

Mexican Telecom Carrier Sets DWDM Speed/Distance Record Using Italian System With RadiSys SBC Inside

Facing a monthly growth rate of 400,000 subscribers, wireless telephone carriers in Mexico scramble to meet demand in a timely, efficient and cost-effective fashion. One major commercial carrier-Bestel-leads all competition with a superior fiber-optic network featuring a Pirelli DWDM system running a RadiSys embedded computer.

INTRODUCTION

Mexico encompasses a large geography-1,972,550 square kilometers, the third largest nation in Latin America-with an estimated population of over 95 million persons with an annual growth of 1.96 percent. Telecommunications in Mexico is a highly developed system undergoing expansion and privatization. The Mexican telecommunications market is growing at double-digit speed spurred by industry deregulation which has created heated competition in the long distance, local, wireless and value-added services sectors.

In December 1990, Mexico sold its state-owned telephone system-Mexico Telephone or Telmex-to private investors. However, customers continued to complain about delays in contracting operators, installing new phones, and receiving service upgrades. Three years later, Telmex launched a US\$30 billion modernization program. Analysts expected Mexico's US\$6 billion

long-distance telephone market to continue or exceed its 14 percent annual growth rate predicated upon increased telephone communications between the U.S. and Mexico. Almost 13 percent of all international calls from the U.S. were made to Mexico, while more than 90 percent of all long-distance calls from Mexico were to the U.S.

By 1995, the Telmex network had some 8.7-million telephone lines in service. This wireline density of only one telephone line for every 10 persons was attributed in large part to weaknesses in Mexico's public network infrastructure. This ratio was a major contributor to the huge pent-up demand for wireless service throughout Mexico. That potential grew into reality in a hurry. By December 1998, Mexico boasted 3.3 million wireless subscribers. By mid-1999, that figure soared to 5.4 million. If the rate of growth holds, Mexico will have more wireless phone subscribers than wireline phone subscribers by the end of 2000. However, the volcanic expansion to wireless has not been implemented without considerable cost.

In September 1999, Mexico's Communications Minister called for carriers to quickly and efficiently correct problems exacerbated by the way wireless service was initially implemented. His call for action by carriers requires quicker expansion of cellular systems and a switch to higher-capacity digital technology. The hoped for result is the ability to serve an expanding monthly growth of some 400,000 new subscribers.

Initially, wireless service was made available in as many markets as possible to a vast population scattered throughout various massive mountain ranges, spread helter-skelter on an interior high plateau, and saturating the coastal lowlands. Caught unawares by sheer volume of the explosive demand for wireless, carriers opted for quality and reliability versus simply putting up systems, especially in high-usage areas, merely to service demand.

DIFFERENTIATION IS ESSENTIAL

Bestel is a Mexican Long Distance company that provides National and International telecommunication services in Mexico offering customers the highest

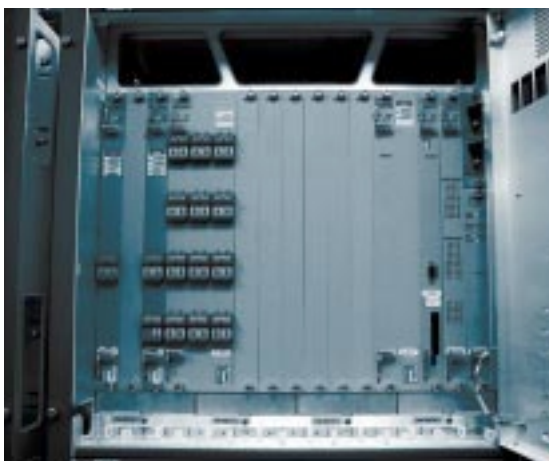


Figure 1. Bestel, a Mexican long distance telephone carrier, recently set new dense wavelength division multiplexing (DWDM) speed and distance records.

