

SPOTLIGHT

Testing the IMS Waters

Exclusive industry survey indicates IMS testing is making headway, albeit slowly. by Edwin E. Mier

For 12 days last October, several telecom labs and development centers around the world linked up in what many view as a watershed event for IMS, the IP multimedia subsystem. After months of planning, several dozen participants—carriers, network-infrastructure suppliers, and test-and-measurement vendors—conducted an eclectic assortment of interoperability tests.

But how much was really achieved during the Global MultiService Forum Interoperability 2006 event and what it all means depends very much on who you ask. IMS, considered a “reference architecture” for the next generation of carrier networks, promises to converge voice, data, and video; fixed and mobile; TDM and IP; circuit and packet switching; and pretty much everything else that needs converging.

And with so many dimensions, “testing IMS” has likewise devolved into a piecemeal undertaking. According to Duane Sword, Vice President of Product Management with Empirix, IMS testing today ends up focusing on one of three functional areas:

- Control plane, which entails signaling for call and session control, quality of service (QoS) control, security, peering, and so on across the many supported IMS environments.
- Feature oriented, addressing core IMS features from the unrestricted roaming of subscribers and devices to the optimal routing of each media type.
- Load, or performance, where high volumes of simulated traffic are applied and metrics such as call connect time and voice quality are monitored and assessed.

“We had every Empirix product in use there,” says Sword. Empirix, one of several leading test and measurement vendors to participate, brought to bear its entire

arsenal of products, ranging from FX and NXT call-traffic generators, to the DEX device emulator, which simulates IMS core and non-endpoint behavior, to the XMS monitoring system and the Hammer Call Analyzer for signaling analysis.

Most test-and-measurement vendors agree that the state of IMS testing today is still much more focused on simply getting two systems to converse on a control-plane level than on applying high volumes of multimedia test traffic across a broad, IMS-based network infrastructure.

Sword says that testing different vendors’ IMS-oriented packages today involves less than five percent commonality of test cases. In other words, more than 95 percent of the testing for each particular test-bed interaction is customized. It can take days to set up for a single test between, say, an IMS core controller and an application server, and analyzing the results can take just as long, Sword says.

How far along is IMS? Asked to consider where IMS is expected to be in five years, Sword says “maybe 50 percent” is defined in fairly solid specifications today. That means half of what IMS will be hasn’t been nailed down yet.

Of the portions that are defined, “Maybe 10 percent has been implemented by application and infrastructure vendors in any meaningful, useful way,” he says.

And what percent of that has been shown to be interoperable today? “It’s a pretty small amount,” says Sword.

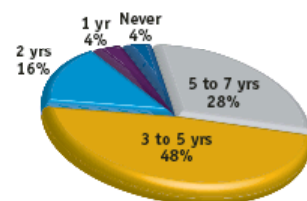
The State of IMS

To better quantify where IMS is at today, MierConsulting, in cooperation with VON Magazine, undertook an e-mail survey in February. The focus was on IMS test and measurement. Nearly 40 surveys were sent out to all the vendors of IMS-oriented test gear known to us, to a representative

sampling of IMS infrastructure equipment suppliers, and even to a smattering of consultants who profess IMS expertise.

By the response deadline, we received two dozen completed surveys, about half of which were from test and measurement vendors. Respondents could ask that they remain anonymous, and a couple did.

Figure 1: When will IMS interoperability at most levels and interfaces be plug and play?



No one is expecting IMS to emerge overnight or even anytime soon. As Figure 1 shows, half of the respondents do not expect general IMS-based interoperability to emerge for three to five years yet. And one-fourth see IMS coming of age even further out—five to seven years. Still, the respondents agree that IMS, or something like it, is sorely needed.

“The IMS architecture is needed from an operator perspective to provide a means to more quickly deliver applications that can generate revenue,” comments Charlie Baker, Senior Product Manager with Brix Networks. “The core elements of IMS are absolutely mandatory for this transition.”

Few of those who responded maintain that the success of IMS is inevitable. Indeed, many express reservations that IMS may be moving too slowly, throttled by carriers whose decades-old networks have a long way to go.

“IMS is not evolving as fast as the tech-

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nologies that underlie it, like WiMAX, 3G, and 4G," says Vijay Kulkarni, President of GL Communications. "IMS needs to stay abreast of technology trends better."

