

White Paper: Softswitch Technology and the Migration to Full Convergence

Introduction

As the public switched telephone network (PSTN) is transformed into a packet switched network capable of supporting voice, data and video, the softswitch becomes a key component of this transformation. The International Softswitch Consortium defined the term softswitch as a “media gateway controller” (MGC), which controls network elements that mediate between, route or translate different data streams. The softswitch can clear a path across an IP network and complete it at circuit-switched endpoints. In order to set up these services, softswitches utilize databases, for authentication and authorization, and application servers to define the features that are offered to customers. To communicate with each other and with network endpoints, such as gateways, IP-phones and softphones, Session Initiation Protocol (SIP) is used so extensively that it has become an industry-wide standard.

Convergence is the “quintuple play” of uniting of voice, data, video, fax and instant messaging across a single network infrastructure. Similar to the Voice over IP (VoIP) component, Internet Protocol is used to deliver this integrated traffic over a converged network. Although convergence multiplies the capabilities of communication systems, it also creates challenges as these streams share and vie for common bandwidth resources. IP convergence solutions enable companies to simplify network management and reduce infrastructure costs, lowering the total cost of ownership (TCO) of a network. Growing confidence in IP telephony is driven by convergence, as it is a contributing factor to cost savings leading to return on investment (ROI).

Some softswitches are designed to support the gradual migration from voice-centric to data-centric and media-centric environments. They provide the brains for a converged voice, data and media network. Softswitches handle call setup, establish control paths, control trunking gateways that convert TDM signals (Public Switched Telephone Network voice calls) to Voice over IP and support all services in the existing PSTN. Full VoIP implementation is customarily carried out in new or “greenfield” locations, branch offices and other standalone corporate sites, but an increasing number of small and medium sized businesses (SMBs) are making the decision to proceed with softswitch installation to focus on full company-wide convergence, adding IP equipment incrementally as legacy platforms are retired.

The eventual transition by corporations to IP telephony and enterprise convergence is inevitable due to packet-switched systems cost efficiency and positive business impacts. The economy and simplicity of

softswitches should motivate IT executives to take full advantage of convergence and begin to develop migration plans in order to take full advantage of their benefits.

Vendor Selection

Customers are seeking systems that are cost effective to purchase, easy to use and maintain, with a high level of vendor product and technical support. Systems need to be integrated with PC technology to provide advanced features, such as automatic call routing and Call Detail Record (CDR) reporting. Software administration, operation and management must be supported by centralized Web browser control. In the vendor selection process, companies take into account strategic vision, financial resources and geographic coverage.

Vendors should provide an engineering strategy that will result in a smooth integration of softswitch technology while helping to retain and expand revenues. The product will present prospective clients with the ability to get into the VoIP business with an easy to use range of service features for their customers and the capacity to maintain control over the pricing of these services. Converged solutions must be deployable without having to establish complicated network infrastructures.

Software architecture must ensure carrier-grade high availability, redundant components and survivable connectivity to an IP network for continued Quality of Service (QoS). The Internet Telephony Service Provider (ITSP) will need to utilize their softswitch and network architecture to connect with their customers using various access methodologies, including the reuse of existing technologies, such as currently owned gateways and switches. As the number of subscribers in their network grows, their softswitch solution and architecture should be scalable to a capacity that will ensure that services continue with interruption.

In May 1999 several vendors and carriers, including Cisco Systems, Lucent Technologies, Nortel Networks and North-Point Communication launched the International Softswitch Consortium, an organization formed to help provide a pathway to convergence and simplification of networks. It evolved into the International Packet Communications Consortium (IPCC), whose mission is to develop the market for all products, services, applications and solutions that utilize packet-based voice, data and video communications technologies, regardless of transport medium – wireless, copper, broadband, fibre optics, or other. The IPCC promotes and defines the market acceptance of Packet Networks in four important ways: Through Validation; Architecture and Operational Definitions and Information; Advocacy; and Diversity.

The ITSPs Perspective

ITSPs are relying on softswitches to help them move into the converged market. There is a lot of competition for multimedia services, as the whole telecommunications industry is moving to packet-switched environments. This gives operators a chance to rethink their business models. With softswitching technology, ITSPs can provide service to a whole new set of applications for their subscribers. According to a Dell'Oro Group study, sales of softswitches and media gateways will double from \$2.5 billion last

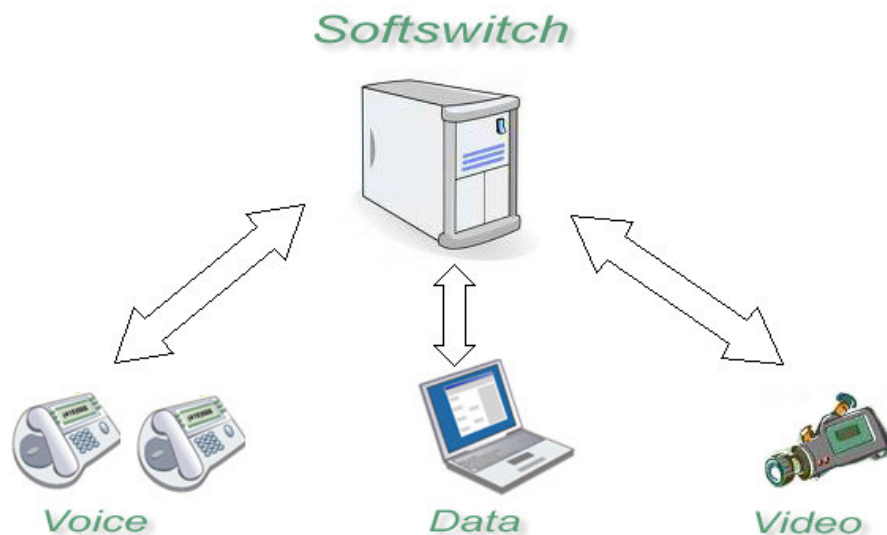
year to \$5 billion in 2010. ITSPs will be among the enterprises that contribute to this boom.

