

## Redes en Argentina<sup>(+)</sup>

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### Networks in Argentina

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#### 1. Introduction

Argentina has connections to all the usual worldwide networks, including the Internet, BITNET, UUCP, and USENET. In addition, there is much use of Delphi and CompuServe. The main language used on all the Argentine networks is Spanish, which may explain the apparent lack of traffic from Argentina on the worldwide networks.

##### 1.1. Network Names

Several names are used for networks within Argentina: RAN (Red Academica Nacional, or National Academic Network), RECYT (Red de Ciencia y Tecnologia, or Science and Technology Network), Red Argentina de Salud, and ARNET (Argentine Science Network). These are all so intertwined that it's best to describe them all at once and make distinctions where they appear, rather than trying to describe them separately. There appears to be no consensus

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on exactly where the distinctions lie. The distinctions given here are only one possible set.

ARNET, the Argentine Science Network, is a national science and research network connected to the Internet. ARNET uses IP among a few machines, and is properly IP class B network 140.191.

Most of the other links for the other networks named above are by UUCP, either over dialups or over the national X.25 network, ARPAC. In addition, there are BITNET nodes, and use of commercial systems such as Delphi Argentina. We describe these, as well as a mailing list about Argentina.

RAN (Red Academica Nacional, or National Academic Network) for the early UUCP star network centered around host dcfcen at the Departamento de Computacion de la Facultad de Ciencias Exactas y Naturales.

RECYT is a name used by SECYT, the Secretariat of Science and Technology, or Secretaria de Ciencia y Tecnologia, for the more recent UUCP network.

Red Argentina de Salud is the Argentine Health Net, and is a UUCP network managed by several organizations, particularly the Children's Hospital of Buenos Aires.

There has been some confusion within the country about these different networks: which to connect to? one or all of them? should each be contacted? This is changing, as the various historical Argentine networking projects coordinate more closely as they grow. Each has its own goals and political issues, but all are finding ways to cooperate.

## 1.2. History

High-level networking in Argentina began in 1982 at the University of Buenos Aires (UBA). A few university machines were connected using X.25 over ARPAC, the national Public Data Network (PDN). University salaries and telephone dialup links were a big problem with expanding network facilities and usage: \$100/month for staff and \$300/month for professors was normal. There were theoretical networking projects and some courses on X.25 and TCP/IP, but little actual network development.

Impetus came from Alberto Mendelzon of the University of Toronto. While taking a sabbatical in 1986-87 at UBA, he became involved in a project sponsored by UNDP, the United Nations Development Programme, whose objective was (and is) the introduction of modern information technology into the Ministry of Foreign Affairs (MREC). Mendelzon helped

establish an international UUCP connection for the Ministry by setting up the node atina. The host atina was first connected by direct dialup to the University of Toronto, and later via X.25 to pyramid and to seismo. UUNET then took over from seismo as an international UUCP hub.

Jorge Amodio and Carlos Mendioroz joined the UNDP project during this period and helped solidify the international connections. An enthusiastic group studying Unix and networking at the Department of Computer Science of the Faculty of Exact Sciences of UBA, or Departamento de Computacion de la Facultad de Ciencias Exactas y Naturales, became involved in the early stages. They helped persuade the project authorities that the quality and amount of information being received over the international connection should be shared with the larger academic community, at least on an experimental basis.

UBA staff members Jorge Amodio and Julian Dunayevich set up the node dcfcen (Departamento de Computacion, Facultad de Ciencias Exactas y Naturales), which connected UBA to the rest of the UUCP world via atina. This node started publicizing UUCP-style networking in academia and became the hub of the RAN (Red Academica Nacional), an academic UUCP network.

Because of growth in traffic, a cooperative action was started to establish a direct satellite link between Argentina and United States. The partners were the Secretariat of Science and Technology (SECYT) and the Ministry of Foreign Affairs (MREC). The result of this initiative was the establishment of an Internet connection under the name ARNET.

