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Cuba, the Internet, and U.S. Policy

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Cuba's growing involvement with the Internet is a complicated topic with implications for both politics on the island and relations with the United States. This issue of the *Cuba Briefing Paper Series* begins with a review of how computer networking developed in Cuba, then surveys recent events, and concludes with an assessment of whether some of the hopes and fears about the long-range impact of the Internet in Cuba may be overblown.

HISTORICAL CONTEXT

In 1964, five years after the Castro government came to power, Cuba's Ministry of Industries established a Department of Automation and imported a handful of computers from Poland. Four years later, the University of Havana (with the support of the Political Bureau of the Cuban Communist Party) established a Center for Digital Investigation to develop a domestic computer-manufacturing capability. In 1970, an engineer, Orlando Ramos, designed the CID-201—the first Cuban computer. Between 1973 and 1976, a series of bilateral agreements were signed with the Soviet Union whereby the latter agreed to help Havana develop a computer industry. With Soviet assistance, Cuba built its first personal computer assembly line in 1978. Cuba's computing resources grew from twelve mainframe computers and one hundred minicomputers in 1976 to twenty-eight Soviet-made mainframe computers, more than two hundred Cuban-built minicomputers, and almost four thousand microcomputers as of 1987. Meanwhile, the 1980 Cuban Communist Party Congress officially acknowledged the need to develop computerized telecommunications, including the transmission of data and information.

In 1983, a satellite link gave Cuba access to some fifty Soviet computer databases, which were used primarily in connection with economic planning. By contrast, computer networking among Cuban institutions was almost nonexistent until 1988, when a branch of the Cuban Academy of Sciences established the first domestic electronic network, which offered data transmission, electronic mail (e-mail), and access to Cuban databases. As of November 1992, Cuba had nine computer networks serving some fifteen hundred users. By the summer of 1994, the total had nearly tripled to twenty-six networks (including eleven for use by scientists, eight serving the social sciences and libraries, and four educational networks linking universities, high schools, and technical institutes).

DOMESTIC NETWORKING TODAY

As of this writing, Cuba has thirty-two public domestic computer networks plus hundreds of "local," "closed," or "private" networks. E-mail is available to thousands of individual users associated in one way or another with institutions

Partial List of Networks and Major Sites in Cuba

- BioRed (Havana)
- BioTec (Centro de Información y Consultoría para la Biotecnología y la Industria Médico-Farmacéutica: biotec.cu
- CENIAI: ceniai.cu
- Compañía Telemática Internacional SA, Gerencia DHL-Havana: havco.dhl.com
- Estación Terrena de Holguín, MINCOMS: holguin.cu
- InfoMed: infomed.cu
- Instituto de Cibernética, Matemática y Física (Havana): redacc@ceniai.cu
- Joven Club de Computación (Youth Computer Clubs): tinored.cu
- Movimiento de los Joven Club de Computación: tinohlg.infomed.cu
- Red de la Academia de Ciencias de Cuba (REDACC) (Havana)
- Red Biblioteca Nacional de Cuba (Havana): binanet.cu
- Red de Centro de Ingeniería Genética y Biotecnología (Havana): ingen.cu
- Red de Centro de Ingeniería Genética y Biotecnología (Sancti Spíritus): biotss.infomed.cu
- Red del Centro de Neurociencias de Cuba (Havana)
- Red de Centro Provincial de Información de Ciencias Médicas (Camagüey)
- Red de Centro Provincial de Información de Ciencias Médicas (Guantánamo): cpicmgu.infomed.cu
- Red de Centro Provincial de Información de Ciencias Médicas (Sancti Spíritus): cpicmss.infomed.cu
- Red de Ciego de Avila (FICA)
- Red David
- Red de Electromedicina Provincial (Holguín): esinet.infomed.cu
- Red de la FIDICT de Cienfuegos (PERLA): perla.cu
- Red de Granma (Bayamo)
- Red de Instituto de Ciencias Básicas y Preclínicas (Havana)
- Red del Instituto Superior Politécnico "José Antonio Echevarría" (Havana)
- Red del Instituto Superior Politécnico "Julio Antonio Mella" (Santiago de Cuba): ispjam.cu
- Red del Ministerio de la Industria Alimenticia (Havana)
- Red del Polo Científico de Sancti Spíritus ("Yayabo")
- Red de la Provincia de Guantánamo (RedGtmo): gtmo.cu
- Red de Turismo
- Red de Unidad de Análisis y Tendencias en Salud (Havana): hesp.infomed.cu
- Red Universidad Central de Las Villas: uclc.cu
- Red Universidad de Cienfuegos (UDEC)
- Red Universidad de la Habana (COMUH): redunic.cu
- Red Universitaria de Información Científica y Tecnológica (RedUniv) (Havana)
- World Ordering Network Service (Grupo Cubanacán, Havana)

