



**The Pan Asia Networking Yearbook (PANY) provides comprehensive coverage of Internet infrastructure, content and key organizations for 22 countries in the Asia Pacific region. It is a reference sourcebook for all interested in Internet networking issues in Asia.**



Copyright © International Development Research Centre, 1998

© All Rights reserved. No part of this web site may be reproduced, stored in a retrieval system or transmitted, in any form or by any means, electronic, mechanical, photocopying, or otherwise, without the prior permission of the International Development and Research Centre.

The material in this Yearbook has been peer-reviewed by in-country resource persons. The views expressed are those of the writers and do not necessarily reflect those of the International Development Research Centre.

Cite as follows :

The Pan Asia Networking Yearbook (1998).

Singapore: Asia Regional Office, International Development Research Centre.

[On-line serial, subscriber-based :<https://www.panasia.org.sg/ecomsec/bookshelf/user/webdriver>]

## **Abstract**

*Australia has a well-developed communications infrastructure for Internet and its use is widespread throughout business, government, education, and the general public. According to the latest figures from the Bureau of Statistics, almost a third of Australian adults, or 4.2 million people, used the Internet, while the number of households with access to the Internet increased by 46 per cent in the last year to almost 1.25 million (18 per cent of households), giving it one of the highest penetration rates for Internet in the world.*

---

## **Australia**

By Geoff Long



## **OVERVIEW**

The island continent of Australia is a large land-mass with a population of only 18 million, making it one of the least densely populated places on earth. The interior is very dry and does not support intensive agriculture. As a result, most of the population is concentrated on the coastal fringes, particularly the eastern sea-board. The capital of Australia is Canberra but it is an administrative city only. The two major business centres are Sydney and Melbourne, while Brisbane, Adelaide, and Perth are the other larger cities. Despite media images of Australians living in rural settings, most of the population live in cities and the country is very urbanised. Australia is also a multi-cultural country and has over the years taken in immigrants from nearly every nation. Today it is one of the most culturally mixed societies in the world. While English is the only official language, there are significant linguistic resources available as a result of immigrant groups. Indigenous Australians, or Aborigines, make up just over 1 per cent of the population and have a wealth of culture and many languages in use.

Although Australia is a large area to cover, infrastructure is well developed in nearly all parts of the country and telecommunications coverage is approaching 100 per cent. The rural areas have some strong lobby groups that attempt to push policies that will give remote areas the same access to services as city people have, and to a large extent this has been successful. Nevertheless, city areas particularly Sydney and Melbourne have access to high-bandwidth networks and a choice of services that are not available in country areas.

Until recently Telstra (formerly Australian Telecom) had a monopoly on telecommunications services. The government introduced one competitor Optus in the lead-up to full-deregulation on 1 July 1997. Since that time at least 25 telecommunications carriers have obtained licences to build and operate networks. Nevertheless, Telstra is still the dominant player and operates the largest network in the country, while Optus also has major infrastructure, including the Australian satellite system, Aussat. Telstra was partially privatised in 1998 and the government is looking at completely privatising it some time in the future.

Australians have a reputation as early adopters of technology and the take-up of Internet has been no exception, with almost one-third of all Australian adults using it in the last year.



## REGULATORY ENVIRONMENT

On 1 July 1997, the Australian communications industry gained a new regulatory framework and regulatory body, the Australian Communications Authority (ACA). The ACA was formed through the merging of two previous regulatory bodies, the Spectrum Management Agency (SMA) and the Australian Telecommunications Authority (AUSTEL). The ACA regulates communications consumer and technical matters, and manages radio communications.

Under the new framework, industry self-regulation is encouraged in all areas, including access, technical standards, interconnection standards, and consumer and customer service standards. Various regulatory bodies have the power to intervene if self-regulation is seen to be not working.

Communications providers are divided into three types: Carriers, carriage service providers, and content service providers. Telecommunications carriers must apply for a licence from the ACA, although there is no limit to the number of companies that can build and operate telecommunications infrastructure. Internet service providers are classed as carriage service providers and generally do not need a special licence, nor are there any fees payable to the government. Online content services as well as broadcasters are classed as content service providers and are subject to the Trade Practices Act 1974 and to content regulation by the Australian Broadcasting Authority (ABA).

Another important body is the Australian Competition and Consumer Commission (ACCC), which makes sure there is no anti-competitive behaviour in the industry and arbitrates when there are industry disputes. The government ministry responsible for communications is the Department of Communications and the Arts, which also provides advice on all aspects of policy and has input into the role and function of the ACA. There are also a number of other important bodies under the new regulatory framework. These include the Australian Communications Industry Forum (ACIF), which develops codes and standards, the Australian Communications Access Forum (ACAF), and the Telecommunications Industry Ombudsman (TIO), an independent dispute resolution forum for complaints made by residential and small business consumers of telecommunications services.

The government has also proposed new copyright legislation, which will extend the intellectual property rights in current law to works which are reproduced digitally.

The Australian country top-level domain (**.au**) has in the past been administered by one person, while sub-domains under .au have been administered by various organisations. More recently, there have been attempts to form an independent **.au** domain body and restructure its administration. The Australian **.com** sub-domain, the most widely used, is administered by Melbourne IT, a commercial arm of Melbourne University.



## INTERNET CONNECTIVITY

Australia has a well-developed communications infrastructure for Internet and its use is widespread throughout business, government, education, and the general public. According to the latest figures from the Bureau of Statistics, almost a third of Australian adults, or 4.2 million people, used the Internet, while the number of households with access to the Internet increased by 46 per cent in the last year to almost 1.25 million (18 per cent of households), giving it one of the highest penetration rates for Internet in the world. This is backed up by the number of hosts, which has been consistently in the top-five nations even though the population base is a mere 18 million. Of the 4.2 million users, 1.9 million accessed the Internet either from work or home, 934,000 from a friend or neighbour's house, 933,000 from tertiary institutions and 395,000 from public libraries. In addition, about 425,000 adults used the Internet to buy or order goods and services in the last year for an estimated 1.3 million transactions. With more than 600 ISPs, Australia also has one of the largest number of access providers in the region. However, in the last year there has been some rationalisation in the industry, with a number of mergers and some larger ISPs folding. For the first time, the number of ISPs dropped in 1998, from 666 to 642, although overall traffic is still increasing.

The ISP industry is dominated by two major players: OzEmail and Big Pond, the Internet subsidiary of Telstra. Together these two hold some 40 per cent of the market, while no other player holds more than five per cent of the market. Last year OzEmail absorbed its biggest competitor in the corporate sector, Access One. Other significant ISPs to fold in the last year include Geko and Pronet. Pegasus Networks, one of the first commercial ISPs in Australia and a proponent of community networking, was bought out by fellow ISP Microplex, which was in turn bought out by carrier Optus Communications.

Even in small regional towns there are many niche ISPs and very few people are without potential access to a local Internet service. In some instances, local governments have funded regional Internet services as a community venture, while telecentres and other community networking ventures in small towns have had some success. Telstra is currently experimenting with high-speed Internet access via satellite in rural areas through a trial involving the National Farmers Federation. The trial of Big Pond Satellite extends to 200 sites and offers download speeds of around 400kbps. The service will be launched sometime in 1999 and is based on DirecPC digital video broadcast technology developed by Hughes Network Systems in the US.

Many of the smaller ISPs use Telstra/Big Pond's backbone network (Big Pond Direct) for access, which is the most extensive in the country. Connect is another backbone provider which serves a lot of smaller ISPs, while Optus has also been pushing its wholesale Internet service, known as Spinnaker. Many of the larger ISPs also have points of presence nationwide, including Big Pond, OzEmail, Connect, and Optus. Their bandwidth between major cities such as Melbourne and Sydney is often in the order of 100Mbps. There are a number of different Internet exchanges offering neutral exchange points around Australia and many of the larger ISPs also have peering arrangements with each other.

Both Telstra and Optus have hybrid fibre-coaxial (HFC) networks that cover the eastern seaboard for the delivery of pay television services. Both had also announced plans to use the same infrastructure for Internet access, but to date only Telstra has done this. Its Big Pond Cable service was one of the first cable TV networks in the world to offer high-bandwidth Internet access. ISDN, xDSL, frame relay, and high-speed direct data links are also available from various carriers. While ISDN is widely available in the cities, it is still priced too high for most residential users and mainly used by the corporate sector.

Another major player to arrive on the domestic scene recently is America Online (AOL), which started offering access to home users in 1998. It intends to use the same mass-market strategies that it does in the US to gain a large share of the consumer market. However, it remains to be seen if this approach can be transplanted to Australia. Microsoft has made a number of attempts to capture the home market in recent years one of which was in conjunction with Telstra but has since decided to concentrate on content provision. CompuServe has also offered access in Australia for a long time through a tie-up with Fujitsu, but its customer base is relatively small.

Internationally, Telstra Big Pond again dominates the market and most other ISPs use its network for international connectivity. Its links include 191Mbps capacity to the US, 12Mbps to New Zealand, 4Mbps to Japan, 2Mbps to Korea, as well as connections to Hong Kong and Singapore. Optus also has its own international links and points of presence in the US through parent company Cable & Wireless at its C&W Internet Exchange. It has approximately 66Mbps of cable capacity to San Francisco and Los Angeles as well as additional satellite capacity and a link to Japan and New Zealand. Other ISPs are free to use any carrier for their international links, but only the larger ones initiate their own. International connectivity is the largest cost for ISPs and some have been looking at alternatives to Telstra's and other carrier's links, which cost between 16c and 19c per Mb of traffic. One favoured solution of late is to use satellite, which a number of ISPs such as Zip World and OzEmail have done. OzEmail recently initiated a T3 satellite link from the west coast of the US to its own earth stations in Sydney, Melbourne, and Brisbane. It is also a partner in the undersea Southern Cross Cable scheme, which will link Australia, New Zealand and the US. OzEmail will initially have 45Mbps capacity on the cable, while the main investors in the project are WorldCom, Optus, and Telecom New Zealand.

In the academic sector, Australia has a long tradition of Internet use through the Australian Academic and Research Network (AARNET), the original Internet backbone in the country. When formed in 1990 it was one of the first academic networks outside of the US. AARNET is now an internetwork of regional networks in every state of the country, which are connected using ATM-based links from Optus. Every university in the country offers some form of Internet access for students, who each have an individual account. Some universities also offer dial-up access to the general public as a commercial operation.

In the government sector, most departments and agencies are now online, with many of them moving to Internet-based models for transactions, tender registrations, and other services. Each state government has been pushing IT as an industry in an attempt to attract multinational businesses and most have some form of IT policy and co-ordinating agency. The state government of Victoria has been particularly active in this area and became the first government in the world to appoint a minister for multimedia. One of the most recent initiatives from the Federal government is the formation of the National Office for the Information Economy (NOIE), which comes under the Department of Communications,

Information Technology and the Arts. NOIE's role is to develop, coordinate and overview broad policy relating to the regulatory, legal and physical infrastructure environment for online services, including facilitating electronic commerce. It also presents a government position in international forums and oversees policies for applying new technology to government services. Some of the recent initiatives it has been involved in are facilitating a new self-regulatory regime for the .au domain space and establishing a national authentication authority for electronic commerce.

The Internet industry itself has a number of representative bodies, although in the past there has been in-fighting between various sectors and a number of bodies with the same goals. The main bodies at present are the Internet Industry Association and the Internet Society of Australia (ISOC-AU).



## CONTENT INITIATIVES

Australia has a mature content industry characterised by the arrival of the major media organisations moving into online ventures and hundreds of specialist web design companies. Most major newspapers, magazine publishers, and broadcasters have now created a significant presence, sometimes in collaboration with IT companies. For example, Microsoft and its MSN network has formed a partnership with Channel Nine - one of four commercial television stations - as well as magazine publishing group Australian Consolidated Press. Fairfax and News Limited, the two major newspaper publishers, have invested heavily in their online presences while the Australian Broadcasting Commission (ABC) the government broadcaster has one of the most popular local web sites. The site is regularly updated throughout the day using resources from the ABC's broadcasting network.

Content aggregators such as Yahoo! have also started local operations in Australia and join a fairly large group of existing local sites providing similar services. Popular local search engines include OzEmail 's ANZwers, Web Wombat, and Matilda while content aggregators such as AusIndex and Charles Sturt University's Guide to Australia are also popular and have many competitors.

The multimedia industry is represented by the Australian Interactive Multimedia Industry Association, whose web site has good resources for developers. One Federal government initiative was the creation of six co-operative multimedia centres (CMCs), whose aim is to collaborate between education, training and public and private sector organisations involved in design, production, technology, publishing or promotion in Australia's multimedia industry. The CMCs are spread in different states and the ultimate aim is to ensure significant local content. The six centres receive government funding and produce innovative online material as well as acting as training and resource centres for the industry.

Multimedia also has an annual awards ceremony run by AIMIA, which coincides with a multimedia festival held in Melbourne each year. The awards are a good showcase of local Australian content skills.

The federal government has a gateway site that lists all ministries, departments, and agencies as well as having links to other important sectors such as education and research. Another good gateway is the National Library of Australia, which has links to government sites, many online journals and cultural information, and a guide to Australian content on the web that is one of the best around. Another excellent site is that of the Australian National University (ANU), which hosts hundreds of research and information sites, including Coombsweb a pioneering site for social sciences and Asian studies and other sites covering indigenous culture, the arts, and specialised science fields.

In terms of electronic commerce, there are many shopping malls and businesses selling online. Telstra invested heavily in its SureLink site while Australian banks such as St. George have also made major investments.

Finally, probably the most comprehensive showcase of Australian content to date stems from Online Australia Day, which was held in November and co-ordinated by the National Office of the Information Economy. The day was intended to build an awareness of opportunities in the online world and to promote community involvement with the Internet. As part of the campaign, an Online Australia Day web site was created that will stay up for the next 12 months. Part of the site is a virtual web expo, which provides a gateway to over 1000 businesses, government departments and community organisations. The site will continue to be developed over the next 12 months and is one of the best starting points for Australian content on the Net.

## **OTHER PROJECTS**

Australia was a major participant in the satellite industry more than 30 years ago with its space launching pad in Woomera, South Australia. Australia built and launched a satellite from the site back in 1969. After being dormant for most of the intervening years, the local space industry looks like it is taking off again. A \$50 million commercial rocket range being constructed in the same location is expected to launch a low-earth orbiting (LEO) satellite called FedSat in 2001. The satellite will facilitate research experiments but may also be used to provide Internet access to remote parts of the country. FedSat participants include the Cooperative Research Centre for satellites and a number of local universities and IT companies. The launch pad itself is being built by US space technology company Kistler Aerospace, which plans to use the location to launch a range of commercial satellites from around the world in future.



## SITE LIST

### ANZwers

*Australian and New Zealand search engine*

[www.anzwers.com.au](http://www.anzwers.com.au)

### Australian Broadcasting Commission (ABC)

*Up-to-date news and resources from ABC broadcasting*

[www.abc.net.au](http://www.abc.net.au)

### Australian Interactive Multimedia Industry Association (AIMIA)

*Main body for the multimedia industry*

[www.aimia.com.au](http://www.aimia.com.au)

### Big Pond (ISP)

*Main Big Pond site*

[www.bigpond.com.au](http://www.bigpond.com.au)

### Federal Government Entry Point

*Gateway to government departments and agencies*

[www.fed.gov.au](http://www.fed.gov.au)

### Matilda

*Local search engine*

[Matilda.aaa.com.au](http://Matilda.aaa.com.au)

### News Limited

*News Ltd's newspapers online*

[www.news.com.au](http://www.news.com.au)

### Optus

*Information on Australia's second largest carrier*

[www.optus.com.au](http://www.optus.com.au)

### AusIndex

*A list of Australian indexes, search engines and directories*

[www.ausindex.com.au](http://www.ausindex.com.au)

### Australian National University (ANU)

*Hosts many web sites including pioneering Coombsweb*

[www.anu.edu.au](http://www.anu.edu.au)

### Fairfax

*Access to major newspaper group*

[www.fairfax.com.au](http://www.fairfax.com.au)

### Guide to Australia

*Links assembled by Charles Sturt University*

[www.csu.edu.au/australia](http://www.csu.edu.au/australia)



National Library of Australia

*Excellent collection of resources and links*

[www.nla.gov.au](http://www.nla.gov.au)

Nine-MSN

*Content initiative from Channel Nine and Microsoft*

[www.ninemsn.com.au](http://www.ninemsn.com.au)

Telstra Internet

*Information on Telstra's wholesale Internet offerings*

[www.telstra.net.au](http://www.telstra.net.au)

Online Australia

*Created as part of Online Australia Day*

[www.onlineaustralia.net.au](http://www.onlineaustralia.net.au)

Web Wombat

*Local search engine and site list*

[www.webwombat.com.au](http://www.webwombat.com.au)

Yahoo! Australia

*Local Yahoo! site*

[www.yahoo.com.au](http://www.yahoo.com.au)

## CONTACT LIST

Internet Industry Association

PO Box 74, Red Hill

ACT 2603

T: +61 2 6232 6900

F: +61 2 6232 6513

E-mail: [info@iia.net.au](mailto:info@iia.net.au)

[www.iia.net.au](http://www.iia.net.au)

Internet Society of Australia (ISOC-AU)

PO Box 468

Paddington NSW 2021

F: +61 2 9332 4066

[www.isoc-au.org.au](http://www.isoc-au.org.au)

Asia Pacific Network Information Centre  
(APNIC)

Level 1

33 Park Rd

Milton, Queensland

T: +61 7 3367 0490

F: +61 7 3367 0482

E-mail: [webmaster@apnic.net](mailto:webmaster@apnic.net)

[www.apnic.net](http://www.apnic.net)

Connect (ISP)

Level 9, 114 Albert Rd

South Melbourne

Victoria

T: +61 3 9251 3600

F: +61 3 9251 3639

E-mail: [info@connect.net.au](mailto:info@connect.net.au)

[www.connect.com.au](http://www.connect.com.au)

National Office of the Information Economy

23 National Circuit

Forrest, ACT

T: +61 2 6283 8200

F: +61 2 6283 8222

E-mail: [info@noie.gov.au](mailto:info@noie.gov.au)

[www.noie.gov.au](http://www.noie.gov.au)

OzEmail (ISP)

Locked Bag 5678

St Leonards, NSW

T: +61 2 9433 2400

F: +61 2 9437 5888

E-mail: [sales@ozemail.com.au](mailto:sales@ozemail.com.au)

[www.ozemail.com.au](http://www.ozemail.com.au)

Copyright © International Development Research Centre, 1998

© All Rights reserved. No part of this web site may be reproduced, stored in a retrieval system or transmitted, in any form or by any means, electronic, mechanical, photocopying, or otherwise, without the prior permission of the International Development and Research Centre

The material in this Yearbook has been peer-reviewed by in-country resource persons. The views expressed are those of the writers and do not necessarily reflect those of the International Development Research Centre.

