

Broadband Wonderland

Nearly everyone in South Korea has Internet access that puts Americans' to shame. Result: This little nation could have a giant influence on the digital future.

The sky is the color of cement, hallmark of the rainy season in South Korea. For weeks, low clouds shroud the tops of Seoul's skyscrapers and make the seemingly endless clusters of nearly identical apartment buildings that radiate from the city's core appear even more monotonous than usual. It's as if one architect--a not very creative one--had been hired to design housing for most of the capital's 12 million inhabitants, a quarter of South Korea's total population. These residential hives typically ascend ten to 15 stories and are indistinguishable except for the large blue Samsung or pink LG logos painted up near their roofs. Why the advertising? It turns out that LG and Samsung, Korea's rival electronics giants, have construction subsidiaries that build the apartment buildings emblazoned with their logos.

Though visually uninspiring, the cookie-cutter buildings are totems of a bright and exciting future for little South Korea as it morphs itself into a force in the Digital Age. Nearly every one of the towers is woven with glass and copper wires that deliver high-speed, always-on digital communications--broadband--to some 75% of South Korean households. That is the highest per capita penetration rate of broadband in the world. In comparison, slightly more than 20% of homes in the U.S. have broadband connections.

Even those numbers don't do justice to the communications advantage Koreans enjoy over Americans; bit for bit and dollar for Korean won, ordinary households in Korea get faster Internet connections than all but the biggest U.S. businesses. Here in Seoul and in other large cities like Busan, broadband is as basic a utility as water or electricity and touches its citizens' lives in ways that are barely imaginable to most Americans. If universal broadband access is critical to the success of nations in the Information Age--something President Bush and his challenger, John Kerry, both say--the U.S. is lagging far behind.

Will America be eclipsed by an ally that is smaller in population than France? Hardly. But imagine a South Korea with as much influence over the future of communications as France has had over wine and cheese. The South Korean government expects pervasive broadband to increase industrial efficiency, create e-businesses and jobs, improve global competitiveness, and add the equivalent of several thousand dollars to per capita GDP (now some \$17,700 per year, vs. more than twice that in the U.S.). And by moving smoothly into making digital products, \$54-billion-a-year Samsung Electronics and \$30-billion-a-year LG Electronics have challenged the likes of Sony and Nokia as world electronics leaders.

Nor is Korean broadband restricted to wires. The air of Seoul is saturated with radio waves that penetrate into the city's modern subways and that deliver constant communications to cars creeping along the congested streets. When millions of South Koreans stream out of those apartment houses to start their notoriously long workdays, many of them are clutching a broadband mobile phone. (The government anticipates that 39.5 million Koreans--of a total population of 48.5 million--will carry broadband-enabled handsets by 2008.) Young people

festoon them with feathers or tassels and dangle them around their necks. The phones are for more than just talking: The mobile handset has evolved into an all-purpose multimedia device. Call it a universal remote control for daily life.

Hung Song, vice president of business development at Samsung, takes his broadband with him wherever he goes. On the drive home from work at 9 or 10 P.M., says Song, a tall, thin in-line-skating enthusiast, he uses the phone to check traffic. Because phone carriers can track the location of his third-generation (3G) phone to within a few meters, he has access to a location-based service that monitors real-time road reports and displays alternative routes around traffic jams. (The system also lets him call up a map showing the location of his children, who carry location-based mobile phones too.) If Song gets stuck in traffic anyway, he can always use the handset to watch television news, or go over his next day's appointments, or download music (Koreans spend more on downloaded music than they do on audio CDs). More likely, though, he'll do his banking or log on to his computer at the office to check e-mail. As Song drives his Renault Samsung sedan across the Yeongdong bridge, over the broad Hangang River that bisects Seoul, his phone buzzes as nearby restaurants automatically send text messages offering discounts to tempt him to dinner. Some restaurants even let him pay his tab by beaming a code from his handset to a scanner and punching in a PIN number.

"My life has changed" because of broadband, says Song, especially because of his mobile handset. "It's essential to my daily business and my personal life. Even in the office I have instant access to almost any information or service without having to sit at my desk. I don't have a checkbook anymore because I don't need one. I can pay bills with my mobile phone."

It's necessary to get a little geeky to do justice to the gulf between Korean and U.S. broadband users. America's broadband "fat pipes," it turns out, are mere garden hoses compared with the firehoses most South Koreans enjoy (see illustration). At a time when the Federal Communications Commission defines broadband as an Internet connection capable of transmitting 200,000 bits of information a second (200 kbps), the Korean speedometer doesn't even start until transmission speeds pass the one million bits (one megabit) mark. Wired connections of eight megabits are routine--about five times faster than my American high-speed cable modem on a good day--and many Korean subscribers have already bumped up to 20-megabit connections.

