NETWORKING IN LATIN AMERICA AND THE CARIBBEAN AND THE OAS/RedHUCyT PROJECT

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Abstract

From December 9-11, 1994, the Summit of the Americas was held in Miami, Florida. Thirty four heads of States gathered in this city and signed a Plan of Action which specifically included a chapter for Telecommunications and Information Infrastructure. In this chapter, the governments of the Americas recognize that a country's information infrastructure is an essential component of political, economic, social and cultural development. The Governments assume several key responsibilities including to encourage major universities, libraries, hospitals and government agencies to have access to these networks, building on the work of the OAS/RedHUCyT project.

In 1991, the Organization of American States (OAS) approved the initiative entitled "Hemisphere-Wide Inter-University Scientific and Technological Information Network" (RedHUCyT, an acronym in Spanish). It allocated financial resources as seed money to start the project. In the following years, special funds were provided by the United States and other governments.

RedHUCyT's main objective is to connect the member countries to Internet, by integrating an electronic network for the exchange of specialized information among different academic and scientific institutions in the member States.. The project provides high-tech equipment, technical support, specialized training, and sponsors technical workshops and seminars in the region to prepare technical projects, improve skills, share technical knowledge, and train network managers.

Introduction

Computer networking in Latin America and the Caribbean has had an impressive growth during the past two years. According to recent ISOC statistics, some of these regional networks have had the highest rates of growth worldwide. About half of the new full Internet connections in the region were established during 1994.

The first two countries in Latin America to connect to Internet were Brazil and Mexico. Using the Morelos satellite, Mexico established a connection to the National Center for Atmospheric Research (NCAR) in Boulder, Colorado, allowing the researchers at the National University of Mexico (UNAM) to access the network. Currently, telecommunications facilities include satellite and fiber optics links to the United States. A lot of information about the Mexican network is available through their web sites and there currently are over 50 web hosts distributed all over Mexico. A good reference is located at http://info.main.conacyt.mx/.

Brazil is expanding its networks and there is a planned backbone interconnecting Recife, Fortaleza, Brasilia, Belo Horizonte, Rio de Janeiro, Sao Paulo, and Porto Alegre at 2MBps as well as E1 links to the U.S. from Brasilia and Rio de Janeiro. The latest ISOC statistics report show 7,641 interconnected hosts in Mexico and 7,010 in Brazil.

Also Argentina, Chile and Costa Rica have had a very high growth during the past year, having the largest number of direct Internet connections relative to the number of people.

As mentioned, the Internet development in Latin America and the Caribbean is fairly recent. The Peruvian network, Red Cientifica Peruana (RCP), became connected to the Internet about a year ago, and is experiencing a very rapid growth. It is expected to have over 50,000 users by the end of this year and it is also expected that the current 64Kbps satellite bandwidth will be expanded to 512Kbps. Their web site is very popular: http://www.rcp.net.pe which contains a lot of information about Peru and more generally about Latin America. Also, Ecuador, through the efforts of ECUANET and Banco del Pacifico, and Venezuela have a very important presence on the Internet. A Latin American "Who Is" was jointly developed by ECUANET and the UNIRED of Chile. More recent connections include Colombia

and Uruguay.

In Central America, Nicaragua and Panama connect to the Internet through microwave links to Costa Rica which has recently expanded its satellite bandwidth to 128Kbps. Costa Rica, as well as Ecuador, Peru, RETINA from Argentina and Colombia connect to Homestead, Florida using the PanAmSat satellite interconnecting through a router managed by Sprint and sponsored by the National Science Foundation who pays the management port fees. Also, in the Caribbean, Jamaica was connected to the Internet through a 64Kbps satellite link. In addition, there are many UUCP nodes providing e-mail and file transfer to most of the Caribbean countries, under the sponsorship of the OAS/CUNet project and other organizations. The most recent nodes were implemented in Guyana and Saint Vincent & the Grenadines.

