

Paving The Way With Next Generation Media and Signaling VoIP Gateways

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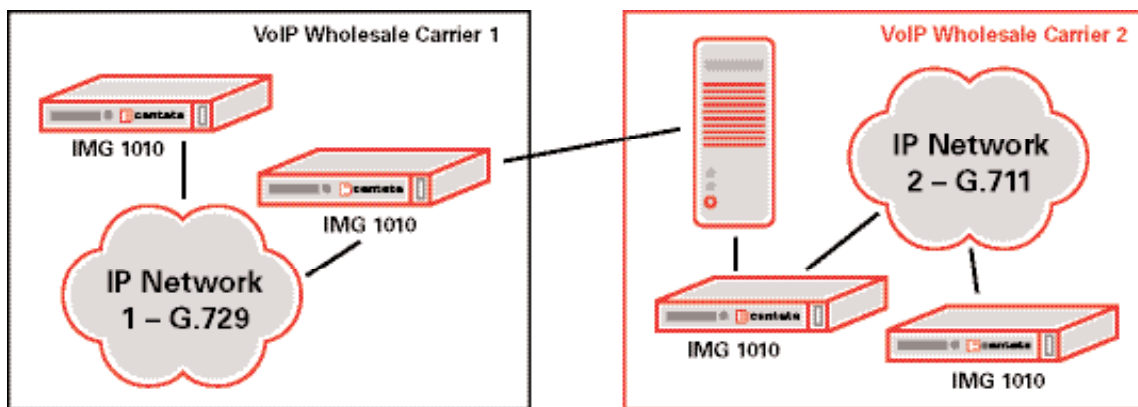
VoIP networks: architectural shift

VoIP is changing quickly with the rapid adoption of SIP and the disaggregation of network elements into best of breed components. As VoIP evolves, connectivity between different signalling protocols, conversion between voice compression protocols and peering between IP networks are the next great challenges in network design. VoIP networks are experiencing explosive growth around the globe. According to Steve Raab an analyst at Dell'Oro Group, VoIP equipment sold by US equipment providers will double in five years from \$2.4 billion in 2005 to \$4.7 billion in 2010.

As these VoIP networks grow and mature, characteristic changes in the architecture and makeup can be seen. First generation VoIP networks appear as islands of transport connected via TDM cross connects. These networks traditionally used ISDN (*Integrated Service Digital Network*) for TDM connectivity and H.323 for VoIP signaling. Usually a large Class 4 TDM switch would be used for routing and billing calls as shown in Diagram 1.

In actuality, the VoIP gateways were used for long haul transport and all the enhanced services were handled in traditional TDM based platforms. SS7 connectivity was also made available through connectivity to existing Class 4 TDM switches.

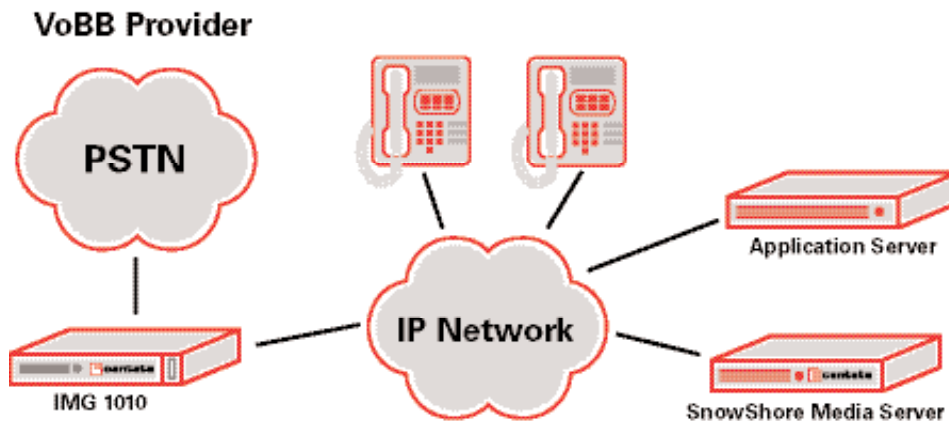
Diagram 1: First Generation VoIP Network



the introduction of SIP

With the introduction of SIP, architectures have moved from a strict hierarchical model to a disaggregated design as shown in Diagram 2. These new network elements include media servers for media processing, proxy servers for call control, and application servers for enhanced services. With these enhanced features media processing and session control occur in the IP domain. This brings additional efficiency into the network and the ability to reconfigure capacity on the fly. Additional services can be added in IP domain through upgrades or additional Application Servers.