### 1.3. Network Administration

There is no single network administration, nor lead national funding agency, for Argentine networks: nobody owns the network. This allows distributed support and avoids certain issues that have been controversial in other countries recently. Many parties involved in networking in Argentina wish to preserve the distributed character of the network. However, the cost of the international link is supported by an agreement between SECYT and the UNDP project at MREC.

## 2. ARNET

ARNET, or Argentine Science Network, is the name used for the current IP links within and without Argentina, including the Internet connection. It mostly connects universities and research organizations. It has no central planning or administration.

## 2.1. Services

Services of ARNET include electronic mail and lists, USENET news, and the other usual IP services. Most of the news and mail passes over the IP link between atina.ar and uunet.uu.net. In addition to these internal services, atina.ar supports anonymous FTP to the Internet, providing the current copies of the Argentine UUCP maps, among other information.

## 2.2. The Internet

ARNET is connected to the worldwide Internet by a satellite IP link from the machine atina.ar in Buenos Aires to the University of Maryland, connecting to SURANET, an NSFNET regional. The link actually goes from Buenos Aires to New York City, and from there to the University of Maryland, to reach SURANET. The BA-NYC link is 19200bps, but half of that is used for internal MREC traffic. The effective bandwidth BA-NYC-MD is 9600bps. The link was first operational 17 May 1990.

The international link is funded under United Nations Development Programme (UNDP), Project ARG-86-026 at MREC, and also with funds from SECYT. The link from New York to Maryland was funded by the University of Maryland, apparently using funds from the U.S. National Science Foundation (NSF). The international link is managed by MREC and SECYT.

## 2.3. Internal connections

ARNET has a class B IP network number (140.191), and uses subnets for physical networks within the country, with a netmask of 255.255.254.0. That is, with seven bits for subnet number and nine bits for the host on subnet part. This unconventional netmask is possibly due to a very large Ethernet at MREC.

The host atina.ar is located at MREC, and managed by UNDP and MREC. It is an Intel 386 system running UNIX System V. This machine is on one of the local MREC Ethernets, using IP. It is also connected to the ARPAC X.25 network, and also has five telephone dialup lines with Telebit modems.

A cisco MGS router is used on the atina end of the satellite link to SURANET, and is connected to the MREC LAN.

Most other network connections inside the country use UUCP, not IP.

#### 2.4. Naming, Addressing, and Routing

Most hosts on ARNET use Internet DNS domain addresses. UUCP addresses are also accepted, and are often used to reach hosts on the various Argentine UUCP networks, not necessarily on the IP network ARNET. These addressing forms are used:

```
user@node.subdomain.ar
uunet!atina!node.subdomain.ar!user
uunet!atina!node!user
```

Second level domains within the AR top level domain are arranged by either organizational type or province. These domains are available to UUCP hosts as well as IP hosts. The usual edu, com, org, etc. organizational domains are available, plus one for mrec:

Organizational subdomains:

```
edu.ar   Academic and research institutions
org.ar   Non profit organizations
gov.ar   Government institutions and agencies
com.ar   Commercial organizations
mil.ar   Military institutions
mrec.ar  Ministry of Foreign Affairs Network
```

Hosts or organizations that don't ask for names under the above domains get provincial subdomains, such as ba.ar for Buenos Aires, cb.ar for Cordoba, rn.ar for Rio Negro, tm.ar for Tucuman, or tf.ar for Teirra del Fuego (which has several hosts, but none registered under tf.ar).

There is a bit of flakiness in the IP implementation on atina.ar, which has led to ar and atina.ar not being completely registered for DNS. This is expected to be resolved by remapping the nameservers for AR and by a host software change on atina.ar.

#### 2.5. Plans

There are plans for expansion of IP connectivity within Argentina, involving a cooperative agreement between the current UNDP/MREC project and the Secretariat of Science and Technology, under the name RECYT (Red de Ciencia y Tecnologia, or Science and Technology Network). The first phase consists of installation of UNIX machines in major provincial and regional sites. These will be interconnected with UUCP over ARPAC and national satellite links, or microwave, dialup, or leased lines, as appropriate. The second phase will move these links from UUCP to IP. Other

methods of IP extension are being studied, as are methods for upgrading the international Internet link.

