now very well accepted:

- Decouple access from applications.
- Provide functions as modules.
- Use standardized interfaces, reusing as many existing standards as possible (e.g., SIP).

These may sound simple, but there are wide-ranging implications, many of which are already evident in early IMS products and trials.

Increased Complexity

While IMS ultimately aims to simplify service delivery through a common IP-based core infrastructure and application layer, migrating to this new model is an enormous undertaking. Old systems and architectures must be supported while the several dozen new IMS functions are implemented. Just keeping track of IMS is a huge headache — just the 3GPP specs for IMS require several rows of shelf space alone and there are many other standards groups involved.

Nebulous Standards

For an industry that took 12 years to standardize T1 and E1 and 15 years to standardize AIN, getting to the current IMS framework in five years is remarkable. However, many issues remain, and standards haven't yet addressed several big areas like the definition of

common security elements and security aspects such as: handing of denial of service, topology hiding, and overload protection. Legal requirements for "lawful intercept" aren't dealt with yet, nor are the "transcoding" approaches that will be necessary when going between wireline and wireless networks. In addition to areas that are not yet addressed, there are areas that are not defined well or not addressed outside of the 3GPP including charging, OSS/BSS integration, user data management, fixed-mobile convergence, and provisions for peering.

At the end of the day, infrastructure vendors need to deliver cutting-edge products to drive sales, even when standards are not ready. As a result many vendors have differing interpretations and implementation approaches. While this is not a new problem, the new expectations for IMS have helped to accentuate these issues.

Delivering on the promise of interoperability is perhaps the foremost challenge of IMS.

Multi-Vendor Interoperability

Service providers want to mix and match network devices from multiple vendors according to their unique network needs. IMS further disaggregates network devices, creating a larger opportunity for multi-vendor deployments. In fact most end-to-end system vendors are finding they can not offer an end-to-end solution using only in-house products. This also means there is a need for multiple vendors' equipment to interoperate in a much deeper, cleaner way than the industry has ever been accomplished in the past. Delivering on the promise of interoperability is perhaps the foremost challenge of IMS for vendors.

To date, there haven't been any "interoperability" events or conformance test suites beyond those that existed with the existing protocols IMS encompasses. However, the first real interoperability events are coming in mid 2006. Now vendors are scrambling to prepare for these tests and to avoid the negative consequences of not playing well with others.

Quality

IMS promises to accelerate convergence in many dimensions (technical, business-model, vendor and freedom-of-access) and make "anything over IP and IP over everything" a reality. However, stratification of the transport layer, control/session plane and applications create unique challenges from a service quality-assurance perspective. More network functions and interfaces means more failure points. IMS products are by definition new, which makes them particularly prone to bugs. Furthermore, while products may work in a vendor's lab, new issues are often arise when they are attached to other vendors' devices.

Blending fixed and mobile networks will introduce new and more complex quality challenges.

Addressing IMS Problems With Testing

The challenges of IMS can certainly be discouraging. The best way to overcome the new complexities, standards conformance, interoperability, and quality of experience issues associated with IMS is to test.

Fortunately the test market is introducing a new and improved set of test tools to help identify and resolve these issues and verify that IMS can to live up to its promise.

Start With a Test Plan

The industry is still in the early stage of development of test tools and processes that can reach across new IMS elements and converged networks. However, there are many key testing and deployment functions requirements already known for successful product development, interoperability, and deployment:

- Each component within the infrastructure must be tested for reliability, scalability, security/integrity, interoperability, and performance to ensure it meets both the vendor requirements and subsequently the service provider requirements.
- At each layer (access, control, and application) interoperability must be tested at the equipment, application, and underlying protocol level. Network equipment manufacturers will need to test their own equipment as well as other vendor equipment for interoperability and performance characteristics. Service providers will expect their vendors to provide pre-tested multi-vendor solutions as well as bring new equipment to the solution and expect their vendors to enable interoperability.
- Service providers will need to be able test across disparate internal networks as well as test across multiple external networks in order to provide the end user with a quality service and user experience. The end user will expect quality end-to-end performance regardless of device or network.
- All applications will need to be tested both separately and in conjunction with the other applications on the network to ensure compatibility, interoperability, and bandwidth availability.
- Since IMS deployments are a migration, both service providers and NEM will need to test interworking with existing network infrastructure and applications.

The variety of testing needs is broad (Figure 1). Each area includes verification under load, since scaling and performance (particularly latency) are essential aspects of testing.

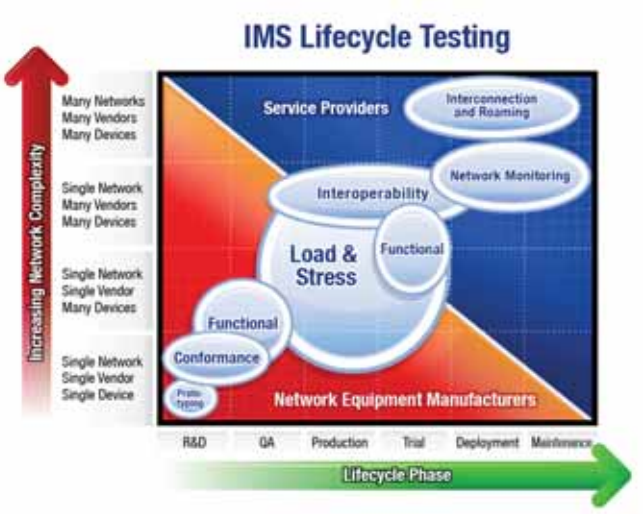

Figure 1

Get the Right Test Tools for IMS

Proper testing tools and automation techniques can overcome this complexity and reduce development and deployment costs substantially. Looking across the many layers of IMS, is essential to successfully implement and maintain the IMS architecture. Focusing on end-to-end performance and interoperability is extremely important in order to find and resolve the issues that have the most impact on customer experience (and, hence, support cost and service revenue). Performance of IMS applications, especially latency for signaling and media, will also continue to be a focus area for quite some time.