Pierre Lynch, Product Line Manager for Mobile Wireless at Ixia, says, "I think that a full [IMS] architecture deployment will happen in most instances, but the subscribers and applications will be migrated and deployed incrementally."

What will IMS actually bring to the future of networking? We asked respondents to consider a dozen or so of the promised features of IMS, gleaned from various white papers and other promotional pronouncements. We asked which

of these are actually being implemented and to what extent.

Figure 2 shows how respondents view the state of key IMS features, as far as actual implementation to date. We prescribed a 1-to-5 scale, where 5 meant that implementation of the feature was universal. However, most of these key features have not yet reached the point of even "scattered implementation," which was represented by 3 on our scale. Two of the ones least implemented so far—end-to-end QoS and unrestricted roaming—have been held up as the cornerstones of what IMS would deliver.

"Yes, IMS has been around for a long time, with no real implementations until fairly recently," says Paolo Trevisan, a Development Manager with Tektronix. "Reality is showing that IMS is hap-

pening in phases," he adds. "No one will embrace the whole of IMS all at once."

We then asked the IMS community to assess how well these same key features can be tested and measured given the products offered today for IMS test and measurement. The results, shown in Figure 3, paint a fairly rosy picture, concluding that, in most cases, test systems today can adequately exercise, monitor, or simulate these features.

Several vendors cautioned, though, that depending on what is being tested, IMS test gear is still evolving, too, and may still be fairly limited or may entail protracted and customized set up. In only

Figure 2: Key IMS Features – How Widely Implemented?

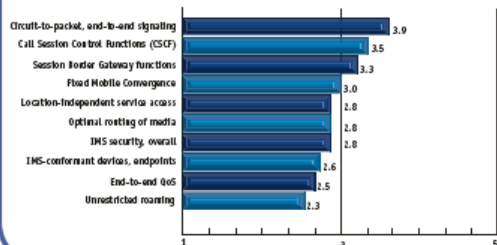
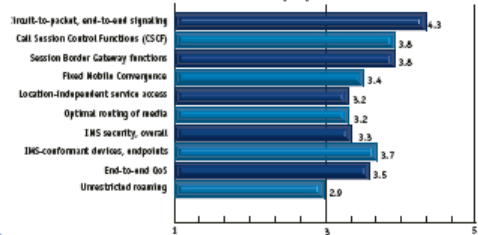
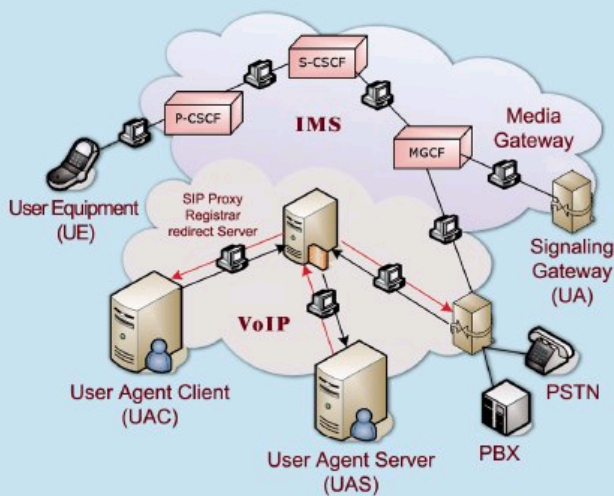


Figure 3: Key IMS Features – How Well Can Current Test Equipment Measure?



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Leading IMS Test, Measurement, and Development Tools