Satellite links are used less than in some other countries, apparently because the quality of the telephone system is high. SECYT is also working on a connection to Antarctica.

## 2.6. Foreign Connections

The Ministry for Foreign Affairs (MREC) may become more involved in foreign connections, since it wants to communicate with each foreign country. This can perhaps be done less expensively by going through New York City, home of the United Nations, than directly from Buenos Aires.

There is a UNDP network in New York City, connecting the United Nations missions of various Latin American countries. This may eventually be used for communications among those countries, but is not yet. At the moment, the main connection between Argentina and Bolivia, for example, is through the University of Bolivia calling [cdp.org](http://cdp.org) (PeaceNet, in California), which has general mail access.

Academics and the various ministries actually have very similar needs for communications with, e.g., the United States. MREC and SECYT are already cooperating. As traffic grows, the percentage related to MREC will probably decrease, as academic traffic becomes predominate.

Discussions are in progress regarding regional Latin American networks in several areas.

## 2.7. Access to ARNET:

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### 3. UUCP Networks: RAN and RECYT

There are about 400 hosts scattered throughout the provinces, mostly connected by UUCP. The largest concentration (two thirds of all hosts) is in Buenos Aires, with smaller concentrations in Cordoba, Santa Fe, Rio Negro, and Tucuman.

#### 3.1. History

Academic mail distribution started from the host dcfcen, in a star using UUCP, under the name RAN (Red Academica Nacional, or National Academic Network). The general UUCP network is now often called RECYT (Red de Ciencia y Tecnologia, or Science and Technology Network), after the name of the Secretariat of Science and Technology, or Secretaria de Ciencia y Tecnologia.

#### 3.2. Status

Since most of Argentine universities have MS-DOS machines and little extra money to spend on networking, most of the machines on the network (currently 60%) are MS-DOS machines. Most ARNET connections are carried over the national X.25 Public Data Network (PDN), ARPAC (sometimes by dialup to a PAD). Much of the traffic is carried by UUCP on top of X.25. UUCP is used for all of UNIX, MS-DOS, and VMS. The effective link speeds vary from 300bps to 9600bps.

Best results for dialup connections are obtained using Telebit modems with PEP. There are also a few leased lines, mostly among MREC facilities in Buenos Aires.

#### 3.3. Plans

SECYT and others distinguish three kinds of network nodes, serving as concentrators for other traffic.

- 1) geographical, e.g., provincial
- 2) thematic, e.g., astronomical
- 3) technical support

The technical support nodes can be the hardest to set up, since they require finding people with experience or interest in software, communications, the ability to ask and answer questions, and an appropriate character (hackers, in short).

Most of the projects for network expansion within the country concentrate on getting network links established, without telling the users what to use them for, and leaving

politics to the users. Although there have been many discussions of large network projects (e.g., one that would have put mainframes everywhere, but without funding for support), the projects that are spreading have mostly been built by starting small with available equipment and software (e.g., 386 boxes, DOS, and XENIX), and building up, not by funding or imposition from above.

When you can buy an inexpensive laptop that will handle most of your computing needs, it is not clear that there is much value in investing in chip manufacturing facilities with the intent of building computers locally. Networking provides a valuable opportunity for investment in human resources, such as software, instead, and without having to concentrate all investment in a few locations or projects.

#### 4. Delphi Argentina

Health organizations in Argentina have been using Delphi Argentina by dialup or X.25 connections for four or five years. This is a private commercial company providing mail, BBS, and other services.

##### 4.1. Access to Delphi Argentina

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#### 5. Red Argentina de Salud

Red Argentina de Salud, or Argentine Health Net, is a distributed network using UUCP to connect health organizations. It is loosely managed by several organizations:

- + By The Children's Hospital of Buenos Aires, Hospital de Niños ``Dr. Ricardo Gutierrez."
- + By OPS (Organizacion Panamericana de la Salud), or Pan American Health Organization (PAHO), which is a regional office of the World Health Organization (WHO).
- + By the Faculty of Pharmacy and Biochemistry (DACFYB), University of Buenos Aires.

