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PAVING THE WAY TO DATA OPTIMZED NETWORKS

(bylined article, Sycamore Networks)

Carriers today stand at the crossroads between a new era of prosperity and obsolescence. While opportunities for dramatic growth and high profits have never been greater, so is the competition. The Internet's emergence has made it possible for carriers to build new businesses based on a rich array of multimedia, high-bandwidth IP services. However, deregulation's growing footprint has opened up these emerging markets to new as well as traditional players. Any misstep may not only prove damaging – it could be fatal.

To succeed, carriers must now pave the way from today's voice-based business model to a new paradigm that facilitates tomorrow's multimedia services. Although a complete overhaul of existing voice infrastructures for new data-optimized architectures might seem the perfect antidote, this approach is virtually impossible from a business standpoint -- especially in today's capital constrained environment.

Clearly, while carriers strive to squeeze as much life out of their existing equipment as possible, they sorely need new-generation devices that can give them a smooth, gradual and – above all -- cost-reducing migration to a data optimized network of the future. Such products must support industry standards and enable carriers to integrate them seamlessly into existing networks. Intelligent optical switches have all of these attributes and are today's best solution to add more bandwidth to choke points, build out service areas and construct networks to support new services.

The Changing Telecom Marketplace

Once stodgy and staid, telecommunications services are now the computer industry's most volatile segment. As desktop computers become more powerful and local area network performance rises, the need for high-speed WAN connections to support businesses and consumers is clear and present. Throughout Europe, carriers are running fiber close to office parks and outfitting residences with multi-megabit per second links. The Internet is the driving force behind this dramatic continental rewiring, and even as the dotcom shakeout winds down, carriers are busily rolling out new ATM, DSL, Ethernet and cable modem services designed to deliver more graphics, video and interactive content to customers.

The deployment of broadband links in the access network (between the customer premises and telcos' local exchanges), has fostered dramatic changes in core networks. Since this is the spot where all of the new transmissions are funneled, carrier core

networks are experiencing unprecedented bandwidth growth, with quarterly increases of 30 percent and annual boosts of more than 100 percent becoming common.

While core networks need more bandwidth, carriers are often hamstrung in building a business case that outlines how to pay for these investments. On the plus side, data service revenue is rising between 20 and 30 percent annually, so there are opportunities to build a viable business. However, these gaudy numbers have attracted a growing legion of competitors. As more and more countries deregulate and open up their markets, venture funded start-ups as well as ambitious entrenched suppliers armed with grandiose business plans have been attacking new data opportunities. The glut of suppliers has forced carriers to shave service pricing, which has reduced margins and pinched profitability.

Legacy Limitations

As a result, management has put new network expenditures under the microscope. Carriers need products that can deliver immediate cost and revenue benefits today as well as a growth path toward the future. To date, many telecommunications service providers have relied on legacy SDH equipment in their core networks. However, its limitations are becoming more pronounced – especially with the influx of data traffic. SDH technology was designed to deliver a solid voice communications infrastructure at a time when network upgrades occurred in a slow, steady, predictable fashion. With unpredictable data traffic driving dramatic increases, established carriers find themselves in a reactive mode, frantically trying to upgrade distinct links to keep pace with customer demand.

With legacy systems, carriers have difficulty delivering services in an end-to end fashion. Since these networks are composed of distinct links, each must be separately provisioned, a manually intensive, time-consuming, inefficient and operationally expensive process. The same is true once a connection has been installed. Rather than examine end-to-end performance, network technicians must tinker with individual links to pinpoint troublespots.

With all its benefits, the Internet-driven bandwidth boom is now taxing carriers' operations staffs' abilities as they race to meet customer demands for more capacity and new services. Hiring additional technicians would speed service deployments and provide more hands for pinpointing network problems, but, due to the tremendous operational expense this would incur, is not viable in today's business climate.

Three Step Migration Plan

Carriers' only solution to these problems is to move from a legacy network to a more automated, data optimized network -- but they can't do it overnight. Instead, they must make a migration that maintains their current services and revenue streams without straining their technology or financial resources. This phased in approach can best be implemented in three steps: traditional, transitional and data optimized.

The first step starts with strategically positioning intelligent optical switches into carriers' existing networks. Leveraging these systems support of industry standards, (OSPF and MPLS), carriers can easily integrate them into their networks and utilize them like a Digital Cross-Connects (DCS) or an ADM to relieve congestion in network pressure points.

Such an approach offers many immediate cost and operational benefits. Optical switches have a much smaller footprint than DCS equipment. The industry leading DCS up to 64 STM-16 ports in over 20 line bays, compared to an intelligent optical switch that provides the same port count in a half of a line bay. The difference in density leads to dramatic floor space savings of 90% or greater in most configurations. Since Central Offices and Points of Presence are often in metropolitan areas, the lease savings can be significant and the change opens floor-space for the collocation of equipment from a range of partners. The reduction in equipment results in less power consumption, which cuts a carrier's energy consumption.

As the carrier installs more intelligent optical switches to replace legacy equipment and further reduce operational expenses, it can then move to the transitional phase and begin to realize the automation benefits the new products offer. Unlike legacy equipment, intelligent optical switches are network aware. This means they monitor the network condition in real-time, and make automated provisioning and restoration decisions based on those events. These capabilities insure maximum operational efficiency without incurring operational expense.

A second advantage of automation is service delivery speed; because plotting a route between two end points is no longer a manual process, services can be delivered rapidly, which improves customer satisfaction and decreases time to revenue. The net result is manual network operations requirements fall, so a carrier can cap or cut its operating costs while concurrently improving network performance.

Reaping the Benefits of Data Optimized Networks

In the third phase of integration, carriers utilize their intelligent optical switches to create a data-optimized network. With their high degree of automation, these products will eliminate most of the costly manual tasks that network technicians perform with legacy equipment. The resulting network will be simpler to manage because it will consist of a single, integrated data transport mechanism rather than a mix of voice and data protocols.

With this new automated infrastructure in place, carriers have the flexibility to keep pace with wildly fluctuating, unpredictable bandwidth requirements. Intelligent optical switching gives service providers the ability to instantly provision a lightpath across multiple optical network segments. If a customer wants to deploy a high bandwidth Gigabit Ethernet service, between two main hubs, the provisioning process can be completed simply in minutes, rather than weeks or months it takes over traditional networks. As an added bonus, the service can be provided for a limited duration, to

support a specific business requirement; thus avoiding entirely cumbersome, multi-year commitments that are often required for high bandwidth services today.

The new data optimized infrastructure also is designed to support the rapid deployment of advanced services, such as tiered restoration options, flexible private line services and multiple types of Service Level Agreements. It additionally places carriers in a position to design unique services and target specific customer segments, which in turn helps defend margins and increase profitability and competitive differentiation.

With competition intensifying, carriers' long term survival depends on three factors: their ability to reduce operating expenses, their capability to deliver bandwidth quickly and their introduction of a wide array of differentiating services. Legacy networks and voiced-based business models are unsuited for these tasks; data optimized networks are designed specifically to fulfill them. By migrating to a data optimized infrastructure in a strategic, methodical manner, carriers can avoid the perils of obsolescence and put themselves on a path to long term viability that will allow them to capitalize on the opportunities of their rapidly changing marketplace.

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