Cite as follows :

The Pan Asia Networking Yearbook (1998).

Singapore: Asia Regional Office, International Development Research Centre.

[On-line serial, subscriber-based : <https://www.panasia.org.sg/ecomsec/bookshelf/user/webdriver>]

*(Date of publication : December 3<sup>rd</sup> 1998)*

## **Abstract**

*One of the features of the Bangladesh ISP market is the presence of large development organizations, who are offering Internet access as a purely commercial venture. Another factor for ISPs is a lack of telephone lines, and as a result some of the larger ISP's networks are close to being saturated because of a shortage of dial-up lines.*

---

## **Bangladesh**

By Geoff Long



### **OVERVIEW**

Formerly East Pakistan, the People's Republic of Bangladesh became the world's 139<sup>th</sup> country in 1971. It is situated between India and Myanmar and has a population of 120 million. The country is predominantly Muslim and the national language is Bangla (the same as the state of West Bangla in India).

Bangladesh is one of the poorest and most densely populated places in the world and basic infrastructure is minimal. The situation is made worse due to the natural disasters that regularly befall the country, including almost yearly heavy flooding as well as cyclones and earthquakes. The floods in 1998 were among the worst to hit Bangladesh and will take many years to recover from. The source of Bangladesh's floods stems from its location at the delta of two major river systems, the Ganges and the Brahmaputra.

Agriculture is still the largest employer of labour in the country, with jute and rice two of the more important crops. Bangladesh is also an exporter of garments and the cotton textile industry is a major export earner.

In terms of telecommunications, Bangladesh has one of the lowest teledensities in Asia, with a mere 0.4 lines per 100 people.

By 2000 the government is targeting one line for every hundred people and 4.0 by the year 2010. The task of extending the network is largely the domain of the state-owned Bangladesh Telephone and Telegraph Board (BTTB), although there are two private operators the Bangladesh Rural Telecommunications Authority (BRTA) and Sheba Telecom with licences to provide fixed network services in rural areas. However, in reality the two private operators have had minimal impact. According to local press reports, the government is unhappy with the progress of the two newcomers and could revoke their licences.

The mobile phone sector has been opened up to competition in recent years, with one of the licences operated by Grameen Phone, which is linked to the pioneering Grameen Bank (see PAN Activities for more details). Grameen Phone and sister company Grameen Telecom are planning to provide phone services to 100 million rural inhabitants in 68,000 villages of Bangladesh over the next four years using wireless technology.

Sales of computers within Bangladesh have taken off considerably in the last year following a decision by the government to allow the duty-free import of computers and accessories. As a result, prices have dropped dramatically and the number of computers sold jumped from 40,000 to 120,000 last year.



## REGULATORY ENVIRONMENT

The regulatory framework in Bangladesh for telecommunications and Internet is still a grey area. One of the problems is that there is no independent regulator as such, although a Telecom Regulatory Commission is currently being established and could be operational by mid-1999.

The task of regulating previously belonged to Bangladesh Telecom & Telegraph Board (BTTB), the monopoly carrier, but has since been moved to the Ministry of Posts and Telecommunications. BTTB still has significant impact on communications policy, however.

Internet is an even more unclear regulatory issue, as there is as yet any licensing fee structure or licence document that has been drawn up. ISPs must still apply for permission to operate services and have a licence to operate a VSAT satellite link from BTTB if they want their own international connectivity.

The **.bd** country top level domain is also not in use because of a lack of agreement on which body should administer it. There have been a number of attempts over the years to bring the various parties together and form a neutral body to administer the **.bd** domain, but to date they have been unsuccessful.



## INTERNET CONNECTIVITY

Internet in Bangladesh first started in late 1993 with e-mail services using UUCP connections. Two of the pioneers, PraDeshta and Drik, are still offering Internet services today but have been joined by a number of other companies, some with significant financial resources behind them. One of the features of the Bangladesh ISP market is the presence of large development organisations, who are offering Internet access as a purely commercial venture. Another factor for ISPs is a lack of telephone lines, and as a result some of the larger ISP's networks are close to being saturated because of a shortage of dial-up lines. According to the ISPs, BTTB can't provide enough telephone lines.

Full Internet access first arrived in Bangladesh through Information Services Network (ISN), a private organisation started by local entrepreneurs, which started with a 64kbps satellite link to Hong Kong in 1996 (it has since added another 64kbps link to Singapore). A few months afterwards, Grameen Cybernet also initiated its Internet service. To date, these two companies still command the largest (around 60 per cent) share of the market, which is estimated to have approximately 10,000 users. There are now around 12 main ISPs, the majority of which only operate in Dhaka, although there are also three ISPs based in Chittagong, the country's second largest city. Most operate their own 64kbps satellite link to either Hong Kong or Singapore, although some have upgraded to 128kbps capacity. Bangladesh does not have access to any submarine cable scheme, so satellite is the main option for international connectivity. Because it must go through BTTB, it is also expensive.

Two of the larger ISPs that have entered the market are Bangladesh On-Line and BRAC BDmail Network, which together with Grameen Cybernet are all associated with large development agencies and offer Internet as a purely commercial service.

Bangladesh On-Line is the Internet arm of Proshika Computer Systems, a subsidiary of Proshika Manobik Unnayan Kendra, one of the largest NGOs in Bangladesh. It offers discounts to the education sector and has a 64kbps leased line to Singapore.

Grameen Cybernet is a joint venture between Grameen Fund, the venture capital arm of the Grameen Bank, and CITech, a well known private sector company that distributes IT equipment. It has a 128kbps link to Singapore. Another Grameen organisation, Grameen Communications, is a non-profit company that aims to provide low-cost Internet to educational, research and social organisations as well as government departments (see PAN Activities for more details on Grameen Communications and the Grameen Bank).

BRAC BDmail Network is a subsidiary of BRAC, another large NGO that started out helping refugees from the country's war of independence in 1971. BRAC now has a number of programs to help disadvantaged people in Bangladesh, although again its Internet service is a commercial venture. It has a 64kbps link to Singapore.

Another major ISP in terms of financial resources is Bangladesh Online Ltd (BOL), which is owned by one of the country's largest business conglomerates, Beximco. Beximco has interests in the food, medical, and construction industries, among others, and is a major Bangladesh exporter. BOL was the fifth ISP to start-up and has a 128kbps connection to the US.

Of the original two "off-line" Internet providers PraDeshta and DRIK both are now offering full Internet access. PraDeshta has a fairly widespread network and a 64kbps international link to the Singapore Telecom Internet Exchange (STIX).

It has a mixture of corporate and dial-up customers and specialises in providing tailored wide and local area networks. One of its customers is the local UNDP office. It has also recently absorbed a number of smaller access providers, giving it a number of points of presence (POPs), although mainly in Dhaka.

Other ISPs include Agni Systems, BDcom Online, Spectra an IT distributor with operations in Chittagong and Global Online Services, which provides Internet to the corporate sector only. BTTB has also made a move into Internet services, but at this stage it is only offering services to the government sector. It has a 128k link to the US.

DRIK does not have its own international link but has a mixture of both off-line and on-line services. Its main market is in the education/research and NGO sectors and it is also involved in multimedia production. In addition, Drik has piloted an innovative program in the rural area of Sylhet, in the north eastern corner of Bangladesh, where students are planting trees to help fund their own Internet and multimedia facilities for education. Students are paid to plant trees on barren land and the trees are then sold at present day discounted prices. The money generated can then be invested in computers and other facilities for the student's education. While the scheme is still being piloted, there are now 10 sites throughout Sylhet where computers and Internet access have been set up within the schools. They are then linking up the schools to set up multimedia teaching modules. Schools are also set up as electronic post boxes and IT centres in the villages. So after school hours it's a normal business where people from outside can come and use facilities to send faxes, e-mail, or learn desktop publishing and other skills.

The university sector in Bangladesh has been slow to connect to the Internet. However, a program being implemented at present could see a number of universities connected. Proshika Computer Systems was awarded a contract by the University Grants Commission, which plans to connect the main Bangladeshi universities. The initial phase of the project will connect two or three campuses, including Dhaka University, and they will be linked by 64kbps radio modems. As part of the project, Proshika will initiate a 128kbps leased line to Hong Kong for the education sector. In terms of private educational institutions, PraDeshta is working with the American International School, which is planning to have Internet access in every classroom.

A number of walk-in Internet centres and cybercafes have started up recently, although they are not common. One of these is run by the British Council and located in Dhaka Library. It has seven public access computers and also provides Internet help and other computer services.

There is no Internet backbone as such in Bangladesh, rather just individual ISPs with their own links to the outside world. There have been discussions to set up an Internet exchange but until now this has not happened. A fibre-optic communications network owned and run by the state railways has been looked at by some ISPs as a possible means of gaining more widespread connectivity. The transmission lines run alongside the major rail corridors and connect most major centres in the country but its capacity is underutilised. However, the railway authority has been reluctant to let others use its dormant capacity.

The main IT association in the country is the Bangladesh Computer Samity (BCS), which was formed in 1987 and has about 100 members. It lobbies the government on various issues and runs promotional activities for the local industry, although not specifically the Internet industry. An association known as the ISP-Forum was started by the ISP industry but after an initial flurry of activity it has been quiet and it is unsure whether it will take off again. One of the issues that it was looking at was the administration of the **.bd** country top-level domain and an Internet exchange.



## PAN ACTIVITIES

The PAN Bangladesh project is a joint effort between the International Development Research Centre's Pan Asia Networking (PAN) program and Grameen Communications, part of the Grameen Bank family of organisations. The project aims to deliver Internet access throughout the Grameen Bank's network of branch offices and to subsidise Internet access for other suitable government and social institutions throughout Bangladesh.

The Grameen Bank is one of the world's great success stories. Pioneered in Bangladesh by Professor Muhammad Yunus more than 22 years ago, Grameen has overturned conventional banking practices by lending small amounts of money to the poorest of the poor in rural areas. So successful has the scheme become that the Grameen Bank is now the largest rural credit organisation in the country, with over two million borrowers 94 per cent of whom are women and enviable repayment rates of over 95 per cent. More importantly, it has helped break the cycle of poverty for many rural Bangladeshis. Another of the Grameen Family, Grameen Telecom, has helped to bring telecommunications to rural areas by using the same "micro loans" to fund Village Pay Phones. Under this system a borrower can purchase a mobile phone and charge others in the village to use it. Not only does it allow the borrower to start up a small business and pay back the loan, it provides a service to the rural areas that otherwise would not exist. Under the PAN Bangladesh project a similar scheme will be piloted to bring the Internet to rural villages.

The project will eventually bring the Internet to Grameen Bank's network of more than 1000 branches, which together provide services to more than half of all villages in the country. As an alternative, low-cost Internet provider, PAN Bangladesh will also enable educational institutions and government departments to cheaply connect to the Internet.

To get around the lack of telephone lines, PAN Bangladesh is already experimenting with alternative connection methods with the help of Grameen Telecom's mobile phone infrastructure, which it intends to use to connect to the Internet. Over the next four years Grameen Telecom expects to make its wireless network available in 68,000 villages across Bangladesh, giving hope that rural people will also be able to access information services. Already, project staff have drawn up a number of proposals that may be started as pilot projects, such as a Village Internet Program. Through this program, Internet kiosks will be set up in the villages as pilot projects and afterwards villagers will have the opportunity to buy the kiosks using small loans from the Grameen Bank. The kiosks would provide services such as e-mail, word processing, printing facilities, and desktop publishing. In this way income generating schemes are brought to rural people at the same time as much needed services.



## CONTENT INITIATIVES

In the aftermath of one of the worst floods in Bangladesh's flood-prone history, one thing that stands out is the way the Internet could be harnessed to help in the relief operation. Web sites were created to show donor agencies the full extent of the damages, while government departments, aid workers, and other bodies could provide up-to-date information and coordinate their efforts over the Internet. Even after the floods have subsided, researchers are debating the issues online and posting their research results to show how future relief efforts might be tackled next time. Some of the main sites have been developed by NGOs such as Grameen Communications, Proshika, Brac, as well as the multimedia centre of Drik. The NGOs are also a good source of other development information and research.

Drik has news and reports from Bangladesh and many pictorial essays on the country from its in-house photographers. The premises of Drik also contains a gallery and some of the images from exhibitions can also have an online component.

Most of the ISPs have pointers to Bangladeshi web sites, with the best of these including Grameen Cybernet and Proshika's Bangladesh Online. Bangladesh Online also has a government site that gives a good overview of the parliamentary system, key players, and other information. There is no central government gateway as such and very few government departments are online yet.

Another good central site that includes excellent links and resources as well as a local search engine is the Bangla Centre. It also has free local e-mail service.

For an overview of Bangladesh its history and culture, Virtual Bangladesh is a beautifully designed site with good graphics, information and sound. It provides a virtual tour of the country, as well as news, chat forums, and links to other information.

There are a number of sites that give daily news from Bangladesh, including an Internet news service from Global Amitech and a net edition of the Daily Star.

Both the Bangladesh Agriculture Research Council and the SAARC Agriculture Information Centre are located in Dhaka. The SAARC website gives information on all of the south asian countries from its main site. Other Bangladesh-based research institutions include the Centre on Integrated Rural Development for Asia and the Pacific (CIRDAP) and the International Centre for Diarrhoeal Disease Research Bangladesh (ICDDR), both of which give significant information about their activities and research abstracts.

TechBangla is a voluntary, non-profit organisation aiming to transfer technology and develop indigenous technologies in Bangladesh. Its web site acts as a resource list for people with technology skills and has other information for local tech. people.





## **SITE LIST**

### British Council

*Runs a walk-in Internet centre*

[www.britcoun.org/bangladesh](http://www.britcoun.org/bangladesh)

### Bangla Centre

*Local site list and search engine*

[www.banglacentre.com](http://www.banglacentre.com)

### Drik

*Multimedia site with lots of photo essays*

[www.drik.net](http://www.drik.net)

### Centre on Integrated Rural Development for Asia and the Pacific (CIRDAP)

*Dhaka-based research centre*

[www.cirdap.org.sg](http://www.cirdap.org.sg)

### Grameen Bank

*Central site for Grameen family of organisations*

[www.grameen.com](http://www.grameen.com)

### International Centre for Diarrhoeal Disease Research Bangladesh (ICDDR,B)

*International research centre based in Dhaka*

[www.icddrb.org.sg](http://www.icddrb.org.sg)

### SAARC Agricultural Information Centre

*Info on south asian agricultural centres*

SAIC-Dhaka.org

### News from Bangladesh

*Internet site for daily news*

[www.bangladesh-web.com/news](http://www.bangladesh-web.com/news)

### The Daily Star

*News on Bangladesh*

[www.dailystarnews.com](http://www.dailystarnews.com)

### Tech Bangla

*Non-profit organisation for local technology people*

[www.techbangla.org](http://www.techbangla.org)

### Virtual Bangladesh

*Pioneering and well-designed introduction to Bangladesh*

[www.virtualbangladesh.com](http://www.virtualbangladesh.com)

## CONTACT LIST

### Bangladesh Computer Samity

House No. 8/A, Rd 14

Dhanmondi

Dhaka

T: +880 2 9122847

F: +880 2 9122847

E-mail: [samity@dhaka.agni.com](mailto:samity@dhaka.agni.com)

[www.bcsweb.org](http://www.bcsweb.org)

### Bangladesh Online (ISP)

(Proshika Computer Systems)

Proshika Building

i/1-Ga Section 2

Mirpur, Dhaka

T: +880 2 809003

F: +880 2 805811

E-mail: [info@bdonline.com](mailto:info@bdonline.com)

[www.bangladeshonline.com](http://www.bangladeshonline.com)

### Drik (ISP)

House 58, Road 15a (new)

Dhanmondi

Dhaka

T: +880 2 812954

F: +880 2 9115044

[www.drik.net](http://www.drik.net)

### Grameen Cybernet (ISP)

Road 1, House 80

Gulshan 2

Dhaka

T: +880 2 872103

F: +880 2 9886304

E-mail: [info@citecho.net](mailto:info@citecho.net)

[www.citecho.net](http://www.citecho.net)

### BRAC BDmail Network (ISP)

Aarong House, 18th Level

65-66 Mohakhali Commercial Area

Dhaka

T: +880 2 9883978

F: +880 2 9884587

E-mail: [info@bdmail.net](mailto:info@bdmail.net)

[www.bdmail.net](http://www.bdmail.net)

BOL (ISP)

T: +880 2 966 8320

F: +880 2 966 8321

E-mail: [help@bol-online.com](mailto:help@bol-online.com)

[www.bol-online.com](http://www.bol-online.com)

Information Services Network (ISP)

52 New Eskaton Rd

TMC Building

Dhaka

T: +880 2 842785

F: +880 2 9345460

E-mail: [info@bangla.net](mailto:info@bangla.net)

[www.bangla.net](http://www.bangla.net)

PraDeshta (ISP)

House 50/1, Road 1

Banani

Dhaka

T: +880 2 988 2751

F: +880 2 9881396

E-mail: [info@pradeshta.net](mailto:info@pradeshta.net)

[www.pradeshta.net](http://www.pradeshta.net)

Copyright © International Development Research Centre, 1998

© All Rights reserved. No part of this web site may be reproduced, stored in a retrieval system or transmitted, in any form or by any means, electronic, mechanical, photocopying, or otherwise, without the prior permission of the International Development and Research Centre.

The material in this Yearbook has been peer-reviewed by in-country resource persons. The views expressed are those of the writers and do not necessarily reflect those of the International Development Research Centre.

Cite as follows :

The Pan Asia Networking Yearbook (1998).

Singapore: Asia Regional Office, International Development Research Centre.

[On-line serial, subscriber-based : <https://www.panasia.org.sg/ecomsec/bookshelf/user/webdriver>]

*(Date of publication : December 3<sup>rd</sup> 1998)*

# Bhutan

By Geoff Long



## OVERVIEW

Bhutan is a small Himalayan Kingdom land-locked between China (Tibet) to the north and India to the south. It covers an area of about 47,000 square kilometres, most of which is dominated by mountain ranges separated by deep valleys. The population of 600,000 people live in small communities, isolated from each other by the arduous geographical terrain. Bhutan is divided into 20 Dzongkhags, or local government districts, for administrative purposes.

The economy is agro-based and agriculture provides the livelihood for around seventy percent of the population. The exporting of electricity generated by hydro-electric schemes also contributes valuable export income and is seen as a one of the country's future strengths economically.

Bhutan had been relatively closed to the outside world until some two decades ago and is still determined to protect its values and environment. For this reason tourism is limited.

The national language is Dzongkha, although English is widely spoken and is the primary language taught in schools. Nepali is also spoken in many parts, and there are many languages spoken by various ethnic groups throughout the country. There is no standard for using Dzongkha on computers, although there has been some discussion on creating one.

