Competitive Telecom Advisor

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A Softswitching Update

Introduction

Softswitch deployments are on the rise. Worldwide carrier next generation voice equipment revenue hit a new high in 2005, topping $2.5 billion, a 50% jump over 2004, and is projected to reach $6.2 billion in 2009, according to Infonetics Research. The "big iron" legacy switches that were traditionally deployed over the last 20 years or so have fallen out of favor with carriers for a variety of reasons, and most, if not all, purchases of new switches are now softswitches. The technology has swept over us so quickly that some new industry participants might have missed some critical events. Given that, we thought a brief primer was in order to discuss the evolution of softswitches from the time they first emerged in the marketplace in the late 90's through today. To round out the picture, this piece also provides a peek at where the softswitching market is headed.

The Early Days – Late '90s

The first softswitches that came to market in the late 90's were essentially purpose built for a few select services, primarily Class 4 applications. These Class 4 applications include long distance traffic handling (including wholesaling, 1-800 calling services, TCAP, and calling card), tandem switching, IP voice termination (for PSTN interworking), and PRI offload of dial-up modem Internet connections. They were popular among carriers because they resulted in immediate tangible cost benefits, with minimal impact on the most visible part of their business – the services delivered directly to subscribers.

Many of the early softswitches were pure TDM switches, featuring TDM switching fabrics and external interfaces (OC-3, DS3/E3, and DS1/E1). As ATM and IP interfaces were introduced, they were used primarily for packet tandem connections to long-haul IP data networks. Since these switches did not provide any subscriber services, POTS interfaces for direct end user connectivity and application server interfaces for CLASS services were typically not needed. The first-to-market softswitches allowed carriers to offer Class 4 services with significantly lower operational and capital costs than circuit-based alternatives, and really ushered in the softswitching era in telecom networks.

Additionally, many early softswitches were integrated solutions that combined most of the softswitch elements (call agent, media gateway, and signalling gateway) into one physical box, or where they had a distributed architecture involved proprietary signalling between the various elements.

Softswitches were still predominantly deployed for backbone trunking (Class 4) applications until very recently. "Until last year we can safely state that except for a few isolated projects nearly all softswitch deployments were in the area of Class 4 deployments," states Lilian Tau, Executive Vice President of Market Research & Consulting, Dittberner Associates Inc. "However, during 2005 Class 5 softswitch port shipments reached 55% of the total, which is a strong indication that service providers finally started to embrace the technology for their Class 5 VoIP based services."

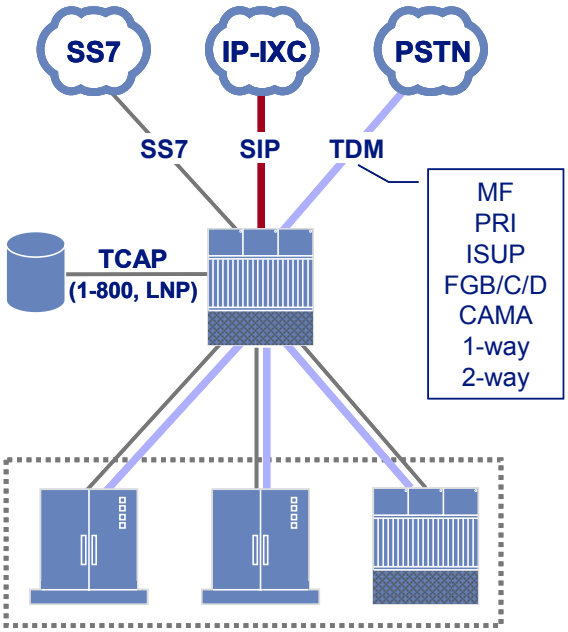

Figure 1 -- Early softswitches were deployed primarily for Class 4 services

Class 5 Replacement

The next wave of softswitching in the mid-2000's targeted the replacement of legacy Class 5 switches such as the Nortel DMS, Lucent 5ESS and Siemens EWSD products. These switches were nearing their effective end of life, or were unable to cost-effectively provide critical new features such as CALEA or Local Number Portability (LNP).

In order to offer full legacy replacement, Class 5 softswitches have to offer equivalent subscriber services as the legacy switches they aim to replace, while at the same time provide the carrier significant OPEX reductions. This is certainly not a trivial task, as there are literally hundreds of features provided by legacy Class 5 switches, some of which are the popular CLASS features such as Call Forwarding, Caller ID, *etc*., but many others are not widely used and therefore vendors were often faced with tough decisions about which features were absolutely necessary to implement. Rather than develop these services in-house, some softswitch vendors have chosen to use 3rd party feature servers to deliver Class 5 services.

Around this same time, the industry as a whole started to embrace IP technology in other areas of the telecom network as well. Access networks especially started to transition from TDM- or ATM-based Digital Loop Carriers (DLCs) to IP-based Broadband Loop Carriers (BLCs) in order to capitalize on the cost savings and service-enabling capability of this technology.