- + By the RAN (Red Academica National, or National Academic Network) project of the Faculty of Exact Sciences of the University of Buenos Aires.
- + By a private company (PCCP SA).

There are about 160 connected institutions, from Salta in the north to Tierra del Fuego, covering the entire country. They include hospitals and health centers, faculties of medicine, and government offices. The traffic is about 10 Megabytes per day. Most is information retrieval from listservers, library servers, and other information sources.

All the connections are by dialup telephone, or ARPAC. They use an MS-DOS program, PcCorreo (in English, PC Post), to simulate a UNIX mailer.

Exchange of information among networks is habitual, including BITNET, the Internet, UUCP, Delphi, CompuServe, etc.

There are four key systems in this Argentine health network:

UUCP name	domain name	funding organization
opsarg	opsarg.sld.ar	OPS Argentina
guti	guti.sld.ar	Grupo Computacion Medica del Hospital
pccp	pccp.com.ar	a private company
dacfyb	dacfyb.sld.edu.ar	Laboratorio LACYR

They are all Intel 386 systems. All run XENIX, except opsarg, which runs UNIX System V. All of them are listed in the UUCP maps for Argentina, except pccp.

The funding organizations for these systems are indicated above. Each other system on the network is funded by its owners or users.

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## 6. BITNET in Argentina

A connection to BITNET was first made in January 1989, from the National Atomic Energy Commission, or Comision Nacional de Energia Atomica (CNEA). There were three initial nodes, all at CNEA, all using the RSCS implementation of NJE. The current direct BITNET connection is from ARGCNEA2, by dialup, to the Chilean node UCHCECVM, at 1200bps, during limited daily hours. There are about 200 users, transferring about 200 files daily.

In February 1990, the University of La Plata, or Universidad de La Plata (ULP), also connected to BITNET, with two nodes, both IBM mainframes. The main one with the outside connection is CESPIVM2. There is also an experimental connection using JNET to a VAX/11-780 running VMS.

Chile has a NASA-sponsored BITNET connection to Easter Island. It will soon be converted to VMnet, which is NJE over IP, or the same technology as what is called BITNET-II in the United States. There is a direct BITNET link between Chile and Argentina. The same protocol conversion will soon be done in Argentina.

Another connection is expected to Uruguay (to the Universidad de la Republica del Uruguay) from ARGCNEA2, at 2400bps.

The Northeast National University, or Universidad Nacional del Noreste (UNNE) has a dialup BITNET link to the Universidad de Santa Maria in Brazil. They expect a leased line to be in place by December.

There appears to be no current gateway in Argentina between BITNET and the UUCP network. There has been no gateway between BITNET and the IP network, ARNET. However, in October 1991 the University of La Plata added an IBM-3720 with TCP/IP, which would permit a local gateway.

### 6.1. Access to BITNET in Argentina

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## 7. Mailing Lists

There are a few dozen mailing lists based in Argentina, and at least one based outside (in Toronto) about Argentina. The main language used is Spanish.

The original idea for the Argentina list is difficult to ascertain, and there was a smaller list before the larger one started. Early participants included Cristobal Pedregal, then at MREC, and who was born in Brazil and was a member of the Brazilian mailing list bras-net. Hector Gefner, then at UCLA (the University of California at Los Angeles), was a member of a list about Venezuela, and attributes the original idea for the Argentina list to a discussion with Julian Araoz. Pedregal contacted Gefner, who contacted about ten people, and started the list with about 30 members.

The list is not moderated; postings are distributed automatically. It has over 900 members, in over 15 countries. Its distribution point is currently in Toronto, Ontario, but will be moving to Buffalo, New York, at the end of 1991.

### 7.1. Access to mailing lists:

All health institutions in Argentina,  
plus some in Uruguay and Paraguay:

salud@opsarg.sld.ar

Nuclear Medicine Institutions in Argentina:

nucmed@guti.sld.ar

The international Argentina mailing list:

argentina-request@db.toronto.edu  
Carlos G. Mendioroz  
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tron@db.toronto.edu

After 1 Jan 1992:

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## 8. Acknowledgements

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