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Internet Traffic Begins to Bypass the U.S.

By JOHN MARKOFF

SAN FRANCISCO — The era of the American Internet is ending.

Invented by American computer scientists during the 1970s, the Internet has been embraced around the globe. During the network’s first three decades, most Internet traffic flowed through the United States. In many cases, data sent between two locations within a given country also passed through the United States.

Engineers who help run the Internet said that it would have been impossible for the United States to maintain its hegemony over the long run because of the very nature of the Internet; it has no central point of control.

And now, the balance of power is shifting. Data is increasingly flowing around the United States, which may have intelligence — and conceivably military — consequences.

American intelligence officials have warned about this shift. “Because of the nature of global telecommunications, we are playing with a tremendous home-field advantage, and we need to exploit that edge,” Michael V. Hayden, the director of the Central Intelligence Agency, testified before the Senate Judiciary Committee in 2006. “We also need to protect that edge, and we need to protect those who provide it to us.”

Indeed, Internet industry executives and government officials have acknowledged that Internet traffic passing through the switching equipment of companies based in the United States has proved a distinct advantage for American intelligence agencies. In December 2005, The New York Times reported that the National Security Agency had established a program with the cooperation of American telecommunications firms that included the interception of foreign Internet communications.

Some Internet technologists and privacy advocates say those actions and other government policies may be hastening the shift in Canadian and European traffic away from the United States.

“Since passage of the Patriot Act, many companies based outside of the United States have been reluctant to store client information in the U.S.,” said Marc Rotenberg, executive director of the Electronic Privacy Information Center in Washington. “There is an ongoing concern that U.S. intelligence agencies will gather this information without legal process. There is particular sensitivity about access to financial information as well as communications and Internet traffic that goes through U.S. switches.”

But economics also plays a role. Almost all nations see data networks as essential to economic development. “It’s no different than any other infrastructure that a country needs,” said K C Claffy, a research scientist at the Cooperative Association for Internet Data Analysis in San Diego. “You wouldn’t want someone owning
your roads either.”

Indeed, more countries are becoming aware of how their dependence on other countries for their Internet traffic makes them vulnerable. Because of tariffs, pricing anomalies and even corporate cultures, Internet providers will often not exchange data with their local competitors. They prefer instead to send and receive traffic with larger international Internet service providers.

This leads to odd routing arrangements, referred to as tromboning, in which traffic between two cites in one country will flow through other nations. In January, when a cable was cut in the Mediterranean, Egyptian Internet traffic was nearly paralyzed because it was not being shared by local I.S.P.’s but instead was routed through European operators.

The issue was driven home this month when hackers attacked and immobilized several Georgian government Web sites during the country’s fighting with Russia. Most of Georgia’s access to the global network flowed through Russia and Turkey. A third route through an undersea cable linking Georgia to Bulgaria is scheduled for completion in September.

Ms. Claffy said that the shift away from the United States was not limited to developing countries. The Japanese “are on a rampage to build out across India and China so they have alternative routes and so they don’t have to route through the U.S.”

Andrew M. Odlyzko, a professor at the University of Minnesota who tracks the growth of the global Internet, added, “We discovered the Internet, but we couldn’t keep it a secret.” While the United States carried 70 percent of the world’s Internet traffic a decade ago, he estimates that portion has fallen to about 25 percent.

Internet technologists say that the global data network that was once a competitive advantage for the United States is now increasingly outside the control of American companies. They decided not to invest in lower-cost optical fiber lines, which have rapidly become a commodity business.

That lack of investment mirrors a pattern that has taken place elsewhere in the high-technology industry, from semiconductors to personal computers.

The risk, Internet technologists say, is that upstarts like China and India are making larger investments in next-generation Internet technology that is likely to be crucial in determining the future of the network, with investment, innovation and profits going first to overseas companies.

“Whether it’s a good or a bad thing depends on where you stand,” said Vint Cerf, a computer scientist who is Google’s Internet evangelist and who, with Robert Kahn, devised the original Internet routing protocols in the early 1970s. “Suppose the Internet was entirely confined to the U.S., which it once was? That wasn’t helpful.”

International networks that carry data into and out of the United States are still being expanded at a sharp rate, but the Internet infrastructure in many other regions of the world is growing even more quickly.

While there has been some concern over a looming Internet traffic jam because of the rise in Internet use
worldwide, the congestion is generally not on the Internet’s main trunk lines, but on neighborhood switches, routers and the wires into a house.

As Internet traffic moves offshore, it may complicate the task of American intelligence gathering agencies, but would not make Internet surveillance impossible.

“We’re probably in one of those situations where things get a little bit harder,” said John Arquilla, a professor at the Naval Postgraduate School in Monterey, Calif., who said the United States had invested far too little in collecting intelligence via the Internet. “We’ve given terrorists a free ride in cyberspace,” he said.

Others say the eclipse of the United States as the central point in cyberspace is one of many indicators that the world is becoming a more level playing field both economically and politically.

“This is one of many dimensions on which we’ll have to adjust to a reduction in American ability to dictate terms of core interests of ours,” said Yochai Benkler, co-director of the Berkman Center for Internet and Society at Harvard. “We are, by comparison, militarily weaker, economically poorer and technologically less unique than we were then. We are still a very big player, but not in control.”

China, for instance, surpassed the United States in the number of Internet users in June. Over all, Asia now has 578.5 million, or 39.5 percent, of the world’s Internet users, although only 15.3 percent of the Asian population is connected to the Internet, according to Internet World Stats, a market research organization.

By contrast, there were about 237 million Internet users in North America and the growth has nearly peaked; penetration of the Internet in the region has reached about 71 percent.

The increasing role of new competitors has shown up in data collected annually by Renesys, a firm in Manchester, N.H., that monitors the connections between Internet providers. The Renesys rankings of Internet connections, an indirect measure of growth, show that the big winners in the last three years have been the Italian Internet provider Tiscali, China Telecom and the Japanese telecommunications operator KDDI.

Firms that have slipped in the rankings have all been American: Verizon, Savvis, AT&T, Qwest, Cogent and AboveNet.

“The U.S. telecommunications firms haven’t invested,” said Earl Zmijewski, vice president and general manager for Internet data services at Renesys. “The rest of the world has caught up. I don’t see the AT&T’s and Sprints making the investments because they see Internet service as a commodity.”