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editor's note

Growing Pains

by Richard "Zippy" Grigonis

IMS is unusual in that it was designed in a top-down manner — a huge, architectonic, perfectly logical schematic diagram.

Old circuit-switched networks such as the PSTN, evolved in a "bottom-up" manner, built mostly through trial-and-error on existing technology. In the 19th century, for example, the "pair" of wires connecting two telephones was actually just one wire (and that wire was iron or steel instead of copper, as was the custom with the earlier telegraph technology). The oldest telephone circuits could get away with one wire because they were "earth return" circuits, which consisted of a single transmission wire from the phone company to each phone, with a metal rod stuck into the ground each end — the electrical circuit was thus "completed" through the earth between the rods. This saved on wire, and the telegraph industry had used this design for decades. However, recall that telegraphy is really a robust "digital" medium and is more immune to electromagnetic noise than a subtle analog system such as the telephone. If the soil was too dry or too wet the circuit would lose the earthed ground. Moreover, phones could pick up strange noises ("telluric" eddy currents in the ground, movement of the earth's magnetic field by the solar wind, etc.). On July 19, 1881 Alexander Graham Bell received a patent for using a second wire to achieve a stable ground by providing an insulated return path (back to the phone company) for the signal current, an arrangement now called a voice circuit. Over a 20-year period the one-wire "grounded" system was replaced with the noise-eliminating, two-wire "metallic" system.

Just as 19th century technicians attempted to build the fledgling telephone system with the base materials and components of the earlier telegraph system, so too did 20th century experts attempt to build early IP networks as extensions and adaptations to the older telephony network and circuit switching legacy. A special signaling protocol such as BICC (Bearer Independent Call Control) was just a method for transporting SS7 information over a packet switched network. Softswitching and gateway control protocols such as MGCP and Megaco/H.248 also simply "decomposed" a circuit switch into various interacting though independent components.

IMS, however, is based totally on packet-switched IETF standards and Internet-friendly signaling and call control protocols such as SIP (Session Initiation Protocol). Routing, switching, directories and general "intelligence" itself are distributed throughout the network instead of being totally hierarchical and centralized.

Its *a priori* design philosophy and reliance on IETF standards leads us to the irony that IMS is a mature concept with as yet immature or nonexistent applications and components. Since IMS has a theoretically perfect, top-down design, not a whole lot "at the bottom" that's physically real is equally perfect and will work perfectly with it! Real network element stuff needs to be tweaked and tested for interoperability at various "bake-off" interoperability events. Moreover, every vendor tends to sneak in a "special sauce" extension of some sort, so thorough interoperability testing among various vendors' wares has the potential to succumb to combinatorial explosions of test-revise-test cycles — though nothing that serious has happened yet.

Some vendors appear more "prepared" for IMS than others. Sonus Networks (news - alert) (http://www.sonusnet.com) for example, claims that their switching equipment has always worked in accordance with IMS principles, so they'll simply have to "divide the functionality currently supported by one Sonus product into two separate products to better adapt to the IMS architecture", and then merely do some software upgrades. Sonus customers will be able to upgrade to full IMS compliance by updating the software while it's still running, processing data and calls.

Moving to an all-IMS network will doubtless be a more thrilling experience for some vendors and network operators than others. We'll see what happens.

Richard Grigonis is Executive Editor of TMC's IP Communications Group.

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IP MULTIMEDIA SUBSYSTEM

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contents

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DSP Resource Board Vendors Expand Focus

by Rich Tehrani

I would have to say the largest trend I have seen lately is that of development program and ecosystem growth. Ten years ago there were few choices for developers if they wanted to write applications for the communications space. Some board vendors, TSAPI, TAPI and application generators were the basic options. There are now virtually infinite choices for developers. There is Skype, Asterisk and myriad other open source choices. There are development programs from Avaya, Cisco, Nortel, 3COM, Pactolus and many others.

Even service providers like Packet8 and SunRocket seem to be exploring opening up APIs so other developers can gain access to their platform and add value. I imagine Vonage too has this concept in the works.

Then there is AppExchange by SalesForce.com and even the new entrant, Xcerion's XIOS operating system which lives in a web browser and is based on XML. The latter is not a communications play but who knows how it will evolve over time.

Perhaps most important of all the development environments is how the entire suite of Microsoft Development tools (http://www.tmcnet.com/547.1) will be available to help developers come up with new communications applications.

In short there is now so much choice, developers can have their pick of platform and language. I would imagine first-time communications developers are bewildered.

The last few weeks has seen an explosive amount of news in technology and communications and trying to justice to it all in a single written piece is impossible. Still I saw many things this week worth pointing out and providing some analysis on the technologies that will ultimately comprise the world's future IMS network. Instead of focusing on a random sampling I will set my sights more on a single phenomenon in this piece.

While all these options are fantastic for developers and customers, the myriad choices may be putting some pressure on DSP resource board vendors to extend their development communities more quickly than they would like. Note that these board vendors also have HMP-based solutions (using the host processor for media processing instead of the DSPs on the plug-in boards) but for now I will refer to this group as board vendors. These companies consist of Dialogic, Cantata, NMS, Aculab, Pika, AudioCodes and others. It should be noted that AudioCodes, Cantata and NMS have many other products besides boards in their portfolios these days.

But something interesting is happening in the board world. In the last few months there have been rumblings of change/expansion among traditional vendors. For example, Aculab has moved up market by launching a line of communications appliances (http://blog.tmcnet.com/blog/rich-tehrani/ip-communications/applianx.html) which are powered by their DSP-based solutions but are easier to configure and manage. Think of them as black boxes that perform fixed functions well. So for Aculab they have moved up the food chain. For more details check out this detailed interview about the Applianx (news - alert) (http://www.tmcnet.com/548.1) family of products which will include gateways and transcoding solutions.

As for Dialogic, for some time now they've been offering all sorts of things besides boards: turnkey gateways, SS7 servers and gateways, and various other "higher" level products as well. Indeed, from a marketing standpoint, Dialogic has been working hard to make sure they aren't seen only as a "board vendor".

As it happens, I recently attended their Dialogic One (news - alert) (http://www.tmcnet.com/549.1) conference and met with many company partners. These companies are absolutely thrilled with the New Dialogic under the leadership of CEO Nick Jensen.

Nick is focusing on generating the tremendous revenue goals he outlined (http://www.tmcnet.com/550.1) last year in Portugal which amounts to doubling sales in three years. One step towards this goal is adding new distributors and the company has recently added five more (http://www.tmcnet.com/551.1) of these. But this

sort of growth, while good, won't likely be solely responsible for the massive revenue explosion predicted by Nick.

So how will this growth be achieved? It would seem one way is through partners such as LumenVox. I spoke with company CEO Ed Miller and he told me things are doing very well. The company is expanding support for myriad languages and dialects. Thankfully for board vendors, Speech is a resource-intensive application and could be a great way to boost sales. Still it likely isn't going to be all that is needed to generate the massive increases all board vendors desire.

Nick thinks video will provide a growth engine for the future of his company. Now, I have been a skeptic of video in the past. Not that we won't be using video. In fact I have watched videos online since the mid-1990s. The question is just how will anyone besides Google and content providers make any money from it?

After many discussions at the Dialogic One conference it seems the intersection of video and mobility is where the money will be made for developers and manufacturers. Areas to look for are transcoding video from one format to another and streaming of video feeds to mobile devices.

Of course there is mobile videoconferencing and even the potential for digital avatars to be used by companies and individuals.

In addition, Nick believes videos will replace ringtones. So when your kids are calling you could see a video on your phone of your kids telling you they love you. The transcoding opportunity could be a massive one as service providers interconnect their disparate video coding systems to interoperate. Streaming too could be a very lucrative opportunity.

Virtual touring could be an area to watch as well. For example, Plantronics has a new 18 wheeled truck they drive around the country to provide a trade show booth on wheels. When you take the tour of the inside of the trailer you can use one of the company supplied iPods to learn where everything is and what each product does.

If this idea works with an iPod wouldn't it work better if it linked to your cell phone, was video enabled and took advantage of GPS? Imagine virtual tour operators in cities where your cell phone tells you your options and directs you where to go.

You could be presented with the following in Manhattan for example:

- Restaurants
- Museums
- Attractions

You click on Museums and would be directed to the location of choice. Once there you get a tour of the facility with descriptions of the various artwork choices you have made. You can even see what the most popular paintings are as the carrier would have this information in their databases.

Video clips could be available to tell you the significance of a painting. You could see a clip of the city in Holland where Van Gogh grew up. You could even see a live webcam view of the area of the country he was from.

In addition you could click a button to see other expressionist artists. You could even see which ones are in the museum or city at the moment.

Today this scenario is a bit far-fetched but can anyone really think this won't happen? As of now it is anyone's guess who will provide this sort of service but I imagine Google, Yahoo and Microsoft would love to be extracting revenue from such opportunities. It may even be IMS which enables the above scenario to take place. Think about the ads that can be shown in such a scenario. I can definitely see Snickers advertising in the museum, for example. And for wireless carriers, this sort of service makes consumers stay connected all the time — something very good for the bottom line.

So the pace of change in the communications space continues to increase and board vendors are looking beyond their traditional markets to find new areas to fuel their growth. It will be an interesting journey for these vendors as they explore new opportunities in the market. It will also be exciting to see if there are enough customers in the video and appliance space for Dialogic and Aculab to hit their numbers.

One thing is for sure. The communications market continues to evolve at an ever-increasing pace and opportunities are there for the taking. One has to wonder — with all the potential for exciting new communications business models, what will be the killer applications of tomorrow?

Many of the communications killer applications of 2008 will be discussed at the Communications Developer Conference (http://www.commdeveloper.com) taking place May 15-17 in Santa Clara, CA. Expect to see the traditional board vendors such as Aculab (news - alert) , NMS (news - alert) and Audiocodes (news - alert) as well as the ability to network with Cisco, Skype, Avaya, Digium/Asterisk, Nortel, Pactolus, Inter-Tel, Mu Security, Data Connection, VoiceAge and many others.

2007 IMS Leadership Award Winners

We live in an age when awards and honors are no longer rare. Yet, there remain unsung heroes and innovators out there whose efforts deserve some sort of recognition. This is particularly true of those who help bring forth emerging technologies of enormous importance, such as IMS.

To remedy this situation, TMC is pleased to announce the debut of a new award, the IMS Leadership Award, established "to recognize outstanding achievement in the IP Communications community and their superlative products, services and technologies relating to IP Multimedia Subsystem."

The companies and their products or services listed in this issue are recognized by the IMS Leadership Award for being both innovative to an outstanding degree and for being successful from a market perspective. The products or services must have made a major contribution to the success of both the company developing/deploying them and the IMS industry as a whole.

