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By Jeff Baumgartner, Editor-In-Chief

IMS geared up for industry-wide Explosion

It's the rare occurrence when vendors and cable operators show excitement about a new technology at the same time.

Typically, the vendors beat the drum first, while operators keep it at arm's length for a while to determine its true potential and work out the kinks, but generally don't reveal too much excitement about something that has yet to be proven or at least made it out of slideware mode.

Such is not the case with the IP Multimedia Subsystem (IMS), a service convergence architecture that is in the process of being embraced by cable operators and other forms of broadband service providers.

"The promise of being able to converge services of high-speed data, voice and video – whether you're fixed or mobile – is what's really exciting and what gives us a big step up," says Mike LaJoie, Time Warner Cable's executive vice president and chief technology officer, in a recent CED-led roundtable with some of the industry's top CTOs (see p. 28).

He adds that Time Warner has IMS up and running in a lab trial, with plans to launch a "very small" market trial sometime this year. "The [IMS] framework, I think, is proven," adds David Fellows, the EVP and CTO of Comcast Corp. "There are pieces within the framework that are deployable and working well. Can you believe everything that's on an IMS vendor's viewgraph? The answer is definitely not. But I think we've all gained enough confidence in it that this is a good road to go [on]."

IMS is becoming "increasingly important as an architecture of the future," adds Jody Bennett, vice president of marketing at GENBAND, which has just released an "IMS-compliant" system that includes gateway and application server elements.

The 411 on IMS

So, what is IMS? For starters, it's a technology that originated in the wireless world and the 3GPP (3rd Generation Partnership Project), established in late 1998.

At its core, IMS is an architecture that aims to deliver a raft of IP-based services across any form of IP access network – on the ground or wireless. That means cable, fiber-to-the-home, WiFi, WiMAX and the various flavors of cellular.

"It breaches legacy barriers, enabling service providers to expand their reach over access networks that are not necessarily owned by them, and open the network for best-of-breed transport, control and application elements," says Yehuda Hershkovits, vice president of systems at AudioCodes.

On the technical end, the IMS architecture is comprised of layers controlling applications, sessions and transport/access.

At the control layer, IMS handles elements such as call control and the "policy" of an IP stream. The application layer, meanwhile, can include the voice service itself, "push-to" applications, messaging and "buddy lists." In that mix, a mobility management application server, meanwhile, can help operators bridge the gap of the fixed and wireless networks.

At the physical layer, IMS is designed to be access-agnostic, meaning it can work across any IP-based network.

IMS also makes "considerable" use of SIP (session initiation protocol), Hershkovits says. So, how does this all translate to the world of cable? Right at the top is its ability to help operators bridge their wireline and forth coming wireless networks and plot plans for a coveted "quadruple play" of video, voice, data and mobile services.

Driving the Urge to Converge

The big driver of IMS is convergence, namely the fusion of voice, video and data services across multiple access networks.

"IP enabling services on all the networks is probably at the core," when it comes to the driving interest behind IMS, notes Alexander Brock, vice president, technology and architecture development for Rogers Communications. "It will allow us to tie together services in a more concrete manner."

"For cable operators, the biggest benefit of IMS is to provide mobility and to interface with wireless networks," says Mike Clement, director of market management for Siemens Communications. "IMS can get cable to the 'quad-play' faster than the telcos can get there," he adds, noting that it will take longer for the telephone companies to roll out video services across the board. "Cable operators are still in a very good position, and ready to evaluate IMS for the quad-play."

"One driver behind this architecture is the ability to do multimedia services – meaning more than just voice – to multiple devices, and to bring in the mobility element," adds David Bukovsky, director of product marketing for Cisco Systems Corp.'s voice systems division.

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This also relates to some of the applications underway within the Sprint joint venture with Comcast Corp., Time Warner Cable, Advance/Newhouse and Cox Communications, including the ability to program a digital video recorder (DVR) remotely via a mobile phone and streaming video to handsets.

It will also apply to the convergence of "buddy lists" and other messaging applications.

"It may show people you want to contact and what devices they have that communicate with you, and show which [devices] they prefer to use to communicate with you," Bukovsky adds.

But, because voice services do not require IMS, voice probably won't be the first, big driver of IMS, he believes. "No one has found the killer app yet," for IMS.

But voice is a key driver of another technology called Unlicensed Mobile Application (UMA), a dual-mode platform (WiFi and cellular, for example) that could hit the market before IMS. Although cable is not incented to incorporate it because they want to offer much more than voice among their suite of mobile services, UMA is gaining interest among some wireless service providers that are trying to increase usage and minutes. UMA is designed only for voice, and it's only capable of running on GSM networks, Bukovsky explains, noting that the cable industry has "no interest" in UMA.

"IMS is firmly on the agenda for cable," as the industry pioneers its way toward the quad-play, Brock explains. "I believe that cable will push the boundaries of IMS. CableLabs has embraced it."

Indeed, CableLabs is reworking the PacketCable 2.0 specification to accommodate SIP and IMS.

"PacketCable is actually being based on IMS. It will provide all of the functionality that IMS does," says Ed Miller, vice president of advanced network systems at CableLabs.

But, even so, there's a bit more to it than that. The spec, he adds, will also address some specific requirements IMS will have to adhere to in order to live on the cable plant. IMS, for example, did not initially provide a lot of mechanisms for landline applications, though it can certainly address those now. Cable also has some specific requirements for the traversing of NAT and firewall devices that had to be incorporated into IMS so that the network can support clients that are not embedded with DOCSIS cable modems.

