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## Japan's Warp-Speed Ride to Internet Future

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TOKYO -- Americans invented the Internet, but the Japanese are running away with it.

Broadband service here is eight to 30 times as fast as in the United States -- and considerably cheaper. [Japan](#) has the world's fastest Internet connections, delivering more data at a lower cost than anywhere else, recent studies show.

Accelerating broadband speed in this country -- as well as in [South Korea](#) and much of [Europe](#) -- is pushing open doors to Internet innovation that are likely to remain closed for years to come in much of the United States.

The speed advantage allows the Japanese to watch broadcast-quality, full-screen television over the Internet, an experience that mocks the grainy, wallet-size images Americans endure.

Ultra-high-speed applications are being rolled out for low-cost, high-definition teleconferencing, for telemedicine -- which allows urban doctors to diagnose diseases from a distance -- and for advanced telecommuting to help Japan meet its goal of doubling the number of people who work from home by 2010.

"For now and for at least the short term, these applications will be cheaper and probably better in Japan," said Robert Pepper, senior managing director of global technology policy at [Cisco Systems](#), the networking giant.

Japan has surged ahead of the United States on the wings of better wire and more aggressive government regulation, industry analysts say.

The copper wire used to hook up Japanese homes is newer and runs in shorter loops to telephone exchanges than in the United States. This is partly a matter of geography and demographics: Japan is relatively small, highly urbanized and densely populated. But better wire is also a legacy of American bombs, which razed much of urban Japan during World War II and led to a wholesale rewiring of the country.

In 2000, the Japanese government seized its advantage in wire. In sharp contrast to the Bush administration over the same time period, regulators here compelled big phone companies to open up wires to upstart Internet providers.

In short order, broadband exploded. At first, it used the same DSL technology that exists in the United States. But because of the better, shorter wire in Japan, DSL service here is much faster. Ten to 20 times as fast, according to Pepper, one of the world's leading experts on broadband infrastructure.

Indeed, DSL in Japan is often five to 10 times as fast as what is widely offered by U.S. cable providers,

generally viewed as the fastest American carriers. (Cable has not been much of a player in Japan.)

Perhaps more important, competition in Japan gave a kick in the pants to Nippon Telegraph and Telephone Corp. (NTT), once a government-controlled enterprise and still Japan's largest phone company. With the help of government subsidies and tax breaks, NTT launched a nationwide build-out of fiber-optic lines to homes, making the lower-capacity copper wires obsolete.

"Obviously, without the competition, we would not have done all this at this pace," said Hideki Ohmichi, NTT's senior manager for public relations.

His company now offers speeds on fiber of up to 100 megabits per second -- 17 times as fast as the top speed generally available from U.S. cable. About 8.8 million Japanese homes have fiber lines -- roughly nine times the number in the United States.

The burgeoning optical fiber system is hurtling Japan into an Internet future that experts say Americans are unlikely to experience for at least several years.

Shoji Matsuya, director of diagnostic pathology at Kanto Medical Center in [Tokyo](#), has tested an NTT telepathology system scheduled for nationwide use next spring.

It allows pathologists -- using high-definition video and remote-controlled microscopes -- to examine tissue samples from patients living in areas without access to major hospitals. Those patients need only find a clinic with the right microscope and an NTT fiber connection.

"Before, we did not have the richness of image detail," Matsuya said, noting that Japan has a severe shortage of pathologists. "With this equipment, I think it is possible to make a definitive remote diagnosis of cancer."

Japan's leap forward, as the United States has lost ground among major industrialized countries in providing high-speed broadband connections, has frustrated many American high-tech innovators.

"The experience of the last seven years shows that sometimes you need a strong federal regulatory framework to ensure that competition happens in a way that is constructive," said [Vinton G. Cerf](#), a vice president at [Google](#).

Japan's lead in speed is worrisome because it will shift Internet innovation away from the United States, warns Cerf, who is widely credited with helping to invent some of the Internet's basic architecture. "Once you have very high speeds, I guarantee that people will figure out things to do with it that they haven't done before," he said.

As a champion of Japanese-style competition through regulation, Cerf supports "net neutrality" legislation now pending in Congress. It would mandate that phone and cable companies treat all online traffic equally, without imposing higher tolls for certain content.

The proposed laws would probably save billions for companies such as Google and [Yahoo](#), but consumer advocates say they would also save money for most home Internet users.

U.S. phone and cable companies, which control about 98 percent of the country's broadband market, strongly oppose the proposed laws, saying they would discourage the huge investments needed to upgrade broadband speed.

Yet the story of how Japan outclassed the United States in the provision of better, cheaper Internet service suggests that forceful government regulation can pay substantial dividends.

The opening of Japan's copper phone lines to DSL competition launched a "virtuous cycle" of ever-increasing

speed, said Cisco's Pepper. The cycle began shortly after Japanese politicians -- fretting about an Internet system that in 2000 was slower and more expensive than what existed in the United States -- decided to "unbundle" copper lines.

For just \$2 a month, upstart broadband companies were allowed to rent bandwidth on an NTT copper wire connected to a Japanese home. Low rent allowed them to charge low prices to consumers -- as little as \$22 a month for a DSL connection faster than almost all U.S. broadband services.

In the United States, a similar kind of competitive access to phone company lines was strongly endorsed by Congress in a 1996 telecommunications law. But the federal push fizzled in 2003 and 2004, when the [Federal Communications Commission](#) and a federal court ruled that major companies do not have to share phone or fiber lines with competitors. The Bush administration did not appeal the court ruling.

"The Bush administration largely turned its back on the Internet, so we have just drifted downwards," said Thomas Bleha, a former U.S. diplomat who served in Japan and is writing a history of how that country trumped the United States in broadband.

As the United States drifted, a prominent venture capitalist in Japan pounced on his government's decision to open up the country's copper wire.

Masayoshi Son, head of a company called [Softbank](#), offered broadband that was much cheaper and more than six times as fast as NTT's. He added marketing razzmatazz to the mix, dispatching young people to street corners to give away modems that would connect users to a service called Yahoo BB. (The U.S.-based Yahoo owns about a third of it.) The company's share of DSL business in Japan has exploded in the past five years, from zero to 37 percent. As competition grew, the monthly cost of broadband across Japan fell by about half, as broadband speed jumped 33-fold, according to a recent study.

"Once a customer enjoyed the high speed of DSL, then he or she preferred more speed," said Harumasa Sato, a professor of telecommunication economics at Konan University in Kobe.

The growing addiction to speed, ironically, is returning near-monopoly power in fiber to NTT, which owns and controls most new fiber lines to homes. Growth of new fiber connections exceeded DSL growth two years ago. Fiber is how all of Japan will soon be connected -- for phones, television and nearly all other services.

"NTT is becoming dominant again in the fiber broadband kingdom," Sato said.

That infuriates its competitors. Yahoo BB and others are demanding that the government once again compel NTT to unlock the lines.

In Japan, the regulatory wars over broadband are far from over.


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