COMPANY	PRODUCT	WEB SITE
Atreus Systems	Atreus IMS Provisioning Solution	www.atreus-systems.com
BroadSoft Inc.	BroadWorks IMS Product Portfolio	www.broadsoft.com
CommuniGate Systems	CommuniGate Pro	www.communigate.com
Comverse	Converged Messaging	www.comverse.com
Convergin, Inc.	Accolade WCS Platform	www.convergin.com
Covergence	Eclipse access-edge Session Border Controller	www.covergence.com
Empirix Inc.	Hammer for IMS	www.empirix.com
Ixia	IxVoice	www.ixiacom.com
Outsmart	Smart Convergence Platform	www.outsmarttelecom.com
Personeta, Inc.	TappS IMS Application Server	www.personeta.com
RadiSys	Convedia CMS-9000 Media Server	www.radisys.com
Reef Point Systems	Universal Convergence Gateway	www.reefpoint.com
Siemens Networks	Siemens Policy Control Server PCS-5000	www.networks.siemens.com
Sipera Systems	Sipera IPCS 520	www.sipera.com
Spirent Communications	Spirent Protocol Tester	www.spirent.com
Sprint Nextel	Sprint Wireless Integration	www.sprint.com
Stratus Technologies	Inter-network Services Signaling Gateway (ISSG)	www.stratustelecom.com
Sylantro Systems	Sylantro Synergy 4.1	www.sylantro.com
Tekelec	T6000 Call Jump	www.tekelec.com
Telcordia	Telcordia® Converged Real-Time Charging	www.telcordia.com
Veraz Networks, Inc.	ControlSwitch User Services Core	www.veraznetworks.com
VoiceObjects, Inc.	VoiceObjects 6	www.voiceobjects.com

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http://www.tmcnet.com/557.1

Engage Communications has chosen GENBAND's G6 Universal Media Gateway and C2 Signaling Controller to provide telephony services in Key West, Florida. Engage provides security/fire alarm systems, video surveillance, access control systems and telephone systems to residential and business customers throughout the Florida Keys. The company chose GENBAND (news - alert) in conjunction with Sylantro Systems to enable VoIP services for a new triple play service offering being rolled out in Key West. Targeted for the residential and hospitality market, the new converged service offering will provide a more cost-effective combination of voice, video, and Internet service.

http://www.genband.com

http://www.tmcnet.com/567.1

Cedar Point Communications (news - alert) announced a new trial of its SAFARI C^3 Multimedia Switching System with Plymouth State University in Plymouth, NH. As part of a comprehensive evaluation of VoIP technologies, Plymouth State will deploy SAFARI C^3 to a pilot group of faculty, administration and students. The University will use the SAFARI C^3's unique architecture to support SIP-based residential devices in dormitories and TDM and VoIP applications for its offices.

http://www.cedarpointcom.com

http://www.tmcnet.com/563.1

Telecom giants IBM (quote - news - alert) and Nortel (quote - news - alert) announced that, together, they've reached a new network convergence landmark. As a consequence of their partnership, customers of both companies now have access to a wide range of devices which can be accessed from any network - be it wireline, wireless or DSL/cable broadband. The agreement also enables the inclusion of Nortel fixed/mobile convergence (FMC) and VoIP applications in IBM's carrier solutions.

http://www.ibm.com
http://www.nortel.com

http://www.tmcnet.com/569.1

CounterPath Solutions (quote - news - alert) announced that its eyeBeam 1.5 softphone is now interoperable with NeuStar's (news - alert)Presence Platform (PSP). That means operators deploying the PSP have the ability to deliver personalized presence-enabled communications - including smart-call routing based on presence information and VoIP-to-video calling - to customers using the eyeBeam 1.5 softphone on their PCs.

http://www.counterpath.com
http://www.neustar.biz

www.tmcnet.com/568.1

According to Siemens Communications' (news - alert)vice president of product planning Luc Roy, the real benefit - and the feature that four out of five enterprises truly covet - is single number and single mailbox functionality, which is a key part of Siemens' newly announced FMC solution. The idea of being able to have but one number on a business card, and having only one voice mailbox to check, offers benefits above and beyond seamless mobility. "While the 'sexiest' part of the solution is the seamless roaming, the most popular feature is the single number/single voicemail capability," expressed Roy. "That's actually the meat behind this solution."

http://www.siemens.com

industry news

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Point your browser to the URL above the story you wish to read.

http://www.tmcnet.com/552.1

VoIP infrastructure solution supplier Sonus Networks (news - alert) has announced that the latest release of its IP Multimedia Subsystem (IMS)-ready solution now includes IMS standards-based support for billing between different service providers' IP voice networks. The latest release includes support for a standards-based feature, as outlined by the 3GPP, that enables operators to track individual calls throughout their own network and when the call is handed off to other network operators. Sonus claims to be one of the first telecommunications vendors supporting this IMS-required billing feature.

http://www.sonusnet.com

http://www.tmcnet.com/565.1

NexTone (news - alert) announced it has been selected by Avaya (quote - news - alert)for Platinum membership in the Avaya DeveloperConnection program. Platinum is the highest level of membership available. The NexTone IntelliConnect System interoperates with Avaya's suite of enterprise Internet telephony products, including Avaya Communication Manager, the Avaya SIP Enablement Server, and Avaya Meeting Exchange, to deliver high-quality, secure, and cost-effective business SIP trunking services that replace costly ISDN trunks.

http://www.nextone.com
http://www.avaya.com

http://www.tmcnet.com/554.1

Polycom (news - alert)announced the availability of its new real-time media conferencing platform, Polycom RMX 2000. The platform is designed to simplify delivery and management multipoint video and unified conferencing, both within enterprises and through service provider IP networks. Polycom based its new platform on AdvancedTCA technology, optimizing the system for use on IP networks. The solution, which is based on open architecture and industry standards (SIP, H.232, IMS, Linux, XML, etc.), was designed from the ground up to be at the core of a unified communications network.

http://www.polycom.com

http://www.tmcnet.com/555.1

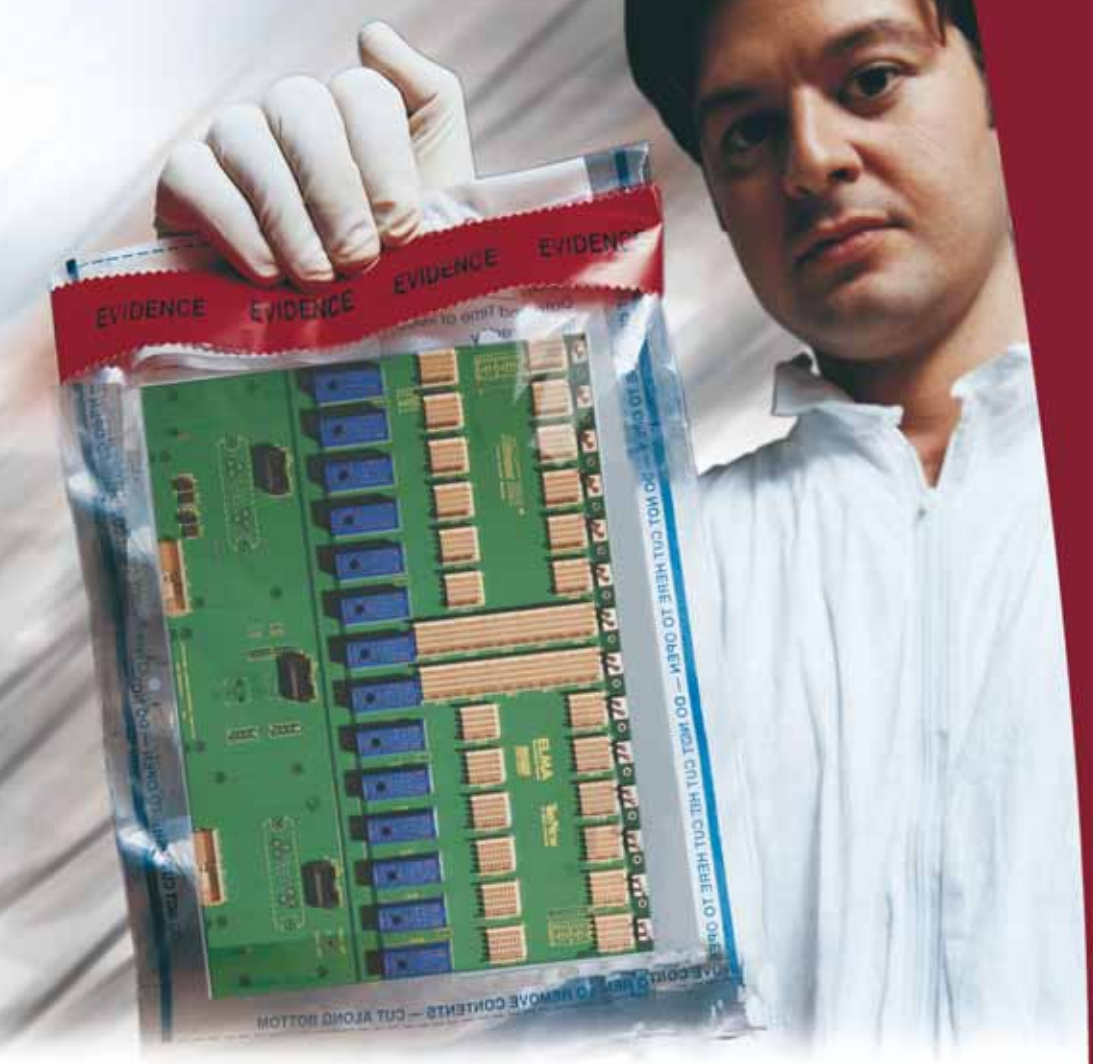
MetaSwitch (news - alert)and Calix (news - alert) announced the successful completion of joint H.248 interoperability testing, providing carriers a compelling combined solution for advanced IP-based services on copper and fiber networks, and a smooth and cost effective migration to converged packet-based access networks based on IP Multimedia Subsystem (IMS) standards. The integrated solution has been welcomed by joint Calix and MetaSwitch customers, such as innovative service providers PCS1 and MNSi.

http://www.metaswitch.com

http://www.tmcnet.com/556.1

MetaSwitch (news - alert)also announced the availability of a new component in its industry-leading UC9000 Unified Communications application suite. The UC9000 Conference Server combines standards-based SIP conferencing control with a reservation-less "meet-me" conference application and an easy-to-use web-based management interface. Capable of supporting conference calls of up to 500 participants, the MetaSwitch UC9000 Conference Server offers the industry's most flexible, real-time conference capabilities for service providers and their enterprise customers. Delivering a full-featured, SIP-based conference solution UC9000 Conference Server enables moderators to easily set up conferences via an intuitive web interface, and control participant interaction and call flow via the phone interface or through the web.

http://www.metaswitch.com



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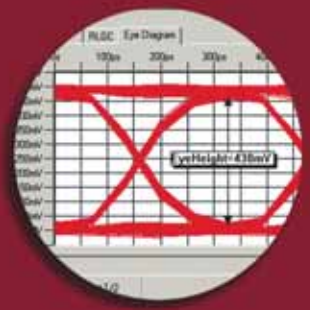

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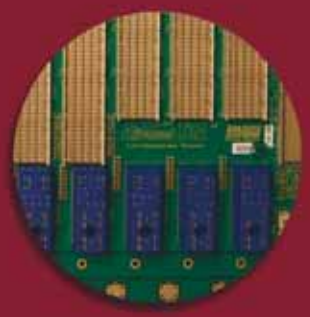

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What Can We All Learn from MVNOs?

by Grant F. Lenahan

MVNOs exemplify a shift that must occur in the communications industry if we are to successfully take advantage of IMS technology, generate services that consumers desire, and turn our huge capital investments into a profitable revenue stream. Unlike traditional operators, MVNOs are, at their core, marketing companies. Unlike traditional network operators, they are service providers — without a network. Their entire focus is on how to identify opportunities, attract customers and deliver services.
That's a perspective that few operators — new or old, fixed or mobile, have.

