



White Paper

Top 10 questions to ask IMS vendors *What's important and what to watch out for*

You have decided to investigate IP Multimedia Subsystem (IMS) technology, PacketCable 2.0 and the wireless convergence opportunity. You have a couple of key applications that will differentiate your organization from the competition by creating new and innovative services on the fly. You have decided to either start compiling a lab of equipment to get a feel for it yourself, or you are going to start a small market trial. Does this scenario sound familiar?

If so, now it's time to actually select some solutions and vendors to work with. Where to start? The variety of vendors who claim an IMS product of one kind or another is vast. All of them are pitching to get into your lab, start a trial and issue a press release with your name on it. Since you don't have unlimited time and resources, you'll want to

select the right vendors to work with the first time. But how do you find them?

As Joe McGarvey of Current Analysis so eloquently put it: "The honeymoon is over for telecommunications equipment makers that have yet to reveal details about the various components in their IP Multimedia Subsystem (IMS) product lines and strategies... the media, the analyst community, and, of course, customers, now need specific performance information in order to

better assess the completeness of IMS components and how those components — as well as professional services and application development strategies — stack up against competitive offerings.¹"

If you are looking to make some IMS decisions, this paper is for you. It will help you know exactly what to ask those IMS vendors, and why you should be wary of some of the answers you will get.



¹ Current Analysis Advisory Report: Carrier IP Telephony – U.S./Europe, J. McGarvey, November 22, 2005

Q1: What protocols and industry standards does your solution support?



Watch out for: “lite” — a hallmark of immature solutions.

Network equipment vendors generally use the term “IP Multimedia Subsystem” or IMS to loosely refer to the common services architecture initially defined for GSM/UMTS, which is rapidly gaining acceptance among all types of service providers — cable operators, CDMA wireless providers, Internet service providers and traditional telephony providers.

The IMS promise means more than just converging your existing services on your existing network; it means collaborating between access methods and service providers to an extent never seen before.

You need an IMS solution that can reach across domains, for three big reasons:

- **Quality of user experience** — Your subscribers are going from one domain to another in real life. You need to provide a superior end-user experience and convenience wherever they are, on the same device or different devices.
- **Speed to revenue** — When services can be delivered across access types, you’ll see faster acceptance among a larger community of interest.

- **Future-readiness** — You need the flexibility to address new and evolved business models two to three years into the future, even if you don’t know where your company will be.

Your IMS vendors should be comfortable in all the service domains. Open interfaces support the widest range of clients and applications, so they increase your opportunities for differentiation. Ask your vendors which industry standards their equipment supports across the whole multi-domain landscape (observers and lurkers don’t count). More important, ask how many of these standards are supported simultaneously and dynamically on the same core network infrastructure:

- 3rd Generation Partnership Project (3GPP) IMS
- 3GPP2 Multimedia Domain (MMD)
- TISPAN (Telecoms & Internet converged Services & Protocols for Advanced Networks)
- ITU-T FG NGN (International Telecommunications Union standard for next-generation networks)

- ATIS NGN-FG (Alliance for Telecommunications Industry Solutions Next Generation Networks – Functional Group)
- IETF (Internet Engineering Task Force)
- CableLabs’ PacketCable 2.0

Ask your vendors to list their affiliations with enabling organizations, such as the Multi-Services Forum and Open Mobile Architecture. The more active their participation with standards bodies, the more likely that their products will align with ever-changing industry directions.

Be sure to ask how easy it is to increment the system with existing market- or customer-specific attributes such as support for PacketCable Multimedia (PCMM), a technical specification adopted by CableLabs® to enable cable operators to deliver multimedia and other enhanced broadband services with guaranteed bandwidth.

Q2: Does your solution adhere to the IMS architecture of CSCF, HSS and application server?



Watch out for: “We’re helping you out by putting it all together in one box!”

The modular design of the IMS architecture has been carefully considered, with specific functions assigned to separate components:

- A **Call Session Control Function (CSCF)** manages IMS sessions in the network, whether the sessions are voice, video, data, messaging, gaming or any other service.
- The **Home Subscriber Server (HSS)** manages subscriber authentication, fraud prevention, billing and other transaction processing for IMS services.
- **Application servers** deliver high-value multimedia services and content.

With this modular architecture, you can leverage each element in the network across many services. The functional separation of components is a key factor that supports rapid and flexible network growth and scalability.

If a vendor tells you these elements have been conveniently merged into a single box, you should be concerned about growth pains, geographic distribution and proprietary engineering optimizations. What will you do when your market launch is wildly successful, and you are adding the fifth, tenth or hundredth application server?