While different tools are often required for different tests, it is important for infrastructure vendors and service providers to be able to rely on as few test vendors as possible in order to quickly develop internal processes and minimize test costs. Chosen test tool vendors should be able to support the diverse IMS protocols, equipment, and applications, and offer testing tools that can perform a wide variety of testing functions.

Conformance, interoperability, security, and performance remain key technical challenges for the industry.

In addition, there are a few "must have" capabilities for test automation in IMS:

- Ability to verify core elements of the IMS architecture including both positive and negative testing across signaling, media types, and applications, including vendor variants;
- Ability to verify interoperability and interworking, including legacy-to-IMS scenarios, multi-vendor situations, and effective interworking across layers;
- High-density stress and load testing capabilities, including both signaling and media;
- Diagnostics and troubleshooting insight.

Test for Success in IMS

IMS promises delivery of new applications across multiple devices, media types, and locations. Service providers of all types, as well as network equipment manufacturers, are actively progressing down the IMS path, in search of a more flexible, modular, access-independent application delivery platform. Yet conformance, interoperability, security, and performance remain key technical challenges for the industry. This is exacerbated by the sheer complexity of IMS and the fact that there are still "holes" in both standards and implementations.

Testing is always important, but it is even more crucial with IMS. Requirements for testing are shaping up to be substantially broader and deeper than the industry has seen before. Creating a test program that spans the layers, functions, applications, and lifespan of IMS deployment is challenging. But not creating a test program spells failure. Test tools and techniques for IMS are emerging, and there are significant resources — both knowledge and tools — you can bring to bear today to manage the IMS new challenges.

Chad Hart is product marketing manager at Empirix. (news - alert) For more information, please visit the company online at http://www.empirix.com.

IMS – Finding the Killer Apps

by Scott Hoffpauir

IP Multimedia Subsystem (IMS) is quickly becoming the architecture of choice for wireless and wireline convergence. Many service providers are also beginning to tap into its ability to offer advanced, revenue-generating features over next-generation networks. But making advanced services accessible by broadband wireless users constitutes only part of the equation for service provider success. The other part consists of service delivery using VoIP and IP multimedia application platforms designed to attract developers and host the true killer application: Continuous application innovation that responds to — and even anticipates — customer need.

A Look at the Architecture

Today, a typical service provider infrastructure consists of a collection of disparate networks running voice, data, video, and wireless as separate entities. Not only is this approach inefficient, it is costly and inflexible. By contrast, IMS provides a set of standards and architecture that allows service providers to collapse those disparate networks into a common set of elements. This approach pulls together the core switching, transport, and application elements into one common set of network components that manages all functions.

IMS provides a common framework for wireless, wireline, and cable access and for the delivery of VoIP, data, and multimedia traffic. Instead of deploying and managing several different networks, with IMS there is one network managed at a core level, delivering common services to multiple transport mechanisms such as phones, personal computers, video, and television. Not only can you use IMS to deliver separate applications to multiple devices, but you can also combine those services as bundled offerings. Far more efficient than running four or five disparate networks, the IMS approach reduces operating costs and enables innovative service creation.

Creative Applications

Because basic services have become commodities, service providers are constantly looking for new ways to differentiate their offerings. That is the inherent beauty of IMS. IMS allows service providers to leverage their investments to increase revenue and deploy innovative new IP voice, data, and multimedia services at the application layer. Types of applications include those that enable network convergence between wireline, wireless, and packet networks, applications that enhance the user experience, and applications for specific markets or specific customers.

With the IMS architecture, service providers can rapidly enhance and deliver new mix-and-match services across one core network for delivery to many transport elements. For example, you might integrate your mobile PBX with your fixed line PBX and add enhanced services to both applications. In another example, you may already provide residential voice service and now want to add video. By adding an IPTV video server, you can now deliver video and voice through the core IMS platform to various devices — mobile phone, television, personal computer, and hard phone.

Taking IMS to a higher level, you can create integrated applications managed by the IMS core. For example, with both an IPTV and a voice server sitting separately in the application layer above the core network, you may want to create a combined service such as one that allows a user to receive caller ID notification on the television screen and use a remote control to answer the call or send it to voice mail.

In a different combination, you might create a new service by adding a presence application into the mix. Based on a user's presence, the application could provide a specific message for a specific caller, block particular callers, or notify callers when a user does not want to be disturbed. In this instance, the IMS core would interact with a voice server, an IPTV server, and a presence server, all residing in the application layer. Because IMS enables such quick creation of enhanced services, combined applications such as these may be available in the not-too-distant future.

IMS also provides greater freedom to operators by enabling them to separate applications from architecture. This means that, unlike traditional networks, you can buy from different vendors to quickly and easily add new services. It becomes much easier to differentiate your company from your competitors even if they are using the same core network or applications, because you can add and customize with no change to the core network.

Paving the Way

Deploying the basic network infrastructure is the first step to migrating to an IMS architecture. Since the first application pays for the core network infrastructure, adding the next application becomes a matter of adding a new server or new software, making the business case for new applications far easier to justify and quicker to deploy.

Say, for example, that you're deploying POTS-style residential voice services. Since it is the first application that you're putting on top of IMS, your business case should include the core network infrastructure. But after you've deployed that first service and you want to add a new application such as IPTV, there is no change to the core network. With the infrastructure in place, you can deploy new services quickly with little or no impact to your other applications, greatly improving your speed to market and lowering your deployment costs.