In the past, different media were like islands, but there were problems with interoperability. For example, separate broadband streams would have to be dedicated to video and voice, but now a softswitch can handle all kinds of media using SIP. A unified core of both voice and multimedia services is available for ITSP customers via their provider's fixed network softswitch, so the ITSP must consider that updating their technology to handle more than just voice is a good investment. Although voice is the biggest revenue for ITSPs, they need to have multimedia in the mix to remain competitive in today's situation.

There is a lot of digital content now because content can be digitized very easily. IP has made it possible to bring all this content together. For the ITSP, all services can be implemented on top of IP protocols using the right softswitch. With SIP, end to end Quality of Service (QoS) can be assured, creating new value for an ITSP's clients. The goal for service providers is to offer customers seamless communications without having to incur the expense of a platform that will become obsolete. ITSPs are embracing softswitches because they are functionally equivalent to conventional phone switches, only better, faster, and cheaper.

How Softswitches Benefit Convergence

Softswitches connect calls using software running on a computer system, work that was originally carried out by hardware and routing switchboards. Carrier-class servers that include two key elements: session agents for signaling and control, and back-end servers for delivery of critical functions such as accounting, billing, and provisioning. The Media Gateway is used to connect different types of digital media together and create a stream for the media in the call. Softswitches tend to be modular, which makes them easily scalable, offering the ability to add new features, as needed, depending on changing markets and technologies.



Next-generation enhanced technologies benefit from softswitches modularity. Softswitches separate the routing of traffic, network control and applications development, similar to traditional mainframe networks. Conver-

gence is using one resource or technology for many things, eliminating redundancy. Since the softswitch converges voice and data onto a single network, only the signalling goes through the softswitch itself. All the bearer traffic moves along the bearer path into the packet network, so calls no longer need to be provisioned with multiple trunks. Voice compression increases gains in efficiency.

Reduced operating costs are one of the many benefits that converged networks offer. Softswitches cost less than the Class 4 and Class 5 switches that they replace. They make more efficient use of the bandwidth so there is less hardware to operate and repair. Softswitches are cheaper to maintain and they take up less area and power in their host office. Converged networks generate new sources of revenue since their open architectures contribute to the rapid development and rollout of new services.

Adopters of softswitch technology seek an edge through wide-scale deployment of converged networks via the integration of provisioning, billing and performance reporting into their organizational scenarios. The monitoring, diagnosis and resolution of performance issues is required to capitalize on the new network order. ITSPs should recognize the need for new relationships with channel partners who can develop, deliver and sell the new service offerings that a converged network infrastructure will create. Implementing this converged architecture will revolutionize the way we do business and communicate over public networks, and softswitches play key roles in this revolution.

Features of Dialexia's Technology

Dialexia's Dial-Gate product is a Web-based softswitch and billing server for the VoIP and PSTN Networks. SIP/JAIN compliant, it provides real-time communication over IP networks. Its programmable routing intelligence and support of network calling plans can be assigned to endpoints in order to filter calls. Dial-Gate translates standard telephone numbers into their corresponding IP addresses and looks for available gateways or domains to place calls through the PSTN. It functions as a softswitch by giving an integrated control point for various telephony services.

The Dial-Gate billing platform provides advanced real-time monitoring pre/post paid billing, rate/route table management, and CDR report generation. It is fully integrated with MS Exchange providing voice-mail unification, instant messaging and video communication. The IP-Tone module enables service providers to generate DIDs equipping subscribers with a real or virtual phone number. With Dial-Gate's first-rate billing platform and high scalability factor, service providers can generate revenue with minimal investment.

Features include: IP to IP Dialing, IP to PSTN Dialing, PSTN to PSTN Dialing, Enhanced Billing (Pre/post paid, Wholesale, Agent), Call Detail Record (CDR) Management Reporting, Real-time Service Provisioning, Invoice Creation, IP/Analog Phone Compatibility, Network Calling Plans, RADIUS Client and Billing Server, Far End/Near End NAT Firewall Support, Centralized Web Management, E911 Support, DID Provisioning and Management, SIP Device Provisioning and Management.

About Dialexia Communications

Dialexia Communications is a pioneer in the world of IP Telephony and Call Processing. SMEs can make a significant transition towards a telecommunication system that will provide enhanced productivity by simplifying the complexity of their numerous needs; one system will be enough to manage telephony, Internet, e-mail and long distance thanks to Dialexia's low cost VoIP solutions. All their products are designed to work with the industry's leading gateways, facilitating installation and compatibility. Dialexia Communications offers a full suite of integrated IP Telephony applications. Their innovative Dial family includes: Dial-Gate a comprehensive web-based SIP proxy and centralized routing server with a traffic management system for pre/post paid billing services; and Dial-Office a powerful web-based 100% SIP IP-PBX. Visit Dialexia at: www.dialexia.com



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