Additionally, and just as importantly, IMS has provisions for QoS but the cable industry already has an answer for that: PacketCable Multimedia (PCMM).

"The IMS specs included a similar type of [QoS] functions for wireless networks, but it made sense [for the cable industry] to hook into PacketCable Multimedia," Miller explains. "We'll reuse the QoS component of PacketCable Multimedia in PacketCable 2.0."

PCMM's more specific role in this relationship is to provide a policy control infrastructure, explains Susie Kim Riley, the founder and chief technical officer of Camiant Inc., a maker of policy servers and application managers for the PCMM platform.

She notes that PacketCable is taking the SIP signaling component of IMS, including the SIP proxy server and HSS (home subscriber server), which is a database that holds subscriber information. This way, policy can be applied to both wired and wireless services.

But to make IMS hook into the cable environment, another component, dubbed the SIP application manager, is also being defined.

"IMS is generic across wireless and wireline. We're now trying to help cable leverage the IMS technologies. There's some work that has to be done, but now we can leverage IMS into cable with the definition of what these little hooks are," Riley says.

PacketCable will also interoperate with PacketCable 1.5 and allow SIP and NCS (Network-based call signaling)-based MTA clients to coexist and exchange traffic. In that scenario, for example, a SIP videophone and a PacketCable 1.x MTA could converse with each other using only the voice component. That coexistence also carries plenty of operational value, since cable operators have already deployed millions of NCS MTAs, and it would be too expensive to change them out.

CableLabs is not ready to telegraph specific dates for PacketCable 2.0 finalization, but it expects to release specs throughout 2006.

Migration and Integration Issues

Although operators will differ in how, and how quickly they will support IMS, they will likely share this common denominator: it will be a multi-stage, multi-year process.

"IMS is a journey, not a destination. It's much more than a network decision," Brock says. "It will affect engineering, operations, customer care – all of those are going to be affected by IMS."

Plus, the timing on the decision to migrate largely will be dictated by particular revenue-driving services and applications. Because it costs money to migrate, the expected return on that investment will determine how far and how fast operators will push the IMS needle.

"It must generate tangible benefits," Brock says. "The cable industry has already invested heavily in its architecture. We won't throw everything away because of the promise of IMS."

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"IMS is not a 'build it and they will come' situation," agrees Cisco's Bukovsky, noting that operators will tap the architecture when they find applications that work better in an IMS environment.

Although IMS holds many promises, implementing it – even in an evolutionary manner – will come with its own set of challenges, particularly in the area of component integration. While some vendors like to say they can provide the all-in, integrated solution, operators certainly know better.

"There is no single vendor out there that has 'the IMS'," Brock says. "By definition, it's the integration of multiple vendors' components."

That, of course, means there is a significant need for standards and interoperability.

"SIP is still an evolving standard, making interoperability a challenging task," AudioCodes' Hershkovits says. "Access-agnostic is the goal, but not yet the reality. Each access presents a different set of challenges and requirements. As per early VoIP days, standards will eventually reach their equilibrium, although it will take some time."

GENBAND's Bennett says IMS and the equipment that will support it is mature enough that changes can be made in software if any future compliance issues pop up. "What is required from [customers] is that you're committed to that architecture," he adds.

Operators, meanwhile, are a bit more guarded on the standards subject.

"It will be nice to have some standards people actually conformed to," Brock says. "We'd like to see some real interoperability testing versus the promises of interoperability."

But vendors are apparently catching on that IMS is not a one-size-fits-all technology. In fact, Brock says it's "refreshing" to hear vendors say they'd like to serve as the "core" of the IMS network and integrate with third parties.

Regarding migration, multiple components must be introduced to the IMS network, "but it doesn't have to be that painful," Clement says of the integration that lies ahead.

PacketCable 1.x, for instance, has a call management server and a signaling gateway. The media gateway control function in an IMS network is almost identical with how it is used in the cable world.

To support IMS, Clement says, operators can use the existing CMS and gateway controller, but separate out the voice applications and move them – logically or physically – to the IMS application layer.

"It's still a valid PacketCable 1.x architecture. You're not really stranding your investment," Clement says.

Later on, the operator will have to bring in the other IMS core components, including the session control layer, the HSS and CSCF (call session control function). It will also have to interface to the cellular network.

"It's not just plug-and-play," Clement acknowledges. "You'd need a new database (the HSS, in the IMS world) for new subscribers on the network. Currently the databases are in the call management servers."

When Will it be Real?

So, when do operators expect to move to SIP and IMS? The timing will certainly vary by operator.

In the case of Rogers, it hopes to move to a SIP architecture during the next 18 to 24 months.

From an optimistic standpoint, Cisco's Bukovsky sees IMS field trials and deployments happening in the next six to nine months, and outwards to 18 to 24 months.

"The key is to define the end-points," he says. "Just like the handsets are the gating factor for dual-mode (services), the end-points in cable dictate if you can have IMS and broker into these applications."

Clement says he expects to see some trial activity late this year, but no full-fledged service deployments.

"IMS is certainly real. This is a year in which there's a lot of proving out that will take place," he says.

But some are not going to wait for IMS. "Some [operators] are using SIP in conjunction with PCMM today to do pre-IMS-based applications," Camiant's Riley says. "But others are waiting for PacketCable 2.0 and for IMS to be defined. The more astute ones are doing some initial SIP work, and then they'll make sure what they're doing can [be integrated] with IMS and PacketCable 2.0 when they are defined."