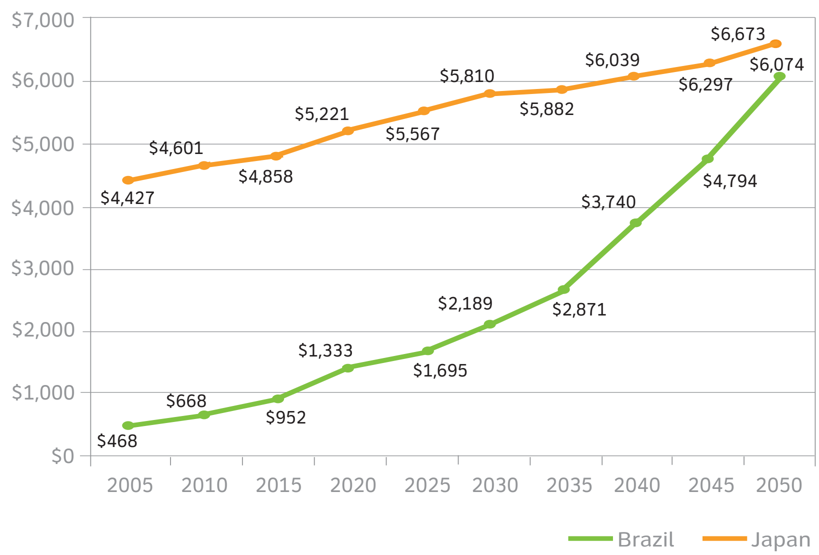
NETWORKING IN

# Brazil…Poised for Strong Economic and Infrastructure Growth

As the world's 9th largest economy, with a GDP of almost U.S.$1.5 trillion (2004 estimate) and a growth rate of 5.1%, Brazil is the largest economy within Central and South America. Brazil's geographic location halfway between Europe and Asia allows enterprises to tap into Asian, European and American markets for partners and customers. These facts make Brazil an attractive country for multinational investment and expansion. As the international and regional ambitions of large companies expand to Brazil, CIOs will be impressed by its infrastructure, particularly in and around Sao Paulo, skilled workforce and political environment. However, they should be cognizant of the inconsistencies in infrastructure beyond the major metropolitan areas and English language proficiency across the country as well as the complexities of doing business in Brazil. This paper provides an overview of the Brazilian communications and networking market and highlights some areas worth special attention as managers plan for doing business in a market that potentially could become one of the largest in the world.

**GNP Projection**




*Figures in 2003 US Billions*

*Source: Goldman Sachs "Dreaming With BRICs: The Path to 2050" 1 October 2003*

### Economy Size and Potential Make Brazil a "Must Have" Country on Many MNCs Expansion Lists

Due to the size of its economy, relative size within the region, geographic location and cosmopolitan history Brazil has appeal to multinational corporations as a domestic market as well as a hub for regional expansion. This is demonstrated by the fact that Brazil has been a major trade and business partner of Global 2000 companies for decades.

Turbulent at times, as many emerging markets are, Brazil nonetheless is often classified as a component of the BRICs (Brazil, Russia, India and China) economies. Grouped together, the BRICs economies could be larger than the G6 economies in less than 40 years, with Brazil itself potentially equaling Japan's economy by that time. Therefore, the appeal of Brazil as a market for foreign investment, should also lead to future infrastructure development.

Achieving these heights is going to be a function of Brazil continuing its recent period of economic and political stability. For now, one study projects annual GDP growth rate of approximately 4% over the next 40 years. Strong signs today are Brazil's stable exchange rate to the U.S. dollar with the local currency (real) getting stronger. Other encouraging signs are a stock market index that is at an all time high of 30,000 in late 2005, and unemployment at its lowest level since March 2002.

