SUMMER 2003 | VOLUME 3e
gl guide lines
CORNING

Leading the World Down the Broadband Path: The Asia-Pacific Region

John A. Jay, worldwide application engineering manager, Corning Optical Fiber
and
Michael Kunigonis, Jr, market development manager — Asia, Corning Optical Fiber

While broadband is becoming increasingly accepted throughout the world, Asia Pacific leads the pack. Broadband penetration levels and technology adoption rates are stunning.

According to In-Stat/MDR, Asia Pacific accounts for the majority of the global DSL market, with about 41 percent of all DSL subscribers in the world located in Asia. The Communications and Information Network Association of Japan (CIAJ) recently forecast 13 million broadband subscribers in Japan this year, a penetration of about 29 percent. Last year, South Korea led per capita broadband penetration worldwide, with slightly more than half of its households connected via broadband and about 8.5 million subscribers, according to "Wired.com" magazine. The Korea Herald has estimated that as of October 2002, there were about 10 million broadband subscribers, or about 21 percent of the total population of the country.

And while other Asian nations and territories may not have yet reached those numbers or penetration levels, they are surely compensating for it with staggering growth. Hong Kong's broadband subscriber level has more than doubled since a year ago, now up to 900,000 subscribers, and a recent study in Singapore showed an 84 percent increase from last year, up to 400,000 subscribers.

The People's Republic of China currently lags behind many of its Asian cousins (as well as several western nations); however, it has set an ambitious path for itself. The Ministry of Information Industry (MII) has set a target of 200 million Internet users by 2005, with the expectation that approximately 30 percent of them, or about 60 million subscribers, will have broadband connections.

When comparing Asian broadband deployment and acceptance rates to other Western nations, particularly the U.S., there are obvious disparities in infrastructure, size and population characteristics that lend themselves favorably to Asian broadband deployment. However, there are some unique differences in market drivers, technology, government and cultural influences that have played important roles, also.

In Asian nations (as well as many European nations), high population density in urban centers creates shorter subscriber loop lengths (Figure 1). Network construction in South Korea or Japan, for example, is advantaged by the concentration of population in a few urban centers and within multi-dwelling units (MDU). Not only do these shorter loop lengths lower system cost by reducing cable and hardware requirements, they may enable alternative solutions outside of broad, common system designs developed by standards bodies.

However, there is a significant technology adoption difference also – cable modem v. DSL – between most Asian broadband nations and the United States that is not explained by population density. The U.S. has notably high cable television penetration relative to the rest of the world. In fact, it's not significantly lower than U.S. telephony penetration: 106.5 million homes have a telephone, and 98.6 million are passed by CATV.

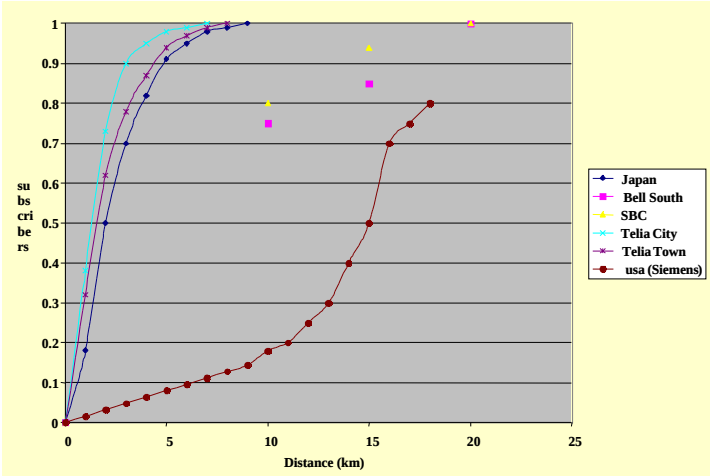

Figure 1 – International subscriber access loop lengths. These data come from a variety of public sources, including submissions to IEEE 802.3ah, its Ethernet in the First Mile project.

This helps explain the large lead — nearly 2:1 — cable modem has over DSL as a broadband connection technology in the U.S., an arrangement unique to North America and the United Kingdom. However, nations with leading per capita broadband deployment have seen greater DSL adoption than cable modem. Japan and Korea, for example, have almost a 2:1 lead for DSL.