Development activities were started in Bhutan in the early 1960s with the implementation of the country's first five-year plan. Infrastructure and human resource development were accorded priority with an emphasis on sustainability. Although the government of India was initially the main development partner, many bilateral and multi-lateral donor agencies are currently active. Telecommunication services were first introduced into Bhutan during the first five-year plan to support the ongoing development activities. Bhutan's telecommunication network was previously quite fragmented, with an independent network each for the Western, Central and Eastern regions of the country. Hence, it was impossible to communicate from one region to another region of the country until a few years ago. The upgrade and modernisation of telecommunication services in the country started with the installation of a satellite earth station and an international gateway switch at Thimphu in 1989-90.

A telecommunication Master Plan was prepared with the assistance of UNDP/ITU in 1990 and provided a comprehensive strategy for the development of the telecommunication network throughout the country. Based on the Master Plan and with assistance from the Government of Japan, the erstwhile fragmented links in the country were unified into a single telecommunication network. The backbone network consists of 34 Mbps digital microwave radio transmission links and digital switching centres.

Alongside the development of the national telecommunications network, the international satellite links evolved from a single destination link to an IDR-based multi-destination network, through the Intelsat satellite network.

According to local estimates, there are approximately 6000 personal computers operating in Bhutan today, and approximately 80 per cent of these are located in the capital, Thimphu, mainly in government offices.



## **REGULATORY ENVIRONMENT**

All telecommunication services in Bhutan are operated and maintained by the Division of Telecom, a department under the Ministry of Communications. The Division's voice services are operated under the name of Bhutan Telecom while Internet services are provided through DrukNet. Being the sole provider of local, long distance and international telecommunications, the Division plans and executes all project activities for telecommunication network expansion and upgrades. The Division is, at present, a public entity under the Ministry of Communication, which acts as a regulatory body.

However, plans are being prepared to convert it into a fully-autonomous public corporation so that it is able to function independently. The existing telecommunications regulatory function will remain within the Ministry of Communications.

There are very few rules directly relating to Internet. There is some limited filtering of pornographic web sites through a package known as X-Stop, but otherwise there are no restrictions on content. Internet is designated as a value-added service, which allows the private sector to setup alternative ISPs. However, in reality the country's population is too small to support a second ISP, which would in any case struggle to compete with the Division of Telecom.

DrukNet is also responsible for the Bhutan domain (.bt), which had been originally delegated to US-based NetNames.



## INTERNET CONNECTIVITY

Bhutan officially joined the global networking community on 2nd June 1999, the silver jubilee anniversary of the King's coronation, with the launching of the country's first Internet service, DrukNet. Before its arrival, there was a small number of users and businesses that would connect through ISPs in neighbouring countries such as India, while others went directly to the US, both of which were expensive undertakings.

DrukNet was jointly funded by four organisations: the Royal Government of Bhutan, IDRC, and UNDP, and APDIP. The project was implemented by the Ministry of Communications' Division of Telecom. A 256kbps satellite link is provided by British Telecom (BT) and connects to BT's London Internet exchange point.

Within the country, Internet access is available for local call charges nationwide, although local calls are metered. Charges for the Internet service range from Nu. 1500 (approx. US\$38) for 15 hours per month to Nu. 6000 for 100 hours per month. These charges, which were current as of September 1999, are out of the range of most individuals, but were expected to be reduced.

The main point of presence (POP) is in Thimphu, but there are also POPs in Phuentsholing in the South and Trashigang in the East. As of September 1999, the service had approximately 250 users, with 220 of these based in Thimphu. Only 20 percent of users are in the government sector, with the remainder comprising private users or others such as NGOs.

The largest user of Internet access in the country is the Royal Institute of Management (RIM), which has about 100 computers with Internet access through its local-area network (LAN). The network connects a number of training labs as well as individual faculty members, while there are further plans to add Net access to the RIM residential areas. RIM's network as of September 1999 was still awaiting a leased line connection to DrukNet, although its installation was pending. RIM is one of the major technical training institutes within the country, and offers courses including a two-year diploma course in Information Management Systems, which are now being updated to include Internet-based technology. As well as its information management systems, RIM also runs a number of short IT courses, and since July 1999 it has been offering these on various aspects of Internet. Topics include web publishing, Internet awareness, and Train the Trainer courses, which aim to train staff from other learning institutions. RIM is also expected to become an official regional Cisco training academy through a joint APDIP-Cisco initiative.

A Telecom Training Unit was established under UNDP/ITU assistance in 1992 and was designed to cater to the training needs of the telecom organisation itself. The Training Unit has some experience with the use of remote training provided by the ITU, initially through TIES (Telecommunications Information Exchange System), and will join the ITU's VTC (Virtual Training Centre) service.

Other major users of Internet in the country are the local UNDP and Unicef offices, both of which have leased line connections, as well as the World Wide Fund for Nature and the Department of Agriculture.

ISDN access is not available yet, although the NEC digital exchanges would be capable of supporting the service.

A Bhutan Multipurpose Community Telecentre (MCT) pilot project was set up in 1999 with assistance from the ITU. The project is located in the town of Jakar in Bumthang and aims to offer basic office services such as fax, photocopier, and computer access along with public Internet access. To date, most of the equipment and building is ready, although the Internet service had been delayed. All of the necessary equipment including computers and routers is in place but still awaits the final connection.



## PAN ACTIVITIES

The PAN-Bhutan project, which was first planned in 1997, was the catalyst for the DrukNet project, and initially aimed to provide an intranet within the country and access to e-mail internationally.

However, Bhutan's push to modernise saw the proposal grow into a full Internet service with a permanent connection to the Internet's backbone and funding from other sources added. The eventual service was funded by the Royal Government of Bhutan, IDRC, along with the United Nations Development Programme (UNDP) and its Asia Pacific Development Information Programme (APDIP). And while the country might have been cautious before adopting Internet, once it made the decision the whole project was up and running in a period of only three months.

Thinley Dorji, the PAN-Bhutan project leader and joint-director of the Division of Telecommunications, has been involved with the implementation of the programme from the beginning. He says that the cautious approach taken by the government in implementing DrukNet was more due to a lack of available information rather than a mistrust of the medium. But now that it is here, he believes that widespread access is the key to its possible benefits.

"The government was not suspicious about Internet, rather hesitant to get into something they didn't know anything about. It sounded like too much of an unknown. Everyone was talking about it, the world was talking about it but not many people knew much about it," he said.

"But now that we have it, we have to see that people use it and benefit from it. If people don't benefit from it I think it's just a white elephant, it's just a whole lot of computers strung together."

While so far the number of users is small and can be counted in the hundreds, those that have taken it up are enthusiastic about its benefits and potential. One of the first customers to take up the service was Dago Beda, managing director of Etho Metho Tours & Treks, one of the country's many private travel agencies. Beda had been making limited use of e-mail even before the arrival of DrukNet by making an international call to an Internet service in the US,

so one of the first advantages was lower costs. But she also notes that it has improved communication between clients and other agents, likening its arrival to that of the fax. “When the fax came to Bhutan we thought it was great, it replaced long-distance telephone calls which were very expensive, and I never believed that something else would come beyond the fax,” she said.

“Then come June 2nd , e-mail and Internet were introduced. We haven’t had time to really browse. For us, as soon as it was introduced, we were busy on e-mail with all our travel agents telling them that we had it, so every day we have been busy and it’s fantastic.”

Another early adopter is Yeshey Dorhi, the owner of the country’s first computer dealership. He was one of the first to sign-up when DrukNet started, then in July he was the first customer to host a web site at DrukNet. “It’s very useful, particularly in terms of information. If somebody wants computer specifications or something that we may not have, we can just access the Internet and give it to them, so from that point of view it’s very good.”

To spread the use beyond the country’s initial Internet “pioneers”, DrukNet is now embarking upon a series of education campaigns with the aim of making people more aware of the Internet and to train them in how to use it. Central to that aim is the Royal Institute of Management (RIM), one of the country’s leading training institutions for management and technology and a partner with DrukNet in providing training to other institutions, government departments, as well as the private sector.

A further aim for the future, says Thinley Dorji, will be to connect the nation’s schools. “What we’ve now got to look at is sending a lot more computers to the schools, that would get us somewhere,” he says, adding that the government is now working on how this can be achieved. He also points out that another goal of the PAN-Bhutan project, that of putting existing Bhutanese information and research materials online, is also being explored. Already some government departments, such as the Department of Agriculture and the Planning Commission, are creating their own web sites, while DrukNet has started hosting local web sites such as the national newspaper, Keunsel, among others.



## CONTENT INITIATIVES

Because of the recent introduction of Internet, there are not many local content initiatives, although this could change in the next 12 months due to ongoing training through DrukNet as well as the Institute of Management.

DrukNet’s own site is the best starting point for general information. It has general information on the country provided by the Ministry of Tourism, details of the Internet service, and links to existing sites.

Keunsel, the country’s national newspaper, has recently moved its site to DrukNet. It was previously hosted in Singapore. It has news, archived material, and some introductory information on Bhutan.



The Institute of Management has a site that was first developed internally for its local-area network. The site will be developed further and there are plans to experiment with sound and video files.

Many of the country's travel agencies have sites with information on tours and travel packages, with many of these having been created since before DrukNet. As a result, they are often hosted overseas. The national airline, Druk Air, also has a web site giving flight schedules, reservation details, and local information.

One of the first local web sites to be created was from computer dealership Wangpoh Inter + Sales, which was also the first company to bring computers to Bhutan. The site has basic information on the computers available locally, with some links to suppliers.

The World Wide Fund for Nature Bhutan has research and other data that outline the country's biological significance, which includes some of the best remaining representatives of Himalayan wildlife and habitat types.

 [back to top](#)

## **OTHER PROJECTS**

The Telecom Training Unit was established under UNDP/ITU assistance in 1992, and has provided 43 training courses to date. The Training Unit was designed to cater to the training needs of the telecom organisation itself. The unit employs two full-time staff (including its manager), and the capacity in the training centre is for up to 12 trainees at a time.

Computer training courses are also conducted, but as the unit has no computer facilities of its own, computers for these courses need to be "borrowed" from other parts of the division. The 10-day course, offered for the first time during 1996, covers general personal computer usage (including Windows, Word, FoxPro, Excel etc.), and is planned as an on-going activity. The Training Unit has some experience with the use of remote training provided by the ITU, initially through TIES (Telecommunications Information Exchange System). It hopes to join the ITU's VTC (Virtual Training Centre) service once suitable computers and modems are obtained.

There are a number of staff within the Division, located primarily within the Billing Unit, who are trained in computer operations and/or applications development. A number of other staff of the Division have a high level of engineering training, and would be suitable for training in data networking and Intranet technologies.

The Royal Institute of Management (RIM) is the major institution offering computing courses in Bhutan, through 1-year certificates and 2-year diplomas. The Institute also attaches computer studies units to all of its other courses, which are mainly in administration and management disciplines. Within the computing program, courses are offered in all aspects of computer operations, in personal computer (PC/Windows) applications, and in programming. Short courses are also offered.



## **SITE AND CONTACT LISTS**

### Bhutan Ministry of Communications

Division of Telecommunications

Royal Govt of Bhutan

Thimphu

T: 975 2 22346

F: 975 2 24312

### Druk Air

PO Box 209

Thimphu

T: 975 2 322215

F: 975 2 322775

Web: [www.drukair.com](http://www.drukair.com)

### DrukNet

Division of Telecom

Drophen Lam 2/28

Thimphu

T: 975 2 326999

F: 975 2 322098

Email: [marketing@druknet.net.bt](mailto:marketing@druknet.net.bt)

Web: [www.druknet.net.bt](http://www.druknet.net.bt)

### Kuensel (Bhutan's national newspaper)

PO Box 204

Thimphu

T: 975 2 322482

F: 975 2 322975

Web: [www.kuensel.com.bt](http://www.kuensel.com.bt)

### Royal Institute of Management

PO Box 416

Simtokha, Thimphu

T: 975 2 322989

F: 975 2 324188

Web: [www.rim.edu.bt](http://www.rim.edu.bt)

Wangpoh Inter+Sales (computer dealer)

PO Box 222

Thimphu

T: 975 2 325333

F: 975 2 323242

Email: [wangpoh@druknet.net.bt](mailto:wangpoh@druknet.net.bt)

Web: [www.wangpoh.com.bt](http://www.wangpoh.com.bt)

World Wide Fund for Nature Bhutan

PO Box 210

Thimphu

T: 975 2 23528

F: 975 2 23518

Web: [www.panda.org/resources/countryprofiles/](http://www.panda.org/resources/countryprofiles/)

Copyright © International Development Research Centre, 1998

© All Rights reserved. No part of this web site may be reproduced, stored in a retrieval system or transmitted, in any form or by any means, electronic, mechanical, photocopying, or otherwise, without the prior permission of the International Development and Research Centre.

The material in this Yearbook has been peer-reviewed by in-country resource persons. The views expressed are those of the writers and do not necessarily reflect those of the International Development Research Centre.

Cite as follows :

The Pan Asia Networking Yearbook (1998).

Singapore: Asia Regional Office, International Development Research Centre.

[On-line serial, subscriber-based : <https://www.panasia.org.sg/ecomsec/bookshelf/user/webdriver>]

*(Date of publication : November 11<sup>th</sup> 1998)*

*(Revised: March 23<sup>rd</sup> 1999)*

*(Revised: November 15<sup>th</sup> 1999)*

## **Abstract**

*Full Internet arrived in Cambodia on May 6th 1997 with the arrival of CamNet, a joint venture between the Ministry of Posts and Telecommunication Cambodia (MPTC) and International Development and Research Centre (IDRC). Shortly after, a second ISP, (Big Pond Cambodia, a subsidiary of Australian carrier, Telstra) in cooperation with MPTC, entered the market. As part of the licence conditions, no new players are allowed in the first five years of operation, or until 2002.*

---

# **CAMBODIA**

By Geoff Long



## **OVERVIEW**

The Kingdom of Cambodia, as it has been known since 1993, is only just emerging from a well documented period of civil war, political instability, and international isolation. Even as late as 1997 there have been outbreaks of fighting in the capital Phnom Penh and it remains to be seen if the country can avoid further instability. As a result of the past decades of trouble, Cambodia's infrastructure is desperately in need of attention, with telecommunications, power, and other utilities prone to failure in the main cities and non-existent in many rural areas.

Many areas outside of Phnom Penh have been heavily laid with land mines and require a painstaking and dangerous process of de-mining before they are safe and a process of rebuilding can occur. An estimated 85 per cent of the 10 million population lives in rural areas, with the remaining 15 per cent living predominantly in two centres: the capital Phnom Penh and the second largest city, Battambang.

Despite recent upgrades to the telecommunications network in Phnom Penh, line quality varies considerably and there are a number of different systems in use. A recent introduction has been the installation of telephone service via wireless local loop in some parts of the city. While this is fine for voice communications, it is reportedly inadequate for data communications and supports email-only services at best.

Other parts of the city have aging copper wires that require replacing. However, the number of new lines was increased significantly in 1997 with Japanese funding for key projects. A new exchange building was built and around 10,000 new lines added, bringing the number of lines available to 16,800. Additionally, a digital radio loop has been built on the edges of Phnom Penh to service outlying business and administrative offices. Testing by MPTC suggests that Internet access at 28.8kbps is possible on the system.

In rural areas, telecommunications are poor and calls are routed back to Phnom Penh via an outdated satellite system that makes data transfer unreliable.

Power supply is also erratic in all parts of the country and prone to outages. As a result there are many privately-operated electricity services using diesel generators, which can damage computer equipment unless high quality line conditioning equipment is used.

The official language of Cambodia is Khmer. There have been a number of attempts to create a unified standard for Khmer language fonts but as yet none has been forthcoming. As a result, transferring text between users can present problems and many users transfer text via inefficient and time-consuming graphics formats. At present two local NGOs, the Open Forum Information Exchange and Lidee Khmer, are spearheading attempts to create a unified system for Khmer coding.



## REGULATORY ENVIRONMENT

The Ministry of Posts and Telecommunications of Cambodia (MPTC) is both the operator of telecommunications and the regulatory body. However, in future there are plans to separate the two functions and create a separate regulatory body. At present there are no specific laws relating to Internet in the country, nor are there any copyright laws.

The government has issued a declaration that Internet users should not violate the Ministry of Information rules in relation to pornography and false information, but this has not been backed up by legislation.

The MPTC is also against the use of voice services over the Internet, as it sees this as taking revenue away from the PSTN.

The country's top-level domain, **(KH)**, has recently been transferred to the MPTC, which will be the new KH administrator. From 1996 until 1998 the domain had been administered by Norbert Klein of the Open Forum of Cambodia.



## INTERNET CONNECTIVITY

Full Internet arrived in Cambodia on May 6<sup>th</sup> 1997 with the arrival of CamNet, a joint venture between MPTC and IDRC. Shortly after a second ISP, Big Pond Cambodia, a subsidiary of Australian carrier Telstra in cooperation with MPTC, entered the market. As part of the licence conditions, no new players are allowed in the first five years of operation, or until 2002.

CamNet is connected via a 128kbps satellite link to SingNet in Singapore while Big Pond also uses a 128kbps satellite link to connect to the Telstra Internet backbone in Australia. In the event of a connection failure, both services lack redundant links. There have been talks to connect the two ISPs locally but this will depend on sufficient local traffic being generated.

The arrival of the two ISPs has greatly changed the landscape for data services within Cambodia, and a number of existing e-mail only services have closed while others have flourished.

The Open Forum Information Exchange, one of the first to offer E-mail services and newsgroups, has increased its user base from 160 in 1997 to around 550 in 1998. This compares well with the two full Internet providers, who each have around 500 main account holders.

Open Forum first started E-mail services in 1993. Before the arrival of CamNet, it used a UUCP connection to download email and newsgroups from the Institute for Global Communications (IGC) in San Francisco.

It now has a 9.6kbps leased line to CamNet, but the line is very unreliable and subsequently is out of action for most of the time. Instead, Open Forum uses a dial-up system that automatically connects to CamNet in 20 minute intervals around the clock.

One of the main reasons for Open Forum's popularity is its lower fees. It has a flat, all inclusive pricing scheme of US\$25 per month for international users and US\$8 per month for local Cambodian users, compared with the, on average, US\$10 per hour charged by both CamNet and Big Pond. And because it only offers E-mail and newsgroups, the service is capable of being used on lower performance PCs and with lower grade phone lines.

Open Forum's network is based on the Linux operating system, while Big Pond and CamNet have both opted to base their networks on the Windows NT platform. The Cambodian Technological University (check??) is also trialling the Linux platform at present.

Another early provider of email services, CCCNet, has decided to wind-up its operations following the introduction of full Internet to Cambodia. CCCNet was run by the Cambodia Committee for Cooperation, a membership organisation for NGOs working in Cambodia. Similarly two other networking operations, TOOLNET, a Dutch-based NGO network provider, and Unilink are no longer active.