that have been assigned e-mail accounts. Examples of Cuban networks include the National Library's Binanet, the National Neurosciences Center's CNC, Oriente University's UOnet, and BioTec, a network devoted to biological and biotechnology information. Four of the networks—CENIAI, TinoRed, CIGBnet, and InfoMed—are particularly important:

CENIAI. The Centro Nacional de Intercambio Automatizado de Información (National Center for Automated Exchange of Information) is a network that was started within the Cuban Academy of Sciences but now operates under the auspices of the Ministry of Science, Technology, and the Environment. CENIAI, which has more institutional and individual users than any other Cuban computer network (perhaps in excess of five thousand), serves the academic community, particularly that portion devoted to the "hard" sciences. It functions as a gateway to other domestic and foreign computer networks and offers access to databases produced by more than two hundred domestic research facilities. CENIAI's establishment of a data-transmission satellite link with the Soviet Union in 1983 gave Cuba its first access to on-line databases abroad. It has trained personnel from hundreds of other Cuban institutions in the use of foreign databases and e-mail.

TinoRed. "TinoRed" is a combination of the name Tino (a robot cartoon character) and the word *red* (Spanish for "network"). This is a nonprofit Cuban nongovernmental association whose more than four hundred users include institutions and individuals involved in the social sciences, culture, health, education, religion, and other fields. TinoRed users do not pay for access to the network service. TinoRed links some 150 Youth Computer Clubs located throughout the country. In his recent study, *Cuban Telecommunications, Computer Networking, and U.S. Policy Implications* (Santa Monica, California: RAND, 1996, p. 29), California State University academician Larry Press reported that about one hundred of these clubs had e-mail accounts, but only eighty had working modems. (These clubs are closely associated with the Union of Young Communists.)

Red David (whose name is a reference to the story of David and Goliath) is a group of Cuban nongovernmental organizations (NGOs) that uses the TinoRed network. Because Red David has a highly democratic and participatory subculture that is not shared by TinoRed's administrators, their relations have sometimes been tense.

InfoMed. Created in 1992, InfoMed, the network of the Ministry of Public Health's National System of Health Information, is now used extensively by the Cuban medical community. (As of early 1996, it had five hundred fee-paying user accounts, some 80 percent of which were institutional accounts shared by more than one individual.) As described by the ministry, InfoMed's goals are "to facilitate the exchange of electronic information in the field of medicine, biomedicine, and general health [and] to facilitate linkages between professionals, academicians, researchers, functionaries, and public health workers in general in Cuba and abroad."

[Despite significant limitations, the e-mail] service was a vast improvement over the previous situation in which a letter into or out of the country could take months to arrive (if it arrived at all).

InfoMed is connected to all of the major Cuban domestic networks. It offers domestic and international e-mail, hosts moderated and unmoderated discussion groups, and makes a variety of data files available for remote retrieval. Users can request bibliographic and reference materials kept at InfoMed on CD-ROMs or in databases elsewhere. InfoMed distributes health news from Cuba and abroad, the tables of contents of foreign medical periodicals, and other information. Its staff members also provide hardware and software technical support to member institutions.

With assistance from the United Nations Development Program, InfoMed has established nodes (server computers) in thirteen of Cuba's fourteen provincial medical schools. InfoMed has also received help from the Pan American Health Organization and the World Health Organization.

CIGBnet. This is the network of the Centro de Ingeniería Genética y Biotecnología (Center for Genetic Engineering and Biotechnology) research facility in Havana. Established in 1991, CIGBnet serves more than one thousand users at four major Cuban genetic engineering and biotechnology centers. In addition, its staff members engage in software research and development, some of which may prove useful to other developing countries.

Commercial Networks. One example of a commercial network is Cubanet, which as of December 1994 served twenty-eight joint-venture and tourism-oriented enterprises, offering them access to other commercial services around the world (at prices unaffordable to most Cubans). (This network is completely separate from the Miami-based World Wide Web site described in the "For Further Information" box on page 11.)

The success of the negotiations leading to the 1992 global e-mail connection via Canada demonstrates that a low-profile policy of cooperation without politicization can produce concrete results fairly rapidly.