Don't be lured by the appeal of a cheap-and-dirty way of launching one or two services. One or two services has never been a problem. For a limited range of services, your all-in-one-box investment will not take you any closer to the operational benefits of IMS.

For example, the HSS should be accessible by all of your policy controllers, session controllers and application servers, so subscriber data is available to all applications (or multiple instances of the same application) in real time. Your subscribers will benefit from single sign-on, centralized authorization of identity and unified subscriber self management and billing. Ideally your HSS should be the virtual PayPal™ of subscriber management, enabling your subscribers to shop for services from within your network and outside, and you're the

broker. Your new and innovative services will plug into the network without extensive provisioning of subscriber information, through an integrated service creation environment. Adding capacity for an existing service should be as simple as plugging in another processing blade.

The HSS will only be visible to other applications if the industry standard open interfaces of ISC (IMS Service Control) and Sh are implemented.

Ask the IMS vendor which of their interfaces are proprietary. Make sure you can have a 'one-to-many' relationship with the elements, using the open interfaces you need. Make sure the vendor has a multi-faceted approach to defining and provisioning services across existing and new applications (homegrown, legacy, IMS based, third-party content, etc.) and the facilities and processes to perform the necessary interoperability testing.

Also ask for proof of openness, such as OMA Testfest participation and specific interoperability tests already achieved in a multi-vendor environment.

Q3: How will systems integration work?

Watch out for: “That’s the beauty of our solution; we’re standards-compliant, so integration is minimal.”

Minimal or not, there are always integration issues to address. You need to be able to mix equipment from an array of vendors to create a best-of-breed solution, and to evolve that solution over time as needs and capabilities evolve. A vendor who glosses over integration issues may not have the depth of resources or commitment to help you address them.

Being standards-compliant is only part of the picture — and it’s a baseline

expectation anyway, since a multi-vendor deployment requires a broad base of protocol support.

But it is one thing for a vendor to implement the latest protocol into their product, and another thing entirely for you to break new ground in interoperability — developing, testing and certifying components from numerous vendors to build your unique solution. In that scenario, the best you can hope for is that you have the tools and resources to run a large-scale test facility or you have selected a vendor who can do it for you.

Ask the IMS vendor:

- What tools do you have to help us integrate your product into our solution?
- How do you see us avoiding finger-pointing between providers of each piece of equipment in the network?
- Can you integrate your solution into our existing network infrastructure, OSS and billing systems?
- What professional services manpower and expertise is available to help us do this?

Q4: What SIP expertise do you have?

Watch out for: “We were a key part of developing that IETF committee.”

So many vendors proclaim to be participating in standards bodies that those SIP specification-development meetings have been mighty crowded. Since their participation may or may not have been substantive, you need a better way to determine a vendor’s SIP expertise.

Make no mistake about it, this is an important attribute. The IMS network depends on efficiency and interoperability of SIP messages. Ask the IMS vendor to detail their SIP deployment and integration experience, and compare it with this list of SIP implementations

on which they should already have proven experience:

- **SIP interconnect between voice networks** — This is a good test of the vendor’s SIP expertise, because this type of implementation requires both the rigor of high-volume, delay-intolerant voice traffic and multi-carrier, multi-vendor interoperability.
- **SIP services deployment** — What’s their track record of implementing those fancy, new multimedia SIP features that you’re hoping to deploy?
- **SIP device interoperability** — IMS is all about reaching new audiences and delivering your services to new access types. Ask about experience

with all these SIP endpoints: clients, phones, eMTAs, IADs, PBXs, media gateways, ONTs. Make sure their experience isn’t restricted to their own SIP devices.

Oh, and those SIP development meetings? SIP has been around for a long time and has been an academically entertaining exercise — much like TCP/IP before the WWW. It would be pretty hard to identify who was at which table — even if that was a useful factor in making your decisions.

Q5: How well does your solution scale?



Watch out for: “The sky is the limit... millions!”

Networks will undergo many changes from initial deployment to full-scale operation. They will expand in size and geographic reach. They will encompass new technologies and revenue opportunities that are not even available today. Scalability is the ability of the network to achieve this growth without compromising performance.

When the answer to your question about scalability is a subscriber count — either a finite number or infinity — watch out. There are too many variables at play to make either claim, and scalability depends on much more than the capacity of a server to support x number of subscribers.

