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# IMS – The Next SONET?

IMS (IP Multimedia Subsystem) is heralded as the greatest advance in voice communications since the advent of Voice Over IP. It promises to usher in a new era of application development, leading to service creation times that would make a C-programmer's head spin. It is now time to look at what IMS is, and where it is really going.

IMS is a standard based on interconnected of elements, or "building blocks", that perform various functions in the Service Provider environment. By combining these building blocks, one can replicate the functions of an environment familiar to VOIP Service Providers. In addition, IMS extends to service architectures based on other standards, such as PacketCable 2.0 or 3GPP (Wireless). The goal is to have interoperable "blocks", available from different Vendors, and be able to add application platforms as easily as one might add a server to a data center. With these blocks, it should be possible to interconnect a PacketCable network with a 3GPP network as easily as connecting two PacketCable networks to one another.

In the 1980s, SONET (Synchronous Optical NETwork) standards were introduced as a way of interconnecting TDM transport platforms. SONET was to be able to carry virtually any type of desired payload, voice, data, or video, over multiplexers and cross-connect devices that would enable Service Providers to mix and match vendor's equipment. What has happened in the over two decades since SONET first arrived?

When SONET multiplexers first appeared, the vendors initially would only permit connections with their own equipment – there was no interoperability. Not even the physical fiber connectors were the same! Smaller upstart companies created new SONET platforms, at a reduced cost, that also did not interoperate with platforms from other vendors. These multiplexers in their vendor-specific networks became the telecommunications infrastructure of our continent and, with SDH (Synchronous Data Hierarchy), the world.

The first cross-connect switches with optical interfaces did not arrive on the scene until the late 1990s. While these did interoperate for payload and protection switching, access to the management overhead was not available. Even today, while it is possible to interconnect SONET equipment from various vendors, it is generally not possible to *manage* one vendor's equipment from another's. Most significantly, however, different service providers could optically interconnect their networks with one another, and optical handoffs became commonplace using the SONET standards.

Why did SONET flourish despite never achieving the interoperability touted by its early proponents? SONET allowed service providers to deliver products to customers at a reasonable cost. SONET facilitated things that were impractical before its introduction.

Is IMS destined to achieve the kind of interoperability that its supporters propose? Can you purchase a P-CSCF (Proxy Call Session Control Function) from Vendor X and expect it to operate with an HSS (Home Subscriber Server) from Vendor Y and a MGCF (Media Gateway Control Function) from Vendor Z? Does it matter?

In the earliest days of IMS, the interoperability and substitutability of Core Elements was the focus of the standard. With core elements obtained from different vendors, a Service Provider could choose the best of breed in each function. As the standard developed, it became increasingly clear that vendors did not necessarily wish to pull their cores apart, and customers did not want to choose Core parts from many vendors. As it was when SONET customers rarely wanted to build access networks with elements from many vendors, IMS customers see more value in feature delivery. Core interoperability is not the thing in IMS that makes it most attractive.

IMS helps service creation. Using a network of generic servers at the top of the IMS diagram is, in my opinion, the main purpose for the entire standard. The greater question is would Service Creation engines still develop WITHOUT IMS' assistance? Applications such as Presence/Instant Messaging and Cellular/WiFi hand-off are possible with and without IMS.

IMS can help network reliability and survivability. Elements may be located in multiple locations and shared via network connections. Would network survivability be possible without IMS? SIP provides the basis for multiple registrations of endpoints, thus providing improved network survivability. SIP functions with and without IMS.

IMS fosters interconnection of networks. Networks today interconnect with SIP, using Border Control devices to massage protocols to achieve interoperability. Will adoption of IMS make Border Control devices unnecessary, or will these functions just get new names?