Coral Container Lines—an enterprise involved in the shipping of containers to and from Cuba—operates a fifty-five-terminal private/local network (with about thirty-five to forty users per day) offering international e-mail services via connections to CENIAI and CIGBnet.

The tourist sector has its own network, administered by the Electronics for Tourism Group (Grupo de Electrónica para el Turismo), which serves all tourist chains in the country. The Islazul tourism chain, for example, is planning to link forty-three of its hotels to the Internet.

OPENING A GLOBAL CONNECTION

In 1988-1989, a small group of North American academics talked with Cuban Communist Party officials and computer specialists about the possibility of opening electronic data-transmission links between Cuba and the West. In 1990, the Canadian and U.S. affiliates of the Association for Progressive Communications (APC), an international computer network serving NGOs and citizen activists "working for social justice, environmental sustainability and related issues," decided to explore the possibility of establishing an APC routing mechanism for e-mail with Cuba. U.S. legal advice was sought, because the Institute for Global Communications (the U.S. APC affiliate) was concerned that its work might be hampered if the U.S. government were to declare this effort illegal.

In April 1991, the office of the ideological secretary of the Central Committee of the Cuban Communist Party, then under the direction of Carlos Aldana, approved the establishment of an e-mail connection between Cuba and Canada. It was understood that the Cuban side could not afford to pay for the daily

Some E-mail Addresses

Association for Progressive Communications (APC) Cuba Desk: cubadesk@igc.apc.org

CENIAI: postmaster@ceniai.cu

Saúl Hahn, Coordinador de Ciencias Básicas y Redes, OAS: shahn@umd5.umd.edu

Ham radio clubs (Federación de Radioaficionados de Cuba): frc@tinored.cu

Hotel Havana Libre: hlibre@ceniai.cu

Hotel Riviera: hriviera@ceniai.cu

Hotel Tuxpan/Varadero: hotuxpan@ceniai.cu

Jesús Martínez, Director, CENIAI: jemar@ceniai.cu

Fernando Martínez, CUBACIENCIA: cubacien@ceniai.cu

Ministry of Foreign Affairs: minrex@tinored.cu

NBC Television: nbctv@ceniai.cu

Nicolás Garriga Mendez, Director General, CENIAI: garriga@ceniai.cu

Radio Havana Cuba: radiohc@tinored.cu

Red David: davidpost@tinored.cu

TinoRed: postmaster@tinored.cu

Mimi Whitefield (*Miami Herald*): mimiw@ceniai.cu

Note: Cubaweb (http://www.cubaweb.cu) has an extensive e-mail directory.

telephone calls to Canada. This decision was a major step toward Cuban participation in the Internet. A key reason for the success of the negotiations was that security and ideological issues did not surface. Neither the Cubans nor the Americans involved attempted to bring pressure to bear over who should or should not be allowed access to the e-mail connection. In short, no attempt was made to frame the issue of external connectivity in the context of the clash between the United States and Cuba.

With help from the Canadian and U.S. affiliates of the APC, the anticipated e-mail link was finally established in January 1992. Every night at about 11 P.M. EST (unless there were technical or financial difficulties), a long-distance call was made in Toronto by Web Networks (the Canadian APC affiliate) to CENIAI in Havana. For about ten minutes, each side sent e-mail messages accumulated during the preceding twenty-four hours. In this way, the Canadians relayed for the Cubans messages to and from the rest of the world. The volume of traffic through this connection sometimes overwhelmed its capacity (which was constrained by the APC's modest budget).

This e-mail service had significant limitations. It offered no means of Internet exploration or interactive communications, and data searches were difficult. In contrast to the near-instantaneous e-mail enjoyed elsewhere in the world, Cuba's e-mail via Web Networks was subject to delays of up to a day. For Cubans, however, the APC service represented a vast improvement over the previous situation in which a letter into or out of the country could take months to arrive (if it arrived at all). In 1993 and 1994, moreover, Cubans began to make adroit use of e-mail to access a significant part of the Internet's resources by means of commands sent to automated data servers abroad.

By early 1996, the debate over networking had clearly been settled in favor of greater connectivity.

CONNECTIVITY BECOMES A FOOTBALL

In autumn 1992, the U.S. government began to notice Cuba's new global e-mail capability and to wonder out loud whether this development could be used to put additional pressure on the Cuban government. In particular, Edward Gonzalez and David Ronfeldt, both working under contract for the Office of the Secretary of Defense, wrote a study, *Cuba Adrift in a Postcommunist World* (Santa Monica, California: RAND, 1992, Section 6, pp. 71-77), that advocated "[building] bridges across computer networks" in the hope that "freer information flows" would "foster pluralist tendencies."