The carrier used Pirelli WaveMux 6400 DWDM systems boast a RadiSys single board computer featuring an Intel Pentium P-133VRT processor and chipset, CompactFlash, PCMCIA interface, Ethernet and dual EIDE channels. The RadiSys SBC is hot pluggable.

value business solutions of for their voice, data and video needs. Created through a strategic alliance between Grupo Varo (51%), based in Guadalajara, and Global Light Telecommunications (49%), a publicly traded company in Vancouver, British Columbia. Bestel was granted a concession to install and operate a telecommunications public network in Mexico in January 1996.

Bestel was the only Mexican carrier to obtain and utilize the national railroad rights-of-way for construction of its fiber-optic network. This differentiation gives Bestel significant security and cost advantages over competition. Use of the railroad rights-of-way and advanced construction techniques enabled Bestel to deploy its network throughout Mexico and within major population centers at much lower costs than others. The network runs from Nuevo Laredo Tamaulipas at the US/Mexico border southward nearly 2300 kilometers through Mexico's major business and population centers including Mexico City, Guadalajara and Monterrey.

In 1997, Bestel USA was formed and the FCC granted it a 214 license to offer telecommunication services in the USA and worldwide. Bestel's network connects Mexico with the USA through its fiber optic border crossing between Nuevo Laredo Tamaulipas, and Laredo, Tx. From its point of presence in Laredo, Tx., the Bestel USA network continues to San Antonio, Texas, from where it connects to multiple carriers in the USA and worldwide.

NETWORK

Bestel's network is state of the art setting a new standard in telecommunications. It is based on a three-conduit, hermetically sealed, buried cable system. The fiber is a 60 strand, Corning Glass cable capable of supporting speeds of 2.5 Gbps and utilizing DWDM technology. The fiber has been tested to achieve losses of no more than 0.2 dBs per kilometer and has splicing tolerances of no more than 0.03 dBs per splice, guaranteeing high quality transmission.

Bestel has deployed 3 high capacity switches in Guadalajara, Mexico City, and Monterrey, each capable of handling up to 64,000 lines simultaneously. Supporting the network is an ATM-based data management system integrated with the Network Management Center that provides 7/24 network monitoring, testing and maintenance.

Bestel has full redundancy metropolitan fiber rings in major cities along its network. Wireless systems are designed to complement fiber coverage and provide "last mile" access. Bestel has two point-to-point frequency licenses in the 23 GHz spectrum, with bandwidths of 56 MHz and 100 MHz respectively and four Point-to-Multipoint licenses in 10.5 GHz, with two more for partial use each with 60 MHz total bandwidth. Bestel can link customers requiring large capacities (over STM-1) with fiber optic cable.

In June 1999, Bestel announced that it will construct an additional 1800 kilometers of fiber from Guadalajara, North on the West Coast to Mazatlan, and across the center of Mexico. Bestel also will cre-



Figure 2. (see Figure 1)

ate another redundant fiber ring within the network connecting through Torreon to Monterrey. When the 4100 kilometer network is completed, Bestel and Telmex will be the only carriers in Mexico capable of providing fiber optic communications services in the western and central sections of the country.

EQUIPMENT IS KEY

By recognizing the crucial role that telecommunications play in business transactions, Bestel will use its high-capacity, low-cost network to position itself as the carrier's carrier of Mexico targeting high volume business users and other communications companies for domestic and international services. When it initiated service in Mexico in September 1998, Bestel negotiated inter-connection with Telmex; completed successful testing of the SS7 signaling network; obtained an independent network quality certification, completed Inter-carrier International Agreements; and passed testing of its Carrier Access and Customer Billing Systems. Hector Carlos, Bestel vice president of Sales, said, "Bestel provides a range of switched, dedicated and co-location services providing carriers, wholesalers, and corporations with world-class service and customer care.

According to Interactive Week, Bestel sent optical data at 10 gigabits per second over two fiber spans, each covering a distance of nearly 180 kilometers, without Synchronous Optical Network signal regeneration using a Pirelli WaveMux™ 6400 Dense Wavelength Division Multiplexing (DWDM) System. This accomplishment caused Pirelli to claim a new speed and distance record for Dense Wavelength Division Multiplexing networks. Pirelli, perhaps better known for their tires, is a manufacturer of fiber optic cables and optical networking equipment. ■