There are several scalability issues to be considered, not just subscribers:

- **Service scalability** — Adding new end-user services, or changing the mix of services, must not impact the performance of existing services.
- **Load scalability** — The network may grow both in user population and utilization per user, as subscribers embrace new services. The IMS solution must scale to handle both types of growth without degrading the performance of existing services or interrupting network services when new subscribers or services are added.
- **Cost scalability** — There must be an acceptable relationship between total network costs and the size of the network. You don’t want a network that costs the same when it serves 100 or 100,000 end users. Even if the network offers competitive costs at its upper size limit, you have to consider the costs during the initial phases. Ask the IMS vendor about their cost structure from start-up all the way to high capacity, to avoid surprises.
- **Geographic scalability** — Growth of a network in geographic coverage may include several factors, such as efficiency in costs and performance when extending services to areas of the network with different population densities, or the limitations that distance will impose in delivering service to all geographic areas.
- **Technology scalability** — When planning today’s network, you’ll want to consider how new technologies will be introduced in the network later. Even if these future technologies will offer great advantages — new services, more mobility, expanded capacity or improved costs — you won’t want that upgrade to cause a major impact to current services and network performance. A well-designed solution will gracefully incorporate new technologies with little or no impact on current services.

So don’t accept a subscriber count as the final answer on scalability. Ask IMS vendors how they are able to deliver on all these requirements of network scalability. Then ask for the methodology they use to test it.

Q6: How does your solution support billing?



Watch out for: “Most of these new features will be offered for free trial at first. We’ll talk about our extensive billing support later.”

One goal of service convergence is to be able to mix and match free and fee-based services, for example:

- Free to test new service potential, acquire new subscribers and retain the old ones
- Fee-based to generate new revenue and earnings to your bottom line

Although your near-term plans might be to offer free trials, don’t be led astray by solutions that will need major retrofits when you want to start generating direct revenue. Any IMS strategy must include a solid plan for supporting subscription-based, usage-based, on-demand and tiered billing. Flexible billing mediation is needed to support a variety of service definitions.

As a service provider, you have a significant investment in your billing systems and in other OSS areas. You may be upgrading your legacy systems, and you may have a preferred OSS (operations support system) vendor in mind. The IMS solution must integrate with your OSSs, and the choice of systems should be yours. Your IMS vendor should not stand in the way and restrict your options.

To take advantage of your IMS implementation, both your OSS and IMS solution will require changes in billing applications and processes. Disappearing are the days of only flat-rate billing; transaction-based billing on application usage and subscription profiles is a likely future reality.

The picture grows even more complex with content-based billing, context-based billing and differentiated billing by QoS. For another twist, consider that in many cases the IMS service will be provided by a third-party service provider. In this case, you will need business-to-business OSS integration processes to enable services from third-party service providers.

Ask the IMS vendor how their solution supports your OSS choices in the real world. Does it interoperate with your preferred OSSs? How do they work with OSS vendors? Will it support various billing models? These issues can really influence the complexity of integrating IMS services into your operations and business processes.

To find out how Nortel’s standards-compliant IMS solutions address these questions for wireless, wireline and cable networks, contact your account representative or visit us at www.nortel.com/ims.

Q7: How reliable is your network solution?

Watch out for: “Oh, we’re carrier-grade because of our hardware platform.”

Reliable networks built with fundamentally sound engineering practices — “carrier-grade” networks — are not just for the telecom diehards. These networks are easy to operate, have few surprises and provide solid performance. Notice that we’re talking about reliable networks, not products.

If component parts comply to standards and individually offer “five-nines” availability, these facts do not necessarily mean that the complete system will deliver that level of availability. Once these component parts are put together, they also have to behave as an integrated

system that is serviceable, maintainable and conforms to expected operating environment requirements.

The truth is that the only way to measure the reliability of any network is historical performance. You’d have to implement a network, use it for many years and measure how it performed. This is not a helpful situation for making IMS engineering decisions today.

As a substitute for this data, networks should be evaluated for reliability by understanding how they deliver on the following key attributes of a reliable network:

- In-service maintenance
- Network survivability

- Fault tolerance
- Rapid disaster/failure recovery

Excellence on these attributes is as much about how the vendor developed and validated the product as it is about technology. That means you can get a feel for reliability by knowing that the solution reflects solid process experience.

Ask your vendor to describe the processes they use for modular and targeted testing, system integration, network integration and large-scale systems integration. The rigor of these processes will say a lot about how their solution is likely to perform in the real world.

Q8: What applications can you offer me?

Watch out for: “We have a very compelling suite of new services efficiently integrated right into our solution.”

The promise of IMS is all about service personalization, mobility and security. You want to work with vendors who have service deployment experience and can enable the services you’ve already identified for your strategy. You’ve probably already asked them about that.

However, when a vendor is offering you only their own services, it is very unlikely that you’ll be able to meet your long-term goals, which could easily require a multiplicity of application

servers. You should be able to plug individual application servers into the solution quickly, leveraging the established core network.