Such unguarded talk in Washington handed powerful arguments to those within Cuba's Ministry of the Interior, military counterintelligence, and other parts of the government who opposed expanded contact with the West. Their position was further strengthened on October 23, 1992, when President George Bush signed into law the Cuban Democracy Act (which specifically mentioned telecommunications), a bill strongly advocated by the conservative sector of the Cuban exile community.

Interpreting the bill's telecommunications section as signaling a program of penetration and subversion, the Havana government put the brakes on further networking with the West. The use of e-mail continued to grow, but movement toward other forms of connectivity (especially those involving real-time interaction) became much more problematic. Whereas establishment of the APC e-mail link had required only a moderately simple decision by a single party official, the new political climate dictated that the move to a full Internet connection could take place only when the highest authorities in Cuba so decided.

The situation was further exacerbated in the fall of 1993, when the U.S. Interests Section in the Swiss Embassy in Havana managed to obtain a TinoRed e-mail account which the U.S. cultural attaché used to post publicly on TinoRed materials about the United States and U.S. government policy statements on Cuba. The Cuban government reacted with a swift cutoff of the U.S. Interests Section's e-mail privileges.

In January 1994, a financial crisis surfaced in Canada's Web Networks, which had to find one thousand dollars per month to pay for long-distance calls to Cuba. The problem was temporarily solved by a combination of emergency donations and a drastic reduction in e-mail traffic by the middle of the year.

Meanwhile, the United States media was discovering the Cuba-Canada e-mail connection. The *Miami Herald* published a long article on the subject in late April 1994, which was soon followed by a number of other articles in Miami-based publications.

Predictably, some exiles immediately began sending antigovernment messages to any Cuban e-mail accounts they could contact. Steve Cisler, a senior scientist at Apple Computer, describes one such incident:

> An anti-government diatribe was sent by email from abajofidel@aol.com to all the TinoRed addresses. Not only was the content unwelcome (abajofidel means Down with Fidel), but the charges for that many messages were substantial. Spamming [i.e., sending unwanted messages to] the Cuban networks (or any site where incoming messages are expensive) is a bad way of promoting international connectivity.

What the perpetrators did not realize was that the systems operator at TinoRed, anticipating such an event, had created a simple routine by which such messages would be flagged before they were forwarded. As the messages continued to arrive from America Online, TinoRed created another routine that simply erased any mass mailings from that source. Such incidents played yet again into the hands of those in the Cuban security services opposed to electronic contact with the West.

One reason for the Cuban government's lack of enthusiasm for a large, uncontrolled influx of Internet users may be the [seriously deficient] condition of the country's telephone infrastructure.

On June 30, 1994, the Cuban Ministry of Communications issued a resolution intended to centralize all networking-related activities. Many Cuban institutions and users spent the next six months trying to clarify the implications of this move. The word circulated that it would "take time" before an Internet connection was established, and this would not be done by the Ministry of Communications.

RENEWED PROGRESS

Even as the idea of connectivity became increasingly politicized, efforts were under way to restore forward movement. Discussions took place in Mexico about the possibility of sharing a communications satellite as a way of giving Cuba a more reliable electronic connection with the outside world. The Pan American Health Organization donated a server computer to Cuba's Ministry of Public Health for use as a medical Internet node. The United Nations Development Program gave Cuba $250,000 to help it get an Internet connection. The Organization of American States, which was involved in the development of a Latin American science and technology

network, also expressed interest in helping, but the United States vetoed this idea. The Internet Society (an international voluntary-membership professional organization that is the Internet's nearest approximation to a managing authority) was eager to provide as much help as the U.S. government would allow.

In the United States, [some] favored the development of networking in Cuba because this might expose the island to ideas that could encourage political change.

Meanwhile, important developments were taking place with regard to Cuba's decrepit telephone system (much of whose equipment was installed in the 1930s and 1940s). On June 13, 1994, at a ceremony attended by the leaders of both countries, the Mexican telecommunications company Grupo Domos signed an agreement with the Cuban Ministry of Communications to modernize the telephone network through a joint venture with the Cuban state. In the following month, the U.S. Treasury Department decided that the transfer of data or information to Cuba by any U.S. carrier could take place, as long as there was no transfer of money to the island. In October 1994, the U.S. Federal Communications Commission approved agreements between the Cuban telephone enterprise and U.S. telephone companies to offer direct telephone service between the two countries—a step that could simplify electronic networking with the rest of the world. Direct service became available on November 25, 1994.