Bolivia and Honduras are expected to be on the Internet when this article is presented at the INET conference.

Currently there are already several commercial providers in the region, including RACSA in Costa Rica, TELINTAR in Argentina and many more PTT's that have started to offer Internet services.

In addition, many technical workshops, training and coordinations meetings, including the First Inter-American Networking Workshop held in Rio de Janeiro and subsequent yearly regional forums, have taken place in the region, allowing network administrators for strong interaction, facilitating the solution of common problems thereby optimizing human and material resources to benefit the region.

A close working relationship has been established with several organizations, in particular with the National Science Foundation's ICM project.

OAS/RedHUCyT

The OAS has been very active in these developments through the Hemisphere Wide Inter-University Scientific and Technological Information Network (RedHUCyT) project. From December 9-11, 1994, the Summit of the Americas was held in Miami, Florida. Thirty four heads of States gathered in this city and signed a Plan of Action which specifically included a chapter for Telecommunications and Information Infrastructure. In this chapter, the governments of the Americas recognize that a country's information infrastructure is an essential component of political, economic, social and cultural development. The Governments assume several key responsibilities including to encourage major universities, libraries, hospitals and government agencies to have access to these networks, building on the work of the OAS Hemisphere Wide Inter-University Scientific and Technological Information Network (RedHUCyT) project.

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RedHUCyT's main objective is to connect the member countries to Internet, integrating an electronic network for the exchange of scientific and technological information among professors, researchers, and specialists at different universities in the member states.

RedHUCyT's approach to the development of electronic networks in the member States is to help local initiatives for either the inception, or expansion, of networks in their countries. The project provides high-tech equipment, technical support, specialized training, and sponsors technical workshops and seminars in the region to prepare technical projects, improve skills, share technical knowledge, and train network managers.

RedHUCyT activities and achievements

1) Seminars and Workshops

RedHUCyT has sponsored and co-organized several seminars and workshops in Latin America and the Caribbean to promote knowledge and experience of electronic communication networks. Among them, The First and Second Caribbean Academic and Scientific Network Workshops; four

Inter-American Networking Workshops; the First and Second Latin American School on Networks; REUNA'94, a major workshop held in Chile for end users with more than 400 participants.

2) The Caribbean Academic, Scientific and Technological Network - CUNet

The OAS, CRACIN, and the University of Puerto Rico (UPR) held the **First Caribbean Academic and Scientific Network Workshop** in September 1991, and the **Second Workshop** in March 1992, also in Puerto Rico.

The participants in these seminar-workshops represented most of the English-speaking countries of the Caribbean Basin as well as the Dominican Republic. Their main objective was to promote and facilitate participation by the Caribbean countries in worldwide academic and scientific networks. At the first workshop, in September 1991, a project to establish an electronic information network linking the universities of the Caribbean, known as the Caribbean Academic, Scientific and Technological Network (CUNet), was formally launched.

The CUNet project has been designed to establish an academic, scientific, technological, and research network for the Caribbean region, and was conceived as a project for cooperation among institutions of the countries in the region.

CUNet's participants include public and private institutions playing leading roles in the establishment of national networks in their own countries, and which also foster international communications for academic, scientific, technological, and research purposes. Currently there are more than 25 nodes in the subregion, connecting nearly 2,000 users within the CUNet framework.

3) Jamaican Electronic Network (JAMNet)

Within the CUNet project, funds and technical assistance were provided for the implementation of the Jamaican Electronic Network (JAMNet), allowing Jamaica to be connected to Internet through a 64Kbps satellite link between Kingston and the United States.

Physically, JAMNet provides distinct connection for each institution through the facilities of Telecommunications of Jamaica (TOJ), the local telecommunications provider. The connection was set-up during September, 1994. Primarily, JAMNet interconnects the following institutions in the academic, research, scientific and technological sector: The University of the West Indies Mona (UWI); the College of Arts, Science, and Technology (CAST) and many other institutions which have dial-up links to UWI or CAST

4) Central American Project - RedCACyT

In Central America, resources have been allocated for the establishment of a backbone of interconnected institutions with an outlet through the Costa Rican National Research Network (CRNet), which is connected to the Internet through a 128Kbps satellite link between Costa Rica and the NSFNet in Florida.