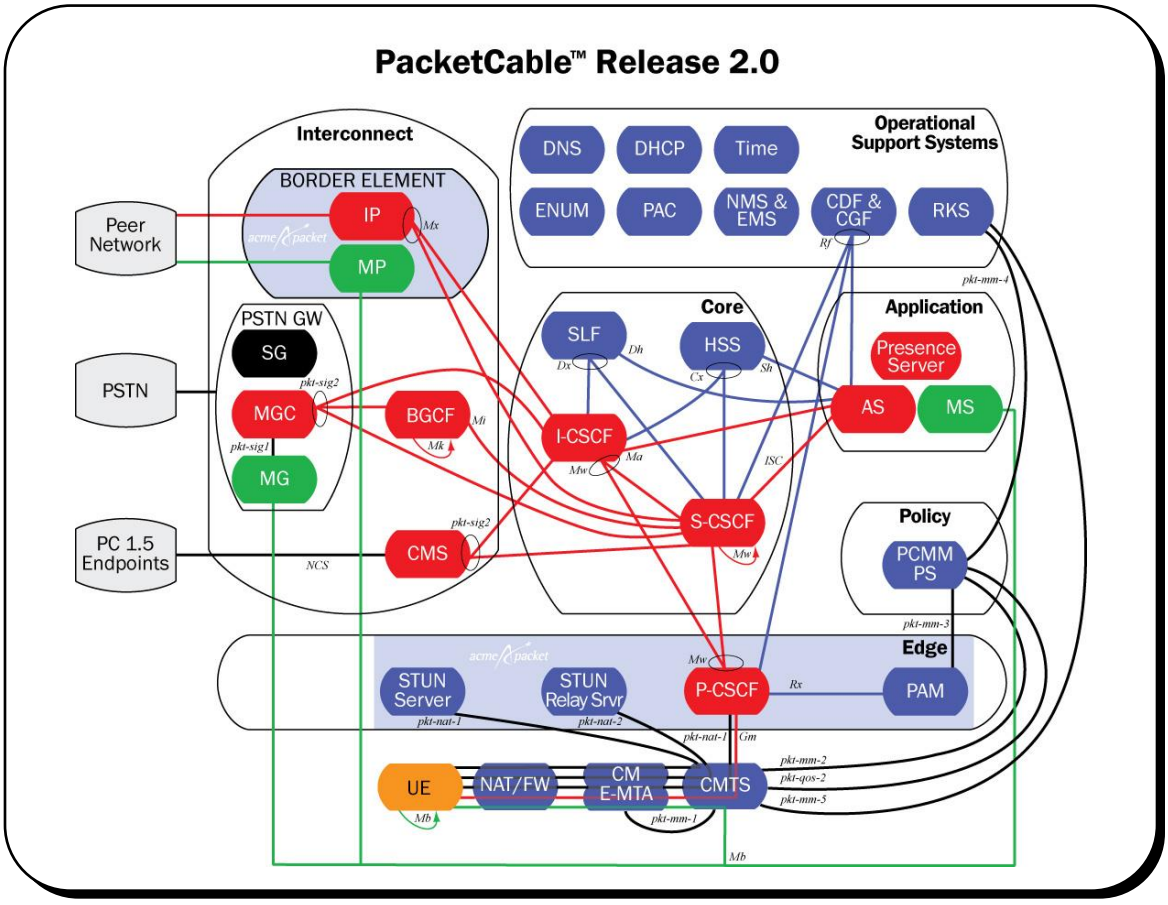
I recall an IMS panel at the 2007 Cablelabs Summer Conference, moderated by Jay Rolls. One of the participants (David Cullerot of AcmePacket) projected the familiar PacketCable 2.0-IMS Architecture slide, showing 34 interconnected boxes (see below). Jay asked, "Now, when it breaks how do we fix it"? This is a very important question. While IMS is an impressive work of art and engineering, is it practical? Will it collapse under its own weight? I have yet to observe anyone performing forklift replacements of existing VoIP networks with IMS based versions. Yet nearly everyone seems to see IMS as inevitable.

In my opinion, a more likely course will be for certain portions of IMS to be adopted as applications develop, and gradually replace non-IMS network elements in our networks. By combining IMS elements into multi-function devices, the task of managing so many

interconnected elements becomes less daunting. For example, the HSS, S-CSCF (Serving Call Session Control Function), MGCF and SGF (Signaling Gateway Function) may be combined into one platform (a Call Management Server). Perhaps some existing non-IMS Call Management Servers could evolve into IMS-compliant ones via a software upgrade path.

Service Providers will add the Service Creation Engines first, because Service Creation Engines enable construction of Applications, which represent products to sell. Cores, on the other hand, represent back-office expenses to minimize. Those with networks that are not already IP based, such as Wireless Operators, will have the most incentive to adopt the ways of IMS-cores quickly.

SONET did not replace proprietary TDM networks overnight, but grew rapidly once it became apparent that it was a better mousetrap. Will IMS have a similar future? Only time will tell.

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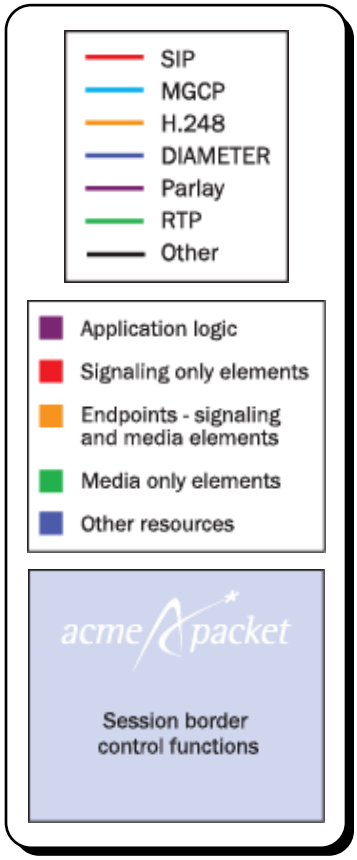


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