Phasing in IMS

Since a complete and immediate migration to IMS may not be a viable option for many operators, it makes sense to begin with selected projects and phase in a full IMS implementation over time. Let's look at some different scenarios. Service provider A leaves its existing switch system in place and installs an IMS architecture on top of the switching network. In this scenario, the service provider uses the switch as the access point and uses IMS to provide applications. Service provider B takes the same approach using mobile phones and standard phones. In this instance, the IMS network resides on top of the mobile network, leveraging existing mobile handsets for access. In both examples, instead of waiting until they can implement a full end-to-end IP-enabled access network, operators are immediately gaining some of the advantages of IMS by taking a phased approach while maintaining existing access.

The IMS Opportunity

Still in its youth, IMS is a network architecture that is specifically designed for rapid and inexpensive introduction of new services. Like the Internet, IMS will grow and evolve over time. It provides some services today, and as the technology continues to advance, it will become even better. Many operators will likely deploy the system on a limited basis to start, choosing to migrate a few projects at a time. There is no one right or wrong way to implement IMS. But operators should begin to adopt IMS now rather than risk getting left behind and losing the competitive edge IMS can bring.

Because IMS allows service providers to quickly create, deploy and replace applications, it is the ideal architecture to rapidly create interesting new services and bundle multiple services into custom packages. With rising competition from wireless and wireline telcos, cable companies and non-traditional competitors such as Google and Yahoo!, leveraging the advantages of IMS—speed to market, low impact, reduced operational costs and operational efficiencies—can make all the difference to your bottom line.

Scott Hoffpauir is founder and CTO at Broadsoft. (news - alert) For more information, please visit the company online at http://www.broadsoft.com.

The Dark Side of IMS

by Dan Dearing

Pre-IMS, service providers had to build a separate network for each service. With IMS, service providers are now able to pull together for the first time an architecture that enables them to use a single IP network to support multiple services. In doing so, they use the access networks of network operators to reach their subscribers. For example, a Verizon subscriber can subscribe to Verizon FIOS but use the Vonage voice service.

Recently, however, a strange twist has emerged on a story that until now has been almost entirely positive. According to some conspiracy theorists, there's a dark side to IMS that isn't being talked about. As part of this theory, IMS isn't only about converging voice and IP onto one network; it's also about industry politics and market power. With the advent of converged IP networks, network operators have lost some control; they have had to open up their networks for the first time to other service providers who now have access to their subscribers. But network operators can also harness the power of IMS to gain power and control from a business standpoint by using IMS to deliver services. The theory posits that IMS is really about traditional carriers wanting to control access to users and thus control the services they can buy. Carriers will create "walled gardens" or "islands of IMS" that keep service providers from accessing their subscribers and keep subscribers from accessing the best, most cost-effective services.

> The IMS architecture has a lot of great things working in its favor; including the fact that it reduces time to market for new and differentiating IP-based services, making it an attractive technology for service providers. Indeed, many providers today have already begun to transform their networks with IMS, recognizing its potential as a flexible way to enhance their existing voice service offerings while also positioning them for future multimedia services. IMS is also hailed as the technology that will enable convergence of all types of communications and ultimately lead to the communications Holy Grail: One number for all services.

The Comfort of the Island Environment

Who is right? Will IMS turn out to be an unalloyed benefit for service providers or will network operators use IMS against them? Equally to the point, why has this conspiracy theory suddenly emerged? Until recently, service provider architects paid little attention to how IMS networks exchanged both session signaling and media with other networks. In effect, IMS networks were being architected as isolated islands with limited interconnections

to other service providers. Some believe that this strategy enables service providers to retain control of their service turf and revenue-generating subscribers by keeping third-party providers out. But now, IMS islands are being interconnected to enable user mobility and roaming, and suddenly the competitive environment has changed. Service providers may fear giving up control of their service turf, but they fear being left in the dust by more agile competitors that provide a seamless roaming environment and greater flexibility for subscribers. The fear is well founded; mobility is a key part of the overall value proposition for many of the multimedia services which today's users want.

IMS islands are being interconnected to enable user mobility and roaming, and suddenly the competitive environment has changed.

Beyond the issue of network interconnects is the question of what type of environment network operators will create with IMS. In the new interconnected environment enabled by IMS, all service and device issues depend on user preference. A subscriber can have any type of device and might use any type of application — multimedia, VoIP, IPTV, and more. The operator cannot control which services the user accesses; the provider might even be a competing third party. However, people tend to gravitate to an environment they are comfortable with, and for operators, that environment is the familiar telephony network — an island that requires physical regulators at their interconnect points with other islands.

Conspiracy theorists fear that network operators will cling to their island environments, using IMS to create walled gardens rather than open up trading routes with other islands. The question is then posed, will a "walled garden" approach really be beneficial for operators?

Why Islands Won't Work

The need for mobility will ultimately make it untenable for operators to maintain IMS islands. Mobile operators were the first to realize the importance of connectivity, which is why IMS has its roots in the mobile world. Now, IMS has become important to service providers and network operators because they can also use it to move forward with important revenue-generating services such as VoIP and the triple play of voice, data, and video. Network operators need to provide the type of flexible and robust services that will attract and retain customers which requires connectivity to other networks. Only by interconnecting islands of IMS can operators give their users access to the services they demand. Operators want the security of knowing they have control over the endpoints and they want to know where the traffic comes from, what type it is, and they want to make sure they can control and manage their network.

What network operators lack from a technology point of view are the tools, diagnostics, and visibility needed to track all types of real-time services — things that are typical in the telephone network but not in the IP network. With the right technology, network operators can retain overall control of their networks AND gain the benefits of connectivity.