The other main provider of Internet E-mail is World Mail. It has an estimated 100 users and uses a 9.6kbps leased line to link to CamNet. In total, the number of estimated users between the two ISPs and the third-party providers is around 2000.

Part of CamNet's charter is the provision of subsidised Internet access for some Cambodian institutions and research organisations. It also provides free access to all Cambodians through a Public Internet Centre, which is located at the offices of Lidee Khmer, an association of Khmer professionals supporting Cambodian research and development. As well as access, the Centre provides training courses on Internet from basic navigating to web page creation. The centre is connected to CamNet via a 19.2 kbps leased line.

A second Public Internet Centre started in May 1998 and is aimed more at expatriates and tourists. The Centre is located within the Foreign Correspondents Club Cambodia (FCCC) building and E-mail access is available for US\$10 per month or US\$1 per message sent. Other access centres catering to the tourist market are also expected to follow.

To date, Internet services are only available in the capital, Phnom Penh. However, ABC Computer Shop, through CamNet, is expected to offer E-mail servers in other provinces in future. Initially these will be in Battambang, Siemreap and Sihanukville.



## PAN ACTIVITIES

On May 6<sup>th</sup> 1997 the first "Ping" command was sent from a computer in the offices of CamNet to SingNet in Singapore. Its acknowledgment heralded the arrival of Cambodia's first full Internet service, CamNet, a joint venture between PAN and the Ministry of Posts and Telecommunications Cambodia (MPTC).

Initially MPTC officials were planning to limit their involvement in Internet to cooperation with Telstra, the Australian telecommunications group that had just been given a licence to setup Internet in Cambodia. But CamNet and MPTC decided to start their own service to gain the skills needed to operate a national Internet infrastructure first-hand.

A first step was the training of the newly formed CamNet staff. One year later and that training is on-going, although now they are discussing Internet issues with people in Thailand, Singapore, and other neighbouring countries.

Another key part of the PAN-Cambodia project was the creation of a public Internet centre, which is seen as one way of countering the lack of computers and telephone lines within Cambodia. The centre provides free access for all Cambodians as well as training.

More than 800 people were trained in the first year, with many going on to publish their own web pages and make use of the Internet regularly. Despite the fact that the centre is open seven days a week, from 8am until 6pm, the demand for computer time still outstrips its availability.

As well as the public Internet centre, CamNet also provides Internet access to a growing number of other organisations. Its main users are in government departments, educational institutions, business and the NGO community.

With CamNet well established within Cambodia's government, education, and NGO sectors, the next phase of activity is to help broaden its reach to other members of the community, especially those that do not have computers. As has been seen with PAN projects in other parts of Asia, once the initial service has been established other donors are willing to help further development. In Cambodia, a donation by Ziff Davis Corporation of fifty PCs has been made to assist PAN's programmes in Cambodia.

As a result, CamNet and the public Internet centre are now working with other Cambodian organisations helping them to publish their own material on the Internet. Institutions such as the National Archives, the School of Fine Arts, and the Department of Performing Arts are now preparing to share their unique heritage and creative spirit with others via the World Wide Web. Khmer artists and scholars are already using computers and scanning equipment to digitally archive old documents and photographs, work that staff from the School of Fine Arts and National Archives are keen to continue as Cambodia participates in the global development of the Internet.

### *Cambodian Connections*

[Read about the first "Ping" command which heralded the arrival of Cambodia's first full Internet service, CamNet](#)



## **CONTENT INITIATIVES**

There have not been many local content initiatives to date, mainly due to a lack of funds within organisations that are potential information providers. Lidee Khmer is co-ordinating the production of a new Khmer dictionary, which will be made available on-line. In the meantime, information and tools relating to the project are available on Lidee Khmer's web site. The site also hosts a discussion forum for posting messages, and information and photographs relating to its projects, which range across a diverse field of interests such as the environment, politics, and local culture.

CamNet has started a community bulletin board to list some of its subscribers sites, but it is fairly limited to date.

The Phnom Penh Post has recently setup on Big Pond with a site that includes an electronic version of the weekly newspaper on a subscription basis. It also has limited articles from the Post available for free and an archive of back issues.

Another site that claims to have the backing of the Ministry of Tourism bills itself as "the official Cambodian Web-Site". It includes useful background information on the country and a listing of contact details for many NGOs and UN organisations operating in Cambodia.





## SITE AND CONTACT LISTS

### ABC Computers

T: 723478

F: 427150

Email: [abc@camnet.com.kh](mailto:abc@camnet.com.kh)

### Open Forum Information Exchange

House 245, Street 51

Phnom Penh

T/F: 360345

Email: [open@forum.org.kh](mailto:open@forum.org.kh)

### Big Pond Cambodia

56 Norodom Boulevard

Phnom Penh

T: 430000

F: 430001

Email: [sales@bigpond.com.kh](mailto:sales@bigpond.com.kh)

Web: [www.bigpond.com.kh](http://www.bigpond.com.kh)

### Phnom Penh Post

Web site for the Post

[www.newspapers.com.kh/phnompenhpost/](http://www.newspapers.com.kh/phnompenhpost/)

### Cambodia-Web

Listing of NGOs and background info on Cambodia

[www.Cambodia-Web.net](http://www.Cambodia-Web.net)

### Public Internet Centre@ FCCC

No 363 Sisowath Quay

T: 427757

F: 427758

### CamNet

Ministry of Posts & Telecom  
Wat Phnom  
Cnr Streets 13 & 102  
Phnom Penh  
T: 724223  
F: 426011  
Email: [support@camnet.com.kh](mailto:support@camnet.com.kh)  
Web: [www.camnet.com.kh](http://www.camnet.com.kh)

### World Mail

#43 Street 240  
Phnom Penh  
Tel: 012 802 010  
Fax: 211-906  
Email: [info@worldmail.com.kh](mailto:info@worldmail.com.kh)

### Lidee Khmer

#5 Street 53  
Phnom Penh  
T: 725 245  
Email: [webmaster@lideekhmer.org.kh](mailto:webmaster@lideekhmer.org.kh)  
Web: [www.lideekhmer.org.kh](http://www.lideekhmer.org.kh)

Copyright © International Development Research Centre, 1998

© All Rights reserved. No part of this web site may be reproduced, stored in a retrieval system or transmitted, in any form or by any means, electronic, mechanical, photocopying, or otherwise, without the prior permission of the International Development and Research Centre.

The material in this Yearbook has been peer-reviewed by in-country resource persons. The views expressed are those of the writers and do not necessarily reflect those of the International Development Research Centre.

#### Cite as follows :

The Pan Asia Networking Yearbook (1998).  
Singapore: Asia Regional Office, International Development Research Centre.  
[On-line serial, subscriber-based : <https://www.panasia.org.sg/ecomsec/bookshelf/user/webdriver>]

*(Date of publication : October 12<sup>th</sup> 1998)*

## **Abstract**

*It is estimated that Internet users in China will exceed 2 million by the end of 1998 and reach 5 million in the year 2000. Considering China's population of 1.2 billion, the percentage of people accessing the Internet is and will be very small. For the whole nation to become "wired", the geographic, professional, gender and economic disparities in accessing the Internet need to be addressed.*

---

## **China**

By Li Zhang



## **OVERVIEW**

China, officially the People's Republic of China, is the world's third largest country by area and the largest by population. Covering a total area of 9,596,960 square kilometres, China encompasses a diversity of landscapes extending to the Tibetan Plateau to the southwest extremity, to the deserts in the Mongolian borderland in north central China, and to the sub-tropical fertile flat plain of the Canton Delta to the south.

By the end of 1997, China had a population of 1,236.26 million (excluding the Hong Kong Special Administrative Region and Macau) comprising 56 ethnic groups: Han Chinese made up 91.9 per cent of the total and Zhuang, Uygur, Hui, Yi, Tibetan, Miao, Manchu, Mongol, Buyi, Korean, and other nationalities 8.1 per cent.

China's population density (126 people per square kilometre according to a 1995 sample survey) is relatively high. Distribution, however, is uneven: the coastal areas in the east are densely populated, with more than 400 people per square kilometre, while the plateau areas in the west are sparsely populated, with fewer than 10 people per square kilometre.

The national language is Standard Chinese or Mandarin (Putonghua, based on the Beijing dialect), but many dialects such as Yue (Cantonese), Wu (Shanghaiese), Minbei (Fuzhou), Minnan (Hokkien-Taiwanese), Xiang, Gan, Hakka dialects, as well as minority ethnic languages are also spoken in their respective dialect areas.

China's administration is currently based on a three-level system: provinces, counties, and townships. The provincial level include provinces, autonomous regions, and municipalities directly under the central government. A province or an autonomous region is in turn subdivided into autonomous prefectures, counties, autonomous counties, and/or cities. A county or an autonomous county is again divided into townships, national minority townships, and/or towns. Autonomous regions (equivalent to provinces), autonomous prefectures (between autonomous regions and autonomous counties), and autonomous counties are all autonomous ethnic minority governmental units.

Telecommunications is one of the fastest growing industries in China. In 1997 aggregate postal and telecommunications volume totalled 177.9 billion yuan, a 33.3 per cent increase over 1995. Telephone lines have been increasing at an annual rate of 41.5 per cent per year for the past seven years. Domestic and international telecom services are increasingly available for private use. By the end of 1997, the number of telephone lines had expanded to 120 million, with 9.55 telephones per hundred persons. The domestic system serves principal cities, industrial centres,

most townships and is fast reaching villages (by 1997, 55.6 per cent of China's villages were connected to the public telephone system). All cities above the county level in China now have program-controlled telephones, and China ranks second in the world in the scale of its telephone network. By 1997, 14 inter-provincial fibre-optic trunk lines had been installed, while mobile communication networks and international services have been expanding rapidly.

The Chinese government encourages the development of Chinese software and formatted fonts to ease the use of Chinese characters for digital communication. It is estimated that Internet users in China will exceed 2 million by the end of 1998 and reach 5 million in the year 2000. Considering China's population of 1.2 billion, the percentage of people accessing the Internet is and will be very small. For the whole nation to become "wired", the geographic, professional, gender and economic disparities in accessing the Internet need to be addressed.

In China, major metropolitan cities and economically more advanced regions tend to have the best network facilities and therefore it is not surprising that most Internet users are based in Beijing, Shanghai and Guangzhou. Beijing also has the most ISPs. Ordinary people are still not very aware of the Internet, let alone use it, and current users are mostly in computer-related professions or have higher education qualifications. The average user is young - 80 per cent are between 21 and 35 years of age; and 88 per cent of Internet users in China are male.



## **REGULATORY ENVIRONMENT**

Placing great emphasis on the strategic importance of information/communication technologies to the modernisation of China's economy, the Chinese government has made it a priority to build the national information infrastructure (NII), especially national economic computer network projects in the country's Ninth Five-Year Construction Plan (1996-2000). The government supports the expansion of Internet into China, though it maintains close control over content. While foreign ownership of any Chinese telecommunications and information infrastructure is strictly prohibited, the government actively seeks foreign investments to fund the rapid development of China's information infrastructure. The four major Internet backbone networks are all government sponsored and must use China Telecom links to connect to Internet sites in other countries. All ISPs must register with the police.

Prior to July 1998, two ministries administered and regulated China's telecommunications and information industry as well as Internet development: the Ministry of Post and Telecommunications (MPT) and the Ministry of Electronics Industry (MEI). Since 1995, a number of legislative measures have been introduced to regulate Internet and computer networks. The PRC Interim Regulations governing the Management of International

Computer Networks issued in 1994 was the first comprehensive set of rules issued by the government to strike a balance between regulating access to the Internet but without denying China the fruits of this new technology.

On February 1<sup>st</sup> 1996, the State Council issued the No.195 Decree, "The Temporary Provisions of Internet Administration of the Computer Information Communication network of the P.R.China". This mandated that the four established Internet networks ChinaNet, CHINAGBN, CERnet and CASnet should be separately administered by the Ministry of Posts and Telecommunications, the Ministry of Electronics Industry, the State Committee of Education, and the Science Institute of China.

More recently, on December 30<sup>th</sup> 1997, the Ministry of Public Security promulgated the Regulations on the Security and Management of Computer Information Network and the Internet, which were approved by the State Council on December 11<sup>th</sup> 1997. The regulations codify the management of computer information networks in China.

In June 1998, the government restructured its information/telecommunications administrative bodies. The Ministry of Information Industry (MII) was established by merging the Ministry of Electronic Industry and the Ministry of Post and Telecommunications. The new ministry is responsible for invigorating the manufacturing business of information products, telecommunications and software; formulating sectoral programs, policies and laws codes; mapping out an overall plan for telecommunications trunk networks (including local and long-distance telecommunications networks), broadcast and television networks (including radio and cable television networks), and special-use telecommunications networks for military and other departments. Moreover, the MII will be responsible for sectoral management, the allocation of resources rationally, avoiding overlapping projects and ensuring information security.

The China National Network Information Centre (CCNIC) administers the .cn country code top-level domain space. It has authorised 32 companies in Beijing, Shanghai, Tianjin, Liaoning, Jilin, Jiansu, Zhejiang, Anhui, Fujian, Jiangxi, Shangdong, Guangxi, Guangdong, Sichuan and Gansu to offer .cn domain name registration services.



## INTERNET CONNECTIVITY

The number of Internet users in China has grown rapidly in recent years, and there were an estimated 1.17 million as of July 1998. However, for the 200 ISPs in China, there are still not enough users to support them and make their services profitable. ChinaNet is the largest ISP in China and dominates the Internet connection service market with about 50 per cent of all users. It has superior high speed network facilities and can offer relatively low connection costs. Small ISPs have to lease lines from ChinaNet and also invest heavily to build up their facilities. To compensate, they tend to charge higher connection fees from users, which only makes them less competitive, and therefore lose users to ChinaNet. A recent survey of Chinese ISPs shows that most smaller ISPs are struggling to compete with better equipped and state backed ISPs such as ChinaNet, and there are a lot complaints from small ISPs about the unfair competition.

## Statistical Report of the the Development of China Internet

The expansion of Internet into China has experienced three main periods. Between 1987-1994 the main activity was the establishment of e-mail exchanges through direct links with Europe and North America. Between 1994-1995 there was a rapid development of China's educational and research computer networks, and then from 1995 onwards came the full scale commercial application of the Internet.

The first network cooperating with the outside world in China was the China Academic Network (CANET), which was established in 1988. CANET could exchange e-mail with the Internet using X.25 technology via a gateway in Karlsruhe University, Germany. Dozens of China's education and research entities joined CANET and in 1990 CANET registered the top domain "cn" with InterNic. In 1990, the China Research Network (CRN) was established. This network also used X.25 links to exchange information with the outside world and connect ten research institutions. In 1993, the Institute of High Energy Physics (IHEP) in China established a direct link to Stanford University in the United States and established full Internet connectivity in 1994.

In 1989, the China State Planning Commission and the World Bank started to support a project called National Computing Facilities of China (NCFC). This project includes a supercomputer centre and three campus networks: the China Academy of Science Network (CASnet), Tsinghua University Network (TUnet) and Peking University Network (PUnet). The construction of these three individual campus networks had been completed by 1992 and in 1994 a 64 kbps satellite link was established, allowing full Internet access for users.

In December 1993, the China Education and Research Network (CERNET) project was planned. It was the first nation-wide education and research computer network in China. The CERNET project is funded by the Chinese government and directly managed by the Chinese State Education Commission. CERNET will connect all universities and institutes in China in the near future and will connect high schools, middle schools, primary schools and other education and research entities by the end of this century. CERNET will link to the global Internet and will become a major part of the Chinese Internet community.

1995 saw the Internet in earnest expansion in China. Commercial and public network projects started to be built and the then Ministry of Post and Telecommunication (MPT) developed the first public network, ChinaNet, in May 1995. The Golden Bridge Network (GBNet), developed by the then Ministry of Electronic Industry (MEI), was launched in September 1996.

By 1997, data communication networks covered 90 per cent of counties and cities nationwide. More than ten local multimedia communication networks were completed and began operation in Beijing, Shanghai, Jinan, and other places, 8 of which have since been interconnected. China's three major data communication infrastructure networks have begun to take shape and to provide services such as frame relay, dedicated lines, virtual private networks, teleconferencing, video on demand, remote medical treatment and education. The three main data networks are CHINAPAC, CHINADDN, and CHINAFRN.

CHINAPAC has established nodes in 2,278 cities above the level of county and economically more developed villages and towns nationwide, with a total volume of 136,000 ports and more than 74,000 users. Regions that are already connected by telephone networks are linked to CHINAPAC via an interconnection with the telephone network. International data networks can be conveniently interconnected via two international ports in Beijing and Shanghai as well as ports in Guangzhou, Macau and Hong Kong.

The Public Digital Data Network, or CHINADDN, is a nationwide public data communication network. It now has nodes in 2,148 cities, villages and towns nationwide connected via optical cable, with a total volume of 184,000 ports and more than 95,000 users.

The Public Frame Relay Broadband Service Network, or CHINAFRN, is the first-phase project of a backbone network that was completed in June 1997. It covers 21 provincial capital cities, including Beijing, Shanghai, Tianjin, Guangzhou, and Shenyang. Beijing, Shanghai and Guangzhou are the international hubs of CHINAFRN. All nodes are equipped with ATM and Frame Relay modules.

The construction and improvement of the three major data communications networks have provided the necessary infrastructures and facilities to provide multiple value-added network services to users including a public electronic mailbox service network (CHINA Mail), a fax storing and forwarding network (CHINA FAX S&F), and an electronic data interchange network (CHINAEDI).

At present, four national networks make up China's Internet: ChinaNet, the primary commercial network and the biggest ISP, is run by China Telecom under the jurisdiction of the Ministry of Information Industry (MII); CERNET, under the directorship of the Ministry of Education, is China's education network; the Golden Bridge Network (Gbnet) is a smaller commercial network owned by Jitong Corporation; and CSTNet is China's Science and Technology Network run by the Chinese academy of Science. The four networks were developed separately and only inter-connected in July 1997 through low bandwidth leased lines.

ChinaNet is the primary national network for government, business, and public use. Its major nodes are in Beijing, Shanghai and Guangzhou. ChinaNet started in 1995 and is now managed by the Beijing Telecommunications Agency, a branch of the recently formed Ministry of Information Industry. It consists of a backbone network and connecting networks, run respectively by the national network centre and connecting network centres. The backbone network is the major data communication line linking the nation's four municipalities and all the provincial capital cities. Connecting networks are the networks built within each province and regions. At present, ChinaNet connects more than 200 cities in China and nearly all the provincial centres have completed their local networks and started offering a wide range of commercial access, including dial-up PPP accounts for individual access, and leased line accounts. The network backbone, the Digital Data Network, has recently been upgraded to support E1 connections between major nodes, and is now connected to the global Internet via at least 14 gateways for a total international bandwidth of 78 Mbps (ChinaNet's total bandwidth jumped significantly with the late March opening of an AT&T 45Mbps underwater cable from Shanghai to the US).

