



The Birth of a New Network:

IMS, Convergence, and the Future of Fulfillment

By Mark Nicholson, CTO and SVP PLM, Syndesis

Imagine you're driving across town and join a meeting via conference bridge from your mobile phone. Still on the call when you reach your office, the battery on your mobile fading fast, you go off-hook on your PSTN landline phone, push a key sequence, and seamlessly switch handsets – and networks – mid-sentence. A moment later, with a point and click of your laptop, you join the video portion of the conference and you're virtually there.

Welcome to the world of convergence. Not the sexiest example, admittedly, but one that illustrates true convergence and true convenience. More than just a single bill and service bundles, true convergence breaks down the technical barriers between traditionally discrete communications spheres. And it enables the transparent interaction and cooperation of services across those spheres – wireline and wireless, legacy and next-gen, voice and data.

“...enlightened customers are coming to expect any service, any place, any time, on any device.”

Communications service providers (CSPs) are not entirely there yet, but they're getting close, propelled largely by tech-savvy consumers and a red-hot consumer electronics market. With telecommunications services rapidly enlightened customers are coming to expect any service, any place, any time, on any device. They want presence and location services, in-session “follow me,” push-to-talk and push-to-see, multi-party conference and collaboration, shared video, unified messaging and integrated contacts – all at their fingertips, regardless of how it gets there and regardless of where “there” is.

Putting these services continually within reach – at the ready to be mixed, matched, and tailored – benefits not only subscribers. It can ultimately mean stickier offerings and more revenue, more quickly, for the CSP. These potential gains for both customer and provider explain, at least in part, the industry buzz surrounding IP Multimedia Subsystem (IMS), which is hailed to be a key enabler of network convergence and the multimedia services revolution.

IMS and “Network vs. Service”

IMS is a unifying technology which, proponents believe, will help operators migrate to a carrier-grade “all IP” world. Originally defined for 3G wireless networks by the Third Generation Partnership Project (3GPP), IMS architectural concepts are now being embraced by other industry bodies to address wireline needs and applications. The IMS architecture and standards provide dynamic routing and session control (including per-session management of bandwidth, QoS, latency, etc.) that spans bearer technologies. As such, IMS has the potential to enable revenue-rich, access-agnostic multimedia services over fixed or wireless networks, with seamless hand-off in between. Such an integrated architecture and such “open borders” between traditionally distinct worlds promise to speed the rollout of new services, features and applications – a key requirement in today's competitive and customer-controlled communications market.

The Birth of a New Network

The impact of IMS on a new generation of communications services is equally as significant as its effect on the relationship of those services to the underlying network. For more than 100 years, the telephone network itself represented the service offering. When people ordered phone service, physical connections were made or built for them. There was no real distinction between transport and access technologies and the voice calls they carried. The network *was* the service.

Even with the emergence of data networks and basic high speed data services, “the pipe equals the service” model persisted. Service came to mean connectivity. When a customer ordered a service, physical resources were commissioned as necessary, and logical connectivity was established to meet the request.

Emerging all-digital, content services transported over IP-based infrastructure are shattering this traditional model, in many ways separating the service itself from the network that carries it. Rather than simply comprise access and transport connectivity, communications services are moving up the value chain and *assuming* connectivity. Services that are more than pure connectivity include VoIP, online gaming, broadcast IPTV, and pointcast streaming video and audio. Services now span access and transport (xDSL, FTTx, WiMax, metro rings and core) to include the “content appearance point” (content server, head-end, etc.) and the IP multimedia terminal (whether that is a cell phone, TV, residential gateway, or gaming console). In such an environment, CSPs must both establish and manage the underlying service- and media-agnostic connectivity and lay the digital content and applications on top of it.

By ushering in the rise of the IP control plane, IMS bridges the widening gap between network and service. It provides a signaling and control layer above the pure IP transport plane and below the service itself. Applications can essentially use the IMS layer to control the underlying network and ensure that requested connectivity meets the needs of the content-based service.

What IMS Means for OSS

Whether IMS proves to be all that industry watchers expect remains to be seen. But one thing is certain: if IMS does rock the world of communications networks and services, it will have an equally transforming effect on communications service fulfillment. This is due primarily to the signaling and control layer IMS introduces, creating more intelligent networks that support more dynamic service offerings. Because IMS addresses a host of logical functions that – in “lesser intelligent” networks – are conventionally handled by the management domain (i.e., OSS), its rise will demand a significant shift in Operations Systems.

Traditional OSS were built to support relatively “dumb” networks – that is, networks with a thin control plane, where each device effectively had to be told what to do. In a world of self-adapting, converged, “smart” networks based on advanced control planes – like IMS promises – OSS must instead accommodate, complement, and leverage that embedded intelligence. As such, “operations” will come to mean telling the network *what* you want, not deciding and driving its every change and movement.

Ultimately, IMS-enabled convergence has the power to split traditional fulfillment into two roles: fulfilling network connectivity and fulfilling requests for application-level services. The

The Birth of a New Network

first leverages existing fulfillment capabilities, while the second demands a virtually new breed of management system.

Taking advantage of IMS and the vast array of services it enhances or enables assumes an end-to-end IP network, which in turn requires pre-existing underlying connectivity. Building and managing connectivity has long been the purview of current OSS. And so it will remain. But in the world of “ready access” services, network build and basic IP connectivity can no longer be handled reactively. They must instead be established ahead of time, removing time-consuming functions from the critical path of higher-level service delivery.

But what exactly does that higher-level service delivery entail in light of pre-built, always-connected networks and an intelligent IP control plane? In the age of IMS-enabled convergence and network intelligence, service delivery is more about application control and permissions than network control and connections. It’s about providing real-time subscription-based access to services coupled with the ability to add, change and remove features instantly and continuously. This is where the traditional fulfillment Operations *Support* System (OSS) must give way to the new Service Delivery Operations System (OS).

While traditional fulfillment solutions will lay the network foundation for converged services, supporting network build operations, the Service Delivery OS completes the real-time service environment, provisioning subscriber connectivity, service subscriptions, and service feature additions and changes. Its subscriber provisioning and application delivery capabilities manage permissions, authentication, privacy, non-repudiation, and more, while enabling subscribers to modify or personalize features (e.g., selecting unified messaging as part of a VoIP service, or setting parental controls on an IPTV). Interfacing with content servers, the IMS-enabled network, and the ever expanding host of IP terminals (handhelds, gaming consoles, smart phones), the Service Delivery OS enables an environment where services are always “at the ready” for delivery to any end point that can support them, via any network segment that can meet their requirements.

IMS heralds an age of true communications convergence that extends far beyond unified billing. It brings the genuine inter-working of IP-based services and enables those services to span long-standing boundaries – across traditional and next-generation networks, wireline and wireless domains. This combination of power and flexibility, however, requires more than conventional operations support; instead it calls for a new generation of Operations System (OS) capable of delivering 100% automation, the rapid roll out of innovative services, and ultimately increased per-user revenues and profitability in a highly demanding communications market.