Session Management Enables Intelligent Interconnects

Viable interconnections and interconnect solutions are critical for next-generation networks employing IMS. The foundation for IMS interconnectivity is the

session border controller (SBC) at the network edge, interoperating in conjunction with a session manager that enables network operators to oversee in a very dynamic way what it happening on the interconnections and apply the business or traffic policies that control them. SBCs act as interconnect points, enabling operators to know who is entering and leaving their network, who is allowed onto the network, and who is allowed to use each service. But SBCs do not operate at the session layer and thus do not provide the type of connectivity required to deal with IMS. This requires a session manager that enables network operators to ask and answer such questions as "Who is doing what on my network? Is the network alert to possible intrusions? How well is my network performing? Is it delivering quality service? Is it profitable?"

The convergence of services enabled by IMS also makes the network edge much more complex, bringing up issues of how to clearly demark end-to-end service delivery and management. Operators must agree with other operators and service providers what services will be carried across interconnects, as well as on the location and functionality of points of interconnect and handover. Other issues include Internet security threats, interoperability, and support for national variants of services and for legacy services. After taking all of these points into consideration, network operators still have to identify the capabilities and limitations of their CPE. An intelligent SBC can deal with these issues, while a session manager can further simplify the network edge by supporting policies that capture revisions of traditional regulatory and commercial rules, agreement on services to be carried across the interconnect, and agreement on the location and functionality of points of interconnect and handover.

Session Management Brings Light to the Dark Side

In a nutshell, session management at the network edge empowers network operators to connect easily, securely, and scalably with carrier and service provider partners as well as enterprise and residential customers. Session management also enables control as operators can manage, monitor, and bill for VoIP, multimedia, and other real-time sessions that flow through their IP networks. Finally, session management solutions allow the operator to scale and adapt in a rapidly changing market by enabling new business models and new service differentiation.

Session management can bring light to the dark side of IMS, providing network operators with the comfort level they need to open up their networks.

Session management can bring light to the dark side of IMS, providing network operators with the comfort level they need to open up their networks to the benefits and possibilities of mobility and convergence — and ultimately enabling network neutrality. On a superficial level, living on an IMS island may appear to be comfortable. But mobility is the driving force behind convergence, and network operators that isolate themselves on their own islands, however large, risk losing subscribers who value connectivity and converged services.

Dan Dearing is vice president of marketing at NexTone Communications, Inc. (news - alert) *For more information, please visit the company online at http://www.nextone.com.*

Assuring Intuitive Communications Through IMS

by Martijn Brouns

As telecom increasingly becomes a more open and competitive market, its end users demand (as with any open market) a balance of affordability, predictable pricing, simplicity, quality, freedom of choice, personalization, and expression. The telecoms market, realizing these demands, is quickly adapting to the rest of the economic environment, mirroring the Fast Moving Consumer Goods (FMCG) market, which has evolved from a Service Economy to an Experience Economy. As such, it has moved from differentiation through offering (packaged) products and services to differentiation based on a total user experience, not subject to quick commoditization due to its 'subliminal' nature (e.g., McDonalds, Starbucks, Vodafone Live).

For more than a century the telecoms market has been seen as a utility selling a service. However, with the changing demands of 21st century users, operators are increasingly under pressure from their customers to provide an attractive experience, instead pushing new products to market.

Innovation on Collision Course

While creating and branding an overall experience, the technological innovations are moving on even more rapidly than ever before. The convergence of telecoms and IT has already given birth to myriad new technologies. The so-called 'Third Wave' of technology comprises the advent of always-on packet networks together with multimedia technologies such as camera phones, video players, Java, Multimedia Messaging Services (MMS), Wireless Application Protocol (WAP), and IP Multimedia Subsystem (IMS). Most of these technologies have been brought to market as if they were services and subsequently failed to achieve mainstream consumer adoption. Even though, the technology itself offers a new world of opportunity for consumer communications; it tends to move ahead of user requirements and, at times, imagination.

The trend towards an FMCG market for communications and the speed of new technology development are potentially on collision course, as the telecoms industry continues the strategy of pushing technology to a market that is not ready to receive it. Although now one of the fastest growing service enablers, this has happened with the initial introduction of WAP. However, if packaged correctly, Third Wave technologies can definitely meet the requirements of the aimed User Experience economy. To enable critical mass, communication services need to be accessible and comprehendible. Therefore, mirroring human interaction seems to be a critical success factor.

IMS' Promise to The End User: Mirroring Human Interaction

As human communication consists of only five per cent words, with 35 per cent relating to expression and 60 per cent conveyed by body language, the Third Wave of technology opens

the door to a giant leap in mediating human interaction by means of electronic communication.

The best example in this respect is IMS' ability to integrate presence in any future service, adding non-verbal components to person-to-person communication services. People will also be able to combine multiple senses within one single session, freely and intuitively combining voice, video, pictures, audio and, in the future, who knows… maybe even smell and taste. This will greatly enhance mobile communications, offering greater productivity through more business interaction and enabling more emotive and intuitive personal communications. From an end user point of view, this is the real promise of IMS.

The Challenge Beyond IMS: Making Messaging Intuitive

To have end users adopt IMS enabled services of tomorrow, a true customer centric approach that meets the end user's core interest — communication — is required. This requires a different approach, where end user interaction is directly related to communicating only. The end user should become the starting point for the communications process, while technology is hidden to the background.

To access a communication service, users do not select a technology (SMS, e-mail, etc.) but instead, select a contact from their presence enabled address book. Contact and presence information will help senders to determine what means of communication best fit their needs. Location, availability, and device used by both sender and recipient determine the nature of the communications, including how it is (technically) delivered and presented at each end.