The debate within Cuba about the Internet intensified in the months following January 12, 1995, when InterNIC (a cooperative U.S.-based project that handles the registration of networks joining the Internet) granted CENIAI a Class B Internet address (in effect giving Cuba permission to join the Internet). Numerous forces were involved. The Cuban military was concerned that hostile foreign governments could use the Internet to threaten national security. The Ministry of the Interior saw the global network as a potential conduit of antiregime political and ideological propaganda.

On the other hand, the Ministry of Communications and the various "mixed" enterprises (i.e., joint ventures between the Cuban state and foreign private capital) involved with telecommunications saw Internet connectivity as a means of increasing their revenues. The ministry argued that any political or military risks could be minimized by charging high prices for access.

Still others—educators, many social sciences and humanities research institutions, and the cultural community—viewed the Internet as a means of access to a vast worldwide pool of information and an alternative to periodicals that they could no longer afford because of post-cold war economic stresses. Some observers consider this intellectual sector to be the largest potential market for Internet services.

In addition to the battle over the Internet's implications for regime stability, there were also struggles over who would control the Cuban system and what its physical structure should be. It took more than a year to resolve these conflicts.

In the United States, as noted earlier, some in government and elsewhere favored the development of networking in Cuba because this might expose the island to ideas that could encourage political change. But some U.S.-based Cuban exiles opposed such connections because of their potential economic benefit to the Cuban government. These exiles also pointed out that the basic tools of network access (e.g., telephones, computers, modems) were largely unavailable to Castro's political opponents or the majority of Cuban homes. In October 1995, the Clinton administration tried to address this concern by providing five hundred thousand dollars to Freedom House, part of which was to be used to purchase computers for the anti-Castro opposition.

Meanwhile, it had occurred to some Cuban observers that Havana itself could play the game of using the Internet to spread ideas. Jesús Martínez, the head of CENIAI, argued in a September 1995 interview with the Cuban news agency Prensa Latina that "the Internet allows us to establish relations [and] make public to the world the reality of Cuba." Prensa Latina returned to this point in mid-1996, stating that "Cuba, with full access to Internet information services, expects to be an active supplier of information and not just a passive recipient."

One step in this direction was the establishment in January 1996 of an official Cuban site (Cubaweb) on the World Wide Web. The site includes sections on news, art and culture, science and technology, medicine, business and trade, consular information, and tourism, as well as an e-mail directory. Because of the limited capacity of the Cuban telephone system, the site is located on computer facilities in Canada.

ACCEPTING THE INTERNET, WARILY

By early 1996, the debate over networking had clearly been settled in favor of greater connectivity. One signal came in mid-January, with the appearance of a statement in the country's media that "Cuba expects to join the Internet in a few months and is working intensively on measures to regulate the service in Cuba."

Havana itself could play the game of using the Internet to spread ideas. [According to a Cuban news agency] "Cuba, with full access to Internet information services, expects to be an active supplier of information and not just a passive recipient."

On March 23, at the Fifth Plenum of the Central Committee of the Cuban Communist Party, Carlos Lage (secretary of the Executive Committee of the Council of Ministers) offered a review of the country's economic situation. In the course of this presentation, he emphasized the growing importance of computer-based communications, pointing out that "one telex can cost twelve dollars [whereas] the same message [costs] seventy-five cents in the form of a fax and three cents via the Internet." He argued that "in spite of our blockaded circumstances, we are in a relatively good position [to face the challenges of such scientific and technological changes], due to the educational and scientific work developed by the Revolution."

In April, a new Computer Technology Video Library was opened in Havana, containing more than two thousand videos, a significant number of which offered instruction on using the Internet. Just a few weeks later (on May 9-11), the Ministry of Science, Technology, and the Environment held its first national Telematics Congress, attended by scientists, technicians, government officials, educators, librarians, and researchers from all over the country. Most of the panel discussions dealt with Internet services, connectivity, administration, and security.

In June, the Executive Committee of the Cuban Council of Ministers completed action on Decree-Law 209, which regulates the use and development of information networks and Internet services within Cuba. It does not give any single interest or institution the power to dictate what should be done and how. Instead, there is to be a functional division of labor among multiple collaborating institutional players and sectors of authority. This model stands in decided contrast to the 1994 attempt by the Ministry of Communications to centralize control of all facets of networking and telecommunications.