The first stage of the project was implemented during 1992 and consisted on broadening the existing communications channel between the University of Costa Rica itself and CRNet, which has a large number of affiliated Costa Rican education and research institutions and more than 2,000 users.

The second stage is the connection of other Central American countries. Links were developed between the University of Costa Rica and the National Engineering University (UNI) in Managua, Nicaragua, as well as with other Nicaraguan universities and research institutes. RedHUCyT provided equipment and technical assistance for the implementation of the Nicaraguan Academic Network (RAIN). The equipment was installed in the facilities of the Nicaraguan Telecommunications Institute (TELCOR) during March 1994. On the other hand, the connection of Panama to Internet was established during June, 1994, also through CRNet. At present, three major universities are connected: Technological University of Panama (UTP), the University of Panama (UP), and the University of Santa Maria la Antigua. Both RAIN and the Panamanian Academic Network (PANNet) are connected to Costa Rica through microwave links.

Meanwhile, the National Network of Honduras

(HONDUNet) project was approved and is currently in its implementation stage. HONDUNet will have its own satellite uplink, through PanAmSat, to the NSF node at Homestead, Florida. A variety of government and academic institutions will participate in the first stage, which involves the interconnection of the Autonomous University of Honduras (UNAH), the Central American Technological University (UNITEC), the Francisco Morazan Pedagogical University (UPN), the Pan American Agricultural School (El Zamorano), the Ministry of Education, and the Honduran Science and Technology Council (COHCIT).

RedHUCyT is supporting Guatemala for the implementation of the MAYANet project. In Guatemala, an agreement between the National Telecommunications Company (GUATEL) and the National Council of Science and Technology (CONCYT) was achieved, where GUATEL will provide, without charges, a 64Kbps satellite uplink to COMSAT, as well as local links to academic institutions. In El Salvador, a project proposal was develop with the participation of several leading institutions and conversations are being held with ANTEL, the national telecommunications company.

5) MERCOSUR Countries and Chile

The OAS has been supporting a project presented by the Secretariat for Science and Technology (SECyT) whose main objective is to optimize the operation and efficiency of the Science and Technology Network (RECYT). At present, RECYT has approximately 300 nodes located throughout the country which are estimated to serve several thousands users, with average monthly traffic of 200 megabytes transmitted exclusively by electronic mail. After SECyT's connection to Internet through TELINTAR, the national PTT Internet provider, the Argentinean Network has had an explosive growth. Another project to support RETINA, which connects to the Internet through a separate satellite link via PanAmSat to Homestead, Florida, was also supported by RedHUCyT and consisted in the acquisition of routers.

SECyT, with the sponsorship of RedHUCyT and other organizations, has organized several meetings in Buenos Aires to seek ways of integrating the regional academic and environmental networks. With this purpose, the first official meeting between Argentina and Uruguay was held in September, 1993. Subsequently, a second meeting was held with the participation of Argentina, Bolivia and Paraguay.

In Chile, RedHUCyT provided significant resources for a Seminar on personnel training of the National University Network (REUNA), which was held in September, 1994, with the participation of more than 20 universities associated with REUNA. Several experts were also invited from the MERCOSUR member countries, strengthening the integration of electronic networks in the region.

On the other hand, UNIRED, another important association of Chilean universities, including the Catholic University of Chile, is providing technical support for the development of regional projects, specifically in Bolivia, where the Bolivian Data and Communications Network (BOLNET) is in its implementation stage. UNIRED is providing technical assistance for the evaluation of alternatives for the connection of Paraguay to the Internet, under the sponsorship of the OAS/RedHUCyT project, which in its first phase includes the connection of the National and the Catholic Universities and setting up a POP to the Internet.