> What do MVNOs [Mobile Virtual Network Operators] have to do with IMS? A lot, really. IMS, while narrowly a technology architecture, must really be thought of as a *service* architecture — a way to deliver more, richer new services faster. After all, its name *is* "multimedia".

In addition to being focused on customers and services, MVNOs have an economic structure allowing them to operate at smaller scale than traditional network operators. A network operator must, first, blanket an entire country with cellular coverage. In the U.S., for example, this may require 15,000-30,000 cell sites. That takes billions of dollars in capital investment, and places a huge premium on attracting the mass market in order to fill that network and cover its costs. MVNOs, on the other hand, operate without a physical network *per se*. Their marginal costs (per minute, per megabyte) will be higher than those of a network operator, but they have a much lower break-even point, enabling them to concentrate on niche markets more easily.

This brings me to a new way we must view our marketplace and the world. Over the past two decades, almost every industry has made the transition from "mass production" to "mass customization". The mass production model produced huge numbers of products — like model T Fords or basic telephone service — that was acceptable to everyone, but ideal for very few. As the economics of manufacturing changed, most industries have been able to make a larger number of products — each targeted to a niche. Mass-produced commodities can't compete with these specialized offerings.

The most successful MVNOs have shown the mobile industry how to capitalize on niche markets. While the first generation of MVNOs simply offered the same service at a discount, or through a wider distribution channel, the more innovative players and the newer breed have moved our industry into new markets and generated significant value. Virgin Mobile USA used marketing, content, and attractive prepaid plans to grow the teenage and young adult market. Movida opened up the Hispanic market with attractive long distance rates, Spanish language support and content that its target market wanted — but couldn't get on mass-market cellular offerings. Disney Mobile made cellular safe for families and young children, while kajeet is making cellular "tween friendly" with a bevy of innovations — some aimed at the tweens themselves, others at concerned parents.

So what have these MVNOs accomplished? They have grown the market, they have differentiated their products, they have exploited the "long tail" and they have managed to move the field of competition to something more productive (and potentially profitable) than low price. Customers get better services; the MVNO gets better margins. A nifty trick we should all learn from.

So what does this have to do with IMS again?

IMS is a reference architecture intended to add service and control capabilities to IP networks. It enables a wide range of shared service building blocks such as security, authorization, quality of service, personalization, as well as robust VoIP and charging. And yet most IMS deployments today include very few service or pricing innovations — they usher in new technology, but don't directly deliver niche marketed services. So they leave money and margin on the table.

MVNOs — almost none of which employ IMS technology yet — demonstrate a way of doing business that could take the flexible technology of IMS and convert it to innovative services and growing revenues. They do this by concentrating on their target niche and its needs, while leaving network build-out and service platform programming to partners such as Sprint (network) and Telcordia (service platform).

Furthermore, MVNOs are not blinded by the traditions and acronyms of network standards and technology evolution. Rather than wait for IMS, they have embraced existing technologies to implement parental controls, account spending limits, digital allowances, loyalty programs, affinity programs, and personal policy/preferences using highly flexible rating, charging and policy service delivery platforms (SDP) and technologies that exist today. They have recognized that a good business begins with customers, and then works its way through attractive services, and only finishes with the enabling technology.

IMS holds the promise of supporting many more services than are feasible today. Together with broadband IP networks, IMS can usher in a world of true multimedia — video, IPTV, VoIP, various kinds of messaging that are difficult on today's mobile or even plain broadband IP networks. And IMS could be a financial blockbuster if the industry embraces the customer and niche-centric, "services first" approach that the most creative MVNOs are implementing — even today.

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Platform for Consumer and Enterprise Services: IMS and Fixed-Mobile Convergence

by David Hayward

Fixed-mobile convergence (FMC) is heading its way into your everyday life. Today, it's second nature to hop onto a WiFi connection at an airport, hotel, bar or coffee shop to web-browse and VPN back to your office. Market intelligence indicates that by the turn of the decade, it will be just as commonplace to hop from the cellular network to WiFi or WiMAX to get high-bandwidth services with your smart phone or wireless PDA. That is what FMC does.

Because consumers expect "anywhere, anytime" access to information, entertainment media and communications, carriers are being compelled to launch all kinds of non-IMS FMC services long before they have completed their core IMS infrastructures. This will drive carriers to build their core IMS infrastructure faster than ever.

That is what analysts, such as Graham Finnie of Heavy Reading, call the "carrier's dilemma." Carriers must bow to market pressures by deploying new services and FMC even though this adds unwanted complexity (e.g., another "silo" to their "already-siloed" infrastructure). Ideally, they would rather wait until they have a single IMS core in place to make it all more efficient. But IMS is an evolutionary process, and "the business can't wait." (See Figure 1.)

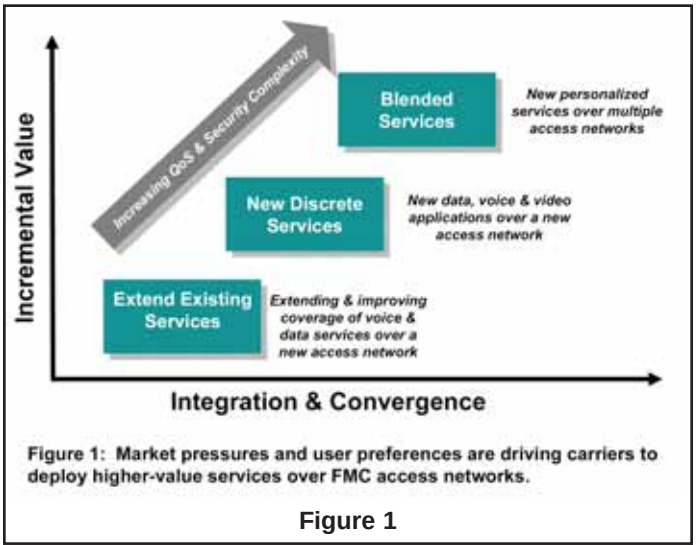

Figure 1: Market pressures and user preferences are driving carriers to deploy higher-value services over FMC access networks.

Figure 1

> Market-watchers always look at the up-and-coming generation of consumers to anticipate trends. In the 1990s, Generation X said, "I want my MTV." It's a new millennium, and Generation Y and Z are saying, "I want my MTV. . . on my smart phone." That is what an IMS core network can do with fixed-mobile convergence (FMC) networks.

Carriers that do not get in the FMC game now are likely to lose. That is what the data from analyst firm iLocus' new report, "The Impact of FMC on World Telecommunications Markets," indicates. According to iLocus, U.S. and U.K mobile operators will lose $3.3 billion and $1.3 billion a year by 2011, respectively, if they don't offer FMC services. In other words, the technology for FMC is here, and if major carriers do not embrace FMC, someone else will do it and will take their customers with them!

Imagine the growth of FMC usage when mature FMC products and technologies are in place. Finally, FMC phones, IMS hand-over solutions and compelling FMC applications are coming out of the woodwork.

The FMC-IMS Connection

According to Stephen Hayes, Chairman, 3GPP Technical Specifications Group, IMS really did not have FMC in mind at the start. It evolved. Indeed, IMS had been evolving to FMC since 2002. Hayes told the audience at last November's IMS Congress in Dallas conference that 3GPP IMS was originally a means for cellular operators to take advantage of higher bandwidth and the growing prevalence of IP and to give operators more control over SIP. (See Figure 2 on opposite page.)

FMC: More than a "Can you hear me now?" Value Proposition

Using dual-mode GSM-WiFi mobile phones, UMA gives the user "a better signal" indoors (i.e., to make up for shoddy cell-tower signals for voice). UMA gets high marks as a reliable mechanism for seamlessly handing off calls between wireless and cellular networks. But VCC carries more weight with analysts as a viable handover technology for IMS. After all, VCC is based on a SIP, the protocol for setting up sessions between the IMS core and user devices.

UMA may be a technology for carriers getting their feet wet in FMC, but if the long-term architectural goal for carriers is

3GPP IMS, then they have to keep their eyes on VCC. And because VCC is based on SIP, analysts favor it to become the mechanism for multimedia (i.e., non-VoIP, SIP-based services) handover between cellular mobile and IP wireless networks.

Consumer Behavior Favors FMC and the Road to IMS

Take it from Time-Warner Cable (TWC), consumers want to "get their MTV" anywhere, anytime. As Mike Roudi, TWC's VP and GM of Wireless Services, explained at last January's FMC & Quadplay Conference in San Francisco, "Mobility will add punch to our existing service offerings, provide an opportunity for sustainable differentiation and offer new revenue for growth."

TWC's consumer research suggests the growing demand for converged services. Here's just a sample of what TWC 2005 consumer poll revealed:

- 85% want mobile access to home email.
- 78% want mobile DVR programming.
- 74% want mobile television.
- 78% want integrated voicemail.
- 74% want to receive mobile calls on the home phone.

TWC is paying attention. In 2005, TWC and Sprint created a joint venture, enabling TWC to jump from triple play (fixed-line voice, TV and Internet access) to quadruple play (triple plus mobile phone service). In 2006, TWC announced a successful demonstration of fully integrated fixed-line, mobile and WiFi broadband technologies via IMS standards to deliver FMC services.

Figure 2: The IMS standard continues to evolve to enrich its set of fixed-mobile convergence access networks.

Figure 2

At the time, Mike LaJoie, Chief Technology Officer at TWC told TMC.net, "Rather than being limited in capabilities due to silos of network architectures, IMS promises a new world of seamless provisioning opportunities for broadband operators. This will include the ability of operators to rapidly and cost-effectively deploy highly personalized entertainment services."

As the cable giant sees it, FMC/IMS will "enhance and extend the in-home experience out-of-home."

Basic Enterprise Convergence Opens the Door to IMS

Creating a mobile culture is critical to corporations' strategies to survive and thrive in the global economy. FMC may be the "IMS Trojan horse" into the enterprise market — another trick in a carrier's bag to enable "the mobile workforce."

Carriers have figured this out, and they are leading enterprises from converged IP applications based on EV-DO up the bandwidth-revenue curve to FMC, blended voice/video/data (IMS) services and, eventually, 4G all-IP networks.