ChinaNet's users are increasing 20 per cent per month and the network plans to link all government offices, over 360,000 state enterprises in more than 600 cities, and over 8 million other industrial and commercial enterprises throughout China.

The China Golden Bridge Network (CHINAGBN) is the only licensed commercial competitor network to ChinaNet. It maintains two international gateways in Beijing totalling roughly 2.25 Mbps, and has nodes in six locations, including Beijing, Shanghai, Shenzhen, Guangzhou, and Dalian. The network is owned by Jitong Corp. It started providing Internet connections in September 1996. CHINAGBN is a hybrid network that uses satellite as its backbone and integrates with terrestrial networks such as CHINAPAC or DDN network. The main users of the network are government departments (the State Economic & Trade Commission, the Ministry of Water Conservancy, the Ministry of Electronics, the State Meteorological Agency, the State Information Centre); science and education institutes (the Academy of Electric Power Sciences, the State Education Commission and the Environment & Development Research Institute); and large- and mid-sized enterprises (such as the China National Offshore Petroleum Corp.).

The current focus of CHINAGBN is to develop a comprehensive nationwide information service by providing value-added service platforms and network security, as well as establishing a national information centre in Beijing and 11 regional information centres in Shanghai, Tianjin, Shenyang, Xi'an, Dalian, Qingdao, Wuhan, Nanjing, Chendu, Guangzhou and Shenzhen.

The China Educational and Research Network (CERNET) is the main scholarly computer network in China and has had its own link to the Internet via a 128kbps Sprint link since May 1995. The network's primary nodes are in Beijing, Shanghai, Guangzhou, Nanjing, Wuhan, Xi'an, Chengdu, and Shenyang. The project was initially funded by Beijing and managed by the State Education Commission. However, at the beginning of last year, CERNET moved to a self-funded model, with the telecommunications and equipment-maintaining fees being shared by all the connected universities. The main objective of CERNET is to establish a nationwide education and research network infrastructure to support education and research in and among universities, institutes and schools in China.

The CERNET national backbone uses Digital Data Network leased lines as its basic infrastructure. It has four international links connected to the Internet, two to the US via Sprintlink and Global One with transmission rates of 128kbps and 2Mbps, and two 64kbps links to Hong Kong (HARNET) and Germany (DFN). In China, CERNET has already hooked up with the university network of Hong Kong, CHINANET, CASNET, and CHINAGBN. Currently, there are more than 300 universities, some middle schools, and some education research entities connected to CERNET from all provinces.

The China Science and Technology Network (CSTNET) is a non-commercial, public network for research institutions, scientists and government administrative bodies of science and technology in China. The current CSTNet links many other science and technology institutions in China in addition to those belonging to the Academy of Science. About 30 research institutes in agriculture, forestry, medicine, meteorology, environmental protection, astronomy and electronics have now been connected with CSTNet. At present, the network has a 2Mbps line



to the United States, a 64kbps line to France, and a 64kbps line to Japan. Nationally, China has more than 5000 research institutes, of which only 200+ are connected to CSTNet. CSTNet is currently expanding its satellite capacity to provide more affordable connections to the large number of research institutes yet to join the network.

<b>Table I</b>	<b>China's four major Internet networks</b>				
<u>Network</u>	<u>CHINANET</u>	<u>CSTNET</u>	<u>CERNET</u>	<u>CHINAGBN</u>	<u>Total</u>
International Links	15	3	4	2	24
Bandwidth	20Mbps	2.128M	2.256M	2.256M	26.64M



## CONTENT INITIATIVES

In recent years Chinese content has steadily increased and now the majority of Chinese web sites are in Chinese. However, there is still a lot of improvement needed as many web sites offer duplicate information and lack innovative contents. Nevertheless, because it is hard for ISPs to survive financially by just providing Internet access, many are turning to value-added Internet content and information services and becoming Internet Content Providers (ICPs). Compared with struggling ISPs, ICPs are in a better financial situation as their business investment and turnover tend to be smaller and they have more choices and flexibility in providing services. In addition to Internet connections, ICPs provide content services such as designing web pages, Internet publicity, creating virtual hosts, leasing hard-disk space, and similar services. Some ICPs have become successful by developing web application software and providing specialised information services.

ICPs such as Sohoo, which has successfully developed a Chinese Internet search engine, Homeway, which provides share market information, and China Real Estate, which puts real estate information on the Internet are now attracting many users to their services and have also won the trust of advertisers.

In 1998, electronic commerce has become the new focus of the media in China. Many are suspicious of the viability of e-commerce in China as Chinese banks are yet to develop their own electronic banking system and ATM cards are far from being extensively used. However, ISPs nonetheless recognise the huge potential of Internet e-commerce. A number of ISPs have been actively experimenting with Internet shopping systems and many companies now have established web pages to sell their products.

Advertising is another area with great business potential and where ISPs hope to benefit. At present, Internet advertising is not as popular as other media and the total revenue from Internet advertising is only a few million yuan. However, ISPs are hopeful of the prospects for Internet advertising.

[See Site and Contact List for specific details of content initiatives]

## **OTHER PROJECTS**

Since 1997, a number of different initiatives have been undertaken to further expand China's national information infrastructure.

In early 1997, a decision was made to build China's first public mobile data communication network. At present, the first-phase project of the network has been finished and covers six cities: Beijing, Shanghai, Guangzhou, Shenzhen, Fuzhou, and Changsha.

In 1997, experiments for ISDN services were conducted in 14 cities, and ISDN pilot services are now available in 22 cities nationwide. Local ISDN networks have been built and completed in Beijing, Shanghai, Guangzhou, Jiangsu and other provinces. The Beijing ISDN gateway will connect with international ISDN networks in 10 countries and regions including the USA and Japan.

The Guangdong Broadband Multimedia Pilot Network has connected 9 cities, including Guangzhou, Shenzhen and Zhuhai. Similar pilot ATM networks are the Shanghai ATM Pilot Network and the Beijing ATM Pilot Network.

The China Financial Data Communication network (CNFN) is a joint investment between the Ministry of Information Industry (MII) and the People's Bank of China. The first phase of the project connected 43 major cities and passed acceptance tests in 1997, paving the way for the country's financial institutions and banks to share information online. The second-phase of the project is in progress. So far 200 nodes of CNFN across 160 cities have been installed and connected. CNFN is China's biggest frame relay network with over 2600 user ports and 80 Mbps total bandwidth. The Bank of China is a 24-hr customer of CNFN.



## NETWORKS

### CERNET

[www.cernet.edu.cn](http://www.cernet.edu.cn)

### ChinaNet:BTA

[www.bta.net.cn](http://www.bta.net.cn)

### CHINAGBN

*Golden Bridge Network*

[www.gb.com.cn/](http://www.gb.com.cn/)

### China National Network Information Centre

[www.cnnic.net.cn](http://www.cnnic.net.cn)

### China Telecom

chinatelecom.cninfo.netCSTNet

[www.csnet.net.cn](http://www.csnet.net.cn)

### CSTNet

[www.csnet.net.cn](http://www.csnet.net.cn)

### Science and Technical Information Network of China

[www.iscl.sticn.com.cn](http://www.iscl.sticn.com.cn)

### Scientific and Technical Information and Communication Network (STICN)

[www.sti.net.cn](http://www.sti.net.cn)

## GOVERNMENT SITES

### ChinaInfo

[www.chinainfo.com](http://www.chinainfo.com)

### China Economic Information Network (CEINET)

[www.cei.gov.cn](http://www.cei.gov.cn)

### Government Pages

[www.cei.gov.cn/inf/homepage/gov/](http://www.cei.gov.cn/inf/homepage/gov/)

Ministry of Information Industry  
[www.mii.gov.cn](http://www.mii.gov.cn)

Ministry of Foreign Trade and  
Economic Cooperation (MOFTEC)  
[www.moftec.gov.cn](http://www.moftec.gov.cn)

Ministry of State Education  
[www.moe.gov.cn](http://www.moe.gov.cn)

## **ISPs:**

Beijing Online  
[www.bol.com.cn](http://www.bol.com.cn)

China Internet Corp.  
[www.china.com](http://www.china.com)

Cenpok  
[www.cenpok.cm.cn](http://www.cenpok.cm.cn)

Read Online  
[www.read.com.cn](http://www.read.com.cn)

Yinghaiwei  
[www.ihw.com.cn](http://www.ihw.com.cn)

ChinaBig  
[www.chinabig.com](http://www.chinabig.com)

China Real Estate  
[www.realestate.com.cn](http://www.realestate.com.cn)

Internet café  
[www.sparkice.com.cn](http://www.sparkice.com.cn)

## **EDUCATION:**

Tsinghua University  
[www.tsinghua.edu.cn](http://www.tsinghua.edu.cn)

Peking University  
[www.pku.edu.cn](http://www.pku.edu.cn)

Tsinghua University  
[www.tsinghua.edu.cn](http://www.tsinghua.edu.cn)

Xi'an Jiaotong University

[www.xjtu.edu.cn](http://www.xjtu.edu.cn)

University of Electronic Science and Technology

[www.uestc.edu.cn](http://www.uestc.edu.cn)

South China University of Technology

[www.scut.edu.cn](http://www.scut.edu.cn)

Huazhong University of Science and Technology

[www.hust.edu.cn](http://www.hust.edu.cn)

Southeast University

[www.seu.edu.cn](http://www.seu.edu.cn)

Shanghai Jiaotong University

[www.sjtu.edu.cn](http://www.sjtu.edu.cn)

Northeast University

[www.neu.edu.cn](http://www.neu.edu.cn)

## **MEDIA:**

China Central Television

[www.cctv.com.cn](http://www.cctv.com.cn)

China Daily (English)

[www.chinadaily.net](http://www.chinadaily.net)

China Internet News Centre

[www.china.org.cn](http://www.china.org.cn)

People's Daily (Chinese)

[www.snweb.com/pdtext.html](http://www.snweb.com/pdtext.html)

## **SEARCH ENGINES:**

Beijixing

[www.beijixing.com.cn](http://www.beijixing.com.cn)

China Navigator

[www.chinavigator.com.cn/defaultn.htm](http://www.chinavigator.com.cn/defaultn.htm)

Chinavista

[www.chinavista.com](http://www.chinavista.com)

Compass

compass.net.edu.cn:8010

Goyoyo

[www.goyoyo.com](http://www.goyoyo.com)

Readchina

search.readchina.com

RichSurf

[www.richsurf.com/richsurf/](http://www.richsurf.com/richsurf/)

ROBOT

[www.robot.com.cn](http://www.robot.com.cn)

SEARCH

[www.search.com.cn](http://www.search.com.cn)

Sohoo

[www.sohoo.com.cn](http://www.sohoo.com.cn)

Yahoo (Chinese):

gbchinese.yahoo.com

Yeah

[www.yeah.net](http://www.yeah.net)

Yippee!

[www.yippee.com.cn](http://www.yippee.com.cn)

MEI Department of Computer  
and IT Advancement

Ministry of Electronics Industry

People's Republic of China

27 Wanshou Road

Beijing

T: +86 10 68 20 8212

F: +86 10 68 27 1654

JiTong Communications (ChinaGBN)

1st Floor, JINGBAO PLAZA

185 Andingmenwai Street

Dongcheng District

Beijing

T: + 86 10 64262695

F: +86 10 64262693

China Internet Network Information Centre

P.O.Box 349 Beijing

100080 P.R.China

T: +86 010 62619750

F: +86 010 62559892

Copyright © International Development Research Centre, 1998

© All Rights reserved. No part of this web site may be reproduced, stored in a retrieval system or transmitted, in any form or by any means, electronic, mechanical, photocopying, or otherwise, without the prior permission of the International Development and Research Centre.

The material in this Yearbook has been peer-reviewed by in-country resource persons. The views expressed are those of the writers and do not necessarily reflect those of the International Development Research Centre.

Cite as follows :

The Pan Asia Networking Yearbook (1998) .

Singapore : Asia Regional Office, International Development and Research Centre.

[On-line serial, subscriber-based : <https://www.panasai.org.sg/ecomsec/bookshelf/user/webdriver>]

*(Date of publication : December 3<sup>rd</sup> 1998)*

## **Abstract**

The Tibetan Autonomous Region (TAR) encompasses some 1.2 million square kilometers of the People's Republic of China, or about 12 percent of the total land area of the country, with a population of just over 2 million, 95 percent of whom are ethnic Tibetan. The TAR's Internet connections can be divided equally between two sectors - education and commercial - both of which have local Internet infrastructure. Currently, most of the educational institutions have no direct links to the network, only basic dial-up connections, but through the PAN-Tibet project a number of institutions will soon have direct wireless connections to Tibet University and the China Education and Research Network (Cernet). The commercial Internet infrastructure is more developed thanks to the presence of China Telecom and its subsidiary ChinaNet.

---

# **Tibetan Autonomous Region (TAR), China**

By Geoff Long



## **OVERVIEW**

The Tibetan Autonomous Region (TAR) encompasses some 1.2 million square kilometers of the People's Republic of China, or about 12 percent of the total land area of the country, with a population of just over 2 million, 95 percent of whom are ethnic Tibetan.

About 70 percent of the TAR is rangeland, concentrated primarily in the central and western parts. This constitutes about 20 percent of all grazing land in China. Over 80 percent of the land area is above 3,000m in elevation, and about half is over 4,500m. The Tibetan plateau is one of the largest grazing ecosystems in the world and the rangelands of the Tibetan pastoral area are also the headwaters for many major river systems in Asia -- what takes place in the Tibetan pastoral area has far-reaching effects on downstream areas, and the water from these rangeland areas will be of increasing importance in the future. The rangelands are also exceptional environments for the biological diversity that they contain in terms of both plant and animal life. About 85 percent of Tibet's total population is rural and engaged in agriculture or nomadic herding. The gross output value of agriculture makes up 83 percent of total production value in the TAR.

The Government of the TAR has made significant progress in recent years in developing Tibet's basic physical, economic, and social infrastructure, and improving people's livelihoods. It has invested heavily in the development of transport, power, telecommunications, health and education in both urban and rural areas. Priority has been given to the modernization of agriculture, both cropping and pastoral livestock production, along with the development of commerce, forestry, tourism, and mining.

In the last decade effort has been placed in alleviating poverty in the poorer regions of the TAR. By 1994, the number of poor, defined as persons with an average per capital annual income of less than RMB 500 (US\$62), had been reduced to about 480,000 people. By late 1997, it was estimated that in the entire TAR about 330,000, or only about 14 percent of the rural population, were still living in poverty. There is also a growing group of well-educated and committed development professionals in government agencies and institutes in the TAR



dedicated to seeking solutions to the problems of poverty in Tibet. In addition, there is increasing levels of financial resources available from the TAR government, the central government and donor agencies.

Telephone services are widely available and of a good condition at least in the capital cities of each district. Digital mobile telephone services are available and well-used within Lhasa.

The Tibetan Autonomous Region is organized administratively into Lhasa Municipality, six Districts/Prefectures, 74 counties, and over 2000 townships and 7468 administrative villages. Chinese and Tibetan are the two predominate languages used, while many younger people are also keen to learn English.



## **REGULATORY ENVIRONMENT**

As part of China, the Tibetan Autonomous Region is subject to most of the central government's regulatory laws. However, in addition companies must also be licensed by the TAR to operate Internet and telecommunication services. There is no separate Tibet country-code domain, so all local domain names come under the main .cn suffix. See main China section for full description of China's regulatory environment.



## **INTERNET CONNECTIVITY**

The TAR's Internet connections can be divided equally between two sectors -- education and commercial -- both of which have local Internet infrastructure, although unfortunately no direct link between the two networks exists.

Internet in the education sector preceded commercial activity by just a few months and is a result of the setting up of a Lhasa node for the China Education and Research Network (Cernet), one of only four allowed Internet backbones in China. Cernet (Tibet region) is located within Tibet University and has a 128kbps satellite link (upgradeable to 2Mbps) to the Cernet backbone via the University of Electronic Science & Technology (UESTC) in Chengdu. UESTC is one of China's premier technical universities and also provides support and training for TAR-based technical staff. As part of development aid to TAR, Tibetan universities are not required to pay fees for their connection to Cernet -- the only institutions in China with such an exemption.

Currently, most of the educational institutions have no direct links to the network, only basic dial-up connections. However, through funding from the Central Government and Canada's International Development Research Centre (see Pan Activities below) a number of

organisations will soon have direct wireless connections to TU and Cernet. The first of these will be the Tibet Academy of Agriculture and Animal Sciences (TAAAS). Already linked is the Department of Education (formerly the Tibetan Education Committee), which has a direct fibre optic connection to TU.

Apart from a lack of Internet connections between institutions, another problem is a shortage of campus networks and in some cases computers. Most institutions want to establish a local-area network (LAN) to connect to the Internet, but a lack of both funds and technical personnel are two consistent problems. As the largest education institution in the region, Tibet University will be the first to get substantial campus-wide infrastructure as part of 20 million RMB in funding from the Central Government. A 5km fibre optic network using Gigabit Ethernet technology will be completed by the end of 2000 and will connect 14 buildings on campus. A new teaching building is also nearing completion and will include some 400 computers for teaching. TAAAS also has a smaller 36-node local area network on its campus, but most other institutions have non-networked PCs with, at best, a single dial-up connection to the Internet.

The commercial Internet infrastructure is more developed thanks to the presence of China Telecom and its subsidiary ChinaNet, by far the largest telecom and Internet provider in China. Nevertheless, the number of dial-up users is still low, estimated at around 3000, with less than 10 percent of these outside of Lhasa. ChinaNet has a dial-up node in each of the six prefectures outside of Lhasa, which are connected via a 64 kbps digital data network (DDN). The main networking centre is connected by fibre optic cable to ChinaNet's main infrastructure, a backbone with 2.5 Gbps capacity.

More recently, another Chinese telecommunications provider has been licensed to offer Internet service in TAR. Ji Tong Communications operates the China Golden Bridge Network, a major project to provide competition in data communication services and only the second commercial Internet backbone operator (the other being ChinaNet). Ji Tong established its office in August 2000 and at the time of writing is testing its Internet service, which is scheduled to begin end of 2000. The company will provide a full range of Internet services and is currently leasing a 2 Mbps connection from ChinaNet to connect with its existing infrastructure in China. Initially it will have one node in Lhasa but expects to expand to other districts, the first of which are likely to be Shanlan, Shigatze and Lyanchi. Another major initiative of Ji Tong will be an IP phone service, which is currently being tested. It will offer both long-distance and international calls in competition with China Telecom.