### Fundamental Strengths in the IT Environment

CIOs looking to develop operations in Brazil will be attracted to a good supply of IT workers, well-developed infrastructure in Sao Paulo and other major cities, a

### Top Networking Facts

- **Mobile penetration is moderate: 41.1%, second to Chile in South America**
- **Teledensity is low: 21% (higher than SA average of 17%); only 38.81 million main lines in use; growth is stagnant**
- **VoIP is legal in Brazil: Accounts for 36% of international calls; regulation expected in early 2006**
- **Broadband is growing quickly: 2.93 million broadband users (13% of all internet users)**
- **Wi-Fi is widespread: Nearly 800 hot spots (primarily in major metropolitan areas)**
- **Top IT schools are in top IT cities: Campiras, São Paulo and São Jose**
- **One telecom regulator: Agência Nacional de Telecomunicações (Anatel)**
- **CIOs exist across industries: CIOs are standard; IT managers are primarily in financial, utilities, communication and health industries**
- **ADSL is most popular: Accounts for 84% of the country's broadband market**
- **English proficiency is growing: Number two language in Brazil, English is taught in most schools**

deregulated telecom industry and a culture of buying and selling IT solutions. Some of the challenges CIOs may face in Brazil are the infrastructure, stability of electric power supply and degree of English language proficiency outside of major metropolitan areas.

Some purely IT and telecom characteristics are encouraging. IT investment, at 12 percent of the total foreign direct investment of $22 billion, is expected to stay in the 8 percent range, according to IDC. While the IT industry still shows signs of immaturity, (as demonstrated by the fact that hardware sales outpace sales of services by about 10%) the sales of IT services are expected to overtake and exceed hardware sales in the next five years.

Another measure of the progress made in Brazil is CIO Magazine's recent Global Outsourcing Report (March 2005) which ranks Brazil 15th on the global opportunity scale. This ranking is attributed to economic stratification issues, infrastructure reliability, English language proficiency and political stability as a Latin American country. Despite this relatively lower ranking the Global Outsourcing Report states that companies are outsourcing to Brazil today such as GE, Goodyear and Xerox. Looking forward, the report found Brazil to be a promising destination, ranking it fourth in 2015.

## Infrastructure in Brazil

An important factor to understand about Brazil is that it is a country of divisions. Geographic, financial, social and technological issues can describe the divide, the primary example being Sao Paulo compared to the rest of the country. Sao Paulo – the state and the city – account for 3 million of the 5.3 million Brazilian enterprises of which small and mid-size businesses make up 99.3 percent. Of Brazil's population, 45 percent live in the southwest – meaning half of the country lives in and around Sao Paulo state. The region accounts for 60 percent of Brazil's GDP.

Infrastructure issues in Sao Paulo and other major metropolitan areas are similar to the ones that haunt CIOs in some of the largest IT economies like the U.S. – now that the networks are there and the technology is available, how does an executive guarantee these facilities deliver the most optimal balance of value and efficiency?

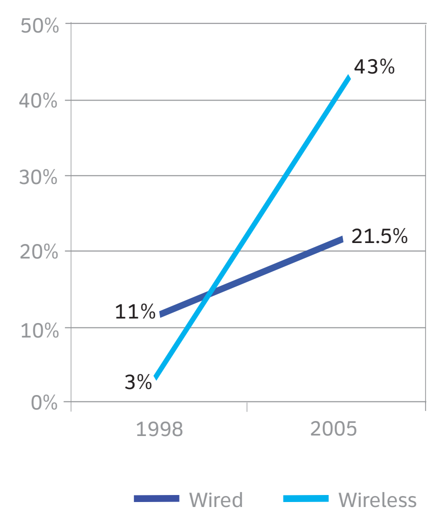
## Telecom Trends

In telecom, the two big trends Brazil is riding are broadband and mobile growth. Mobile penetration has exploded; part of the reason is that it was the first form of telecom venture that was deregulated. Another important factor is that Brazil's wireline penetration is seriously lagging. This is because the company was deregulated relatively recently and private enterprises did not have the time to catch up from decades of underdevelopment. The country's teledensity hit 21.5 percent in 2005, according to Helio Costa, current minister of communications. This is nearly a doubling, on a percentage basis, from 11 percent in 1998. In number of subscribers, this means that over the last seven years the number of Brazilians with fixed line dial tone increased from 18 million to 42 million.

Growth of mobile subscribers is even more significant, with the mobile subscriber base jumping from 3 percent penetration to 41 percent.