Carriers' enterprise FMC playbooks look something like this:

- Offer IP PBX services: save the enterprise money, customize services.
- Extend PBX services to mobile phones: improve productivity, throw out the sales force's desk phone to save money.
- Deploy FMC on campus: improve in-building coverage.
- Unveil high-value, high-bandwidth IMS services over in-building FMC (WiFi, Picocells) and then introduce wide-area FMC (WiMAX): enriched productivity services, such as video conferencing on smart phones.

As early as 2005, Sprint publicized their IMS intentions in the high tech media. And last year, as they continued to build their IMS infrastructure, they introduced wireless (PBX) integration to hold their enterprise customers' attention. Carriers, like Sprint, know that convergence can bring customers real value by "extending the office" to the mobile world, just as much as cable companies focus on "extending the home" to mobile consumers. With Sprint's publicized $4 billion commitment to WiMAX, one might guess that FMC on grand scale is in their future.

Carriers' IMS Imperatives and "New Last Mile"

IMS will go hand-in-hand with multi-access FMC, as Light Reading's 2006 Study "IMS, What the Carriers Really Think" revealed. According to the survey, the top three factors driving carriers' IMS deployment were as follows:

- The need to quickly launch new services.
- The need to deliver services that combine voice, data and video traffic.
- The need to converge fixed and mobile services.

If carriers intend to fulfill their customer's dreams for rich media services "everywhere," then they will have to deliver IMS services over a number of access networks: pico/femtocells, WiFi, WiMAX, 3G mobile, DSL and cable. To support roaming across this new heterogeneous "last mile," carriers will have to grapple with authentication mechanisms. secured access methods. bandwidth and QoS requirements. security models. and cost and complexity.

That will require new technologies and clever solutions as IMS continues to evolve.

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3GSM IMS Steeplechase

by Ronald Gruia

Despite the fact that some industry pundits noticed that on this year's edition of the 3GSM show there was no dominant single technology theme, there were definitely a few key takeaways that will be helpful to the IMS cause, namely the following:

This year's 3GSM World Congress in Barcelona confirmed once more the emergence of IMS as a key architecture for service providers to evolve their networks. The largest wireless show in the world attracted more than 55,000 visitors, breaking all records and establishing itself as one of the marquee global wireless events.

1. — 3G ramp-up: At 3GSM, operators, network equipment vendors and other participants in the value chain alike pointed out the accelerating mobile data usage as the footprint of 3G and 3G+ (W-CDMA, EV-DO, HSDPA) networks expands worldwide. For wireless operators, the offering of a wide range of multimedia and converged services entails more bandwidth than what 2.5G networks can currently support. Therefore, IMS rollouts will be closely related to the deployment of 3G (W-CDMA on the GSM track or EV-DO on the CDMA track), so a wider penetration of 3G is definitely a positive for IMS.

2. — Deployment news: While observers felt that IMS did not quite make the same splash as in 2006, there were some announcements about operators choosing to embark on the IMS path. One such example is Softbank, which bought Vodafone KK in Japan last year. During the 2006 GSM show, Vodafone (news - alert) had announced the two winners of its company-wide IMS RFP (namely Ericsson and Nokia). Any of the Vodafone companies around the globe opting to deploy IMS will have to hold its own mini RFP and pick between these two vendors. The first one to do so was Vodafone KK (which chose Ericsson), but it was encouraging to see that a year later, now operating under the Softbank banner, the company still chose to continue its IMS build-out and picked Ericsson as the supplier of the infrastructure, system integration and support services. The first IMS services to be introduced were Circle Talk (a push-to-talk application) and HotStatus (a presence and group list management service). Softbank's IMS network went live late last year, and the early indicators are that the number of subscribers is growing. There were other tender announcements for future deployments as well, including Telefónica, (news - alert) which picked Alcatel-Lucent (quote- news - alert) to deliver presence-based IMS convergent multimedia services (including IM, click-to-call, push-to-talk and push-to-view, among others). Alcatel-Lucent will provide its IMS Presence Server, the integration in Telefónica's core network and the maintenance services.

3. — Enterprise IMS: The majority of carriers that have chosen IMS are integrated operators with wireline and wireless networks. Not surprisingly, they typically elected to go along the fixed path to launch their initial IMS applications (such as IP Centrex at TDC in Denmark and residential telephony with Telefónica in Spain). Why the emphasis on wireline services? Because on the fixed side, these operators do not have the same obstacles that they are faced with on the mobile side (namely bandwidth, QoS and handset availability). As far as wireline IMS applications go, the enterprise will play a significant role in the future, with more rollouts of IP Centrex (hosted IP telephony). One noteworthy development at 3GSM was the Ericsson announcement of its Enterprise Mobility Gateway, which will provide mobile voice and data services on both 2G/3G handsets and dual-mode (2G/3G and WiFi-enabled) devices. The SIP-based offering can be implemented as a CPE type deployment (for any PBX system supporting Q.SIG) or alternatively integrated in a hosted IP telephony IMS environment. On another front, the official ratification of the Avaya acquisition of Ubiquity Software (widely expected after the initial announcement in January) came at the end of 3GSM. This transaction also signals that the value proposition of a horizontalized SOA-

enabled architecture and a rapid service creation environment is also getting better traction in the enterprise.

Taking a stroll down the main alley in the massive Fira de Barcelona complex, where the 3GSM show was held during the past couple of years. The rule of thumb is to allow 15 minutes between appointments, as walking from one booth to another (particularly if they are on different halls) can take quite some time. *(Photo by Ronald Gruia.)*

4. — SS7-to-SIGTRAN migration well under way: another indicator that operators are beginning to gradually transition to NGN architectures such as IMS is the migration on the signaling front (from SS7 to SIGTRAN, or SS7 over IP). Tekelec has been one of the vendors at the forefront of that transformation and announced that KPN had also picked its next-gen signaling solution (adding to a flurry of recent similar wins in this area, including T-Mobile Germany and TelstraClear in New Zealand). Unlike network equipment vendors, which position the central office switch as the optimal point from which the network should evolve, Tekelec highlights signaling as the starting point of the evolution of the network, leveraging its expertise in this area. The reality is that most pragmatic carriers will first utilize as much as possible their existing SS7 signaling infrastructure prior to investing in SIP/IMS networks. Under this scenario, the first step is the migration towards SIGTRAN, followed then by the addition of other transitional technologies to help carriers bridge IN and IMS applications and the deployment of core IMS infrastructure elements (such as the CSCF and SIP application servers). Hence, an increase in the uptake of SIGTRAN activity can be yet another positive indicator for IMS.

5. — IMS Clients and Handsets: the majority of wireless operators constantly mention that one big restraint for a higher adoption of IMS is the limited availability of IMS handsets and clients. This was one area in which more developments were expected, but this year's 3GSM show confirmed that there has not been that much progress. Creating an IMS handset takes a lot more than simply putting a SIP stack on that phone. While there were some dual-mode models introduced (supporting SIP or UMA), the market anxiously expects the launching of new models. On the client side, the issue is that organizations such as 3GPP and the OMA have only specified a few IMS client mandatory and optional primitives (ensuring compatibility with applications such as PoC and VoIP-VCC, and enablers such as presence). The OMA has issued some provisions in its specification for PoC (push-to-talk application Version 1.0) and other IMS services, such as presence and group management. Perhaps one of the few success stories in this area has been the Ecrio win at NTT DoCoMo. The Japanese operator picked Ecrio's IMS PoC client for its Push-to-Talk service, and some of these FOMA models were on display at 3GSM. The good news is that Ecrio announced total shipments of 10 million of its clients on 25 different phone models from six different manufacturers. (For more details, please consult NTT DoCoMo's 902i series web page at: http://www.nttdocomo.co.jp/english/product/foma/902i/.) Another encouraging sign from 3GSM was that there were signs that a new Java API (JSR281) is slowly emerging as a possible solution to the client problem. The key concept here is to enable either operators or third-party developers to write Java applets that leverage IMS capabilities. However, much work remains and it is not yet clear whether JSR281 will be answer.

While the IMS acronym might have not been as widely used at this year's 3GSM as it was in 2006, a deeper inspection reveals that in fact there have been many positive indicators suggesting that the adoption of IMS technology is under way. Perhaps the smaller number of press releases containing the IMS buzzword is more of a hint that the technology has already passed through the first peak on its hype cycle and is now undergoing further refinements prior to becoming more widely deployed.

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converged views

Integrating New IMS Business Models to Combine Best of Two Worlds

by Arun Bhikshesvaran

All of these players aim to meet subscriber demands in a new and evolving communication culture, which is driven by many things but the community interaction on the Internet is at the core. Increasingly, users expect the best of both worlds: the proven quality and interoperability of telecom with the quick and innovative development of the Internet. In short, they expect to be able to share everyday life experiences, anywhere, anytime, and on any device.

IP and Horizontal Network Layers are Changing the Game

As operators roll out IP-based services, success is largely dependent on how well the end-user experience fulfills or exceeds subscribers' expectations. Services need to be deployed rapidly. Security, interoperability and ease of use are absolute necessities.

But introducing paid-for and high-quality services and ensuring service interoperability in the network is extremely complicated. For example, IP telephony is largely interoperable when users on different operators connect via a PSTN call. In contrast, when calling between a service such as Skype (news - alert) and cellular push-to-talk services, the call must go through the PSTN.

On the other hand, the situation within enterprises is remarkably different. Due to the controlled nature of the environment and applications and the relative ease with which cabling can be deployed, high speed connections to every used desktop is a reality. This has enabled the development and use of high-bandwidth collaboration and communications services. A notable difference from the network operator environments is the lack of a value chain discussion inside the enterprise due to the dominating role of IT departments who control both access and applications. This level of integration and flexibility has eluded the network operator markets where a vast majority of focus has been on a high quality access network. Some early implementations of applications by the network operators are just emerging.

The stakes for capturing new business revenue from broadband-hungry users is strong. So much so, that it is easy to think of the new telecommunications competitive landscape as a wrestling match with at least four major contenders that are competing for subscriber spending. In one corner: the now-consolidated RBOCs delivering services such as traditional and IP telephony, consumer and business broadband, and IPTV; in another, cable MSOs, providing TV distribution, IP telephony and broadband services. In the opposite corner: mobile network operators providing services including voice, messaging and emerging mobile broadband. Finally, there are the newest entrants and driving force in the space, the Internet/Web 2.0 portal providers and content and media providers.

Network operators can do more than provide access. They can climb the value chain and take a more active role in providing a superior service delivery interface for internal and external applications. Such a service delivery layer can provide, among other benefits, awareness of quality, policy, security and charging requirements. It can manage multiple devices under one user ID and provide a high-trust environment that keeps users' interests like privacy in mind. Achieving this new service delivery model is critical for providing users with more attractive, convenient services that work, and that can advance us from today's silos of networks and services to the digital era of all-media communications with ease of use, convenience, control, efficiency and fun.

While there are doubters, within our industry we remain steadfast in the belief that IMS is a key cornerstone for the service delivery architecture which will combine the best of the telecom and Internet worlds, enabling a new business paradigm for the service delivery model.