Finally, in Uruguay, basic equipment was provided to the Technological Laboratory of Uruguay (LATU) to facilitate its connection through the University of the Republic.

6) Andean Countries, Mexico, and Brazil

A project in Ecuador was fulfilled to complement the efforts of the Ecuadorian Information Corporation (EcuaNet), a not-for-profit entity which offers connection to Internet as a free service to universities. EcuaNet's communications infrastructure, which is provided without charge by the Banco del Pacifico, includes satellite antennas in Guayaquil, Quito, Ambato, and Galapagos.

In Bolivia, the Bolivian Data Network (BOLNET) is in its implementation stage which will connect Bolivia to the Internet. Several institutions will be connected, including the University of San Andres in La Paz, University of San Simon in Cochabamba, University Gabriel Rene Moreno in Santa Cruz, the National Council

for Science and Technology (CONACYT) and the United Nations Program for Development in Bolivia (UNDP). This network should be up by June 1995.

Peru, through the Peruvian Scientific Network (RCP), a consortium of more than one hundred institutions, joined the Internet in March 1994. It involved acquisition of a ground station for satellite communication, including the radio-frequency equipment, to support Peru's connection with Internet through a satellite link to the NSF node in Homestead, Florida. A similar project with Venezuela was also implemented, which acquired a ground station.

Conversations have been held with the University of the Andes, the Central University of Colombia, and COLCIENCIAS to seek means of cooperation to assist Colombia in the expansion of its electronic network. On the other hand, Brazilian experts have been supported for their participation in regional and international events.

Conversations have also been held with Mexico and OAS support has been offered for the future expansion of the national backbone, chiefly with respect to the acquisition of certain basic equipment such as routers. Financing was granted earlier for the purchase of a satellite antenna and auxiliary equipment to connect the National Science and Technology Council (CONACYT) to the National Center for Atmospheric Research (NCAR) in Colorado, United States. This equipment is being overhauled at present.

7) Latin American and Caribbean Scientific and Technological Information Web INFOCyT

During the REUNA'95 Seminar, a Pilot Program Workshop about the introduction of scientific and technological data bases through Internet was held in Santiago, Chile with the participation of networking and information systems experts from Argentina, Brazil, Costa Rica, Chile, Mexico, Peru, Uruguay and Venezuela.

The main objective of the workshop was to evaluate different alternatives to facilitate the access to scientific and technological **regional information** through Internet.

The Peruvian Scientific Network is implementing, with the continuous support of the national coordinators of the participating countries, a specific home-page in World-Wide Web. This home-page facilitates the access to regional data bases by using pointers provided by the national networks in each country of the region. Currently, this web site has the following address: http://www.rcp.net.pe/INFOCYT/infocyt.html.

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Saul Hahn is Coordinator of Basic Sciences and Networking at the Department of Scientific and Technological Affairs in the Organization of American States (OAS) since 1987. Under his coordination, the project Hemisphere Wide Inter-University Scientific and Technological Information Network (RedHUCyT) was established in 1991 to help integrate academic electronic networks in Member states of the OAS. A subproject of RedHUCyT, the Caribbean University Network (CUNet) was also established in 1991. Both projects play an important role in enhancing the development of national networks in the Western Hemisphere, in particular with regards to connectivity with the Internet. Dr. Hahn has been co-organizer of major meetings, including several Latin American and Caribbean Networking Workshops. Born in Mexico City, Saul Hahn obtained an Electronics and Communications Engineering degree from the Mexican Polytechnic Institute. He also obtained an M.Sc. and Ph.D. in Mathematics from New York University. Dr. Hahn was a Professor of Mathematics and co-coordinator of the Computer Lab at the Centro de Investigacion y Estudios Avanzados in Mexico City and consultant to the IBM Scientific Center where he did work in digital image processing and coordinated special projects.

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