Why is this important? You won’t want your long-term choices of service offerings to be tied to just one vendor. You’ll want the option to use any of the thousands of applications expected to rise from a growing “cottage industry” in this market. Free choice will give your service portfolio uniqueness and reach, delivered quickly from the applications resources of your choice.

Ask IMS vendors about their set of ready-to-go applications. Ask them which terminals and clients they are compatible with. Then ask about their interoperability plans with other vendor’s application servers. Will they interwork with the application servers of your choice? Make sure their servers are not using proprietary interfaces that you can’t build onto. Don’t forget to also ask them how they can migrate your existing services into their new architecture.

Q9: Tell me about your hardware architecture. How are you leveraging the latest industry innovations?



Watch out for: “We’re using the original ATCA design.”

Exponential increases in the computing demands placed on service provider networks had to be matched by continual innovation in the underlying architecture. The business case required being able to use commercially available, off-the-shelf components — as long as those components could be guaranteed suitable for service provider networks.

In response to these industry challenges, the PCI Industrial Computer Manufacturers Group (PICMG®) established open hardware specifications that define a modular architecture for telecommunications equipment. The resulting Advanced Telecommunications Computing Architecture (ATCA®) standard, released in 2005, created an open, plug-and-play architecture for the telecom industry. Computing equipment built to ATCA standards will work effectively in the network core of a wireline, wireless or cable provider.

The ATCA standard gave rise to a large ecosystem of suppliers who are independ-

ently delivering off-the-shelf components for network architectures, such as blades, shelves, high-availability operating software and OAM&P solutions. Service providers reap the benefits in faster time to market, lower equipment costs and accelerated pace of innovation to introduce new features and services.

So first of all, ask your vendor if their solution will give you these ATCA advantages — but don’t stop there, not all ATCA platforms are built equally.

As with many first-generation solutions, the original ATCA design had some shortcomings, particularly in the areas of reliability, OAM&P and density. Many vendors announced plans to evolve into the second generation of ATCA solutions.

Ask your vendor to detail their second-generation plans:

- In addition to hardware, is the middleware also open and carrier-grade?
- Will they be sharing their enhancement plans with the industry, to maintain the multi-vendor, plug-and-play vision of ATCA?

- How does the configuration minimize the potential for maintenance errors impacting both active and inactive units?
- If an element fails, does the craftsman have a reasonable amount of time to perform the maintenance action?
- Does the platform support software patching with no service interruption?
- Does the platform support common OAM across different network elements?
- Does your configuration optimize performance and footprint for the ATCA standard?
- How does the solution support configuration storage and bootstrapping?
- Are the interfaces to the IP network redundant?
- Ask the vendor if their second-generation ATCA platform is available today.

Q10: With which other vendor solutions does your IMS solution interoperate?



Watch out for: “Oh, we’re part of [fill in name of Utopian interworking alliance].”

One of the great promises of IMS technology is its ability to deliver a far richer user experience, thanks to a fully converged network that spans multiple access devices, media and network domains — wireline, wireless and cable. The other great promise is that you will be able to choose from a vast ecosystem of applications from many vendors, and enable complex interactions among those applications.

To achieve these goals, you’ll need to be able to mix equipment from many vendors, and evolve that vendor pool at will. After all, you never know where tomorrow’s “best-of-breed” solutions will emerge. Tomorrow’s blockbuster service might come from a venture that doesn’t even exist today.

That means your IMS vendor must not only interoperate with the equipment you want to use today, but have a commitment to openness that will set the stage for interoperability in the future as well.

IMS vendors know this is important to you, so if they’re smart, they will join up with technology partners that presumably support their products, and vice versa. However, participation in such an alliance is no genuine guarantee of interoperability. It doesn’t mean the vendor’s IMS solution will work with every other partner technology in the group — or that its future plans will either.

The only way to ensure interoperability of IMS components is to test them in your lab or to see proof from certified test programs in open test networks.

In addition, you should ask the IMS vendor:

- How will I handle integration between your equipment and peripheral IMS components?

- What real-world experience do you have in building and integrating multi-vendor networks?
- What policy, presence, firewall and application servers have you tested with?
- Do you have OSS integration experience with wireless, cable and wireline applications?
- Do you have an interoperability verification program?
- Do you have an application developers community?

These questions will provide important clues as to just how freely the IMS solution will coexist with all the diverse components, interfaces and applications of your network environment.