Emerging IMS Advantages

For each of the four types of contenders, mega-RBOCs, cable operators, mobile carriers, and Internet/application/media providers, IMS is relevant in different ways. Each player is approaching IMS from a unique position of strength and attempting to maximize that strength to secure a strategic advantage.

Several key themes have emerged.

The all-mobile experience. Operators are looking to combine existing circuit-switched voice and SMS services with mobile multimedia and broadband services, including video telephony and active phone book with contacts, availability/presence, and personal dynamic invitations and interests. By implementing such services on an IMS-based Service Delivery Architecture, future mobile services can be developed as an extension and evolution of these capabilities with relative ease.

The connected home and office. Another IMS motivator is triple-play services based on cost, convenience and ease-of-use for the home or office environment. These services are typically based on VoIP/IP-Centrex, with a seamlessly-integrated mobile device offered either as the primary device for the service, or integrated with the offering as part of a multi-device "extension."

In the home, the phone also functions as a location-free remote for TV and Internet services and may also integrate the home environment and provide functionality across three screens: TV, PC and mobile. In the workplace, IMS and service delivery architectures help provide hosted unified business communications, which help to extend business services and applications available in the office to mobile phones.

A commonly-used term is fixed-mobile convergence, which refers to solutions that allow multi-mode mobile devices to gain network access over multiple types of radio, say HSPA outdoors and WiFi indoors. There is strong competitive and new-entrant focus in this area, but there are also mass-market challenges in regards to device availability, battery life on such devices, business models, total cost of solution, and service differentiation. Other solutions for fixed-mobile convergence and mass-market service in the short term include services where users can enjoy multiple devices under one subscriber ID or phone number.

Network evolution and modernization. Particularly relevant for RBOCs and mobile operators is the need to transform the Intelligent Network architecture, decommission the PSTN and circuit-switched networks, and transition to communications over IP.

New Business Models for the IMS Ecosystem. Blended multimedia and communications services are starting to happen, and so is the journey to IN and circuit-switched network modernization. Perhaps an even more significant advancement will be when network operators turn their own service and application offerings into one of several service domains that will become available in managed, efficient and controlled ways over their networks. In other words, for network operators and the IT, media and communications industry to drive a win-win service delivery interface and business model that allow for free-flowing collaboration between applications and services innovation, as well as professional and user-friendly service delivery and device management.

This scenario would benefit end users and attract addressable revenues from advertising and transaction into the wrestling ground. Some traction is already being made outside of the U.S., where mobile operators have opened up to Internet brands and integrated the Internet portal with mobile services. As an industry, we can do more to create opportunities for collaboration between network and access service providers and leading application, content and business service domains.

In today's IP, IMS and service delivery world, the dynamics are strong for the four contenders vying for subscriber dollars. If operators and vendors can combine the advantages of the quick-moving application development industry and the standardized telecom industry, a new IMS ecosystem will emerge that will accelerate creation of innovative new, interoperable applications and services, drive user demand, and create revenue opportunities for all types of operators for many years to come.

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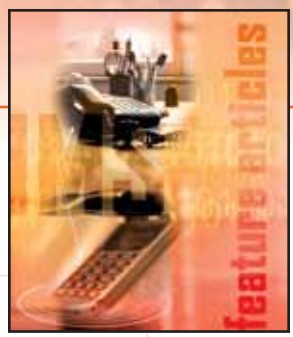

Cut to the Chase: Making Money from IMS

by David McNierney and Gregory Welch

As is often the case with a new technology, a primary focus of IMS implementations is achieving a quick and substantial return on investment. Companies considering IMS are faced with a Catch-22: an ROI is needed to justify the investment, yet it is impossible to determine the ROI without first building the IMS. However, history has proven that ROI is just one of the values to consider in the business model — over the last decade, some of the most revolutionary next-generation services were not the result of exhaustive ROI analyses, but of unbridled innovation. Larry Page and Sergey Brin had no clear idea what the revenue opportunity would be when creating Google in 1996. The same can be said for Skype, YouTube, MySpace and many other highly successful IP-based service providers. But then again, Larry Page and Sergey Brin didn't have the burden that most incumbent service providers have of facing Wall Street each quarter.

Motivating Factors

Business drivers for adopting IMS are generally the same across the industry, as companies tend to have the same goals and motivations. The first step in making money from IMS is to build a business case — for this, a return to the basics is often best. Revisiting marketing's fundamental "Four Ps" — product, price, place and promotion — enables a company to refocus on its essential keys to success: who they are, what they are selling, and who they are selling it to.

Cost savings may be considered a factor in implementing IMS — however, while the cost savings approach may help in securing the initial funding to get the IMS up and running, cost savings alone will not satisfy long-term business goals that must also address service and revenue growth. Service acceleration should factor more heavily into the IMS implementation decision, as the ability to quickly and effectively bring new products online will improve a company's competitiveness over the long run.

A timely release of new technology may provide a company with an incremental lead of a few percent over its competition. However, as the company successfully continues to execute with each new technology, it retains this market lead and incrementally captures more. It is difficult, if not impossible, to capture the entire marketplace in one fell swoop — but with today's "hyper-competitive" communications service environment, successful companies are the ones that stay ahead of the curve.

Companies must also consider the market forces, brought on by the availability of ubiquitous broadband, that are causing price erosion. Service providers are struggling not only to retain existing customers, but also to increase revenues from them. Internet companies such as Vonage, iTunes, Google and MySpace are providing Over The Top (OTT) applications and forcing traditional service providers into the role of the "dumb pipe provider." With IMS, providers can remove commoditization

The IP Multimedia Subsystem is perhaps best described as an enabler — a framework that gives service providers the infrastructure for delivering enhanced communications and lifestyle services. While a portfolio of next-generation services can certainly be provided without the use of IMS, the architecture promises to improve the efficiency of the service implementation lifecycle. Service providers without an IMS are often forced to build a duplicate supporting infrastructure for each new service offering. IMS provides many reusable service enablers that can help reduce the timeframes and lower the costs of service rollouts.

from broadband by allowing innovation to drive cutting-edge premium services that can compete with the OTT providers.

The Killer App

One question that service providers investing in IMS frequently ask is, "What killer applications will provide the revenue stream that would justify the implementation of an IMS?" Not surprisingly, the elusive "Killer App" means different things to different companies. At a recent IMS event, a panel discussing the Killer App issue soon came to the consensus that the Killer App is really the ability to consume any service whenever, wherever and however you want.

In today's environment there may be no single Killer App and service providers should realize that it is a non-starter to wait for one. Many cool new services — such as ring tones — start off as strong differentiators for the service providers that bring them to market first, but often have relatively short shelf lives or are differentiators for only a limited time. As the services and products lifecycles are faster than before, competitors quickly copy whatever some other company invents. Innovative industry leaders must continue to rapidly implement new and better

services in order to enjoy customer loyalty and revenue gains from their innovations.

Innovation: The Killer Approach

IMS promises to facilitate service experimentation and innovation. However, for this to happen, service providers need to stay in tune with what is happening in the broader market, without losing sight of the value of targeting niche demographics with specific combinations of services.

Telecom providers are finding that before they can begin making money from IMS, they need to empower their marketing organizations with an innovative spirit and the freedom to experiment with services to determine what works. By empowering marketing organizations and fostering an entrepreneurial spirit, network operators can discover new and sustainable IMS-based revenue streams.

Revenue Streams

One challenge with IMS today is the lack of evident IMS-enabled revenue streams. Once a company decides to focus on increasing revenue, it needs to be resourceful in determining what revenue streams can be tapped into and what services can be seen as potential revenue opportunities. A recent transformation in the philosophy of determining revenue streams is that the consumer of the service is no longer considered the sole source of revenues — many Internet companies have moved from customer-based revenues to those based on advertising and other third-party sponsorship.

According to Mac Taylor, CEO of research firm The Moriana Group, innovative service bundles will be used to serve new market segments in both a pre-IMS and IMS context. These include fixed-mobile convergence (3G, local, long distance, data); personalized service bundles (multimedia call services, messaging services, data, VPN, content delivery and handset-based applications); context-aware services that shift services to optimal device based on subscribers presence, location, and profile; seamless billing across all network domains (e.g., circuit switched domain, Internet, WLAN); personally selectable and configurable rate plans (individual, family, or group-based); and corporate or departmental level rate plans with controllable acceptable usage policies.

As another example, a telecom company losing customers to a lower-priced provider might want to offer to match the discount provider's price with a lower class of its service but also make its higher-quality service available on a per-call basis. An IMS-based service could make it possible to offer the subscriber control of the level of quality: a basic service may be fine for personal calls, while a higher quality is available for business calls, at an additional cost. It pays for a company to experiment with such innovative service programs. If they prove to be unsuccessful they can simply not be adopted.

Indeed, multiple new services that monetize subscriber control of the network are emerging. One provider is currently offering parents the opportunity to control access to bandwidth in the home, collecting several services into a bundle known as "Parental Allowances." This is a creative way for a network operator to provide parents with control of all aspects of a network session — from blocking adult websites to limiting the total time a child spends on the web.

Another such offering, known as "Bandwidth on Demand," gives the user the option to temporarily increase the bandwidth of the network connection, for example, while playing a media-intensive, high-interaction game. Service providers may charge for each time the bandwidth boost is utilized or just charge a monthly fee for the ability to use the boost feature a certain number of times per month.

Perspective is Key

In the converging worlds of telecom, digital media and technology, Telcos and Cablecos providers face the real possibility of being relegated to simple "bitpipe" utility status, much like the electric company. If viewed in the proper context, IMS can give operators the leverage they need to continue their customer-facing roles as service providers.

IMS should be considered in terms of marketing rather than technology. It delivers the rapid deployment, bundling and control of services that generate revenues from customers, as well as from non-traditional income sources such as third parties and advertising. With initial IMS deployments in place, operators need to shift their focus from cutting costs to developing superior experiences that will surpass the YouTubes, Skypes and iTunes of the multi-service world.