Another distinct characteristic of successful Asian broadband nations is national broadband policy. Successful broadband nations both within the Asia Pacific region and outside it have made broadband deployment a national priority.

Broadband Worldwide

Cahners In-Stat sees FTTH installations increasing at a rate similar to fixed wireless, with several million subscribers worldwide over the next few years. Who is leading for FTTH deployment worldwide? Currently, only Japan reports these figures officially; as of March, the Japanese Ministry of Public Management, Home Affairs, Posts and Telecommunications reported more than 385,000 FTTH subscribers — at least double any other country in the world.

Closing on exact data is difficult for a variety of reasons. First, this is a small but rapidly growing application. Obviously the lack of "official" data creates uncertainty, added to

by the wide variety of sources that take the place of government data. Depending on when a "snapshot" of the data is taken, the reported number can vary substantially almost week-by-week. Finally, definitions cause confusion, such as homes passed vs. homes installed vs. active subscribers.

Broadband in Japan

Japan has developed a national broadband policy, derived from the Basic Law and managed by the Ministry of Public Management, Home Affairs, Posts and Telecommunications (MPMHAPT). The planks in the platform include nurturing high-quality human resources, facilitation of electronic commerce and government, and build out of Japan's infrastructure, with an objective to have high-speed access to 30 million homes and ultra-high-speed access (i.e., fiber) to 10 million homes within 5 years.

This is a daunting objective and the (MPMHAPT) set an aggressive schedule for deploying broadband technology to residential subscribers. Japanese industry has certainly responded to the challenge, exceeding projections for interim technologies like DSL and becoming the largest FTTH market in the world. In January 2001, Japan had 10,000 residential DSL subscribers. As of March 2003, Japan had more than 7 million, more than the United States. Compare this with about 2 million CATV broadband subscribers.

Asian language speakers -- the greatest number of them Chinese speakers -- account for about 28% of the total online population, according to Global Reach, an Internet statistics Web site. The number of Asian language speakers online is expected to nearly double in one year, from 179 million users to 329 million users.

While trailing the government's forecast, FTTH deployment in Japan is impressive by any worldwide standards. Several factors contribute to the rapid deployment of FTTH in Japan. In the network, short loop lengths reduce costs and increase flexibility for inexpensive technical solutions like Ethernet. Also, there is a large amount of dark fiber available in the feeder from installations by NTT (through active, government-mandated unbundled network elements, or UNE), power companies and the government for use by new entrants that lowers the capital requirements and reduces first cost of FTTH projects.

Commercially, service providers have various incentives for providing FTTH. NTT, facing reduced access line counts and local telephony income, seeks additional sources of revenue. On the other hand, cash-rich power companies, enjoying regulated consumer electric rates, need investment outlets for their capital.

In the market, "Speed is fashionable" as a Japanese colleague noted. Financially, metered dial-up Internet access that can cost $2/hour and high second-line charges can improve the value proposition of $50/month FTTH service.

A key point is that there is no direct government subsidization for FTTH in Japan. The government support is indirect, via assertive unbundling of NTT's network elements, making government dark fiber available for broadband networks and some construction-permitting waivers and rights of way assistance.

Broadband in China

There are several current-generation broadband technologies competing for the Chinese broadband subscriber today, all offering comparable performance between 512 kb/s and 1.6 Mb/s downstream. The largest subscriber base can be found in xDSL, clearly dominating the broadband landscape (and continuing to pull away from the rest of the pack) with more than 4 million subscribers at the end of 2002. As a next-generation broadband technology, fiber to the building plus local area network (FTTB+LAN) technology has more than 1 million subscribers. There are about a million subscribers connecting via assorted current-generation broadband technologies such as cable modem and WLAN, according to data aggregated from McKinsey, RHK, Bear Stearns and Park Associates.

The most significant growth is being seen in xDSL and WLAN technologies. FTTB+LAN is seeing moderate growth to-date. Estimates for overall broadband subscribers in China by 2005 range between a conservative 20 million subscribers to an optimistic near 60 million. Corning estimates are about mid-range, between 25 and 35 million subscribers. A competitive monthly subscription fee of $18 has contributed to the explosive demand of broadband in China.