Users are able to receive a single, consistent look and feel across messaging services, whether SMS, MMS, voice mail, video mail, Instant Messaging, e-mail, and messaging based on SIP (Session Initiation Protocol). Furthermore, operators, content providers, and device manufacturers are able to create a common look, feel, branding and — where appropriate — functionality of devices (ranging from PC to mobile device to set-top box). This definitely contributes to the creation of a truly intuitive communications experience.

IMS' Promise to Operators: Assuring Business Control

Operators are facing increasingly severe competition, not only from new market entrants but also from players in other domains. Mobile operators compete with mobile virtual network operators (MVNOs) and wireless local area network (WLAN) providers that offer broadband access through hotspots. Fixed operators are under pressure from Internet service providers (ISPs) and the likes of Skype, who provide free calls based on Voice over Internet Protocol (VoIP), and VNOs that bring down per-minute pricing for voice services. Some fixed operators are losing as much as one per cent market share per month.

Some fixed operators are losing as much as one per cent market share per month.

Migration to an all-IP network, where IMS is an important first step, will help operators to drive down costs and allow them jostle for position in the marketplace along with the other players —

incumbent and new. For example, mobile operators will be able to compete on price with fixed operators and in content provision with many new entrants. By offering converged services they will also be increasingly able to provide a full portfolio of services to engage and retain customers.

The Challenge Beyond IMS: Safeguarding Customer Control

MSN, Yahoo!, and AOL are currently launching branded clients, downloadable for free by any mobile user. As soon as a larger audience will start using these services on a broader scale, mobile operators' messaging revenues will be under further pressure. This is one of the biggest threats for operators, as this might downgrade their business to a mere 'bit-pipe' where other providers actually serve the customers, or enterprises serve their own employees.

However, fighting these global brands and blocking end users' access to their services is not an option as it is not in line with the end user demand for 'freedom of choice' and 'expression.' The operator's best option is to go for an open market model that enables seamless interconnection between the (mobile) operator's domain and other domains (like other mobile operators, MSN, Yahoo! or Google). As an example, introducing instant messaging clients embedded in handsets and making sure that interoperability is provided with MSN, Yahoo!, and AOL will generate more revenue and customer loyalty for the operator. However, ignoring this market trend will result in subscribers downloading third-party clients that bypass their infrastructure. IMS will make it easier for operators to enter partnerships with players in other domains and jointly create new, innovative and compelling end-user services.

In 2005 MSN and Yahoo! already opened up their domains to one another. And in 2006 global operators, joined in the GSMA, have announced to introduce an Instant Messaging (IM) service across their operator domains. As with SMS, the next logical step will most probably be that different IM domains will all open up, creating true freedom for the end user.

IMS: The Holy Grail?

The main benefit of IMS is in the provision of converged person-to-person or group multimedia services on the converged packet domain. Multiple services can be delivered within a single session, for instance, voice can be combined with document sharing and streaming video. IMS also enables multiple simultaneous synchronized sessions, such as instant gaming, push-to-video, or instant messaging (IM). IMS provides more freedom for people to choose what, where, and how to communicate.

IMS is a standardized architecture that enables person-to-person communication services in an all-IP environment with the quality, reach, and chargeability that people are familiar with. It supports many user experience-centric service enhancements such as multiparty and multimedia collaboration for sharing and communicating content between a group of friends or colleagues.

Target Markets & Timing

Fixed operators and ISPs will be the first to implement IMS or pre-standard IMS-like solutions. This group faces the biggest pressure and has fewer means to counter the competition because they traditionally have fewer value-added services on offer and very often no service creation environments at their disposal. IMS will allow them to introduce VoIP, which will support significant cost reduction.

For mobile operators the situation is less immediate, but the opportunities are equally expansive. Mobile operators have a lot of value-added services within

their portfolio and have more sophisticated solutions for controlling user access and to charge for content and services at different levels. Potentially, IMS offers these operators extensive cost reductions and faster time-to-market for new services. However, as long as they cannot replace their current circuit switched voice service by VoIP, the business case is less clear.

Beyond theory...

IMS enables a bridge to be established between Internet-based services (chat, e-mail, IM, multimedia file exchange) and traditional operator services (SMS, MMS, voice). It enables operators to provide an experience above and beyond today's location-to-location communications, whether fixed or mobile. It answers the needs and can exceed the expectations of many in today's FMCG environment. Being aware of what those needs are and how they are changing will enable operators to remain innovative and at the forefront of the market, without overstepping the mark and launching new technologies onto an unwitting audience.

So, instead of continuing to search for the elusive killer applications that IMS could enable, the highest potential for return is based on the evolution of services that already exist in the comfort zone of today's majority of end users: i.e., voice and messaging. Therefore, operators can gain a greater return from enhancements and combinations of applications that users are already familiar with.

Even though IMS offers the right starting points for operators to deal with the inevitable consequences of convergence, creating the required return on investments remains a major challenge. Especially since, all users today, have not yet adopted IMS-based technology. Operators should therefore have a strategy in place to migrate their customer base towards IMS technology.

Service would do well to consider a vision based on the following steps:

- Implement an IMS framework next to the existing service portfolio, still (largely) based on circuit switched technology.
- Enable seamless inter-working between old (circuit switched) and new (IP-based) worlds, as this is a pre-requisite for end users to adopt any new technology.
- Assure that IMS subscribers will start contribute to cost savings for the start by routing their traffic most efficiently through the network (i.e., avoiding expensive SS7 technology whenever possible).
- Start migrating customer base towards IMS enabled services by introducing new services (such as Push-to-Talk over Cellular, Instant Messaging, and video sharing) and traditional services (voice and messaging) based on IMS/SIP with a unified and branded user experience.

