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Long-Term Network Transformation Strategies, Near-Term Results

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Network transformation. Two words that can strike fear and anticipation in equal measure in the hearts of network and software engineers. From the comfort zone of a fit for purpose circuit-switched network with dial-tone reliability, the migration to an all-IP network can look like a leap into the unknown. However, while the network transformation may be a giant stride to take, an incremental step-by-step approach can yield the same end results and have one major added benefit — an immediate revenue stream with new applications.

Viewing network transformation from the application perspective makes the challenge much more digestible. Voice communications based on legacy networks and Class 5 switches are founded on basic call control features such as call forwarding, call waiting, and calling line identity that enable a range of core applications that businesses and homes use throughout the world. However, in the brave new world of multimedia communications where a virtually limitless array of Internet protocol (IP)-based applications are running on an end-to-end IP network, these same fundamentals still apply.

A New Standard

Within the telecommunications industry, standards bodies such as the European Telecommunications Standards Institute (ETSI) and the third-generation partnership project (3GPP) are addressing this migration to an IP-based future with a new set of standards and specifications. Referred to as multimedia telephony (MMTel), the industry is defining and describing the generic functional requirements for all of the basic call control services, as well as the protocol requirements.

MMTel could be the biggest thing to happen to voice communications in recent history. It establishes a set of global standards for fixed, mobile, and cable operators. If accepted universally, interoperability will be easier, since vendors will work toward standard protocol requirements. Customer requirements will be consistent, allowing the industry to focus more on enhanced features instead of constantly tweaking the basic feature set.

MMTel, as its name implies, supports voice calling between two or more users, yet also provides real-time bidirectional voice, video, or other yet-to-be-defined types of data. It provides "simulation" services. So instead of trying to replicate the existing circuit-switched features exactly, MMTel provides functionality equivalence.

At the heart of this network transformation is one key standard that, in telecom, has turned into something of a religious battleground. Traditionally, voice over IP (VoIP) services and public branch exchange (PBX) applications have been powered by H.323-a standard that incumbent telcos know, love, and trust. However, as the network transforms from a circuit-switched voice network to an IP-based multimedia network, IP multimedia subsystem (IMS) has become the glue that will tie the increasingly complex mix of rich services together, with session initiation protocol (SIP) as the standard that underpins it all.

IMS is an end-to-end network solution allowing advanced multimedia services and content to be delivered over broadband networks that use IP technology. By using a single standard to integrate the complete IP multimedia subsystem, IMS enables network operators and service providers to design, develop, and deploy new revenue-generating multimedia services for their subscribers quickly and cost-effectively. Examples of service creation with IMS could include VoIP-Web 2.0 mash-ups that enhance popular business and consumer applications such as customer-relationship management (CRM) and social networking Web sites.

Migrate Strategy

As one can therefore imagine, IMS is certainly no quick fix. A long-term strategy—a carrier's migration from

legacy time division multiplex (TDM) switching networks to next-generation VoIP networks — ultimately means a fundamental network transformation. Some carriers are migrating their service offerings off their Class 5 local-exchange switches and onto IMS-compliant packet-based core networks and application servers as part of a phased strategy.

This service-led approach, therefore, means that many service providers are in fact already well down the network transformation route, even without full IMS deployment. Applications such as hosted PBX, mobile PBX, business trunking, and broadband residential VoIP are both transforming the voice services and providing carriers with immediate new revenue streams throughout the wider network migration process.

Road Map to All-IP

As carriers inevitably migrate to an all-IP, IMS-based environment, each will face its own unique set of network transformation challenges. It is difficult to provide a carrier with a single road map for network transformation, given that the process consists of many phases and each carrier has different legacy equipment that must be interconnected. While agreed-upon best practices have yet to emerge for network transformation, the activity can be broken down into the following five categories:

- Access infrastructure-The equipment used to interconnect with the end customer
- Network infrastructure-The equipment used to interconnect with other networks
- Features and functions-The features provided in the service offering as well as the regulatory, translation and routing, intelligent network, and application interworking functions.
- Information technology systems-The provisioning systems, self-service management systems, and other information technology (IT) systems used by the service offering.
- Management and monitoring-The systems used to manage and monitor the network equipment, ensuring system availability, performance, and capacity.

Summary

By unlocking the full potential of the IP core network as part of an ongoing strategy, operators are able to realize the revenue-generating capabilities of their broadband infrastructure as they invest in it and not at some indeterminate point in the distant future. The key for operators lies not in generating the traffic over their network, since the cost per byte is only ever going to get pushed further down. The future for operators, therefore, is in finding the appropriate service mix that can expand their business beyond early adopters and into mainstream enterprise and residential markets.

MMTel opens up the ability for the carrier to more quickly deploy and deliver a complete set of personal and group services, as well as support for enhanced telephony such as video calls, conferencing, collaboration, presence management, instant messaging, e-mail integration, and support for remote offices and workers. In the home, service providers can deliver a highly differentiated service mix that enables individual customers to define their own service profile and consume those services that best fit their own lifestyle.

As the network transformation moves to embrace both fixed and mobile networks, IMS will provide operators with the integrated service offering that is the end-user driver for consuming fixed-mobile convergence (FMC) services. While IMS architecture is a long-term investment, by starting with MMTel, operators can show immediate returns on their long-term network transformation strategy.

Educational Content Provided by:

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As Chief Technology Officer, Hoffpauir is responsible for guiding the technical vision and direction for BroadSoft as well as promoting continuous product innovation. Prior to co-founding BroadSoft and serving as Vice President, Engineering since 1998, Hoffpauir was Director of GSM Development at Celcore (DSC/Alcatel USA). In this role, he was responsible for all product development on the GSM switching product, including system architecture, product requirements, software development, hardware development, system test/integration and product/customer support. Hoffpauir played a key role in setting up customer trials and providing sales support and served as representative to the GSM SMG standards body. Before Celcore, Hoffpauir was senior architect for Nortel's GSM and Inter-Exchange Carrier switching systems. Hoffpauir holds multiple patents in the GSM, SIP, call processing and switching areas. He is a graduate of the University of Louisiana Lafayette.

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