Matt Renck, a 25-year-old Ohioan who teaches English at a private school in Daejeon, uses his eight-megabit connection to run his personal website (www.torgodevil.com), play games, create classroom assignments, and watch videos. "I can watch movies that aren't released in Korea (legally, he is quick to point out), or watch web videos, or download anything I need to do my work so easily. When I came back to America for two months after my first year in Korea, I was back on a dial-up line," Renck says. "It was like losing a limb."

By next year, Korea's Ministry of Information and Communications wants to upgrade the nation's high-speed backbone to 50 megabits, and by 2012, the ministry says, Koreans will be luxuriating in 100-megabit cascades of data. Nobody is quite sure what they'll do with all that bandwidth, but researchers say it's inevitable that applications and services will be invented to take advantage of it. Broadband paves the way for distance education, for example; beaming

interactive classes to schoolchildren, adults, and the elderly is a particularly attractive vision in a nation where learning is a national obsession. Broadband also makes possible telemedicine, letting specialists in Seoul serve patients in rural communities where advanced medical care is scarce.

Back in the labs of LG Electronics there's even stranger stuff in the works. "Let me give one interesting scenario," says Park Hyung, who heads the company's "smart apartments" development work. "Every morning when you sit on the bathroom stool, your body temperature, pulse rate, and weight will be measured automatically and sent to your physician, including the test results of your urine. Your doctor will call you if he or she finds anything wrong. Whenever you are doing exercise on the running machine, all the information about your exercise, including speed, duration, inclination, and pulse rate, will be collected and your home server will give you the right exercise prescription based on your physical condition."

We in America might prefer to pass on some of those broadband services, but there's much about Korea to envy. While we're oohing and ahing over our ability to download songs from Apple's iTunes Music Store, launched just last year, Koreans are already downloading full-length movies and TV shows on demand--in seconds. Whether wired or wireless, broadband erases any hesitation in doing chores online, like shopping for groceries or clothes. Nearly 20% of all retail transactions in South Korea are now handled online from computers or cellphones, as are most banking transactions and stock purchases. Some Koreans use their phones and handheld computers to connect to home networks, allowing them, for example, to turn on their Internet-connected air conditioners and rice cookers before arriving home.

Broadband goes far beyond entertainment and convenience, changing not just the way people interact with their friends and their things but also the course of national politics. Roh Moo-Hyun's upset victory in the 2002 presidential race is widely credited to online, grassroots campaigning by young Koreans. They bypassed traditional media to create websites that turned Roh into an Internet celebrity, organized voter registration campaigns, and, on election day when early returns showed him trailing his opponent, launched a barrage of mobile-phone and computer instant-messaging. It turned an apparent Roh defeat into victory in the course of a few hours. Roh, who claims to be able to program in HTML, the language of the web, is a believer in the transformative power of broadband. Recently he predicted, "Over the next five years the government will foster new-generation mobile communication, intelligent robots, digital televisions, post-PCs, and various software industries as the new engine of growth." (In contrast, Roh's counterpart in backward North Korea, Kim Jong-Il, recently banned all cellphones as a subversive threat.)

So how did South Korea leapfrog the U.S. to become the planet's pacesetter in high-speed Internet? After all, Americans invented the Internet in the late 1960s, when war-ravaged South Korea was one of the poorest and least industrialized countries in Asia. As recently as the late 1990s, the nation was in deep economic distress, as the Asian financial crisis ravaged its manufacturing and banking industries. It was then that Roh's predecessor, Kim Dae-Jung, decided to recreate the country as a "knowledge superpower." The first step was deregulation, allowing other companies to compete with South Korea's SK Telecom phone monopoly. Skillful government marketing convinced many Korean parents that broadband would enhance their

children's chances in school, and as competition drove down prices for broadband, consumers began demanding it. The giant, family-run conglomerates, or chaebols, that control Samsung and LG threw their weight behind the broadband push, not surprising since they both make everything from wires to handsets to smart appliances, along with those apartment towers. The government spent billions of dollars building a fiber backbone to bring broadband to every school and government office, and offered another billion in financial incentives to phone companies to string high-speed links to homes. It helped that nearly half of all Koreans live clustered in urban apartment complexes, which are easier and cheaper to wire than the sprawling suburban communities more typical of the U.S.

The cultural catalyst for broadband was Korea's passion for online gaming. More than half of all Korean Internet users play online games (vs. just 6% in the U.S.), and broadband enables them to create their own virtual characters, or avatars, that fight epic online battles against other individuals and "clans," or teams of players. Initially gamers flocked to PC baangs (pronounced "bongs"), sort of a combination Internet cafe and game room, which quickly appeared on nearly every other corner of major Korean cities. Soon professional gaming leagues sprang up across the country.