Save yet more OPEX costs by downgrading circuit switched technology as soon as SS7-based traffic decreases.

IMS is definitely the future for telecoms providers, enabling them to provide enhanced experience and offerings for users to compete in a changing and challenging marketplace. A successful deployment however depends on the right migration strategy and the architectural choices that enable this strategy.

Martijn Brouns is product marketing manager — Intuitive Messaging — at LogicaCMG. (news - alert) For more information, please visit the company online at http://www.logicacmg.com.

Rapid Application Development with DIAMETER in IMS

by Arun Handa

Evolving from the RADIUS protocol, DIAMETER provides an extensible framework not just at the message and command-level, but also at the application-level that extends its utility from Mobile-IP, EAP, and NAS applications to the 3GPP framework. In this article, we examine the driving factors behind a need for rapid application development for DIAMETER applications that deliver these important functions. To put things in perspective, we need to understand the role of these applications and where IMS is headed.

The conversation about IMS is agog with buzz, with debating camps of supporters and disbelievers. With the return of industry momentum after the telecom downturn and excitement generated from new multimedia and Internet technologies, several top-tier operators are planning rollouts within the next 12–18 months.

However, the sluggish pace of 3G deployments coupled with overcapacity and underutilization in existing network infrastructure has created skepticism among the wireless community for further evolution. At the same time disruptive technologies ranging from 802.11x and IP phone service from Skype, Vonage, and cable companies continue to chip away at overall market share.

The IP Multimedia Subsystem (IMS) defines a major milestone in the 3G wireless network evolution, paving the way to an all-IP network. IMS is not just a technology, but also a reference architecture that embodies the best-of-breed infrastructure from the IP world and principles from the traditional telecom domain. The IMS concept leverages heavily on a SIP-based architecture that has been proven in VoIP networks. It also utilizes and extends the Authorization, Authentication, and Accounting (AAA) paradigm deployed in mobile-IP networks, including QoS capabilities, with DIAMETER.

The most significant argument in favor of the converged multimedia services is the harmony through standards. The 3GPP in the wireless domain and TISPAN in the wireline domain have worked diligently towards the standardization of an end-to-end IP network embodied in the IMS reference design. Both groups concur that SIP and the underlying protocols from the IP community are to power IMS services. Furthermore, the 3GPP definition of IMS has also attracted interest from WiMAX and cable broadband equipment providers, promising to play a pivotal role in moving towards even broader convergence while increasing average-revenue-per-user through new multimedia offerings for all network operators. While convergence looks certain in the foreseeable future, the means to that end are still speculative.

IMS Solution Providers and Operators

IMS could very well be the final frontier for the telecom operators battling the freedom and speed of adoption of the Internet. There is urgency to either provide differentiated services or to be relegated to a bit-pipe provider. Telecom operators, are well known for their cautious approach to any new technology rollout. Given the high capital investment and customer expectations of high-quality service, operators generally plan new technology rollouts in four distinct phases:

- Definition — Is it technologically and economically viable (ROI)?
- Decision — Should we allocate resources and what are the risks?
- Deployment — How to plan a full service rollout?
- Commercial Realization — Launch and go to market.

From an operator's view, today IMS is in the Decision phase. Operators are now looking to IMS solution providers to demonstrate the operational viability of IMS that goes beyond the proof-of-concept trials of push-to-talk over cellular and video sharing.

Telecom solution providers, for both infrastructure and services, are anxious for new sources of revenue and are trying to carefully time the market entry of their offerings and to position themselves solidly in this emerging market. The pressure is building up on IMS solution providers to rapidly build applications and services around the following:

- Carrier-grade reliability and security that have not been stringent in IP communications.
- New innovative services that will hopefully prove to be the next killer app.
- Interoperability with an ecosystem of solution providers in both the circuit switched and IP network domain.
- Interworking with and support of legacy services.

Solution providers coming from diverse network backgrounds face a dilemma in providing solutions in the IMS architecture. Can existing infrastructure provide a foundation to accelerate the deployment of new applications or does everything get built ground-up?

IMS was designed with best-practices of telecom networks, which includes both VoIP and Cellular networks. The product elements in the control and media plane, from the contemporary VoIP networks, can be leveraged to a fair extent. However, it must be kept in mind that IMS goes beyond the wireline-VoIP evolution. The innovative fixed mobile convergence (FMC) solutions are trying to provide an interim option.

VoIP evolved slowly. Early offerings were interesting, but quality of service was poor. VoIP ultimately became successful as the result of a combination of innovation and de-facto standards allowing low-cost service approaching the quality of circuit switched networks. The success of VoIP has impacted fixed line access to such an extent that "triple play" multimedia services and now "quad-play" with the addition of the wireless element, seems to be a competing point for wireline operators. After quad-play, only one piece of the puzzle remains — mobility.

To a large extent that is what IMS addresses — a juxtaposition of all these five elements, but achieved through a more harmonized industry standard. More important is the fact that each aspect gets broader treatment — take access for example. It is an access independent network. Like all previous network and service build-outs, it is crucial that offerings adhere to the standards. In the case of IMS,

a divergence from standards exposes vulnerability to the operators in the form of service reliability and possible security breaches.

Rapid Application Development

IMS allows the delivery of a multimedia user-experience, and its architecture can be viewed in four distinct planes. The Control Plane provides the necessary signaling and coordination of events to establish, maintain and teardown multimedia sessions. The Media Plane provides for the processing and trans-coding of audio and video streams. The Service Plane provides the logic to enable multimedia applications. While these three planes have been a part of most communication networks, the new Policy Plane provides the ability to guarantee the required quality of service.