The decree designates an Interministerial Commission to regulate access to and management of all Internet information, to supervise the functioning and development of national networks, to monitor technological change and its use, and to supervise security procedures. This commission is made up of five ministries:

(1) The Ministry of Science, Technology, and the Environment (CITMA) is to issue licenses and accounts for the distribution of information. CITMA is a central player on the commission because it controls three major dependencies that are heavily involved with the Internet: CENIAI, with its long track record in international connectivity and domestic network operations; the Information Institute of Science and Technology (responsible for the technical administration of the information services side of the Internet in Cuba), whose librarians and researchers provide the Cuban scientific and technological community with specialized information; and the Agency for the Development of Information, which is involved with the development and marketing of software and databases.

(2) The Ministry of Communications (MINCONS) is tasked with operating the telecommunications hardware and structures used by the networks, but does not run the networks themselves.

(3) The Ministry of the Interior (MININT) is responsible for establishing technical security procedures.

(4) The Ministry of Justice (MINJUS) is responsible for the legal framework of the entire operation, including preparation (if necessary) of new legislation.

(5) The job of the Ministry of the Revolutionary Armed Forces (MINFAR) is to ensure that the Internet will not weaken in any fashion the security of the state. How this will be accomplished has not been made public.

The minister of metallurgy and electronics industry presides over the Interministerial Commission, which coordinates the work of its member

entities. According to the decree, it is the responsibility of the commission "to assure the coherent behavior of the various central state administrative agencies and guarantee that proper action is taken in the face of possible changes in technologies or other problems that might occur." In addition, the commission is charged with addressing "informatics security, development policies, and the introduction of technologies in the country's socioeconomic processes, while ensuring that all investments made are compatible with Cuba's defense systems."

The decree stresses "the need for policies and a strategy" on networking that will be consonant with the country's culture, its developmental needs, and the "interests of national defense and security." It also states that it is necessary to ensure that the information transmitted from Cuba in these networks is truthful and that the information that Cuba receives from abroad will be "in accordance with Cuba's ethical principles and not harmful to the country's interests and security."

The decree establishes general guidelines for network access and states that "priority will be given to institutions considered the most significant in the country's life and development." Only legally recognized enterprises and institutions will have access. For the moment, individual Internet accounts will not be granted.

[Decree-Law 209] stresses "the need for policies and a strategy" that will be consonant with the country's culture, developmental needs, and the "interests of national defense and security."

Nicolás Garriga, director of the Information Institute of Science and Technology, argues that the access limits mandated by the decree will let Cuba acquire some practical experience in Internet operations without having too many users at the outset: "It is senseless to authorize or connect a given number of networks or computers, and then have different kinds of problems. This does not mean we will exclude any sector [of Cuba's society]. . . . We have identified approximately ten sectors that should be connected [to the Internet] in the first phase." Each of these primary sectors (e.g., the medical sector) could contain hundreds of users.

One of the reasons for the Cuban government's lack of enthusiasm for a large, uncontrolled influx of Internet users may be the condition of the country's telephone infrastructure, which is seriously deficient even in Havana and in still worse shape outside the capital. In Cuba, modems work fairly well at a speed of 1200 baud (fast enough for e-mail and text transmissions), but the country's exceedingly old and noisy copper telephone lines are unable to handle the 14,400 to 28,800 baud modem speeds needed for efficient access to the World Wide Web's multimedia environment. As noted earlier, plans are under way to modernize the telephone system, but this will take time.

One way around the overloaded telephone system has been via the special channels available to the Ministry of Tourism and the Ministry of Science, Technology, and the Environment. This infrastructure (based on the X.25 networking protocol) provides the backbone linking the provinces of Pinar del Río, Matanzas, Habana, Villa Clara, Ciego de Avila, and Camagüey to the national data-transmission network. Even the special channels, however, lack the capacity to serve large numbers of future users or to handle high-speed multimedia transfers.

THE INTERNET ERA BEGINS

During July 1996, Internet-related equipment (including routers and servers) purchased a few months earlier was installed. Technical training soon ensued. On July 26, Radio Havana Cuba announced a plan to increase telephone lines from five hundred thousand to 1 million, with a goal of twenty telephones per one hundred urban inhabitants and ten per one hundred rural inhabitants. The installation of digital telephone lines in Havana began late in the month. (In August, the U.S. Department of State put pressure on Grupo Domos, the Mexican company carrying out the telephone modernization, by denying visas to its executives and their families under a provision of the Helms-Burton Act, on the grounds that Grupo Domos was using equipment that had been confiscated from a U.S. firm by the Castro government.)

