

## **Prospering in a Dynamic Telecom Environment**

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### **Abstract**

*Demand for network capacity, broadband technology, the Internet and rising end-user expectations are dramatically transforming the telecom landscape. Within five years, most network traffic will be data. The shift from circuit-switched to broadband networks needs to be driven by business considerations. The cost of a poorly managed transition will be high. Carriers must modernise existing operations, retain valuable customers and grow revenues. Simply enhancing legacy systems will not bring success.*

### **The New Telecom Landscape**

Broadband technology, the Internet and end-user expectations are dramatically transforming communications around the globe. As computing technology and information have become ubiquitous and enabled new services - some of which were not envisioned in the early 1990s - end-users have undergone a change in what they value most. The ever-growing demand for increased network capacity and flexibility to deliver these services is forever changing the telecom landscape. As a result, senior managers in the telecom industry are faced with significant decisions concerning the transition to broadband networks capable of delivering high-value communications services. Failure to do this means falling behind in the marketplace. In addition, the interaction of broadband networks and the Internet is creating changes in the traditional network and Operations Support System (OSS) architectural frameworks and assumptions:

- o The core network can start at the customer location for all segments (residence, small/medium business, enterprise); because of mobile access, the customer location will be where the customer happens to be.
- o Devices and gateways at the customer location can define service capabilities; customers will be able to buy these devices and gateways at retail outlets.
- o Connection of these devices and gateways to the network (motivated by cost effectiveness and speed-of-delivery) is established through "do-it-yourself" installation over the Internet.
- o Multiple services can be delivered in the data stream through one gateway

Because of a variety of choices available to customers, successful companies will need to: (1) establish support for customer mobility and service portability; (2) provide flexible billing (varied pricing strategies, bundled offers, special offers), electronic billing and bill payment; (3) allow customers to control consumption of various services and (4) assure Quality of Service (QoS), performance, and security.

Today, circuit-switched voice telecommunications traffic is about half of the total network traffic and is growing at a rate of six to nine percent per year. Data traffic is predicted to grow anywhere from 45 to 100 percent per year over the next ten years. One thing is certain - within five years, data will comprise most of the network traffic.

In the past few years, the cost of packet technology has fallen significantly and continues to follow Moore's Law (costs of processing power decline as power increases). From both network topology and operations perspectives, packet networks are far less complex than circuit switched networks and can better support the rapid introduction of new services. Advanced optical fibre technology has reduced transmission latency, making packetised voice-communications possible. Introduction of softswitches

makes the data infrastructure even more compatible with voice quality-of-service requirements. In this new environment, it makes more sense to carry voice traffic on a data optimised infrastructure than the other way around.

The implications of this dynamic environment are:

- o Competition will hasten the commoditisation of circuit-switched voice services and reduce revenue from the public switched telephone networks (PSTN). Successful service providers will be those who drive down PSTN operating costs dramatically.
- o Carriers will grow new revenue streams by moving up their customers' value chain into applications and content services.
- o Technology and deregulation will continue to lower or eliminate economic barriers to competition.
- o The combination of the need for low-cost networks and operations and services will accelerate convergence to integrated, "connectionless" broadband data networks.
- o Service providers will deliver content by connecting to the networks of trading partners. No single carrier will have the network reach or applications to provide - by itself - all services needed by large businesses and by mobile employees/consumers.
- o Operations solutions must support these services and networks.

### **The new telecommunications model**

The shift from a narrowband, circuit-switched communications infrastructure into a converged broadband network has to be driven by business and financial considerations. The cost of an unplanned and unmanaged transition will be very high and will negatively impact stockholder value.

The drivers for transitioning networks will be competition, services, and cost efficiencies. Competition will be across all segments - consumer, small/medium business and large business. Broadband access technology will be deployed where it provides a competitive advantage to acquire and keep strategic clients and grow revenue. In the residential market, there are many households that will change carriers as competition and technology enable more attractive services at lower prices. Small/medium businesses are interested in basic voice services, managing their communications costs, and data services that support e-commerce. Competition for the top 25 percent of this market is accelerating. In the large-enterprise market, there is a large and growing demand for virtual private networks and managed IP services.