The media plane can be implemented with a rich set of mature products available from the VoIP industry today. This includes media gateways, controllers, and servers. The bigger challenge lies in implementing the remaining planes, although SIP building blocks can be used. Typically there are two approaches – 'IMS-ification' of existing infrastructure or deciding to build from scratch. Either approach calls for a rapid development framework to allow lower development costs, a driver for IMS.

Most top-tier equipment vendors have tried to leverage existing infrastructure in the traditional circuit-switched or VoIP networks by enabling these elements with IMS specific protocols and support. A well-designed HLR (Home Location Register) can be extended to an HSS (Home Subscriber Server) for multimedia profiles and enabled with DIAMETER to exchange this information with other IMS elements. Session Border Control providers are looking to move into evolving into the P-CSCF function. Application Providers in the charging, content, convergence, messaging, and location space, to name a few are looking to enter the IMS ecosystem rapidly as well.

Core network signaling has been transformed from SS7-based protocols to SIP, DIAMETER, MGCP, RTP, and COPS. While SIP drives the control-plane all the way from the user terminal to the IMS core network bringing in rich media services and presence, it is DIAMETER that truly enables some of the critical functions in the IMS core network.

DIAMETER provides the support for the essential functions of Subscription, Charging, and Policy in the network. Subscriber-related data that defines all the service-related parameters resides in the HSS. Access to this data from session controllers and application servers is made possible by the DIAMETER protocol. Mechanisms for both online and offline charging for multimedia services is enabled by the DIAMETER Ro/Rf interfaces. The function of obtaining resource reservation, QoS support at the edge of the network is provided by the Policy in the Gq interface. Evolving from the more ubiquitous RADIUS protocol providing the AAA support, DIAMETER has provided the 3GPP-IMS network with a more versatile and extensible mechanism to support these interfaces.

In summary, with the telecom operators affirming their commitment and urgency to IMS, the telecom solution providers must continue to position themselves with differentiated offerings rapidly. Enabling existing service infrastructure with DIAMETER application support for instance, using a rapid application development paradigm can bring products to market quickly that fit in the IMS architecture and meet the carrier-grade demands of the operators.

Arun Handa is chief technology officer at IntelliNet Technologies, (news - alert) a provider of application development solutions for the converged network.

IMS Versus UMA? Better Think About Both

by Peter Wexler

While the market opportunity and business reasons for FMC are well documented, operators are faced with two seemingly competing architectures to deliver converged services: Unlicensed Mobile Access (UMA) and IP Multimedia Subsystem (IMS). The dilemma is clear — forgo UMA services and risk missing out on a potentially significant market opportunity, or deploy UMA services and risk significant time and network infrastructure investments that may not be IMS-compatible.

Regardless of the approach operators choose, they must clearly understand how the infrastructure solutions they deploy will help them minimize these risks, while aggressively pursuing the market opportunity for FMC services and delivering services without boundaries.

Communications providers recognize the competitive imperative to deliver voice, data and video services over a common IP infrastructure. At the same time, wireless technology (cellular, WiFi, WiMAX) has emerged as the clear access preference for operator services in both consumer and enterprise markets. Fusing fixed and wireless access networks together to ensure seamless service continuity is a key challenge for operators today. This phenomenon is loosely known as fixed-mobile convergence (FMC).

UMA: The First Wave of FMC

In January 2004, a group of GSM operators and vendors joined together to form the UMA Technology group (http://www.umatechnology.org/index). The goal was to provide GSM operators with a non-intrusive way to deliver GSM and GPRS services over alternative wireless access options. This effort resulted in the UMA specification, which was ratified for inclusion in Release 6 of 3GPP as the Generic Access Network (GAN), or TS 43.318. This first-generation FMC solution makes the existing GSM network view the UMA Network as a Base Station Controller (BSC). In doing so, it moves the voice traffic from the IP access network to the mobile operator core network. This solution leverages the operator's existing network architecture to deliver services across fixed and mobile networks.

As an early effort toward convergence, UMA garnered the support of multiple GSM operators. These efforts are beginning to bear fruit, as there are more than two dozen operator trials globally. Handset vendors have also joined in the collaborative effort to bring UMA to market. By the end of 2006, there are forecasted to be several mass-market handsets available from major manufacturers, including Nokia, Motorola, Samsung, and LG. Availability of these handsets significantly increases UMA's chances of gaining customer interest, as the price point of such phones, coupled with a compelling service offering, will make FMC services attractive for the average consumer.

From an operational perspective, UMA offers operators a compelling proposition in two ways:

1. It lowers carrier costs by offloading traffic from cellular radio infrastructure to low-cost IP networks; and
2. It creates more revenue opportunity by allowing mobile operators to increase indoor voice minutes.

In this respect, the technology makes operational sense, but many industry observers are concerned with UMA's long-term viability.

The main concerns with respect to UMA include the fact that the technology was designed primarily for mobile operators, does not deliver any new services [beyond GSM voice, SMS, and basic GPRS data], and is not based on SIP. Each of these issues has legitimate roots and should be explored prior to operator deployment of the technology. As discussed earlier, the UMA standard was founded primarily by GSM operators and vendors to resolve issues related to indoor coverage. Its architecture also caters to mobile operators, as it moves the traffic from the unlicensed wireless network to the cellular core network. In this respect, it is not ideal for a wireline carrier that would like to put the traffic directly on its backbone.

Many industry observers are concerned with UMA's long-term viability.

The second concern is UMA's limited ability to handle services efficiently beyond standard GSM. However, the bulk of today's mobile phone use involves just voice and text messaging. Nonetheless, multimedia services are becoming an increasingly important differentiator among mobile operators and will likely be an important component of a carrier's FMC network. This is a long-term consideration that operators should be aware of as they evaluate technology alternatives.