In early August, CENIAI began to offer Internet services on a limited trial basis to a select group of persons. The Internet sessions took place (by appointment only) after 4 P.M. on weekdays on four terminals set up in the country's Capitol building.

InfoMed and CIGBnet had also been experimenting with the Internet via long-distance telephone

hookups to Internet providers in Britain and Canada respectively. In addition, the two institutions (with help from the World Health Organization) have constructed an "intranet"—a local (Cuba-only) version of the Internet. The intranet's users cannot access the real Internet directly, but they can see selected materials previously downloaded from the Internet and made available by the InfoMed staff.

Only legally recognized enterprises and institutions will have [Internet] access. For the moment, individual Internet accounts will not be granted.

CENIAI, InfoMed, and a number of mixed enterprises have recently begun to offer courses (open only to persons approved by their workplaces) on various aspects of the Internet (e.g., e-mail, creating Web pages, search engines). These courses are invariably filled to capacity.

Cuba officially joined the Internet on October 11, 1996, an event described by the Ministry of Foreign Affairs in glowing terms:

> Cuba is connected since last Friday to INTERNET, turning into a reality what had been a dream for so long: having access to an international patrimony of knowledge used by some 36 million clients of 160 nations. As a result of the efforts of hundreds of specialists, Cuba will have access from now on to some 34,000 data bases of the most ample spectrum of social, political, economic, scientific and sports information.

THE TECHNOLOGICAL DETERMINISM MYTH

The notion that the Internet inevitably causes drastic transformation in whatever it touches has become something of a cliché. But is it likely to be true in the case of Cuba? Let us examine some of the arguments that have been made in support of this proposition:

"Sovereignty Is Obsolete." Many commentators have asserted that the global pervasiveness of the Internet, which permits information to sweep past borders at electronic speeds, is rendering obsolete the concept of national sovereignty. This view is an oversimplification, however. Governments throughout the world have recognized the challenge and have begun to take various measures to impose at least some degree of control. France, China, and Germany, for example, each have a regulatory agency. Vietnam and Singapore, among others, each route all Internet traffic through a single gateway. A number of countries have blocked access to certain Internet sites offering material deemed to be pornographic or politically unacceptable. Cuba has already taken some of these steps.

Cuba's Internet policy will be determined by the island's own situation and needs. Efforts by outsiders to politicize this issue by demanding that Havana adopt a laissez-faire approach might only produce a stronger nationalist reaction.

"The Internet Will Cause Political Change." Some observers claim that exposure to the outside world via "cyberspace" will create a climate of democratization within Cuba that will lead to the drastic alter-

CENIAI Rates for Internet Access (October 1996)

	MEMBERSHIP FEE	MONTHLY CHARGE
E-Mail		
Noncommercial	120 pesos	40 pesos
Commercial	150 U.S. dollars	60 U.S. dollars
CENIAI Access*		
Noncommercial	120 pesos	45 pesos
Commercial	150 U.S. dollars	67 U.S. dollars
SLIP/PPP Access		
Noncommercial	120 pesos	175 pesos
Commercial	150 U.S. dollars	260 U.S. dollars
TCP/IP**		
Noncommercial	250 pesos	305 pesos
Commercial	450 U.S. dollars	457 U.S. dollars
TCP/IP (High Speed)***		
Noncommercial	250 pesos	450 pesos
Commercial	450 U.S. dollars	675 U.S. dollars

* Limited access to Internet services.
** Dedicated telephone line at 28,800 bps.
*** Dedicated telephone line at 64,000 bps or faster.

Source: "Servicios que prestará el Nodo CENIAI," circular, September 3, 1996, Havana. Distributed by Administración CENIAI, Javier Villarino.

ation or overthrow of the government. The implicit assumption here is that Cubans have not already acted to bring about such changes because they do not know their own political, social, or economic realities.

A variant of the above thesis is the belief that, aside from whatever specific information may be transmitted into Cuba, the example provided by the Internet itself—a decentralized international "network of networks" with no formal governing hierarchy—could encourage Cubans to reject authoritarianism. But this image of the Internet as a libertarian paradise may soon become outdated if, as seems likely, commercial interests move in, convert the Internet into a vast global marketplace, and impose rules, restrictions, and fees. The process is already under way in much of Latin America, where networking has been centralized by private capital. Thus, the Internet that Cubans will encounter in coming years is likely to be driven not by the free-spirited computer enthusiasts of yesteryear but by the profit motive.