In 2005, the number of mobile phone subscribers overshot the number of fixed line subscribers by more than 50 percent (65 million vs. 40 million), according to IDC. This growth is attributed mostly to prepaid mobile services. With the overall mobile telephony penetration going from close to zero to over 40 percent by 2004, post-paid mobile telephony growth failed to ignite. While initially – in 1999 – post-paid accounts stood for 98 percent of the market, that proportion did not hold. By 2000, postpaid services accounted for 73 percent of the market, but the projected fast growth over the next few years pre-paid subscribers are expected to make up 82 percent of the market by 2006.

**Brazilian Teledensity Growth**

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This movement was happening in a market of explosive mobile subscriber growth, with subs going from just under 20 million in 2000 to around 45 million in 2004 and projections putting the total subs at 70 million in 2006.

Similarly, broadband growth is explosive; there are 3 million broadband subscribers in 2005 – more than a three-fold increase from the 700,000 broadband subscribers in 1998. The Internet had 22 million users in Brazil in 2005 according to Computer Industry Almanac, or approximately 12.3 percent of the population, up from 5 million in 2000. As is evidenced by the broadband growth rate, these end users are rapidly migrating from dialup to broadband. Even though Brazil is sophisticated when it comes to different types of communications infrastructure – cable companies are common, and so are satellite-based broadcasters – ADSL (asymmetric digital subscriber line) dominates when it comes to types of broadband. This is consistent with other growing markets. A recent report by Paul Budde Communications found 84 percent of all Brazilian broadband users were using ADSL.

Additionally, broadband growth appears to go hand in hand with VoIP penetration. The same report discovered that 36 percent of long distance calls in Brazil were made using VoIP in 2005, an eye opening statistic for incumbent telecom providers.

### Telecom Deregulation Nearly Completed

All dominant telecom players in Brazil have come out of the national PTT organization that was called Telebras in a divestiture process that has stretched out over a decade. This approach was adopted by Brazil to allow maximum competition to develop with the least pain possible. As of late, 2005 Brazil's telecom industry is almost completely deregulated. The fixed line market is operating in an environment where three players effectively control the local market in three different Brazilian regions. These players are Telefonica (the dominant player in Sao Paulo), Brasil Telecom (West and South), and Telemar (North, Northeast and Southeast). Embratel is the biggest carrier of long distance and international calling. However, the LD market is very competitive with many other carriers competing in this market. (e.g., Intelig, Telemar, Brasil Telecom and Telefonica)

With the phenomenal penetration of VoIP, one of the most contentious issues facing Brazilian regulators right now is deciding what to do about VoIP's growing popularity. Guidelines of Anatel, Brazil's ministry of telecommunications are at least indicative that it is inclined to view VoIP as a technological phenomenon. The three predominant technological views of VoIP include transmissions PC to PC, within telecom networks and via CPE routers of various kinds. The current perspective is that PC to PC, mostly a hobbyist and early adopter way of calling, is not going to be taxed or tariffed; the same approach is reserved for carrier-specific use of VoIP considering it another technology used to move traffic. When it comes to last mile VoIP deployment – Anatel is taking a different view, seeing it as a telecom service and is leaning toward regulation. Nevertheless, this has not happened yet.

### Sao Paulo, Where Business is Done

An economy within itself, Sao Paulo is an address of choice for most international enterprises' headquarters looking to operate in Latin America. Along with this status come educated and trained workers, competitive telecommunications market, choices in IT services and equipment suppliers.

Sao Paulo is a regional hub where enterprises such as Whirlpool and Johnson & Johnson have set up their operations to service the South American continent. Whirlpool, for instance, manufactures a number of its products in Sao Paulo area – products like oven ranges – for sales on the subcontinent and for export to the U.S.

Workers available in Sao Paulo often speak English and, as far as their IT training goes, display solid skills. While English is not a widely-spoken language throughout the rest of Brazil, research like CIO Magazine Global Outsourcing Report found that Brazilian IT managers have good project management skills, excellent technical and managerial backgrounds and special talents when it comes to application development and maintenance. IT and business training seems to be on par with some of the best international IT outsourcing destinations (e.g., China and India). Employment law is more rigid than American "at will" practice, but is not as stringent as in some European countries which have mandatory benefits and termination bonuses. Brazil is not the lowest cost country in terms of labor though – an average pay in IT is higher than in Russia and India.