The third (and certainly the most strategic) challenge with UMA is that it is not based on SIP. This is a particularly relevant point because the IMS architecture leverages SIP as the underlying protocol. Since UMA does not use SIP, many regard it as a short-term solution that will not have lasting value as the carrier network evolves. This uncertainty leads many carriers to believe that they are choosing between UMA's time-to-market advantage versus evolving their network toward the long-term strategic IMS architecture.

IMS: The FMC part

The IMS framework is being developed within the Third Generation Partnership Project (3GPP) and is designed to provide operators with a common service delivery platform across wireless and IP networks. This broad effort unifies network silos and allows carriers to rapidly offer a multitude of new services in a cost-effective manner. The IMS architecture relies on SIP as the underlying protocol used for service delivery. Thus, IMS requires handover solutions that leverage SIP to converge wireline and wireless networks.

Mobility within the IMS framework is currently under development and defined by 3GPP as the Voice Call Continuity (VCC) effort. The current draft specifies an approach that requires the handset to initiate a second call towards the Call Continuity Control Function (CCCF) to trigger call handoff between cellular and IP networks. This is an important first step for SIP-based mobility, but there is clearly quite a bit of work yet to be done, including how to address services beyond voice.

As the market evolves, specifications must address the mobility of services beyond voice, including data and multimedia. Additionally, issues, such as allowing carriers to centrally manage and enforce handover policies and establishing handover triggers based on bearer path parameters such as QoS, should be considered.

Operators worldwide recognize the efficiencies associated with IMS, and major vendors are rapidly winning trials and contracts. In fact, Lucent and Ericsson alone have announced more than 130 product related trials with nearly 35 operators. Many operators will have a FMC component as part of these IMS initiatives. Despite the progress that is being made in the IMS framework and mobility based on SIP, there are issues that must be worked through.

As the market evolves, specifications must address the mobility of services beyond voice, including data and multimedia.

Many industry observers concede that SIP-based mobility solutions within the IMS framework are not yet ready for deployment. The primary reasons are the assertions that mass-market phones are not yet available, early standards proposals do not support services beyond voice, and that IMS networks are a distant reality.

While existing multi-radio smartphones are capable of leveraging SIP for mobility today, these devices are not yet available in a mass market form factor or cost point. This remains one of the critical limitations to SIP-based FMC deployments and a clear advantage for UMA, assuming handsets achieve volume shipments in 2006 as forecasted.

In its current iteration, the proposed 3GPP VCC standard only outlines requirements to support voice. This issue may not be a showstopper for an operator considering initial deployment, but it is problematic as operators become more reliant on revenues from multimedia traffic and as bandwidth requirements increase. When considering an architectural direction, operators should understand how their vendors will evolve to support delivery of multimedia services over various wireless access networks, including the seamless handover of these complex traffic types.

Perhaps the most common argument against SIP-based mobility solutions is that the "holy grail" end-to-end IMS networks will not be built for some time. While this statement is true, it does not preclude operators from deploying IMS-compliant FMC solutions ahead of completing their IMS infrastructure transformation.

Looking Forward

The reality is that FMC services offer operators a tremendous new market opportunity. Regardless of the approach, operators must manage the various risks and advantages associated with each alternative, including time to market, investment protection, and future compatibility. Selecting the right infrastructure will ensure UMA deployments have a clear path to IMS, while an operator deploying SIP/IMS-based FMC services can quickly leverage UMA devices should they be adopted in volume.

Peter Wexler is vice president of engineering at Stoke. (news - alert) *For more information, please visit the company online at http://www.stoke.com.*

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From the Desk of Michael Khalilian

As the telecommunications industry — including wireline, wireless, cellular, cable, ISPs, ASPs — continues converging and leveraging the Internet and broadband technology, elevated consumer expectations of new services and enhanced applications will drive content demand and usage to unparalleled heights.

Service providers and vendors alike are looking to IMS as the next generation solution to break down barriers between wireline and wireless networks. As we know, IMS will allow previously proprietary services and applications, such as instant messaging, video, picture and text transfer, and e-mail, to coexist on one network.

Clearly, we are witnessing an industry in motion.

Simply put, IMS is a technology framework that merges the applications and capabilities of the Internet with both wireless, cellular, and wireline, and promotes fixed/mobile convergence. When realized, IMS will pave the way for true multimedia applications — both voice and video — to be used through multiple forms of access, such as 3G mobile phones, as well as through traditional Internet access methods including corporate LANs and broadband connections.

As we examine IMS and its many benefits over the coming weeks, months, and years, it's very important to note that this new architecture is about much more than just multimedia applications; it is a blueprint for carriers and service providers to architect their networks to deliver these applications, defined in such a way as to make it much easier, simpler, and faster to architect the underlying, interoperable infrastructure that enables service delivery.

The interfaces and protocols required to deliver these IP multimedia applications and services are becoming standardized, making it much easier for providers of these new services to develop and integrate new services that will be delivered over IMS infrastructures.

The expectation of Wall Street is that "Content is King." But, at the end of the day, "Consumers are King," as they are forcing the telecom industry to converge itself faster and more efficiently in order to deliver and provide bundled applications and services with QoS and cost effectiveness in one place — with mobility. These expectations are the main drivers and factors for the IMS framework and architecture.

On behalf of the IMS Forum, we look forward to working with our membership, partners, and other industry leaders in our ongoing quest to educate consumers, the investment community, and the rest of the world, and to validate and expedite deployment of IMS technology.

Michael Khalilian is the president and chairman of the IMS Forum. For more information, please visit http://www.imsforum.org.

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