A carrier's ability to efficiently manage inter-operability between the PSTN and the data network in the next decade will be of paramount importance due to the need to maintain quality customer service. Consequently, it will be essential to plan transition strategies that enable seamless inter-operability between PSTN and broadband services and respond to demand for profitable new services.

A logical transition approach, therefore, is to:

- o Establish packet access to transport data, voice and video services over the "last kilometre" to targeted customers.
- o Stay on packet throughout the network for customers who have packet access (avoiding packet-to-TDM and TDM-to-packet conversions), using soft-switches for call control and routers and/or Asynchronous Transfer Mode (ATM) switches in the backbone.

- o Extend softswitches to provide flexible, open hardware independent services control and services development layers to handle new data and mixed media services in the future.
- o Extend operations processes and OSSs to manage the new infrastructure and services.
- o Introduce "Customer Self Service" by integrating the new data infrastructure with web-based access for self-ordering and inquiries, improving customer care while reducing call centre staff personnel.

The emerging environment portends significant changes for large carriers if they are to survive and thrive in the face of reduced PSTN voice service revenues. In general, they will get more revenue from wireless and data services, pursue new sources of revenue, dramatically decrease PSTN capital and operating costs and minimise customer churn. Specifically, they will:

- o Focus on voice-over digital subscriber line (VoDSL), as a pair-gain opportunity to achieve significant capital and expense reduction.
- o Move customer contact onto a web environment.
- o Accelerate rollout of data services (transport and value-added services) to large businesses.
- o Enhance wireless functionality by providing "sticky" services that integrate with capabilities within the broadband networks.

The application of VoDSL can provide significant savings for the service provider. A small business with five lines could be converted to a single pair using VoDSL, thus freeing four circuits for other customers. By aggressively pursuing this implementation in congested areas, the service provider may be able to avoid installing additional cabling and switching capacity, in addition to providing more rapid service to new customers.

The diagram above describes the projected operations cost reductions for North American carriers inherent in a converged network infrastructure. Caribbean and Latin American carriers can achieve similar reductions .

The changes in the business environment described above are already beginning to take effect and will continue to accelerate for the foreseeable future. Following are some of the operational characteristics required to support this evolving environment:

- o Auto-Discovery and Configuration of Customer Provided Equipment (CPE) are essential. The alternatives (customer contact, service representatives establishing service orders, etc) are time consuming, costly, and undependable.
- o Auto-Inventory of the Network is needed to manage effectively the inventory of elements and services. Caching and propagation of multiple copies of inventory databases are being implemented in the Internet to provide timely, accurate views of network resources and capacity.
- o Service Level Agreements (SLA) and QoS Management will be key service differentiators and need to be supported through appropriate measurements, reporting capabilities, and targeted proactive corrective actions
- o Policy Based Management policies must be translated into specific actions in the network
- o Customer Self-Service via service portals must be established to allow the customer to order service,

monitor service, report troubles, track status, control the volume of services used, and monitor associated billing.

- o Carrier Inter-Enterprise Network Management is needed to enable a carrier to request capacity and monitor services from another carrier, detect interoperability problems between networks; manage capacity to take into account the bandwidth needs for services and to determine whether this bandwidth is present or absent.

- o Flow-Through of Key Business Processes between service providers is required for rapid service fulfillment, proactive service assurance, integrated dispatch.

- o Integrated Services Management capabilities are required to manage services in an integrated fashion; for example, managing integrated access to support multiple services; sharing data about customers, network and services.

- o Statistical Bandwidth Management will support the dynamic allocation of bandwidth across networks and provide information used to support traffic engineering.

- o Mobility Management - support mobility-based network technologies such as wireless, number portability, remote access to Virtual Private Networks (VPN); support the exchange of service related management information.

## **Conclusion**

As regulatory mandates take effect across the Caribbean and Latin America region and competitive pressures intensify, incumbent carriers must modernize their existing operations while at the same time developing strategies to retain their most valuable customers and grow revenues. The rising demand for services that be can best supported on a converged network will provide a trigger and roadmap for both network and operations transition. Enhancing legacy networks and processes will not provide the answers needed to assure a carrier's future success and prosperity.