Associated with the "magic-of-cyberspace" mindset is the absence of a concept of electronic communications between Cuba and the United States as a two-way relation in which both sides might have something of value to offer. On the contrary, U.S. politicians (liberal and conservative alike), as well as some academics, tend to envisage the networking relationship as inherently one-sided (i.e., the Cubans have something to learn from the United States).

The fundamental flaw in the "Internet as agent of change" thesis is its mistaken assumption that a given technology must produce a specific political outcome. As the U.S. sociologist Daniel Bell pointed out nearly two decades ago, the consequences of technology depend on the social system within which that technology is applied:

> [The] new revolution in communications makes possible both an intense degree of centralization of power, if the society decides to use it in that way, and large decentralization because of the multiplicity, diversity, and cheapness of the modes of communication. . . . The effects depend on the context. The new technology, like the old, may induce some cultural and political change, but it may also enable a given system to further refine the political structures that are most acceptable to its culture, which may not be democratic in the Western sense. ("Thinking Ahead," *Harvard Business Review*, May-June 1979, pp. 20ff.)

A political, social, or economic system cannot be created or re-created by means of a technological invention. Such a system is the product of its country's history, social structure, and political culture. It has a certain inertia and resists quick or easy manipulation. As Ken Hirschkop wrote in the July-August 1996 issue of *Monthly Review* (New York), "one cannot buy democracy off a shelf, or download it from a Web site."

CONCLUSION

The computer networking revolution reached Cuba much earlier than it arrived in some other Caribbean and Central American countries. Although nearly five years were required for Cuba to move from e-mail to real-time World Wide Web access, this is not an unusually long interval by Third World standards.

The success of the negotiations leading to the 1992 global e-mail connection via Canada demonstrates that a low-profile policy of cooperation without politicization can produce concrete results fairly rapidly. The e-mail link benefited academics, artists, and numerous nongovernmental institutions at a time when international contact was becoming increasingly important but financial resources were limited. In fact, Cuban academics discovered electronic messaging before many of their U.S. counterparts did.

The fundamental flaw in the "Internet as agent of change" thesis is its mistaken assumption that a given technology must produce a specific political outcome.

As the Internet has moved toward greater commercialization, its potential benefits have become rather obvious to the Cuban authorities. Despite a shortage of capital, as well as concerns about regime security, the government has committed considerable human and financial resources to the development and exploitation of the Internet.

In some ways, Cuba's handling of Internet access will probably resemble the development of its policy on foreign investments. Access to the Internet will initially be limited, and individual accounts will not be permitted. As is the case in many other Third World countries, the preferred model is to provide computing services to groups of users at a few central locations. As the island's telecommunications infrastructure is modernized and the Internet becomes better known, both the central nodes and their users will increase in number. Cuba (like most other developing countries) may never become a densely interconnected nation. Given the comparatively high educational and cultural level of Cuba's population

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in general and the workforce in particular, however, it is reasonable to anticipate significant growth in the popularity and utilization of electronic networking. Already, there are twenty thousand computers in the secondary schools, and during the period from 1993 to 1996 one hundred thousand persons completed computer courses offered by the Youth Computer Clubs.

Internet connectivity can be valuable to all participants. Cuba clearly stands to benefit, but the rest of the world could gain as well from what the Cubans may have to offer. Whether these possibilities are realized will depend on actors both on and outside the island.

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For Further Information

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National Web Site of the Republic of Cuba (Cubaweb): Internet address http://www.cubaweb.cu.

Unofficial Republic of Cuba World Wide Web home page (by Davide Peis of Italy): Internet address http://www.unipr.it/~davide/cuba/home.html.

CubaNet (Miami-based Cuban exile World Wide Web site): Internet address http://www.netpoint.net/~cubanet.

TinoRed Update

The TinoRed network has not functioned since January 1997. Canada's Web Networks, which had been absorbing the cost of relaying e-mail messages, apparently concluded that its services were no longer necessary because Cuba has had Internet connectivity since October 1996. However, Cuba's Ministry of Science, Technology, and the Environment, through which Internet connections are administered, has yet to make the necessary arrangements for TinoRed to function. A number of other networks in Cuba are similarly affected. According to sources in Havana, there is hope that this difficulty will be resolved in May 1997.

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