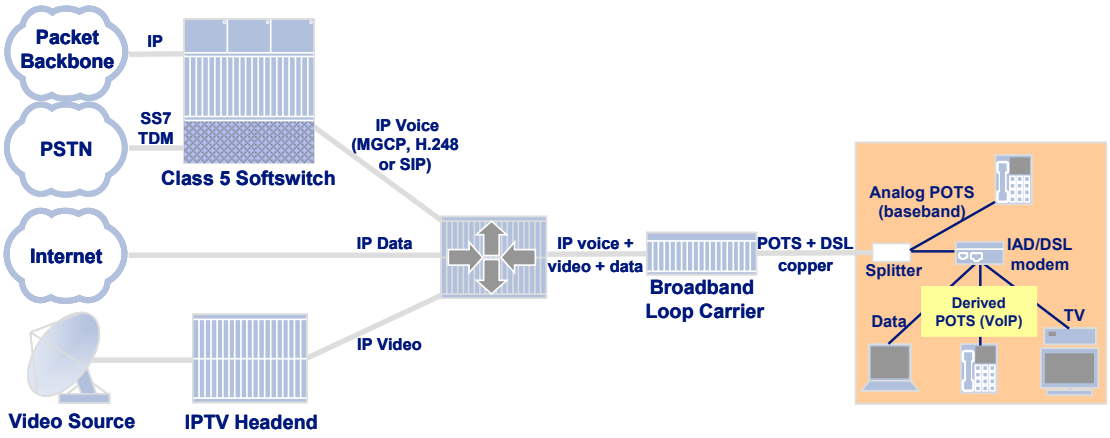

Figure 2: Triple Play services are driving the adoption of IP-based technology

As carriers began to offer more high-speed broadband connections using IP technology, their legacy DLCs were struggling to provide the necessary capacity. BLCs offer an attractive alternative for the IP-based future. Given this momentum, legacy TDM switches and even TDM-based softswitches make less sense technically, and softswitches offer a much more attractive business case than continuing to invest in legacy switch upgrades. IP-based "Triple Play" services of voice, video, and data were, and continue to be, a key driver in the adoption of IP-based Class 5 softswitching.

While Class 5 softswitches typically offer both IP and TDM interfaces, many early products were still built around a TDM switching fabric. A relatively newer trend in Class 5 softswitching is the decoupling of the various components of the system. Softswitch manufacturers are now offering distributed solutions where the call agent, application and feature servers, and the media and signalling gateways may all be physically separate entities interconnected via the IP network.

Where we're headed – IMS

We have now passed through the early adopter phase in softswitching, and are squarely in the mainstream adopter phase. Softswitch deployments, especially Class 5 softswitch deployments, are rapidly increasing in both the size and number of networks in which they are being installed. Additionally, carriers are now deploying softswitch architectures not just to reduce their operational costs, but also to leverage the many advantages that IP provides them in terms of rapid service creation and additional cost savings in both the access and trunking portions of their networks.

Over the last 12 months, the IP Multimedia Subsystem (IMS) has emerged as the next generation architecture upon which carriers will build their networks. The IMS architecture is a blueprint for carriers to follow in order to position their networks to quickly take advantage of the new services coming to market. IMS is able to merge the services and applications of the Internet with both wireline and wireless networks, providing a path towards true fixed/mobile convergence and streamlined network operations for these networks.

Building upon the significant industry momentum of both IP and the Session Initiation Protocol (SIP), the IMS architecture is a layered architecture where applications, call control, and network access are all independent of one another. This is a significant improvement on the current model, where applications, call control, subscriber databases, and network access are all tightly integrated into vertical "silos", with little to no overlap between the various networks, which creates inefficient administrative and network redundancies along with the associated

costs. The promise of IMS is that carriers will achieve much better operational efficiencies and will be able to deliver advanced services (including multimedia-enabled applications) more rapidly to all subscribers, regardless of how the end user chooses to access the network, e.g. via a broadband Internet connection or 3G mobile phone.

While there are still several key areas of the IMS specification that are under active development, nearly all telecom vendors and even many carriers are building their products and services to support the evolving standards. From a softswitch perspective, IMS is an evolution of the existing softswitch architectures, so those solutions that were designed as IP-oriented platforms on open standards will see a fairly straightforward migration to the IMS service core.

Conclusion

Softswitching has achieved broad industry acceptance. Building upon the early successes of Class 4 tandem applications and the more recent widespread adoption of softswitching for Class 5 end office installations, carriers have weathered the early days of this exciting technology and are now leveraging it to exploit the many advantages inherent in VoIP and softswitching technology.

In addition to the industry acceptance of softswitches, IP technology continues its ubiquitous march to all sectors of the telecommunications industry, which has led to the development of IMS, the next generation IP-based architecture upon which carriers will build out their wireless and wireline networks. Softswitch principles are at the heart of the IMS architecture, which will only drive more demand for softswitch deployments for the foreseeable future.