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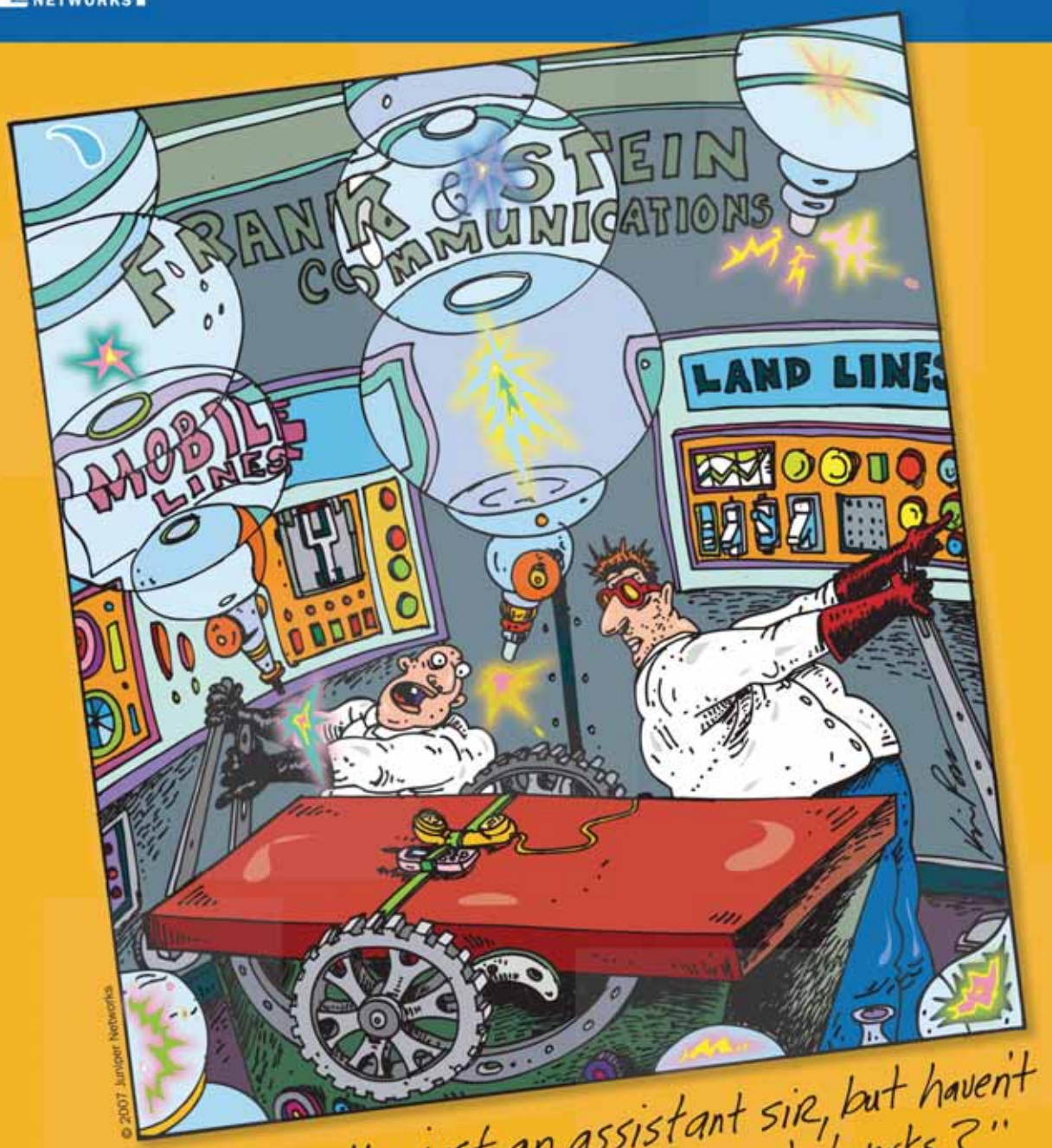

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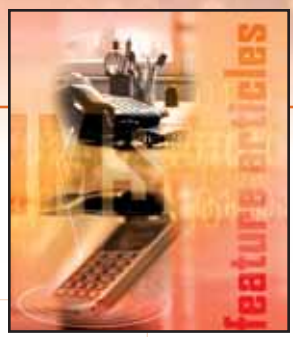


Application Servers and SIP Signaling in IMS Environments

by Frank Salm

Revenue is the key to success of any infrastructure, and applications are the key to revenue. The IP Multimedia Subsystem (IMS) was developed by 3GPP (3rd Generation Partnership Project) to address wireless services, the rich capabilities offered by voice over IP (VoIP) technologies. In order to increase Average Revenue per User (ARPU), IMS allows multiple applications to be delivered to users and also allows the applications to be retained by the users as they roam throughout the world.

At the heart of IMS is Session Initiation Protocol (SIP). SIP is a lightweight protocol, which is transport-independent, and offers a vehicle for rich media interworking between end points. SIP has been used in next generation-networks (NGN) since the late 1990s. In 2000, 3GPP adopted SIP as the protocol standard and as the framework for the IMS control. As part of the IMS model, SIP extensions have been added to accommodate a rich service model that assumes multiple applications interacting with each user session.

There are several major advantages to building a new SIP-based feature or service:

- Simplicity — SIP is based on a straightforward request-response interaction model, making it a simple and comprehensible protocol for developers to implement. The messages are also text-based, which makes them easy to parse, create, read, understand and debug.
- Extensibility — SIP can set up sessions for any media type, such as voice, video and application sharing.
- Flexibility — SIP allows developers to interact with individual protocol messages without breaking interaction boundaries. This allows developers to concentrate on creative application development within the context of IP communications.
- Familiarity — SIP borrows heavily from HTTP and other Internet standards from the IETF, which allows SIP applications to be developed using web-like technologies. SIP development looks and feels a lot like Web development.

Applications in IMS Environments

The IMS architecture introduces several new capabilities to allow for advanced applications. The IMS model specifically was designed to address multiple applications assigned to users and unique invocations for registration, origination and termination events.

In the IMS network, the Home Subscriber Server (HSS) stores each user's registration profile and application filters, such as the following:

- Registration — As endpoint devices register, third party registration filters indicate which applications deployed in the IMS network should be informed of originations. The operational systems populate the HSS filters and the Service Call Signaling Control Function (S-CSCF) uses the data to inform appropriate applications of the condition.
- Origination — As devices within the IMS network originate sessions, the Serving CSCF uses the filter information to determine where to route the originating SIP sessions and in what order. In the case of the girlfriend with the prepaid application (see next page), the origination session routes to the Prepaid application server first, and then to the Synergy application server.
- Termination — Sessions destined for a user's device or application is signaled separately with their own set of filters. Again, multiple applications can receive control of the terminating SIP sessions.

Consider an example of two users: a boyfriend who is not able to dial long distance; and his girlfriend who has Find-me, Follow-me and a prepaid service. (See Figure 1.)

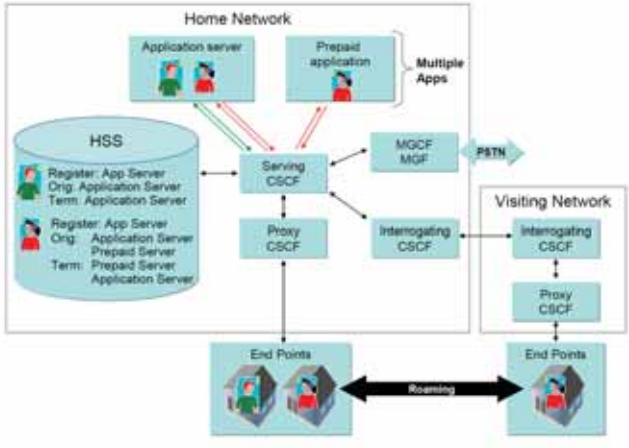


Figure 1. An example of two users in an IMS network: a boyfriend unable to dial long distance; and his girlfriend who has Find-me, Follow-me and a prepaid service.

From a signaling perspective, call setup in IMS environments involves many SIP sessions. The simple call from the boyfriend to his girlfriend involves the following SIP signaling call flows:

- Boyfriend's CPE — Proxy CSCF.
- Proxy CSCF — Serving CSCF.
- Serving CSCF — Application Server, based on boyfriend's originating filter criteria. The Application feature server applies the originating logic for the boyfriend. Based on the example scenario, the logic consists of dialing policies to ensure that the boyfriend does not make a call outside of the local calling area.
- Application Feature Server — Serving CSCF. This is the response to the boyfriend's origination processing.
- Serving CSCF — Prepaid application server, based on girlfriend's terminating filter criteria. The prepaid application server applies the appropriate logic and allows the call to continue.
- Prepaid application — Serving CSCF.
- Serving CSCF — Application Feature Server, based on the girlfriend's terminating filter criteria. The Application Feature Server applies the terminating logic for the girlfriend. This includes playing a Color Ringback tone to the boyfriend and then applying the Find-me, Follow-me applications.
- Application Feature Server — Serving CSCF. This is the response to the girlfriend's termination processing.
- Serving CSCF — Proxy CSCF of girlfriend's phone.
- Proxy CSCF — girlfriend's phone.

The flexibility of the IMS model is that each independent session at the application level is managed separately. The prepaid application can terminate the call to the girlfriend at any point when funds are depleted, drop the call in the direction of the caller, and connect the girlfriend to a media server so she can hear about payment arrangements. The Application Feature Server can pull back the call to the girlfriend's phone and reroute it anywhere depending on the settings of Find-me, Follow-me feature.

Adding new applications, such as an external third party control SIP application server, is easily implemented by updating the filter criteria.

Roaming in IMS Environments

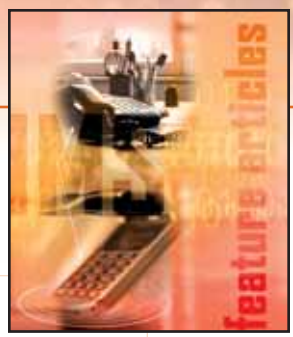
Today's wireless networks offer limited services when a mobile phone user roams into a visiting network. This limited functionality also means that the user receives inconsistent service while roaming and the service provider loses control of the call. IMS architects have solved this issue by leveraging SIP signaling.

Referring again to the residential application example above, if the girlfriend is roaming in another network and uses her phone to place a call, the IMS network uses the I-CSCF in the visiting network to communicate to her Home network. In the Home network, the services operate identically as if they were originating from the girlfriend's phone directly. This means that the originating and prepaid applications can receive control and process the calls, even when the call is placed in a remote network. This provides complete and consistent feature delivery for the girlfriend's phone services and retains application revenue in the home service provider's network.

In Conclusion

Applications continue to drive opportunities within new architectures. IMS has leveraged the SIP signaling to allow delivery of multiple applications to users across any access network. Combine this with the rich media capabilities that SIP introduces, and you've got a foundation established for significant future service provider success.

Frank Salm is Vice President of Marketing for Sylantro Systems. (news - alert) For more information, visit the company online at http://www.sylantro.com.



Today's Alphabet Soup: IMS, BSS and OSS

by Richard "Zippy" Grigonis

Billing/Business Support Systems (BSS) and Operations Support Systems (OSS) are the two areas undergoing the most revamping as IMS slowly reaches fruition. Both BSS and OSS must be separated from their formerly intimate association with services, abstracted out into a lego block-like, modular model that allows such systems to deal with any kind of service concocted by the myriad developers of would-be 'killer apps', not to mention all of those old reliable, existing applications that are already generating revenues but must be ported over into the IMS environment.

Beau Atwater, Executive Director of Portfolio Strategy at Telcordia (news - alert) (http://www.telcordia.com), says, "As service providers pursue consumer-based services such as IPTV or even enterprise-based services, it won't be easy to add services on top of existing networks. Cable or satellite network operators built their networks specifically for one purpose, and that was to deliver specific content over their respective networks. So they were able to build a network specifically to be used for, in cable's case, video transmission, and that's all that they wanted it to do. Today's service providers, however, have multiuse networks. That brings in challenges. The big way to solve such a big challenge is to make sure that the back office systems are in order; if they aren't, the providers will be adding silos of back office systems to support each individual service. That just doesn't scale and eventually the service provider runs out of money or can't compete with cable, or something like that."