Apart from the main ISP services, there are an estimated 10-20 public Internet cafes, offering access for 20RMB (approx US\$2.50) per hour.



## PAN ACTIVITIES

With funding from IDRC, PAN Tibet is the first donor-funded IT development project in Tibet and aims to provide infrastructure within key educational institutions of the TAR. As most of the universities and colleges lack both computers and skilled people to use them, the first stage

of the project has been to equip a select group of universities with computers and provide training on how to use the Internet. PAN Tibet follows a model that has been used successfully by IDRC in other parts of Asia including neighbouring countries Mongolia, Nepal and Bhutan. In fact, the first user training programme for PAN Tibet members was held in Kathmandu and conducted by people involved in IDRC's Pan Nepal project.

The initial participants included staff from the Tibet Academy of Agriculture and Animal Science (TAAS), the Tibet Academy of Social Science, the Tibet Traditional Medicine College and the Tibet Agriculture and Animal Husbandry College. Soon, each of these institutions will be linked to the Internet through Tibet University, a lead institution along with TAAS for the PAN Tibet project and the largest university in Tibet. TU is also the local node for China's main educational Internet backbone, CERNet. But until permanent links are established, the newly trained staff are experimenting with dial-up connections using equipment provided through the PAN Tibet project funding. Already each of the universities has learned how to create a web site and is in the process of putting it online -- and all have bigger plans for the future.

As one of the lead institutions in the project, the Tibet Academy of Animal and Agricultural Sciences (TAAAS) will play a central role in not only helping other organisations to come online, but also assist the many faculties and departments under its umbrella link with the project. TAAAS is involved in basic and applied research in agriculture and animal husbandry and includes four separate research institutes: Vegetable and Flower Research, Agriculture Research, Animal Husbandry Research and a Central Research Laboratory. TAAAS also has some 60-70 employees doing field research at 19 demonstration stations throughout TAR. Training activities have involved more than 100,000 farmers and exchange programmes have been conducted with five countries to date as well as with other provinces of China.

Another PAN Tibet member, the Tibet Academy of Social Science, aims to catalogue its reference library containing some 240,000 titles for online use. It will also put the full text of periodicals such as its quarterly Journal of Tibetan Studies on the web -- eventually in three languages, Tibetan, Chinese and English.

Meanwhile, the Tibet Traditional Medicine College will be able to use the Internet to communicate with its branch in London, England. The college recognises that it has a unique body of information that it can share with the rest of the world and hopes to set up a web site that can reflect that.

Other institutions will also be invited to join the project once the initial members are familiar with the Internet, while training will be ongoing throughout the 18-month programme. One of the earliest tasks related to training was to translate Internet training materials from ITrain into Chinese. ITrain is an IDRC project managed by Canada's Bellanet that aims to create flexible, effective, gender and culture sensitive training materials about the Internet. As all ITrain materials are published under a free licence, known as OpenContent, they can in future be used at no cost by other members of the PAN Tibet project. Other language-related activities include work by Tibet University staff to help create a standard Tibetan font specification for use with PCs and Internet content, while another staff member is working on a similar project to bring a Tibetan script to the Linux operating system.

In the future, the PAN Tibet project may also form the foundation for Internet-based distance-education and e-commerce activities.



## CONTENT INITIATIVES

To date, very few companies or organisations in the TAR have a web site. While the PAN Tibet project is expected to increase the number of local web sites among research organisations, there were only two sites registered by September 2000. One belonged to Tibet University while the other was for the Department of Education -- although both were at a basic stage at the time of writing. One site that promotes itself as a central site for Tibet is based in Beijing and called HelloTibet. However, apart from providing basic information, the sites main purpose is to sell Tibetan handicrafts and other goods.



## SITE AND CONTACT LISTS

Cernet Tibet  
(see Tibet University)

China Telecom  
Beijing Rd  
Lhasa  
Tel: +891-6832046

Hello Tibet  
Web site with some Tibet information and products  
[www.hellotibet.com](http://www.hellotibet.com)

Ji Tong Communications (Golden Bridge Network)  
5th Floor, Daji Hotel  
42 East Linkuo Rd  
Tel: +891-6337777  
[www.cd.cngb.com](http://www.cd.cngb.com)

TAAAS

111 Westem Jinzhu Rd

Lhasa

Tel: +891-6813171

Fax: +891-6813313

Email: [taaas@public.ls.xz.cn](mailto:taaas@public.ls.xz.cn)

Tibet Academy of Social Science (TASS)

Tibet Department of Education

Jiangsu Rd

East Lhasa

Tel: +891-6326836

Traditional Medical College

24 Niangre Rd

Lhasa

Tel: +891-6330342

Tibet University/Cernet Tibet

5 Jin Zhu East Road

Lhasa

Tel: +891-6326847

Fax: +891-6334489

Email: [nmzx@utibet.edu.cn](mailto:nmzx@utibet.edu.cn)

[www.utibet.edu.cn](http://www.utibet.edu.cn)

Copyright © International Development Research Centre, 1998

© All Rights reserved. No part of this web site may be reproduced, stored in a retrieval system or transmitted, in any form or by any means, electronic, mechanical, photocopying, or otherwise, without the prior permission of the International Development and Research Centre.

The material in this Yearbook has been peer-reviewed by in-country resource persons. The views expressed are those of the writers and do not necessarily reflect those of the International Development Research Centre.

Cite as follows:

The Pan Asia Networking Yearbook (1998).

Singapore : Asia Regional Office, International Development and Research Centre.

[On-line serial, subscriber-based : <https://www.panasai.org.sg/ecomsec/bookshelf/user/webdriver>]

*(Date of publication : October 12<sup>th</sup> 2001)*

## **Abstract**

*After a delay of nearly 3 years, and a great deal of litigation and controversy, the long-awaited ISP Policy has been announced and the process of issuing licenses has begun with gusto. On 22<sup>nd</sup> November 1998, Prime Minister Atal Bihari Vajpayee inaugurated SatyamOnline, the first private sector Internet access service in Hyderabad. The highlight of the ISP policy is that licences will be issued for 15 years and there will be no licence fee or any limit on the number of licences awarded.*

---

**India**

by Suchit Nanda



## **OVERVIEW**

India has been the largest democracy in the world since its Independence in 1947 under what is popularly known as "licence Raj". Today it is a country undergoing a massive transition with far reaching consequences not only for its over 900 million citizens but the entire globe. After a delay of nearly 3 years, and mired in litigation and controversy for over a year, the long-awaited ISP Policy has been announced and the process of issuing licenses has begun with gusto.

On 22<sup>nd</sup> November 1998, Prime Minister Atal Bihari Vajpayee inaugurated SatyamOnline, the first private sector Internet access service in Hyderabad, and at the same time the first phase of the Hi-Tec City project near Hyderabad. The highlight of the ISP policy is that licences will be issued for 15 years and there will be no licence fee or any limit on the number of licences awarded.

The railways, state electricity boards and the National Power Grid Corporation are all allowed to provide Internet backbone services. ISPs can set up their own international gateways but require a security clearance from an inter-ministerial committee. The norms for security clearance have not yet been worked out. Foreign equity of up to 49 per cent in an ISP is permitted. Several large Indian industrial groups such as the Ambanis, Hindujas Mittals, Modis, Nandas, and Rais are reportedly undertaking ISP feasibility studies. India currently has an installed base of only 2 million PCs and less than 500,000 Internet users. The demand for PCs and Internet connections is expected to increase significantly due to the new services being launched.

While Internet is not new in the country thanks to the efforts of Education Research Network (ERNET) and UNDP, it has been limited to those associated with educational institutes or R&D organisations. Previously access was highly controlled and restricted, which limited its reach. In August 1995, Videsh Sanchar Nigam Limited (VSNL), a public sector undertaking and the international telecom carrier, launched the first public Internet service in six major cities, which has today expanded to 42 cities and is expected to reach 70 cities by year end. There is also a move to enable routing of calls at local call charges from any of the 800 cities that have STD/ISD (long distance calling) capability. Instead of setting up local POPs in all cities, calls to the number 17222 will be directed to the closest Internet POP at no additional charge.

In the first year, 50,000 customers went online on VSNL's Gateway Internet Access Service (GIAS) and today the number has crossed 150,000. Delhi and Mumbai (Bombay) constitute half the customers.

The target is to reach 1 million users by the year 2000 but that looks unlikely to happen even with the entry of private ISPs. One of the major factors that has limited the expansion of Internet in the country is poor infrastructure, with problems such as the non-availability of telephone lines and an overloading of telephone circuits that were designed for voice communication. To partially overcome this, VSNL has deployed routers at various telephone exchanges and linked them on dedicated 2 Mbps circuits, thus bypassing the congestion. In the last five years the Department of Telecommunications (DoT) has successfully undertaken a mammoth job of converting telephone exchanges to digital/electronic exchanges and shifting to a fibre backbone. This has resulted in very good quality and stable connections. Looking at sheer numbers, a huge quantity of phone connections has been deployed. However, a lot more connections need to be provided as India has only achieved a teledensity of one per cent.

One of the greatest challenges India now faces is to improve the penetration and broaden the base of access to services. If the target of a million Internet subscribers is to be achieved, the entire infrastructure, especially datacom and telecom, will need to be overhauled. Another challenge in the short term will be a lack of expertise and talented people to handle ISP operations. A sizeable number of people are attracted by worldwide growth figures and are thus jumping onto the ISP bandwagon, but have very little clue of the dynamics of the business.

India's software business, which relies heavily on computer networks for international operations, is reportedly poised to touch revenues of US\$6 billion by the turn of the century, out of which exports would account for about US\$4 billion. The improved availability of Internet will have a very positive impact on the software industry.

Some analysts are of the opinion that although there is no license fee, the long-overdue policy still has some shortcomings in terms of bank guarantee stipulations and the prohibition of Internet telephony. Due to the high bank guarantees, NGOs and entrepreneurs have an entry barrier they will find hard to overcome. For a prospective ISP, the required bank guarantee is a lot of money and amounts to an indirect form of licence fee. A Public Interest Litigation (PIL) has been filed in the High Court challenging the ban on Internet telephony and the blocking of sites by VSNL.

Due to the 3 year monopoly head start and the huge funds available to VSNL, private operators face a serious challenge. DoT/MTNL (the other major carrier in India) on the other hand hold an unfair advantage, being the sole last mile telephone provider in the country.



## REGULATORY ENVIRONMENT

India is still governed by ancient and primitive laws that date back to 1885 the time when India was under British Rule. The applicable law is called "The Indian Telegraph Act of 1885", which has been amended by the Indian Wireless Telegraphy Act 1933 and the TRAI Act 1997.

The Department of Telecommunications (DoT) is the Government entity responsible for all telecommunications matters, which includes providing everything from telephone connections to leased line circuits. In the two important metro areas of Delhi and Mumbai (Bombay), DoT has formed Mahanagar Telephone Nigam Limited (MTNL), which provides all local loop circuits. International traffic is under the purview of VSNL.

VSNL has been the monopoly provider of international telecommunication services and Internet services (other than ERNET, NICNET & STPI). With the new ISP Policy, VSNL has been forced to spawn another company that will compete with the private sector, while the parent company will focus on its core business of telecommunications.

In keeping with the changing times, the Telecom Regulatory Authority of India (TRAI) was formed to monitor and propose changes and tariffs. However, due to the different opinions of those in DoT and the TRAI, matters have been dragged to the courts and attempts made to curtail the scope and powers of TRAI. This has evidently been viewed with suspicion by all the players and companies that demand a level playing field and a neutral regulatory body.

On 9th November 1998, the Indian ISP Policy was released. The policy is unique in that unlike cellular or pager licences, the government has decided to freely permit private operators without demanding large licence fees or limiting the number of participants. Licences will be issued to companies registered in India under the Companies Act, 1956. Foreign equity is permitted to the extent of 49 per cent and there is no requirement for the applicant-company to have any prior experience in information technology or telecommunication services. The Internet service areas have been grouped into three categories. Separate licenses would be granted to any company for each service area. Category 'A' includes the whole of India. Category 'B' consists of each one of the 20 Territorial Telecom Circles and the four Metro Telephone Systems of Delhi, Mumbai, Calcutta and Chennai of the DoT. However, if a licence for Telephone Systems of the four major cities of Ahmedabad, Bangalore, Hyderabad and Pune is required, these will also be treated as category 'B' Service Areas on par with the Telecom Circles. Category 'C' includes any Secondary Switching Area (SSA) with their geographical boundaries defined by DoT as on April 1, 1997. The SSAs of Delhi, Mumbai, Calcutta and Chennai and telephone systems of the four major cities of Ahmedabad, Bangalore, Hyderabad and Pune have been excluded from Category 'C'.

While there is no license fee up to 31st March 2003, a performance bank guarantee (PBG) of Rs.20 million is required for each Category 'A' Service Area, Rs.2 million for Category 'B', and Rs.300,000 for Category 'C' Areas. ISPs are free to fix their own tariffs, however, TRAI may review and fix a tariff at any time. Current e-mail and VSAT operators are allowed to obtain ISP licences for any of the areas and the DoT has permitted direct interconnectivity between two separately licensed ISPs.



It is expected that there will be about 10 national level ISPs, 50 regional level ISPs (operating in more than one city), and over 200 local ISPs as early as before the year 2000.

Guidelines have been finalised for allowing cable television operators to offer access to the Internet through their networks. Cable TV operators, which started out as an unorganised sector, have mushroomed into a huge business. Nearly all the TVs in India have some cable connection. All cable TV operators can become ISPs, either by directly hooking to earth stations through VSAT (very small aperture terminal) or to the local nodes by a wired connection. Of the licence period fixed for 15 years, ISPs are not required to pay any license fee for the first five years, while one rupee per connection is proposed from then on.

In the recent past scenario of strict regulation and no ISP policy, enterprising people subscribed to leased lines from VSNL and setup Cyber Cafes. These became very popular locations. Technically these too were illegal as the application form clearly stated that no reselling was permitted. To overcome this some Cafes charged higher rates for food and beverages or charged for the time spent in the Cafe while stating that the Internet facility was free. Fortunately, VSNL and DoT turned a blind eye, thus helping the sizeable population that could not afford a computer, modem and phone connection to also partake in the cyber revolution gripping India.

Public Call Operated (PCO) booths are manned stations that provide a fee-based phone community service. Due to the low penetration of phones, PCOs have mushroomed all over the country and on every street corner. Due to the risk of wrong billing or misuse of long distance calls, a number of phone subscribers disable long distance services and use PCOs for this purpose. These booths, also called ISD/STD centres, may be allowed personal computers and Internet connections. A blueprint has been drawn up as part of the new informatics policy. The move is being seen by the infotech industry as a revolutionary step to proliferate the use of e-mail, a cheaper way of communicating than telephones. The decision expected to be announced soon will not only help the government rake in additional revenue, but also help generate jobs as promised by the government. At present, there are about 80,000 STD/ISD booth operators in the country. According to government sources, allowing STD/ISD operators to give out e-mail addresses to individuals will provide people in villages access to a cheap mode of communication. Voice over IP and pornographic material is strictly banned, although it is not clear how this will be enforced and whether the provider or the end use will be held responsible. Even in the present scenario where it is illegal to carry voice over IP and access pornographic material, customers freely and often do it.

The Indian top-level domain is .in and administered by the National Centre for Software Technology (NCST), ERNET. Currently there are no fees for registration although the domain names are strictly administered. Requirements include that the company asking for the domain should be registered in India and the IP addresses used should be located within India.



## INTERNET CONNECTIVITY

Internet access is available either through GIAS (VSNL), ERNET, NICNET or STP. VSNL has the only public access service and provides most of the international bandwidth to the other three. Customers can either login using 33.6 Kbps (to be shortly upgraded to 56 Kbps) modems or 64 Kbps/128 Kbps ISDN connections. Leased circuits ranging from 9.6 Kbps to 2 Mbps are also available for private use. Dial up modem costs range from Rs. 20 per hour to Rs. 30 per hour in addition to the Rs. 12 per hour charged by the local telephone company (MTNL/DoT). Dial up 64 Kbps ISDN costs Rs. 38 plus Rs. 12 per hour while dial up 128 Kbps costs twice that. Leased circuits are expensive. A 64 Kbps dedicated leased circuit within 50Kms of the node costs Rs. 8,00,000 plus Rs. 1,88,000 per annum.

VSNL directly operates Internet nodes in the following cities: Mumbai, New Delhi, Calcutta, Chennai, Bangalore, Pune, Mysore, Dehradun, Ernakulum, Trivandrum, and Ahemadabad. DoT operates Internet nodes in the following cities: Lucknow, Kanpur, Patna, Jaipur, Chandigarh, Indore, Gwalior, Nagpur, Goa, Hyderabad, Guwahati, Kollam, Pondicherry, Coimbatore, and Aurangabad.

In preparation for the private ISPs and increased demand, VSNL is adding 50 per cent more bandwidth to the Internet backbone. Currently VSNL connects at 80 Mbps, of which close to 70 Mbps is carried over satellite links. Due to the delays that are inherent in satellite links, VSNL is adding new 45 Mbps links via the FLAG (Fibber optic Link Around the Globe) and Atlantic Crossing 1 cable systems, which have landing points in Mumbai (for West) and Kochi (for South India). Shortly this will be increased to 125 Mbps.

Within the country there is already a meshed network of 2 Mbps, which is being further upgraded under a National Information Infrastructure (NII) backbone project. It is proposed to initially set up an ATM backbone of 155 to 620 Mbps and allow for the use of state-of-the-art multimedia applications for distance learning and other research activities. A number of universities and those connected to ERNET also intend to experiment with high-speed links to this ATM backbone. DoT will build a 2.5Gbps backbone for the National Information Infrastructure with an investment of Rs.12 billion. Also among the major ISP players is MTNL the Government basic telephony provider in Delhi and Mumbai. MTNL proposes to start services by 26th January 1999 with a contract of Rs. 70 million already awarded to Digital Equipment (India). MTNL proposes to set up two POPs of 2 Mbps each and within 3 months expand these with gateway facilities. Being the telephony provider and on the receiving end of complaints about network congestion, MTNL, like VSNL, proposes to set up routers and dedicated circuits from various exchanges. It also plans to combine the phone and Internet billing into a single bill, making it easier for subscribers. It may also reduce or eliminate the local call charges of Rs. 1.25 per 5 minutes, which is a hidden cost to dial up customers.