IMS Vendor Evaluation Worksheet

Vendor: _____

Solution: _____

Contact: _____

Details: _____

1. What protocols and industry standards does your solution support?

- Which of these standards does your solution support:
 - 3GPP IMS
 - 3GPP2 Multimedia Domain (MMD)
 - TISPAN
 - ITU-T FG NGN
 - ATIS NGN-FG
 - IETF
 - CableLabs' PacketCable 2.0
- How many are supported simultaneously and dynamically on the same core infrastructure?
- What are your affiliations with enabling organizations?
 - Multi-Services Forum
 - Open Mobile Architecture
 - Others _____
- How easy it is to increment the system with existing market- or customer-specific attributes, such as PCMM support?

2. Does your solution adhere to the IMS architecture of CSCF, HSS and application server?

- Are these functions deployed in separate boxes that can be shared across applications?
- Which interfaces among components are proprietary?
- Can I achieve a 'one-to-many' relationship with the elements, using open interfaces?
- What facilities and processes do you have in place to perform interoperability testing?
- What evidence can you show of architectural openness, such as OMA Testfest?
- Can I see results of specific interoperability tests achieved in multi-vendor environments?

3. How will systems integration work?

- What tools do you have to help us integrate your product into our solution?
- How do you recommend reconciling possible issues among providers of network components?
- Can you integrate your solution into our existing network infrastructure, OSS and billing systems?
- What professional services manpower and expertise can you offer to help us do this?

4. What SIP expertise do you have?

- SIP interconnect between voice networks for high-volume, delay-intolerant traffic
- Development and real-world implementation of multimedia SIP services
- SIP device interoperability with many SIP endpoints from multiple vendors

5. How well does your solution scale, without impacting existing services?

- **Service scalability** — Adding new end-user services or changing the mix of services
- **Load scalability** — Growing in user population and utilization per user
- **Cost scalability** — Appropriate cost structure for small and large deployments
- **Geographic scalability** — Efficiency and performance when extending network reach
- **Technology scalability** — Ability to introduce new technologies into the network in the future

6. How does your solution support billing?

- Does your IMS solution integrate with our operations support systems (OSSs)?
- How do you work with other OSS vendors?
- Will the solution support various billing models?
 - Transaction-based or application-based billing
 - Billing based on subscription profiles or QoS guarantees
 - Content- or context-based billing
 - Billing and revenue reconciliation with third-party service providers

7. How reliable is your network solution?

- What is its record of in-service maintenance?
- What processes or measures ensure fault tolerance and network survivability?
- How does the solution enable rapid recovery from disasters/failures?
- What processes do you use for modular and targeted testing and system integration?
- What processes do you use for large-scale network and system integration?

8. What applications can you offer me?

- Which applications are integrated into the solution, ready to go?
- What terminals and clients are supported?
- What are your interoperability plans with other vendors' application servers?
- Will your IMS solution interwork with the application servers we have chosen?
- Do your servers use proprietary interfaces that we cannot build onto?
- How will you migrate our existing services into the new architecture?

9. Tell me about your hardware architecture. How are you leveraging the latest industry innovations?

- Will you be sharing your second-generation ATCA enhancement plans with the industry?
- Is the middleware also open and carrier-grade?
- How have you minimized the chance of maintenance errors impacting active and inactive units?
- If an element fails, does the craftsperson have reasonable time to respond?
- Does the platform support software patching with no service interruption?
- Does the platform support common OAM across different network elements?
- Does your configuration optimize performance and footprint for the ATCA standard?
- How does the solution support configuration storage and bootstrapping?
- Is your second-generation ATCA platform available today?

10. With which other vendor solutions does your IMS solution interoperate?

- How will I handle integration between your equipment and peripheral IMS components?
- What real-world experience do you have in building and integrating multi-vendor networks?
- What policy, presence, firewall and application servers have you tested with?
- Do you have an interoperability verification program?
- Do you have an application developers community?
- What lab results or certifications can you offer to demonstrate interoperability?

In the United States:

Nortel
35 Davis Drive
Research Triangle Park, NC 27709 USA

In Canada:

Nortel
8200 Dixie Road, Suite 100
Brampton, Ontario L6T 5P6 Canada

In Caribbean and Latin America:

Nortel
1500 Concorde Terrace
Sunrise, FL 33323 USA

In Europe:

Nortel
Maidenhead Office Park, Westacott Way
Maidenhead Berkshire SL6 3QH UK
Phone: 00800 8008 9009 or
+44 (0) 870-907-9009

In Asia Pacific:

Nortel
Nortel Networks Centre
1 Innovation Drive
Macquarie University Research Park
Macquarie Park NSW 2109 Australia
Tel: +61 2 8870 5000

In Greater China:

Nortel
Sun Dong An Plaza
138 Wang Fu Jing Street
Beijing 100006, China
Phone: (86) 10 6510 8000

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