"Billing is always critical," says Atwater. "We separate OSS and BSS. Clearly you're seeing the move to allow for customer self-service, 'zero touch' provisioning. A customer can now buy their own set-top box, plug it in, watch it register itself, and then it's up and running. A splash page appears and the customer can enter account information. These processes may or may not move through CRM [Customer Relationship Management] systems. Instead, they may go through new systems that are hooked up directly to subscriber management. So you're seeing quite a revolution in the BSS space."

"The OSS space isn't undergoing quite the same kind of revolution," says Atwater, "except that the OSS systems must be extremely good at handling these multiple technologies. In the future, the 'order entry' part will feed directly into the OSS systems. This means that the OSS systems will be burdened with more requirements than they used to have. The OSS systems that can handle that will be the ones that are successful in helping service providers roll out these new services. That's our focus here at Telcordia. We're making sure that the 'order-to-cash' process is as efficient as possible."

Chuck Stormon, Vice President, Strategy at Tekelec (news - alert) (http://www.tekelec.com) says, "Tekelec's position is somewhat predictable, since we're the 'signaling Masters of the Universe,' so to speak. We look at everything from that perspective. We have a bit of a bias since all of the signaling information in the world kind of goes through our equipment anyway; so it appears that we're in a very unusual and favored position to be able to see everything that's going on in the network."

"With our customers, we wondered what would happen if we made use of our favored position to drive billin," says Stormon. "That certainly has implications in the PSTN, but more importantly, as you look toward IMS, the billing part of the architecture is already oriented that way, where signaling information directly drives CDR generation, real-time rating, real-time charging and real-time billing both in pre- and postpaid modes."

"To Tekelec, the signaling core, which is the STP [Signaling Transfer Point] in a traditional network and the CSCF [Call Session Control Function] in an IMS network are really the ideal sources for the XDR [External Data Representation] data to 'feed' billing," says Stormon.

Stormon elaborates: "So Tekelec has built an integrated capability to generate Session Detail

The following companies contributed to this feature:

Oracle
http://www.oracle.com

Sigma Systems
http://www.sigma-systems.com

Telcordia
http://www.telcordia.com

Tekelec
http://www.tekelec.com

Visionael
http://www.visionael.com

Records [SDRs] and Call Detail Records [CDRs] directly on our Eagle STP, and we're in the process of doing the same thing for our TekCore CSCF for IMS. This is a little *avant garde,* since it bypasses much of the traditional BSS infrastructure that's related to actual billing, but we don't look at it as a replacement for a billing system; rather, we look at it as a set of real-time middleware that provides the link between the network elements and the billing system."

Escaping the Silo

Tekelec's Senior Manager, Travis Russell, says, "The theme in IMS is that all of those functions previously 'silo-ed' now become reusable. If you look at that theory and the architecture that goes with it, the way in the traditional network we've implemented the silo-ed functions is by basically having the switches produce the data in the access layer and then we have a fairly complicated data flow that gets all of that data pulled together and put into the billing stream."

"In the IMS architecture, the approach is basically to outsource that from the switches and completely divorce that function from the access layer and put those functions into the control plane," says Russell. "In fact, this idea of having the charging data collection and rating and basically the rules functions that are required to make decisions in the all path for prepaid and realtime transactions. Having all of that happen in the control plane makes a lot of sense."

Getting the Fly out of the IMS Ointment

As network operators and service providers wake up to what's entailed in developing and deploying IMS network elements, in many cases various outside experts must be called in.

Michael Cabot, CEO and President of Visionael (news - alert) (http://www.visionael.com) says, "The OSS/BSS space is an interesting one," says Cabot. "Clearly, a great deal of change is going on out there. Our perspective at the 30,000-foot level is that there's clearly consolidation going on out there. The billing guys are clearly seeing the revenue drop-offs that are starting to appear and affect their business. That's why they're turning to other means of supplementing that at high growth areas. Clearly, the OSS space, particularly in what you'd call 'service fulfillment' is a very high growth area. We and our competitors are all experiencing rapid growth, since the providers that are fighting for their lives right now to introduce new services in a cost effective manner that will supplement the loss of some of their other business. The analogy that I use is this: We're like an 'arms dealer', supplying 'arms' to all of the different factions out there fighting the 'war' between the cable companies and the traditional telcos, as well as the ISPs."

"Other things are happening in this field. I come from the IT world, not traditional telecom, so I see the telecom world in general becoming more IT-like," says Cabot. "Obviously the network technologies are becoming more like IT. The model and the way providers deliver solutions to companies are really changing."

I think most providers are now heading reasonably quickly toward the COTS [Commercial Off-the-Shelf] model," says Cabot, "whereby there's applications out there that can integrate with all the different baskets out there, including BSS, but to do it in a way that's very cost effective and doesn't involve hundreds of people to deploy it, nor huge costs of upgrading when upgrades occur. Visionael is coming into the game in a major way to really enable that, because we believe we're one of the few companies that can do it well."

As Brian Cappellani CTO for Sigma Systems (news - alert) (http://www.sigma-systems.com), says, "Some of the IMS euphoria is wearing off a bit, now that the network operators understand what it means to deploy the IMS architecture. But even with all of the hype around IMS and what it could do, IMS as a specification and concept, still really describes what you're doing on the network. It doesn't really specify how you operationalize these services, or can actually deliver those services end-to-end to your customer, including billing and allowing them to order the services. That's the big gap we've seen in terms of operators looking at implementing IMS. Sure there are lots of standards around describing how devices on the networks might want to talk to each other, but how do you bring these things into your back office? How do you truly take advantage of this idea of rapid service creation, or being able to utilize existing assets and repurpose them to roll out other services — sort of build services upon existing capabilities?"

"Service providers need to look at their OSS layer, make sure that they've got what we call an 'All-Play' service management layer, to make sure that those promises can actually turn into reality," says Cappellani.

"IMS is really no different than other evolving network architectures," says Cappellani. "You devise a way of dealing with things on the network and then you suddenly realize that it has to be plugged into a business and you must actually make these network capabilities available to customers. They have to make the capabilities fit into their overall processes, with integration into their OSS and BSS layers. They have to be able to allow customers to be able to order these services, and manage and control them. So you need to have that layer."

Sigma's Preston Gilmer, Vice President of Product Marketing, says, "Operators now see that IMS is going to change what they do at the network layer, and they realize they should make sure

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that it doesn't force them to make dramatic changes or reinvestment in their BSS or OSS layer. They're also realizing that no one is going to move to IMS tomorrow, and when they do they'll probably not instantly flip every service they have over to IMS. Instead, there will be a more evolutionary than revolutionary path toward IMS. Operators want to make sure that they're protecting their investment as they move to this new technology. And all of these things are what we feel operators need to have — this 'all play' service management layer, to shield some of these upstream systems — whether it be BSS or other OSS layers — and to get them really talking at the service layer. So these things are talking to what we call a service level abstraction. You don't necessarily care how the services are delivered, you want to talk about the services themselves. That's the language you want to use at the BSS level — and at a customer level as well, for example."

It's All About Concept-to-Cash

David Sharpley Vice President, Product Marketing and Alliances of Oracle's Communications Global Business Unit, says, "With IMS you've got a separation of the network, the services and the software to support them," says Sharpley. "Therefore, the intelligence is no longer embedded within the network layer and is now free to move into the IMS layer. That separation, in turn, implies that you've got a greater number of network and service elements within the IMS framework that now need to be managed, populated with subscriber information, and interacting both from a network perspective as well as upstream with any of the many types of billing processes. So we're seeing the large number of network and service applications that are resident within an IMS framework obviously create some complexity for the network operators."

Adds Sharpley: "Also, because IMS is software-based, one of the key aspects of all the different IMS-related applications and services is how to do billing, and the billing control function, given that these apps and services are real-time in nature. We see that as being absolutely critical in terms of dipping into the system and determining whether a charge balance is available, whether a particular customer is creditworthy, and doing that in real time, given the fact that you've got different types of SIP sessions that may also be taking place at the infrastructure layer. For example, when do those sessions get allowed and then terminated?"

"Oracle focuses on a number of different approaches," says Sharpley. "It's all about our ability to enable providers to create new services, to allow for sales campaigns around them, and to fulfill the new services in terms of their instant service activation on the network and any updates of subscriber information. Once the service has been turned on, the real-time nature of collecting data from that and rating and billing it in real-time are also now possible, since Oracle Communications can provide everything from real-time customer insight to billing and revenue management."

Bones of Contention

Clearly, BSS and OSS systems will undergo drastic evolutionary changes over the next few years, as the concepts of billing, operations support and other back-office operations are adapted to function (hopefully) smoothly in the brave new world of IMS. Some approaches will be more successful than others, depending upon the nature of the service(s). We'll keep you abreast as to how the BSS/OSS dust is settling on the telecom landscape. . .

Richard Grigonis is the Executive Editor of TMC's IP Communications Group.

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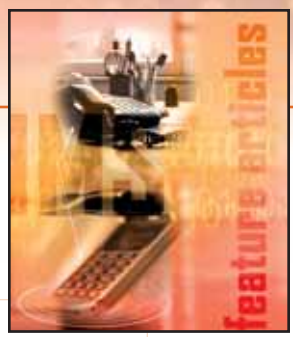

IMS is Ready for Prime-Time — but Only with New OSS Service Management Infrastructures

by Brian Cappellani and Preston Gilmer

IMS (IP Multimedia Subsystem) promises to revolutionize the delivery and management of communications and content services — as well as dramatically enhance the customer experience. IMS makes it convenient and easy for service providers to mix and match services for consumers on-the-fly, regardless of how or where the consumer initiates an order.

Vision vs Reality

IMS specifications lay the groundwork for delivering many different types of application services over a common IP network infrastructure. However, they do not account for OSS service management requirements. IMS relies on data, trigger points and filter criteria that provide the basis for real-time activities. That information is managed in back-end systems that cannot support real-time demands, but have specific responsibilities that should not be interrupted or destabilized.

What's needed is a solution that can orchestrate the provisioning of subscriber and service-related information into the real-time IMS environment without disrupting existing operations or calling for mass integration of back end systems and information models.

While IMS introduces exciting concepts like reusable service components and real-time service integration, it does not provide the tools to create them. IMS does not include specifications for service management or service integration. To realize its promises of faster, cheaper service creation and real time service delivery, IMS should be coupled with a centralized service management framework that can facilitate the integrated subscriber service creation, service componentization, and orchestration on which services — IMS or otherwise — will depend.

As operators begin to work with IMS, they are entering a complex environment with a range of network equipment and service platforms. IMS is supposed to be the glue that elegantly pulls all of these disparate technologies and platforms together. The reality, however, is that IMS is not designed to manage the multi-domain environment inside operator networks and data centers. IMS technology lives in the signaling control layer — not in the management plane — and its specifications do not deal with the operational or service management aspects of the services it is designed to deliver.