Important for any IT operation, Sao Paulo is a competitive telecommunications hub with a number of service providers offering rival services to connect locations of enterprise customers and enable back office and telecommuter strategies. CIOs deploying service here are looking at locations – large and small – within the footprint of a very large metropolitan area and within a well-developed state. E1 prices for metropolitan cross connects are reasonable, starting around $100 a month over some of the smallest distances and scaling up to $5,000 to $7,000 a month. DSL, as mentioned above, is popular with small and mid-size businesses. Finally, there are local integrators of security devices like firewalls and secure services like IP VPNs available from local and international service providers.

There is a disparity between telecom infrastructure in Sao Paulo and the main Brazilian cities, the rest of Brazil and for that matter the rest of Latin America. For instance, John Von Stein, EVPN and CIO of Options Clearing Corp. found, while working as a Vice President of IT for Cargill, that creating an extranet between a manufacturing site beyond the Sao Paulo region and a supplier in Mexico was economically prohibitive. Even working with Embratel, which has the largest network across Brazil, Von Stein was not able to secure the bandwidth and connectivity both in Brazil and Mexico cost-efficiently. Instead, he routed the traffic through Sao Paulo and Miami.

### Other Non-IT CIO Challenges

Issues that CIOs face in Brazil go beyond infrastructure. As mentioned above, corporate taxes are higher than in other countries. However, few executives realize that it is not the amount of taxes that they need to worry about, it is what is taxable. "As an example, moving a desk from headquarters to another building could trigger a state tax on circulation of goods if it is not done the right way," said Lionel Bonner Nobre, Director of BDO Seidman, LLPs Brazilian Consulting Services and Latin American Tax Services Practice Leader.

One of the challenges of Brazil's current administration is to keep taxes and tariffs at a level that keeps the country attractive to businesses operating in Brazil and those considering the Brazilian market. Brazil often imposes import tariffs on products that may be similar to those manufactured in Brazil. An international provider of agricultural products, for instance, found that client software the company was using worldwide would be too expensive to use under the current tariff schedule. The enterprise switched over to a Brazilian product as a result. This policy could be a concern because many organizations have worldwide contracts for IT equipment and these agreements may or may not be useful in Brazil. One of the benefits for Brazil of this policy is that it has been fueling foreign direct investment into the country as more companies are building manufacturing facilities here to qualify as Brazilian products.

Another positive for enterprises...although Brazil does present some security risks, the infrastructure risks are relatively low – practitioners like Von Stein say IT security threats including viruses and spam and were effectively contained with the usual technological solutions like firewalls and VPNs.

## Conclusion

Brazil is a thriving economy and a large market that is both attractive as a destination, and as a regional hub. Brazil's IT strength is best illustrated by an explosion in deployment of mobile phones, rapid penetration of broadband and VoIP technologies, falling prices on telecom services, and a stable political and business climate. In particular, Sao Paulo and the top 10-15 cities in Brazil offer a robust IT networking environment with skilled IT managers, a relatively competitive service provider market, and a well-developed infrastructure.

The future of Brazil's economy, points to significant opportunities for enterprises. It is clearly an economic engine for its region and CIOs and networking professionals should understand and recognize the challenges and opportunities to best position their enterprises for growth in Brazil.

### Networking in Brazil: Quick Facts

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|---|---|
| Telecom Deregulation Status | Agência Nacional de Telecomunicações (Anatel) is the main regulatory body; four local telephony companies operate in different regions of the country (Telemar operates in Rio, Minas, the Brazilian Northeast and the Brazilian North; Telefonica - State of São Paulo; Brasil Telecom Participacoes - the Brazilian South and the Brazilian Central Region; Embratel - largest long distance carrier in market) |
| National PTT | None (1998 deregulations and privatization of Telebras system); Telemar is the major player in terms of sales |
| Other Carriers | 51 companies licensed to provide fixed-line telephone services; approximately half are operating |
| Average Pay (USD) | LAN Administrator - $496 a month; CIO Equivalent - $48,000 per annum |
| Number of Internet Users | 22,320,000 (March 2005); 12.3% of the population |
| Internet Hosts | 3,163,349 (2003) |
| PCs (per 100 inhabitants) | 11.0 |
| Top Telecom Portals | www.sucesusp.org.br, www.cgi.b, www.teleco.com.br, www.computerworld.com.br, www.voipcenter.com.br, www.teletime.com.br |

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