ERNET is the network that was set up as a part of the Advanced Technology Program in Computer Networking (ATPCN) initiated under the auspices of the Dept. of Electronics, with funding from the Government of India and UNDP. In 1986, ERNET began as a multi-protocol network with both TCP/IP and the OSI-IP protocol stacks running over the leased-line portion of the backbone. Since 1995, however, almost all traffic is carried over TCP/IP. The objective of the project was to set up an academic and research computer network in India and to

promote communication and networking research as well as training. All major nodes of ERNET are connected to each other using leased lines. Over 200 academic and R&D groups, 8000 scientists and technologists have access to ERNET facilities. Till recently, the backbone comprised leased analog or digital links, and a TDM/TDMA VSAT network. All leased links except the link between IISc and NCST, Mumbai were analog links and used modems (9600bps to 28.8 Kbps) for data communication. The IISc/NCST link had a 64 Kbps digital link. The hub of the VSAT network is based in the Software Technology Park (STP), Bangalore. The TDM outroute is 512 Kbps and there were four TDMA inroutes, each operating at 128 Kbps. Depending on their configuration, VSAT nodes access the inroutes either using a fixed capacity "streams" mode, or a "reservation" mode. Apart from providing back-up access for seven of the eight backbone nodes, the VSAT network provides network access to about 60 academic/research institutions. Non-backbone nodes also access the network by connecting to the nearest backbone nodes via dial-up links. A 64 Kbps intercontinental link connected ERNET at NCST, Mumbai to the UUNET node in Virginia, USA. A second international link of 128 Kbps connected the VSAT hub at STP, Bangalore, to JVNC in the USA. The IISc node also had a 64 Kbps radio connection to the ERNET router at the VSAT hub.

The Terminal Evaluation Team of UNDP recommended that a suitable institutional structure be provided in order to enable ERNET to sustain its momentum. This gave birth to the concept of setting up a society for ERNET. The Department of Electronics (DoE) has set up a number of Societies, such as the National Centre for Software Technology (NCST), the Centre for Development of Telematics (CDoT), the Centre for Development of Advanced Computing (C-DAC), and Software Technology Parks of India (STPI). A society called ERNET India was also formed.

International connectivity is achieved through gateways at New Delhi, Mumbai, Bangalore and Calcutta, with a total capacity of 6.64 Mbps and daily traffic exceeding over 10Gbps. ERNET teams have been working in association with industry and various user groups to provide know-how and the transfer of technology. Support is also provided for library networks like DELNET, BONET and INFLIBNET.

A number of large and medium sized Indian companies have applied and some already received licenses to operate Internet services. ETH Dishnet, a Sterlite Group company, plans to launch services in Pune and Chennai by mid-January. Satyam Infoways' service, SatyamOnline, has already been launched in Hyderabad, and it shortly plans to start services in Mumbai, Bangalore and up to 12 Indian cities in a matter of months. Bharti Telecom and BT (British Telecom) plan to launch services by March 1999. Reliance Telecom, which is part of the large Reliance Group of companies, already has cellular and basic telecom licenses in various parts of India and is gearing up to offer Internet on a national level. BPL Group has tied up with Intel and plans to launch a range of Net TV set top boxes in the below Rs. 10,000 range. Global Telesystems is offering a whole host of e-commerce services under the Global Electronic Commerce Services (GECL) umbrella. It claims to already have a national FAX server network of 20,000 subscribers and has entered into agreement with Nortel, GE, and Microsoft for Internet services. Global plans to launch its service in 12 Indian cities. The Hinduja Group has a large cable television customer base and it is looking at offering cable modem services. Other players expected to launch services are CMC, HCL Group (the largest

Indian computer company), Punjab Wireless Systems, Ircon International, Aptech (one of the largest computer training institutes), ACME, Radhika Computer Service, Modi Entertainment, and Systems America.



## PAN ACTIVITIES

So far, the market for Indian content has been lopsided and very US and Europe-centric. The number of Net connections has been too small and fairly young. Due to the high costs of connectivity, almost all Indian web sites and content distributors are located in the US, where prices are very competitive and high speeds are readily available. Therefore almost all the content designed and developed in India is hosted in servers typically located in the US.

A large number of web site designers and HTML coders have sprung up to convince Indian companies to put up web sites. The early adopters have been exporters and those that have advertising budgets. One of the earliest advocates and a front runner of web publishing and content aggregation has been IndiaWorld Communications (<http://www.indiaworld.co.in>). Advertising companies such as Rediff (<http://www.rediff.com>) have successfully taken a number of companies online.

Due to the large number of national and regional languages and scripts, the number of non-English medium sites has been limited. The Centre for Development of Advanced Computing (C-DAC), a scientific society of the Government Of India, has made good efforts with Graphics and Intelligence based Script Technology (GIST) in Devanagari and other scripts, but there is a long way to go. Because most computer users in India are English literate there is also less incentive to use other scripts.

While there is a lot of talk about e-commerce, Indian laws need to be amended for it to progress. ICICI Bank followed by Timesbank and Indusind Bank have Internet banking sites. These currently allow query/view functions and shortly will have transfer of funds capabilities. Other banks are satisfied with a web site presence and e-mail. In August, Citibank launched Citibank Cybermall, where its credit card holders could purchase a range of products. A comprehensive cyber law that will seek to prevent computer intrusion as well as recognise the legality of computer data in a court of law is likely to be introduced during the winter session of Parliament. The tabling of this law is expected to boost electronic-commerce and facilitate on-line trade transactions. The IT bill will also seek to safeguard Internet content and recognise encryption data and also digital signatures. It will seek to protect trademarks of Internet web sites as well.



## CONTENT INITIATIVES

Much of the success of the Internet as a new medium and a dependable, low-cost source of information depends on affordable, near-universal access to the Net in countries across the globe. In India, where the cost of a computer, modems and phone lines is still substantial and unaffordable for large segments of the population, Internet Kiosks, Community Communication Centres and CyberCafes may be the right answer. The success of the Public Call Office (PCO), which has brought phone connections within the reach of millions of Indians, re-enforces this concept. WorldTel's Chairman Sam Pitroda, for instance, recently signed a high-profile agreement worth US \$50 million with the Tamil Nadu State Government to set up 1,000 Internet community centres with up to 20 terminals each. This is expected to provide widespread Internet access deep into areas that otherwise would be neglected as well as provide employment for 50,000 people. WorldTel first experimented with such concepts in Latin America, in countries like Peru and Mexico.

It has also been announced that the government will shortly set up 'Vidya Vahini Network' (VVNET), a combination of satellite and land-based communication systems, to place the country at the forefront of network education in the world. VVNET would synergise all planned intranets of various agencies such as the UGC, CSIR, Ministry of Human Resource Development and state-level networks. The first phase of VVNET, to be established through an appropriate body, should be operational by August 15, 1999. The network will also connect with the state-of-the-art inter-university network (IUNET), which will provide a 2.5 gigabit-bandwidth backbone connecting all the IITs, the Indian Institute of Science, Bangalore and Pune University. An MoU under the Indo-US collaboration has already been signed between DoT and IUNET, which is based in Carnegie Mellon University in the US.



## SITE AND CONTACT LISTS

### SITE LIST

#### ERNET Nodal Centres:

##### Bangalore

Indian Institute of Science (IISC)

[ece.iisc.ernet.in](http://ece.iisc.ernet.in)

##### Mumbai

National Centre for Software Technology (NCST)

[ncst.ernet.in](http://ncst.ernet.in)

Indian Institute of Technology (IIT)

[iitb.ernet.in](http://iitb.ernet.in)

## Delhi

The ERNET Group at the DoE, Govt. of India.

<http://www.doe.ernet.in>

## Indian Institute of Technology (IIT)

<http://www.iitd.ernet.in>

## Kanpur

Indian Institute of Technology (IIT)

[iitk.ernet.in](http://iitk.ernet.in)

## Kharagpur

Indian Institute of Technology (IIT)

[iitkgp.ernet.in](http://iitkgp.ernet.in)

## Chennai (Madras)

Indian Institute of Technology (IIT)

[iitm.ernet.in](http://iitm.ernet.in)

## Bombay First

<http://www.ncst.ernet.in/other/bfirst/>

## Bank of India

<http://www.ncst.ernet.in/other/boi/>

## Bombay Library Network

<http://www.ncst.ernet.in/other/bonet/>

## The Computer Society of India

<http://www.ncst.ernet.in/other/csi/>

## The Central Board of Excise and Customs

<http://www.ncst.ernet.in/other/customs/>

## Maharashtra Tourism Development Corporation

<http://www.ncst.ernet.in/other/mtdc/>

## India NIC (India Network Information Centre)

A prototype NIC for India being run with the help of the APNIC.

<http://www.ece.iisc.ernet.in/nic-index.html>

## Jiva Educational Institute

<http://www.jiva.org/>

## Mumbai Net

Mumbai on the net, India's first exclusive E-Zine, covering the city of Mumbai (Bombay)

<http://www.mumbainet.com/>

## Rediff on the Net - Information Entertainment Online

Awarded the most popular Indian Web site

<http://www.rediff.com/>

### India World

India's premier Internet web site creation, hosting and management services

<http://www.indiaworld.co.in/>

### Samachar

Regularly updated news headlines with links to the full articles

<http://www.samachar.com>

### Indian Express Publication

<http://www.expressindia.com>

### Times of India Publication

<http://www.timesofindia.com>

### Live Wire! BBS

Comprehensive list of Indian Bulletin Boards, networks and low cost e-mail solutions

<http://www.lwbbs.net>

### National Stock Exchange

<http://www.nseindia.com>

### NIC - National Informatics Centre

<http://www.nic.in/>

### Indian Armed Forces

<http://www.nic.in/armedforces>

### Indian Parliament

<http://www.nic.in/htm/indpar.htm>

### National Task Force on IT & Software Development

<http://it-taskforce.nic.in/>

### Software Technology Parks of India (STPI)

<http://www.soft.net/>

### Khoj

One of the good Indian Search Engines

<http://www.khoj.com/>

### Indian on Internet

Site containing, Indian Business, Economy, Tourism, Culture, Arts, News, Health, Cities, etc.

<http://www.allindia.com/>

### C-DAC

Centre for Development of Advanced Computing

<http://www.cdac.org.in/>

### SatyamOnline

<http://www.satyamonline.com>

VSNL

Main carrier and Internet connectivity provider

<http://www.vsnl.net.in/>

## CONTACT LIST

Videsh Sanchar Nigam Ltd (VSNL)

Mahatma Gandhi Road, Fort,

Mumbai

T: +91 (22) 2624020

F: +91(22) 2619640

Email: [helpdesk@giasbm01.vsnl.net.in](mailto:helpdesk@giasbm01.vsnl.net.in)

<http://www.vsnl.net.in/>

National Task Force on IT & Software Development

Task Force Secretariat

C/o. National Informatics Centre

A-Block, CGO Complex

New Delhi-110 003

E-Mail: [itff@hub.nic.in](mailto:itff@hub.nic.in)

<http://it-taskforce.nic.in>

ERNET Project,

Electronics Niketan

6, CGO Complex, Lodi Road

NEW DELHI

Tel: +91 11 436 1251

ax: +91 11 436 2924

Software Technology Parks of India

Electronics Niketan, Ground Floor

6, CGO Complex, Lodi Road

NEW DELHI

Software Technology Park Bangalore

Block III, KSSIDC Complex

Electronics City, Hosur Road

BANGALORE

T: +91 80 8520959

F: +91 80 8520958



National Informatics Centre  
Room No.375  
A-Block, CGO Complex  
Lodhi Road  
New Delhi  
T: 91-11-4363692  
F: 91-11-4362628  
Web: <http://www.nic.in>

Netcom  
Live Wire! BBS  
C-503, Eden-4  
Hiranandani Gardens  
Powai Lake  
Mumbai  
T: +91 22 5701111  
F: +91 22 5708926  
<http://lwbs.net>

Mahanagar Telephone Nigam Limited (MTNL)  
Jeevan Bharti, Tower - I  
12th Floor, 124 - Connaught Circus  
New Delhi- 110 001  
INDIA  
T: +91 11 3732212  
F: +91 11 3317344  
E-mail :[mtnlco@giasdl01.vsnl.net.in](mailto:mtnlco@giasdl01.vsnl.net.in)  
<http://mtnl.nic.in/mtnl>

Copyright © International Development Research Centre, 1998

© All Rights reserved. No part of this web site may be reproduced, stored in a retrieval system or transmitted, in any form or by any means, electronic, mechanical, photocopying, or otherwise, without the prior permission of the International Development and Research Centre.

The material in this Yearbook has been peer-reviewed by in-country resource persons. The views expressed are those of the writers and do not necessarily reflect those of the International Development Research Centre.

Cite as follows :

The Pan Asia Networking Yearbook (1998).  
Singapore: Asia Regional Office, International Development Research Centre.  
[On-line serial, subscriber-based : <https://www.panasia.org.sg/ecomsec/bookshelf/user/webdriver>]

*(Date of publication : December 7<sup>th</sup> 1998)*

*(Revised : October 18<sup>th</sup> 2000)*

## **Abstract**

*Indonesia's once burgeoning Internet sector is struggling as a result of the country's economic crisis. Many ISPs are no longer operating and most have dropped their international leased line. On the positive side, this crisis has encouraged the industry to interconnect their networks via a shared Internet exchange to save resources.*

---

## **Indonesia**

By Geoff Long and Onno W. Purno



## **OVERVIEW**

Indonesia, with the world's fourth largest population (200 million), consists of some 13,667 islands, six major religions, and more than 300 ethnic groups. Extending telecommunications to all 27 provinces and each of the main islands is a daunting task but one which Indonesia has embraced, particularly as a means of creating national cohesion. The need to provide communications for development and modernisation was recognised more than 20 years ago, with the launch of Indonesia's domestic satellite, Palapa, in 1976.

Many developments have occurred in the intervening years, however, the current economic crisis has added a level of uncertainty to many businesses and government initiatives. Indonesia's national information infrastructure (NII) is being developed under a program known as Nusantara 21, which calls for all major islands and cities to be linked either by submarine and terrestrial cable or by satellite by the year 2001. Whether this occurs or not will depend largely on how quickly the country's economy is restored. In particular, the devaluing of the rupiah means that most capital purchases will be delayed. Already a major plank of the country's telecommunications development, the joint operation schemes (JOS), known in Indonesia as Kerja Sama Operasi (KSO), have been renegotiated.

The joint ventures between Indonesia's Telkom and foreign telecommunications operators were being used to increase telecommunications capacity in five regions. However, an MoU between Telkom and the investors in the scheme in June 1998 was signed that cuts back on the minimum number of lines that need to be installed in an effort to retain its longer term viability.

Telecommunications growth in the public network of more than 25 per cent was recorded in the last five years and services are provided by a mix of land-based and radio/satellite-based services. The sector has been liberalised in recent years, although it is still dominated by three companies: [Telkom](#), which is the major domestic carrier; [Satelindo](#), which runs the Palapa satellite network as well as other domestic and international services; and Indosat, the country's main international carrier.

IT subjects are widely taught in schools and universities and an association of more than 100 computer colleges has been formed. Unfortunately, skills in Internet and networking technologies are lagging. There are numerous local computer vendors and some equipment is made or assembled in Indonesia. Prices before the economic crisis were on par with countries such as Singapore, but inflation and the devalued rupiah mean that equipment is now much more expensive.



## **REGULATORY ENVIRONMENT**

Internet regulation is the responsibility of the Directorate General of Posts and Telecommunications (DGPT), although as yet a firm regulatory policy has not been finalised. The DGPT is looking at overseas experiences to find a model for regulating the Internet and a number of organisations within the country are currently drafting policies. One such organisation is YLTI, or the Foundation for Telecommunication and Informatic Research, which also financially supports the Nusantara-21 policy framework and research projects.

The government has opened up the ISP sector in recent years, with 47 companies now licensed to offer Internet access. Potential ISPs must first put forward a business plan to the DGPT. Once accepted, the ISPs are required to forward regular reports of their operations. The government also takes one per cent of revenue generated.

There are no laws prohibiting voice over Internet services and some ISPs are currently looking at this option. Electronic commerce comes under the control of the Ministry of Trade.

The country top-level domain was administered by the University of Indonesia at [www.idnic.net.id](http://www.idnic.net.id). However, at the moment, IANA is taking back full responsibility for the country top-level domain.

The primary DNS server for Indonesia is currently being moved from Australia to Indosat's network operations centre in Jakarta.



## INTERNET CONNECTIVITY

Moves to setup Internet infrastructure have come from the commercial, education, and government sectors, although sometimes initiatives are overlapping. Perhaps the most change has been seen in the commercial sector as a response to the economic crisis. While ISPs had for many years resisted attempts to connect their operations through a common Internet exchange, the value of the rupiah has meant that it is no longer feasible for each ISP to have a separate leased line. As a result, most of the ISPs now share three common lines that connect TelkomNet Internet Exchange (IX), IndosatNet IX as well as the newly formed Indonesian Internet Exchange (IIX) to the Internet backbone in the US. As well as being more economical for ISPs, the Internet exchanges are used to keep intra-Indonesian traffic within the country, rather than have it routed via the US or other countries. The IIX, which was implemented by the [Indonesian Internet Service Provider Association \(APJII\)](#), interconnects the sites of the three main telecommunications providers: Telkom, Satelindo, and Indosat. It is connected internationally via a 2Mb line that connects Indosat to MCI and Global-One in the US as well as to SingNet. The IIX was designed for a 34Mbps connection and will be upgraded gradually. In addition APJII is currently looking at peering options with other backbone operators in the Asia Pacific region, most likely in the US and Australia to begin with.

Of the 47 licensed ISPs, only 25 are active, but most of these are now connected to the IXs. Prior to the economic crisis, many of these ISPs had their own leased lines and it can be expected that in future many will re-establish their own direct connection in addition to the connection via an Internet exchange. In terms of coverage and subscribers, the largest ISPs are [RADnet](#), [Indo.net](#), and [CBNnet](#), which were among the first to obtain licences from the DGPT. TelkomNet (run by Telkom's multimedia division) and [Centrin Internet](#) also have significant operations. The TelkomNet IX is currently serving 13 ISPs.

Wasantara Net is a nationwide network of access points operated by the country's postal service, PT. Pos Indonesia. Using a VSAT satellite network, Wasantara Net has a large number of public access points in post offices throughout the country. Another major player is PT Aplikanusa Lintasarta (Lintasarta), which was originally formed to support IT services for the banking industry. The company also offers public X.25 services in 11 major cities, and a wide range of data networking and VSAT services. More recently it has started to offer Internet access under the brand name of [Idola](#). Indosat, the main international telecommunications carrier in Indonesia, has an Internet service under the name Indosatnet.

There are at least seven companies licensed as wireless data network operators, although not all of them are operational. Ratelindo operates a cellular digital packet data (CDPD) network that is overlaid across its existing cellular voice network. It allows mobile devices to connect at speeds up to 19.2Kbps. The service is only available in Jakarta. Another wireless data network is operated by Infokom Elektrindo Nusantara, which is known by the domain [mobilenet.co.id](#). It is based on Motorola's DataTAC standard, which operates at 19.2Kbps, and is available in Jakarta and Bandung with roaming arrangements in Singapore.