To remain competitive, operators need to be able to speed new services to market, while greatly reducing the cost to create and deliver those services.

Something's Missing

IMS plays a critical role in pulling disparate service silos together, but it cannot do so alone. The HSS, for example, needs specific pieces of a customer profile to enable authentication and authorization. A CSCF needs information relating to provisioning and available network resources to perform its set up and delivery functions. Application Servers may need additional subscriber centric information that may not reside in an HSS.

What is needed is an OSS service management infrastructure (based on standards like WebServices, XML and SOA) that pulls together the disparate service elements, but also provides a unified and federated set of user profiles with visibility into the range of services each customer can use, and

service attributes like presence and location. Further, the OSS needs to be capable of orchestrating business and operational processes related to service creation, authentication, entitlements, customer care, service upgrades, billing, and other business and operations functions. Note that these OSS related functional capabilities are not all housed in what the industry calls a "Service Delivery Platform (SDP)" today — an SDP is only part of an IMS architecture, and OSS service management must still be in place to manage SDPs and other application servers.

Many operators have existing legacy systems, but want to evolve to IMS. Rather than following a rip-and-replace strategy with OSS service management, operators should look at OSS solutions that leverage their existing network and newly added SDP/application server infrastructures, while giving them the full capabilities of IMS. This is the most cost-effective and efficient strategy.

Let's All Play

OSS vendors have been using terms like Triple Play, Quad Play, X-Play, Next Play and the like for some time now. But these solutions concepts do not address the full complexity and operational complexity in an IMS-enabled deployment. These solution concepts are missing the essence of what OSS service management is meant to provide: delivering and personalizing any communication/content service, on any consumer device, across any network technology and making these services available at any time, in any location.

"All Play" service management allows for service orchestration whereby reusable product/service assets can be logically assembled to produce bundled and converged service offerings. Rather than coding new delivery logic for every new service, All Play utilizes an open and meta-data driven subscriber information model, coupled with a flexible and configurable service catalog. Pre-configured service components are called or evoked to establish a network connection, enable a SIP-based subscriber device, call on an application, or request information (such as presence or location). By mixing and matching components, new services can be created — including the definition of their associated business and policy rules, service entitlements and visibility into the user's identity — without having to redefine or hard code service logic on a one-off basis, as has been done traditionally.

Consumers are then able to order personalized, bundled services from anywhere — over-the-air, at retail, through the web self-care, by CSR over the phone, and so on — giving them maximum flexibility and convenience.

At Sigma Systems we have been pioneering OSS service management solutions for over a decade and, from the very beginning, adopted a philosophy of managing and understanding all communication services (at their core level) and bundling, packaging and integrating them across any access network technology.

Sigma's All Play service management solutions allow operators to provide their customers with any subscribed, on-demand, event-based or real-time network or application service (e.g. voice, video, data, premium content, entertainment, information, SMS/IMS/unified messaging, push to talk & gaming), on any consumer device (e.g., TV, phone, PC, mobile, PDA), over any access network technology (e.g, HFC, DSL, FTTH, ETTH, WiFi, WiMax, 2-way satellite, 3G/4G wireless).

Having these capabilities managed in an All Play service management system not only helps speed service creation and makes delivery and management more consistent across disparate domains, but it also leverages the full power of IMS and helps to future-proof the operations environment. A technology and domain agnostic All Play service management capability helps maintain flexibility and minimize the impact of potential disruptive technology shifts in the future.

The Bottom Line

With All Play, operators can focus on their customers and on delivering the converged services they want. Services are no longer dependent on the network technology. They become universal assets that can be authorized, provisioned and activated for customers with the agility, flexibility and seamless mobility that operators require — and with the personalization and customization that consumers expect.

Brian Cappellani is the Chief Technology Officer and Preston Gilmer is the Vice President of Product Marketing for Sigma Systems (news - alert) (http://www.sigma-systems.com).

From the Desk of Michael Khalilian

IMS Interoperability, a Priority for 2007

While initially avoiding large-scale interoperability of IMS may seem a good decision for service providers, in the mid and long term, this strategy promises to backfire. The main reason is the loss of a key advantage resulting from having a homogenous interworking architecture among many service providers.

History proves it.

While most of the world standardized on GSM, North America allowed service providers to mix and match various technologies in their cellular networks, which, as we all know, resulted in incompatible networks that didn't allow free roaming. Customers paid more for less service, as roaming was limited to networks using the same standard. Eventually most major service providers in North America moved to GSM, a painful and costly transition. In the end, the consumer paid the bill for a decision to build non-interoperable networks.

Should we repeat the same errors for IMS? Or should we go for large-scale interoperability before major deployments take place?

IMS delivers three key advantages to service providers; to fully realize its potential, all three of the following fundamentals must be in place:

- Increased efficiency in operations resulting in OPEX savings;
- Control of the quality of service (QoS) and quality of experience (QoE) inside the same network and across multiple service providers; and
- Open interfaces for Applications and Services servers delivering critical applications for revenue generation, and competitive parity.

> Interoperability events, such as the IMS Forum's IMS Plugfest™, are a sure sign that the IP Multimedia Subsystem is entering its deployment phase. The so-called 'pre-IMS' implementations were usually based on a single large vendor and its constellation or ecosystem of suppliers and small companies. The interoperability and integration in this case was contained to the ecosystem.

Michael Khalilian is the President and Chairman of the IMS Forum and CTO, Pervasip Corp.

While other non-IMS implementations are possible, *no other technology frameworks can match all three advantages.* For instance, while there are several mechanisms with which to deliver QoS inside a single service provider network, these mechanisms will not work across multiple networks built on different standards and specifications without significant additional operational and technological costs.

Today, we have two major providers for broadband over fixed line, and are entering the broadband-over-wireless phase with the third generation GSM (3G), WiMAX and municipal and enterprise WiFi networks. Consumers and enterprise users have many choices to connect to broadband services, and service providers can no longer afford to keep them inside of a single network.

Again, let's remember what we learned from the cellular industry.

With its Plugfest series, the IMS Forum (http://www.IMSForum.org) is at the forefront of the IMS revolution to ensure that IMS applications and services deployed over wireline, cable and wireless networks can easily follow the subscriber across multiple network boundaries. The Forum successfully completed the first PlugFest in January 2007 at the UNH IMSF InterOperability Lab. This milestone event will be followed by a second *IMS Forum Plugfest, planned for June 4 – 8, 2007* at the same lab. Plugfest II will focus on VoIP services over IMS, covering many aspects of the IP Centrex / IP PBX and fixed-mobile converged calls, allowing customers to roam in and out between mobile and fixed networks.

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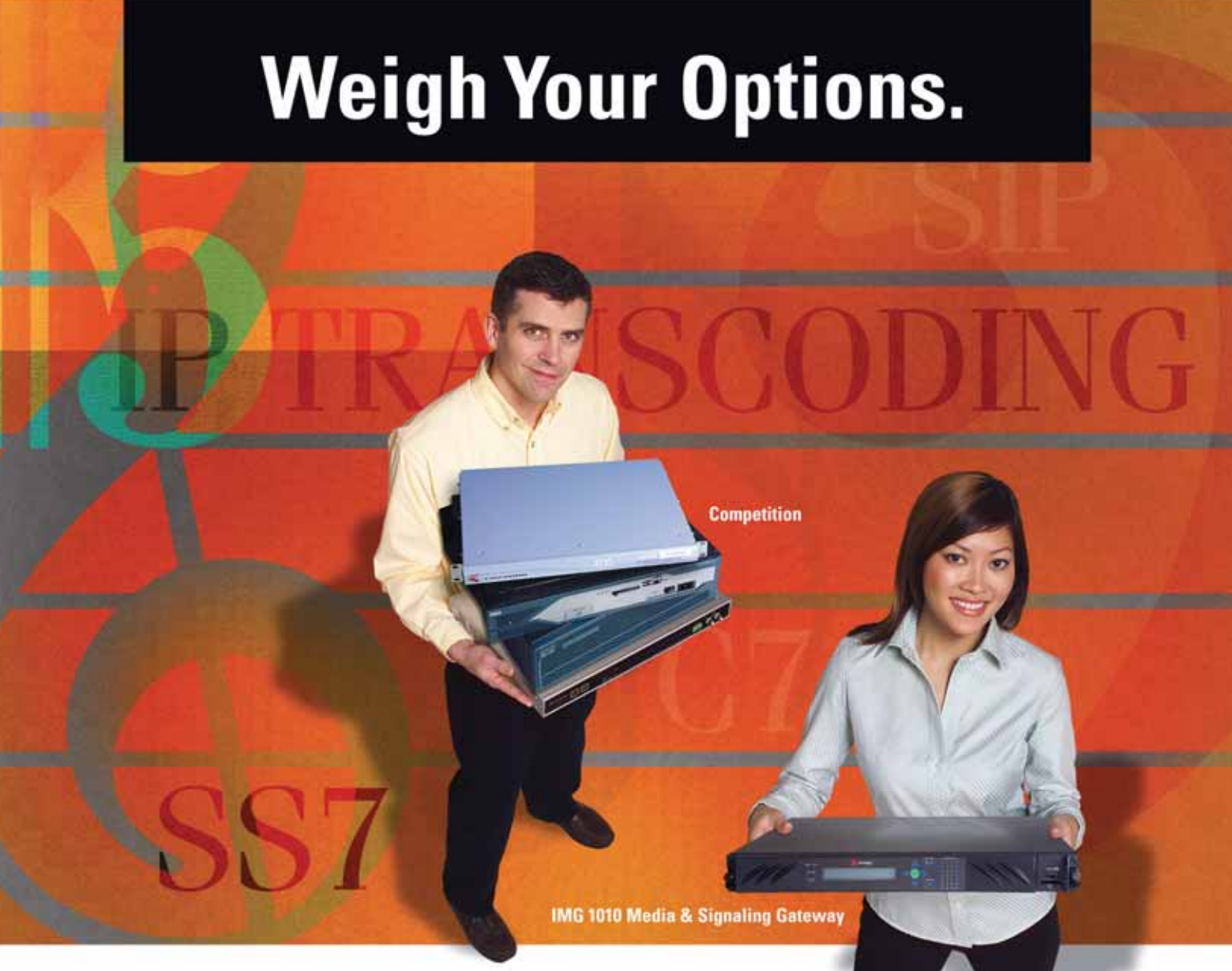
IMS Forum Plugfest II (Packetcable,VoIP, FMC, Security), Interoperability & Certification will be held June 4-7, 2007

The event is open to both IMS Forum member and non-member companies. For membership information, or to participate in IMS Forum working groups, Plugfest and membership info please visit http://www.IMSForum.org, or contact me directly at MKhalilian@IMSForum.org.

Weigh Your Options.



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Weigh the Options	IMG 1010	Competition
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IP-to-IP Transcoding	✓	?
Easy Scalability	✓	?
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