"You have to be prepared to train ten hours a day, every day," said Lim Yo-Hwan, a pro gamer, after leading Korea to the highest overall medal count in the World Cyber Games. A spiky-haired national hero to nearly everyone under the age of 30, Lim has more than 400,000 registered members in his online fan club and some 70 websites devoted to his praise. He took in more than \$300,000 in salary, winnings, and endorsements last year. This summer, in Busan, some 100,000 people--mostly teens and men in their 20s--crowded a park to watch the finals of the Starcraft professional gaming league, which has 11 teams. (The same night, also in Busan, only 16,250 showed up to watch the Korean baseball league's all-star game.) Three television channels in South Korea broadcast round-the-clock shows of people playing computer games, with announcers describing the play-by-play. Koreans spend millions of dollars on online gaming, not just in \$23 monthly subscription fees, but also on online auction sites where they can pay real money for virtual accessories for their avatars, like sunglasses, fancy clothes, and weapons. (One can even pay real money for virtual plastic surgery to augment one's avatar.)

Within four years of Kim Dae-Jung's first initiative, the PC baangs became the locus of young Koreans' social lives--places where they could play games, check e-mail, update their personal websites, smoke like fiends, drink sodas and beer, and flirt for the equivalent of less than \$1 an hour. Soon Koreans began demanding the same fast connections at home. Fierce competition to wire them meant rapidly falling prices, which further fueled demand. (Home broadband service is now typically \$20 to \$35 a month, vs. \$40 to \$60 in the U.S.)

Although the U.S. would do well to learn from South Korea's aggressive adoption of broadband--in less than a decade it went from a 3% Internet penetration rate to more than 75%--the nation's high population density and cultural obsessions with gaming and education, and its highly focused regulatory policies, make it an unlikely template. Regulatory wrangling has certainly contributed to the slow roll-out of high-speed services in the U.S., but the bottom line is, well, the bottom line. Bringing new wires, cables, and fibers to suburban and rural homes is expensive, and without the kinds of generous government incentives offered by South Korea to spur

competition in the fledgling broadband industry, the costs will remain high both for providers and consumers. That's the main reason broadband remains beyond the reach of middle-and lower-income U.S. households.

As there's little money to be made offering basic broadband service in Korea, the focus has shifted to creating value-added broadband services to generate profits. These go beyond personalized ring tones, screensavers, and text messaging to include music downloads, unlimited television and movie subscriptions, TiVo-like video recording, and the ability to connect via a handset to a home network. LG, in particular, makes Internet-enabled home appliances, including air conditioners, microwave ovens, washing machines, and robot vacuums that can be controlled through a television interface or mobile handset. The refrigerators have 13-inch flat-panel displays in the door, along with a videocamera that allows, for example, parents to look in on the kids after school.

The Korean government's goal is to have ten million fully networked "smart homes" by 2007. LG intends to have 13,000 smart apartments operational by the end of this year. And all that's just a start. South Korea is already turning to next-generation technologies like satellite-based broadband. Starting in 2006, it will be able to beam digital movies and television to receivers traveling at speeds up to 90 mph. And LG has plans to export its home networking technology to the U.S. The idea of a smart toilet may not sit well with American consumers, but South Korea will likely have an outsized influence on our digital future.

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AND YOU THOUGHT A CELLPHONE WAS FOR MAKING CALLS

The mobile handset has evolved into a universal remote control for daily life. Here are some of the things South Koreans use it for.

HOME

HOME APPLIANCES

Turn on appliances like air conditioners or lights before you get home

SECURITY

Control security systems and read meters remotely

SPY CAM Peer into other rooms via videocamera links

ENTERTAINMENT

VIDEO

Watch movies and TV shows

KARAOKE

Download songs and lyrics to practice singing

GAMING

Play games online with other users

VIDEOCONFERENCING

View a telephone caller on a videoscreen

PHOTOS

Shoot and send photos and video instantly

SURFING

Browse the Internet

LIFE

SHOPPING

Buy goods by pushing buttons; pay via phone bill

TRACKING

Location-based services track your position

GAMBLING

Buy lottery tickets and gamble online

BANKING

Do banking and trade stocks online

TRAFFIC

Check real-time traffic conditions

E-MAIL

Instant text and video messaging

SCHOOL

EXAMS

Cheat on tests (just kidding)

LEARNING

Take English lessons via videoconferencing

HOMEWORK

Get homework assignments from your teacher

BIGGER, BETTER BANDWIDTH

Korea's broadband networks are much faster than comparably priced (\$40 a month) DSL or cable broadband in U.S. homes.

U.S. -- 2 Megabits per second (Good for downloading music)

South Korea -- 20 Megabits per second (Good for downloading high-definition television)

DIAGRAM: AND YOU THOUGHT A CELLPHONE WAS FOR MAKING CALLS

DIAGRAM: BIGGER, BETTER BANDWIDTH

PHOTO (COLOR): SEOUL TRAIN Cellphones work in the subway--and not just for talking.

PHOTO (COLOR): HI, MOM! And you thought a fridge was just for storing milk. This one has a videocamera and a screen.

PHOTO (COLOR): GAMING NATION Avid online-game players, Korea's youth drove demand for broadband.

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By Peter Lewis

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