Diagram 2: Next Generation IP Network



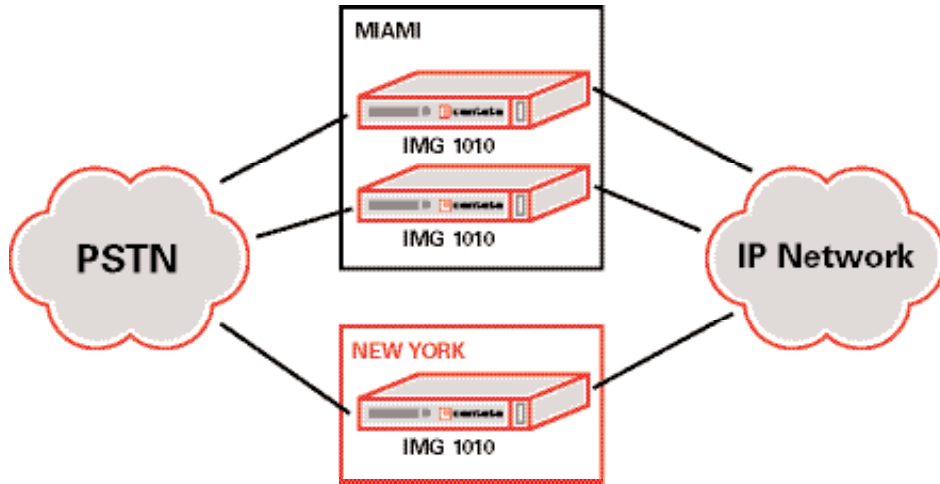
what does today's media gateway need to support in this new disaggregated model?

Service Providers and OEMs need VoIP Media Gateways that evolve as quickly as network requirements do, but VoIP Gateway solutions have until now been cumbersome to deploy and upgrade. First generation VoIP networks that used IP simply for transport are still handling enhanced services in the TDM domain. In the new model, messaging, prepaid, fax, and other enhanced services can now be handled in the IP domain. When evaluating media gateways for this new model, service providers and OEMs need to consider several factors that can impact the success of their applications and services.

SS7 interconnectivity

Traditionally it was the role of a TDM based Class 4 switch to provide access to SS7 networks from IP-based networks. SS7 signaling links would come directly into the Class 4 switch and be converted to other signaling approaches such as ISDN or tonal-based for connectivity to the typical media gateway. This approach puts geographic limitations on the reach of the SS7 network and requires costly SS7 point codes in each physical location. When evaluating media gateways, service providers need to make sure that it will be able to integrate SIP and H.323 signaling but including ISDN and SS7 connectivity as well as shown in Diagram 3.

Diagram 3: Remote SS7 Voice Circuits

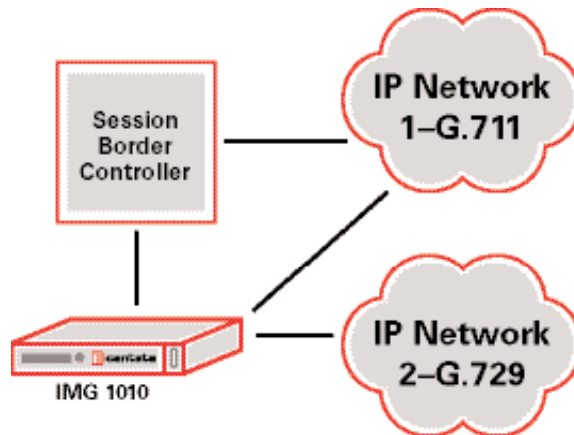


Via integrated SS7, next generation carriers can extend their networks into emerging markets and connect to the operators that require SS7 connectivity. A media gateway combined with a SS7 signaling server can control SS7 voice circuits geographically distributed from a single point code. This makes the network easier to manage as well as reduces costs for SS7 network connectivity.

IP peering

With next generation service providers moving to an all IP-based ecosystem, concerns of security, access control, and compatibility arise. Session Border Controllers have emerged as a common solution means for access control issues in the next generation networks. Session Border Controllers can handle security, manage network address translations, and translate VoIP signaling between two incompatible networks. One area where they are often limited is translating incompatible RTP packet streams of media such as voice or fax. Traditionally, session border controllers cannot convert or transcode media streams.

Diagram 4: Typical IP Transcoding Between 2 Networks



Providers should look for a media gateway that can work in concert with a session border controller and convert IP based media streams. Support for G.711, G.723, G.729, iLBC, AMR, and EVRC voice codecs allows convergence of wireless and wireline networks.

New standards such as Electronic Numbering (ENUM) take IP peering to the next level. ENUM defines a mapping between telephone numbers and SIP addresses. With ENUM native SIP users, even at different VoIP service providers, can call each other directly without ever touching a PSTN service which can result in faster connection times and lower phone charges. Media Gateways that support ENUM map call routing information directly to SIP.

fax

With an estimated 200 million fax machines generating over 100 billion fax pages around the world, fax technology is a business critical communications tool. Simply, it is the most preferred method of transmitting an electronic copy of an original document. Fax is at the heart of a wide range of document exchange processes in important functional areas such as finance, legal, human resources and procurement.

It is important that a media gateway support T.30 on the TDM side as well as T.38 and G.711 pass through on the IP side. Considerable amounts of network traffic are Fax based and for the utmost compatibility these protocols must be supported.

picking the right media gateway

The right Media Gateway evolves as your network evolves. Integrated media and signaling support for ISDN, CAS and SS7 provides an affordable way to increase your network footprint into existing and emerging markets. With the advent of wireline and wireless convergence in the IMS architecture support for popular voice compression protocols like G.711, G.723 and G.729 along with AMR, EVRC and iLBC will insure compatibility. The Cantata IMG 1010 provides all these capabilities and is backed by a supplier that delivers world class support and customer responsiveness.



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