Vendor	Product	IMS focus	IMS control-plane testing	IMS performance testing, monitor	IMS interop/conformance testing	Starting price or price range
Agilent Technologies	NgN Analysis System	Monitors IMS signaling and load to detect and diagnose network and service problems	✓	✓		\$200K+
Azimuth Systems	FMC Performance Suite	Fixed Mobile Convergence test platform stresses wireless (cellular, WiFi) networks, and handsets		✓		\$50K to \$150K
Brix Networks	Brix System	Service assurance monitoring for all IP services		✓		Varies w/network
Empirix	Hammer DEX, FX, NXT, XMS, Call Analyzer	Family of tools includes DEX device emulation, FX and NXT call load, and signaling stress testing	✓	✓	✓	Starts at \$2.5K to \$200K
GL Communications	Message Automation Protocol Simulator (MAPS)	Generates editable signaling for most IMS functions and media traffic; SIP conformance test cases	✓	✓	✓	\$4.3 to \$20K
Ixia	IxVoice	IMS protocol testing; VoIP load testing; test case control and automation	✓	✓	✓	\$17K+
JDSU	DA 3400, DA-3600A, QT-50, QT-600	Real-time signaling decode; interop testing for non-IMS net connections; service-assurance monitoring	✓	✓	✓	\$18K to \$35K
Psytechnics	Unified Comms Experience Mgr	Monitors voice and video experience quality; SLA monitoring		✓		\$125K+
Spirent Communications	Landslide, Protocol Tester, Abacus	Test applications for IMS access (Landslide), IMS core (Protocol Tester), and performance (Abacus)	✓	✓	✓	Varies w/product
Tekelec	Integrated Application Solutions (IAS)	Collects SIP, SS7, and other control-plane protocols; monitors QoS and performance; troubleshooting apps	✓	✓	✓	Varies w/config
Tektronix	K1297/G35 Protocol Tester, Spectra2, TTSuite	IMS functional tests, service monitoring, load tests, diagnostic, and mobile protocol testing	✓	✓	✓	Varies w/product

Source: MierConsulting (www.mierconsulting.com).

Note: The products shown were identified as specifically addressing IMS control-plane, interop, conformance and/or performance testing, monitoring and/or development, in a survey that was sent to all IMS-oriented test and measurement equipment vendors known to us. This may not be an all-inclusive listing, and other viable products may not be included.

For the vendors in the table, here are their full proper company names, HQ locations, and main Web sites: Agilent Technologies, Santa Clara, CA, www.agilent.com; Azimuth Systems, Inc., Acton, MA, www.azimuthsystems.com; Brix Networks, Inc., Chelmsford, MA, www.brixnet.com; Empirix Inc., Bedford, MA, www.empirix.com; GL Communications Inc., Gaithersburg, MD, www.gl.com; Ixia, Calabasas, CA, www.ixiacom.com; JDSU, Milpitas, CA, www.jdsu.com; Psytechnics, Ipswich, UK, www.psytechnics.com; Spirent Communications, West Sussex, UK, www.spirent.com; Tekelec, Morrisville, NC, www.tekelec.com; Tektronix, Beaverton, OR, www.tek.com

a few cases did respondents indicate that the ability to thoroughly test any of these IMS features was available off the shelf.

Andy Huckridge, Director of IMS Solutions with Spirent, points out that there are still competing methods for performing certain of these functions, which frustrates testing different implementations, as well as prospects for interoperability. He cites still-competing approaches for achieving end-to-end QoS and subscriber roaming.

Survey respondents were also invited to briefly describe IMS-oriented test and measurement systems, and the vendors of these systems copiously complied. Figure 4 is a thumbnail comparison of the key IMS-targeted test and measurement systems detailed to us.

Readers should note that in many cases, vendors offer a portfolio of test and monitor systems for the IMS environment depending on what's being as-

sessed. Generally, protocol and signaling analysis are handled by very different packages than those used to generate media streams and traffic load.

In the case of Spirent, the vendor has evolved two discrete systems—one focusing on IMS core components and operations called Protocol Tester, and another, called Landslide, for testing IMS access technologies.

In many ways, today's IMS test and measurement gear reflects the state of IMS itself. It is embryonic and evolving, and every piece is designed to address a different level or aspect of network technology.

Throughout the surveys, though, respondents cautioned that the prospects for IMS, while making headway and showing promise, could yet be sidelined if implementers and vendors diverge and go their own ways.

"IMS risks becoming a collection of concepts, rather than a standardized architec-

ture that can be deployed," says Benjamin Ellis, Vice President of Product Management with Psytechnics. "There is a danger of fragmentation. Focus is required. IMS risks biting off more than it can chew."

Empirix's Sword says that despite the company's significant investment in IMS-oriented testing, it is not beholden to the IMS architecture and concedes any number of different outcomes could still occur.

"If it's not IMS, it will be something that replaces it," Sword says. "But one thing is for sure. It's going to be based on IP transport." **V**

Ed Mier, VON Magazine's test and measurement columnist, runs MierConsulting, which focuses solely on VoIP and network management, monitoring, and measurement. He has designed and installed dozens of local and worldwide networks and been involved in many VoIP roll-outs. He can be reached at: emier@mierconsulting.com.