According to a translation of the Tenth Five-Year Plan of China, from the Ministry of Information Industry (MII), "major cities will employ integrated broadband exchange that can accommodate the transmission of voice, data and images simultaneously." To encourage the establishment of digital venues as e-hospitals, e-government, e-school and e-commerce, the MII has set impressive national Internet and broadband objectives that will help position China as a leading provider of broadband in Asia.

Broadband in South Korea

An interesting broadband consumer phenomenon has occurred in South Korea over the past several years, which until recently saw much of its consumer broadband use occurring in Internet cafes, or PC *baangs*.

The *baangs*, which have a much more social function than most Western Internet cafes — younger generations of Koreans typically spend hours socializing at *baangs* and the socializing is centered around individual and group online game play — are generally given significant credit for the massive acceptance of broadband connectivity in Korea. Online games, in particular massively multiplayer online role-playing games (MMORPGs), are wildly popular in Korea, approaching national pastime status. Game play is even covered on national television. The games are generally bandwidth-intensive and typically require broadband connectivity to facilitate game play — PC *baangs* offer

this connectivity as well as a venue for socializing. [For more information on online gaming, including MMORPGs, see the Winter Issue of GuideLines Online.]

Ultimately, the popularity of broadband connectivity at *baangs* contributed to broadband adoption in Korean households, as consumers became accustomed to faster transmission speeds at the cafes and began to expect the same speed at home. Now, according to McKinsey & Company's 2003 report "Making Sense of Broadband," more than 8.8 million households in the country (or about 54 percent of the nation's households) had broadband access in 2002.

Broadband Throughout Asia and the Pacific*:*

- According to the Australia Bureau of Statistics, the number of broadband connections in Australia rose more than 47 percent from March to September 2002 to reach 350,000 subscribers. The number of DSL connections grew by 112 percent during the same period. About 3 percent of households have broadband access. Australia is most similar to the U.S. in its broadband growth and technology deployment rather than other Pacific nations or Asian neighbors. It has a strong cable modem market, growing apace with DSL, largely due to the heavy metro cable TV household penetration seen in the U.S. market. And, also similarly to the U.S., its still-young FTTH market is being driven largely by deployments by rural exchange carriers and municipalities, which hope to offer more advanced services to remote consumers perceived as having very few service and entertainment options compared with urban Aussies. For information on an exciting FTTH initiative in Victoria, Australia, read the Broadband Spotlight in this issue of GuideLines Online.
- The Institute for Information Industry of Taiwan reported that there were 892,000 Taiwanese broadband subscribers in late 2001, up from 145,000 in 2000 and 15,000 in 1999. By early 2002, Pyramid Research put the figure at about 1.6 million subscribers and project that about 76 percent of Taiwan households will have broadband connections by 2006.
- Hong Kong has doubled its broadband subscriber base in the past year, up now to 900,000 subscribers. And Nielsen/NetRatings estimates that at least 66 percent of Hong Kong households had broadband connections last year.
- McKinsey & Company estimates that as of mid-year 2002, more than 40 percent of the households in Singapore had broadband connectivity.

The Asia-Pacific region leads the world in per capita broadband deployment., with the success of high-speed connectivity in South Korea setting an exciting example for broadband advocates everywhere. Japan leads FTTH deployment worldwide by a sizable margin. Broadband growth rates are stunning in Singapore, Taiwan and Hong Kong. And forecasts for broadband growth in China are breathtaking, complementing the overall economic growth rates projected for that country. Individual nations and the region as a whole provide valuable benchmarks as broadband develops worldwide.

GuideLines Online Work Saver:
Let us save you time and effort — we did the work for you! Here are related links and additional data we found while researching this article.

- The Collaborative Optical Leading Testbed project in Victoria, Australia
- The Statistics Bureau of the Japanese Ministry of Public Management, Home Affairs, Posts and Telecommunications (En1`glish)
- The Statistics Bureau of the Japanese Ministry of Public Management, Home Affairs, Posts and Telecommunications (Japanese)
- Chinese Ministry of Information Industry (Chinese)
- Global Internet Statistics at Global Reach