The education sector in Indonesia is very active and has suffered less from the economic fallout. It should also be noted that the education and commercial sectors are sometimes at odds regarding Internet issues.

Two of the most prominent organisations are the Institute of Technology Bandung (ITB) and the [University of Indonesia](#) in Jakarta, both of which have a pool of Internet-skilled staff.

[The Institute of Technology Bandung \(ITB\)](#) operates an Internet exchange for the education sector. More than half of the country's universities are connected to it, while the others go through a commercial ISP for connectivity. The exchange is connected via a 1.5Mb link to the Asia Pacific AI3 backbone, which is a part of the WIDE Project in Japan. The education network is known locally as [AI3 Indonesia](#). AI3 Indonesia started out as a 1200bps AX.25 network in 1993, and is currently the largest educational network in Indonesia, serving more than 25 educational institutions connected via various media such as WaveLAN radio connections at 2Mbps, Telkom fiber optics at 128-512Kbps, and Elektrindo Nusantara's VSAT links at 19.2-128Kbps. ITB also has a 2Mb link directly to the TelkomNet Internet Exchange (IX).

Expansion of the AI3 Indonesia network is currently underway in several areas through a number of different projects and funding sources. Universities on Sumatra Island will be connected in collaboration with the University of Lampung, Telkom and the JICA-funded Higher Education Development Support Project. Bali Island will be connected in collaboration with YWCN (Yayasan Widya Caraka Nusantara), while several universities in Sumatra, Jawa and Lombok are receiving assistance under a World Bank-funded education project (DUE). Further support from CIDA is expected to help integrate some eastern Indonesian universities into the network.

Because of poor quality local phone lines and limited budgets, the universities have in some areas created their own wireless network that by-passes the local telephone network. A metropolitan area network has been established that uses waveLAN technology to connect ten universities at speeds up to 2Mbps. To extend the scope of the network beyond the ten universities, an innovative network will be built utilising Indonesian-made radio modems that will allow other universities to connect at 64-256Kbps. The circuit boards for the modems are being designed and manufactured at the Institute of Technology Bandung and can be made for around \$100 each. The network will use citizen band (CB) and ham radio frequencies in the VHF 140MHz band at 64Kbps.

In the government sector, the most significant network is Iptek-Net, the original gateway to the Internet in Indonesia that was originally conceived as a science and technology networking initiative. It serves many government departments, although it is no longer the country's sole Internet gateway. Iptek-Net has been developed by the Indonesia National Research Council at the Ministry of Science and Technology and provides services to government departments, research organisations, and educational institutions.

The Canadian National Research Council (NRC) is currently supporting the establishment of the Canada Indonesia Technology Network (CITN), which will be linked to the Canada Technology Network (CTN). It is a collaboration between the NRC and Indonesia's Badan Pengkajian Pengembangan Teknologi (BPPT). The aim of the network is to help small and medium size enterprises through information technology by linking various information resources from educational sectors, NGOs and government R&D organisations.



## CONTENT INITIATIVES

There are a number of sites which attempt to aggregate the main Indonesian web content. On a general level, one of the most comprehensive is Indocenter, which was developed by Radnet. It lists sites by category and also has some good media resources which includes some mainstream magazines and newspapers. Similar sites that list Indonesian links by category are [Indonesia Interactive \(www.i-2.co.id\)](http://www.i-2.co.id), [CBNnet \(www.cbn.net.id\)](http://www.cbn.net.id), and [Idola \(www.idola.net.id\)](http://www.idola.net.id). A good source of news is the interactive version of [Tempo](#), a magazine that had previously been banned in print form in Indonesia but allowed to continue on the web. It has news in both English and Indonesian, although not all Indonesian stories are translated into English.

For development related links, the [Sustainable Development Networking Programme \(SDNP-Indonesia\)](#) is a good source of both local and international information, although it is no longer receiving any funding from UNDP.

[The Environmental Impact Management Agency](#) is a government agency with the task of managing environmental impacts through the control of pollution and environmental damage, as well as issues relating to environmental rehabilitation. Its web site, which is in both Indonesian and English, has many resources related to environmental issues, with links to news, research, services, and other relevant Internet resources.

[The Urban and Regional Development Institute \(URDI\)](#) is an independent institute aiming to cooperate with government, community groups, and the private sector in the field of urban and regional development in Indonesia.

It undertakes research and policy analysis and provides a number of data services including a database of relevant expertise as well as lists of publications. Its web site also allows you to search the URDI library, which contains more than 500 books and study reports.

In the educational sector there are several major activities going on, most of them initiated by AI3 Indonesia and led by the Institute of Technology Bandung. For example there are efforts to link a number of major library databases using WAIS-CDS/ISIS Web, including one in Italy and others from many major Indonesian libraries.

Knowledge management to support distance education activities is being developed by the Computer Network Research Group (CNRG) at ITB with some funding from IBM.

The Indonesia Peer Academic Network & Education Link is an association of universities that are connected to the Net. It has already initiated a mailing list and a link exchange with search engine located at <http://www2.unpar.ac.id/>.

ITB is currently hosting more than 150 Indonesian Internet mailing lists serving over 15,000 subscribers. It is one of the largest Indonesian mailing list services and many of the lists are archived and serve national policy framework objectives.

AIII Indonesia is also supporting the [Nusantara-21 project](#), detailed below, on various levels.



## **SITE AND CONTACT LISTS**

### [APJII \(Indonesia ISP Association\)](#)

Gedung Telkom  
Jl. Gatot Subroto No. 52  
Lantai M  
Jakarta  
T: 526 8777  
F: 526 8789

### [ASEAN Web](#)

Main web site for the ASEAN regional grouping

### [Asian and Pacific Coconut Community](#)

3rd Floor, Lina Building KAV-B7  
Jl. HR Rasuna Said, Kuningan  
Jakarta 12920  
T: 522 1712  
F: 522 1714  
Email: [apcc@indo.net.id](mailto:apcc@indo.net.id)

Asia Internet Interconnection Initiative (AIII)

Indonesia/Indonesia Education Network

Inter University Center Building

4th Floor

Institute of Technology Bandung

Bandung 40132

T/F: +62 22 251-2982

E-mail: [ai3@itb.ac.id](mailto:ai3@itb.ac.id)

Bapedal

Environmental resources from the environmental impact management agency

Canada Indonesia Technology Network (CITN)

Email: [Citnjkt@ibm.net](mailto:Citnjkt@ibm.net)

CBNnet (ISP)

Gedung Manggala Wanabakti IV

Suite 618B

Jl Gatot Subroto

Jakarta 10270

T: 574 2488

F: 574 2481

Email: [sales@cbn.net.id](mailto:sales@cbn.net.id)

Centrin Internet (ISP)

Jl. Pecenongan 72

Kompleks Ruko Atap Merah

Block C3A

Jakarta

T: 352 2323

F: 3483 0510

Email: [info@centrin.net.id](mailto:info@centrin.net.id)

Coarse Grains, Pulses, Roots and Tubers (CGPRT) Centre

Jl. Merdeka 145

Bogor 16111

T: (251) 343 277

F: (251) 336 290

Email: [cgprt@indo.net.id](mailto:cgprt@indo.net.id)

Indonesia Interactive

Good collection of Indonesian links



Indonesian Institute of Sciences (LIPI)

Institute for providing policy and R&D for scientific endeavours

Institute of Technology Bandung

Bandung 40132

T/F: +62 22 251-2982

Nusantara 21

Sekretariat

Gegerkalong Hilir 47,

Bandung 40152

T: 022 214551

University of Indonesia

[www.ui.ac.id](http://www.ui.ac.id)

Foundation for Telecommunication and Informatic Research (YLTI)

F: +62 21 381-0900

E-mail: [ykti@telkom.co.id](mailto:ykti@telkom.co.id)

P4Knet

Information on scheme to alleviate poverty in rural areas

PT Satelit Palapa Indonesia (Satelindo)

Jl Daan Mogot KM 11

Jakarta Barat 11710

T: 545 1745

F: 545 1746

PT Telekomunikasi Indonesia (Telkom)

Jl. Japati 1

Bandung 40133

T: (022) 452 1510

F: (022) 440 313

RadNet (ISP)

Plaza 89, Suite 601

Jl. HR Rasuna Said

Kav. X-7 No. 6

Jakarta 12950

T: 252 6363

F: 252 4777

Email: [service@rad.net.id](mailto:service@rad.net.id)

[SDNP-Indonesia](#)

Resources on sustainable development programs in Indonesia

[Tempo](#)

Independent source of Indonesian news

[Tukang Internet](#)

Indonesian search engine

[Urban and Regional Development Institute \(URDI\)](#)

Resources and a searchable library related to urban and regional development

Copyright © International Development Research Centre, 1998

© All Rights reserved. No part of this web site may be reproduced, stored in a retrieval system or transmitted, in any form or by any means, electronic, mechanical, photocopying, or otherwise, without the prior permission of the International Development and Research Centre.

The material in this Yearbook has been peer-reviewed by in-country resource persons. The views expressed are those of the writers and do not necessarily reflect those of the International Development Research Centre.

Cite as follows :

The Pan Asia Networking Yearbook (1998).

Singapore: Asia Regional Office, International Development Research Centre.

[On-line serial, subscriber-based : <https://www.panasia.org.sg/ecomsec/bookshelf/user/webdriver>]

*(Date of publication : October 12<sup>th</sup> 1998)*

## **Abstract**

With a population of 126 million, the penetration ratio of Internet is approaching about 10 per cent of the population. While the total number of users is high, the number of host computers per population is 22nd in the world, falling behind Singapore and Hong Kong. Still the Internet has shown significant growth in Japan, especially in terms of the overall size of the market and the users and there are about 2600 ISPs officially registered in Japan.

---

## **Japan**

By Izumi Aizu  
[izumi@anr.org](mailto:izumi@anr.org)



## **OVERVIEW**

The island nation of Japan is one of the world's most technologically advanced nations and has the second largest economy after the US. Its GDP is US\$4,189 billion and GDP per capita was US\$33,248 in 1997. The economic growth of Japan after World War II was achieved through a combination of vigorous efforts supported by a diligent work ethic, emphasis on quality education, and a government-led industrial policy that placed priorities on export industries.

Japan is a very homogenised country in that only 1 per cent of the 126 million population are foreigners, including some Koreans and Chinese immigrants who were brought mostly brought by the imperial government before World War II. Now it is facing profound challenges as the world becomes more and more border-less: opening up society and its business practices as well as accommodating diverse values is becoming increasingly critical.

Some of the characteristics of current Japanese society - such as relatively few people with a good command of English, the bureaucrat's inward-looking thinking, and a rigid corporate structure - are serious impediments to these globalisation trends, of which Internet is often seen as a symbol and driver.

The Japanese government has been sponsoring IT promotion policies since the early 1980s. The telecommunications industry was liberalised in 1985 by privatising the then state-owned monopoly NTT and allowing new entrants to foster competition. Spurred by US initiatives such as the NII (National Information Infrastructure) and the GII (Global Information Infrastructure) policies of the Clinton-Gore Administration, the Japanese government came up with its own national IT policy. The policy put forward moves towards electronic government, connecting schools to Internet, giving funds for electronic commerce experimentation and providing incentives to the private sector to install fibre-optic cables for the new communications infrastructure.



## REGULATORY ENVIRONMENT

The telecommunications industry was liberalized in 1985 by privatizing state-owned monopoly NTT and allowing new entrants to foster competition. While the telecommunications industry in general has in the past been under a tight regulatory control, environment, liberalisation is underway and the Internet industry, especially the Internet Service Provider (ISP) business, is treated quite liberally. Startup ISPs are requested to register at the Ministry of Post and Telecommunication (MPT) office, but the criteria are minimal (name and address of the entity, for example) unless large-scale international connectivity is planned. In reality, there is no need to obtain the approval, since MPT does not generally screen any of these criteria. This very loose regulatory policy on Internet has allowed the ISP business in Japan to bloom. Organisations that provide large-scale international connectivity, classified as 'Special Type 2 carriers', have to submit business plans and other documents to prove that their technical and financial capabilities will provide a stable service.

The administration of domain names and the allocation of IP number addresses are handled by the Japan Network Information Centre (JPNIC), a non-profit membership corporation initiated by the Internet technical community and recognised by government agencies. JPNIC operates its own domain name policy, which limits an organisation to using only one domain name and does not screen domain names against registered trade marks.

There are concerns regarding harmful and illegal content. While the MPT has taken a soft approach, encouraging the private-sector to adopt self-censorship, the law enforcement agencies are more concerned and taking proactive measures. The national police office proposed and enforced the amendment of the Sex-related Industry Act, which makes commercial providers of indecent material over the Internet responsible for restricting its distribution to adults only. The operators of such businesses must also register with the police.

The Ministry of Justice is also planning to amend the criminal law to make sure that what is illegal over conventional medium is also illegal on the Net. The Electronic Network Consortium (ENC), an online service industry association, has worked with the Ministry of International Trade and Industry (Ministry of International Trade and Industry(MITI) to start voluntary self-regulation mechanisms, including the voluntary rating of content using the PICS (Protocol for Internet Content Selection) standard. However, the actual use of this rating system is far from wide-spread.



## INTERNET CONNECTIVITY

As of October 1998, it is estimated that some 13 million people in Japan are using the Internet, not only from academia but from all walks of life. It is estimated that the number of users will reach 20 million in the year 2000.

With a population of 126 million, the penetration ratio of Internet is approaching about 10 per cent of the population. While the total number of users is high, the number of host computers per population is 22<sup>nd</sup> in the world, falling behind Singapore and Hong Kong. Compared with per capita GDP, too, the Internet penetration in Japan is noticeably lower than most Asian countries, not to mention that of the United States and many European countries. These factors indicate that Japan is rather slow to accept the Internet despite its massive economic power. This trend is also confirmed by comparing the ratio between the number of host computers connected on the Internet and the size of the economy represented by GNP. Although Japan has the second largest GNP behind the United States, the ratio of its more than 1 million computers to GNP falls to 38th out of 73 countries and economies. Not only does it fall behind many European countries, Australia and New Zealand, Japan is behind such Asian countries as Singapore (18th), Malaysia (23rd), and Korea (35th).

Still the Internet has shown significant growth in Japan, especially in terms of the overall size of the market and the users. There are about 2600 ISPs officially registered in Japan, of which some 40 per cent are still offering public services. The others have either closed their operation or are offering services only to selected private customers. There are many small ISPs scattered around the country, many are based in the local community but do not offer nationwide service. Instead they provide IP connectivity inside their region and gain connectivity from an upstream national backbone provider. This 'tier' structure allows small entities to start an ISP business with relative ease.

Of the 1000 or so operating ISPs, Nippon Telegraph and Telecommunication (NTT), under the service name of Open Computer Network (OCN), has the highest share of the corporate market in terms of the number of domain names it maintains (9506 as of March 98). The second largest is the Internet Initiative Japan (IIJ) with 3300 domain names, followed by Tokyo Net (3079), MESH offered from NEC (1896), Infosphere from NTT-PC Communications (1846), Infoweb from Fujitsu (948), PSINet (947), Spin from AT&T Jems (905), ODN from Japan Telecom (892), BTNIS from Network Information Service (852), and others (1340).

For individual users, dial-up service is popular. The top ten ISPs for dial-up Internet access are shown below (Fig. 4)

One significant obstacle to Internet growth in Japan in the past has been the relative high cost of telecommunications, especially that of high speed digital leased lines. Compared with the United States, a 64k to 1.5Mbps digital leased line in Japan has been at least 5 to 10 times more expensive. One factor is NTT's monopoly status up until the mid-80s, and another factor is that leased line prices have been under heavy government regulation. Under the regulations, the

provider must offer the same pricing to all customers, which sounds equitable but ends up protecting the highest possible level of price and preventing volume discount or business negotiations.

It should also be noted that, again unlike the US, the tariff structure is designed around distance-sensitive pricing so that the long-distance leased line price is prohibitively expensive. With growing criticism from the Internet community and corporate users, as well as competition pressure from the marketplace, leased line prices started to drop and in the process stimulate the ISPs as well as large corporate users. It also triggered a lowering of Internet charges to end-users.

In terms of international connectivity, in the middle of 1996 the total capacity of international leased lines for Internet between Japan and the US surpassed that for voice telephony, a significant milestone in terms of Internet development in Japan. In 1997, the total capacity of Internet connection increased to more than three times that of the voice lines and is still on the increase.

There are 19 companies offering international connectivity through their own facility as of March 1998. Most of them are connected to the United States via submarine cables (Fig.5).

There are 4 national Internet Exchanges (IXs) in Japan currently in operation. The first one, NSPIXP, started in 1996 as a research program under the WIDE project with 35 members and 2 exchange points, one in Tokyo and one in Osaka. The first commercial exchange service, the Japan Internet Exchange Corporation (JPIX) started its operation in 1997, and the second one, Media Exchange Corporation (MEX), started in 1998. Local ISPs are also starting their own IX services, interconnecting small ISPs in one local area to share and efficiently use the national backbone. The first such local exchange, the Yamanashi Network Information eXchange (YNIX), started in December 97, and a second one, the Okayama Internet eXchange (OIX) has also since started.

More than 10 national ISPs are currently running their own national backbones. In addition, academic and research networks such as WIDE and NACIS also have their own backbones and are making interconnections with the commercial ISPs at the IX points mentioned above.

The national government started the Government Informatization Program in 1994 and almost all of the national ministries and agencies were connected to the National Administration Network in 1997. Almost all of the prefecture governments have also connected to the Internet in one way or another, but less than 30 per cent of city, town and village governments have connected to the Internet so far.

**Fig 4 Top ten ISPs offering Dial-up Internet connections**

<u>Service Name</u>	<u>Share(%)</u>	<u>Operating Company</u>
NIFTY SERVE	33.5	Joint venture between Fujitsu and Nissho Iwai
BIGLOBE	13.3	NEC
DTI	8.0	Mitsubishi Electric
So-net	7.6	Sony Communication Network
InfoWeb	4.7	Fujitsu
IIJ/IIJ4U	4.2	Internet Initiative Japan
MSN	4.1	Microsoft
ASAHI Net	4.0	Asahi Shimbun Newspaper
Rimnet	3.2	Rimnet Corporation (acquired by PSINet)
OCN	3.0	NTT

*Source: Internet Whitebook 1998*

**Fig 5. Internet International Connectivity**

<b>Company</b>	<b>Destination Country</b>	<b>Bandwidth</b>
Asia Internet Holding (AIH)	Hong Kong	3M
	Singapore	6M
	Korea	1.5M
	Taiwan	1.5M
	Indonesia	2M
	Malaysia	2M
	Thailand	2M
	Philippines	2M
International Digital Communication (IDC)	USA	45M*2
	Singapore	2M
	Taiwan	1.5M
	Hong Kong	1M
	Indonesia	128K
Internet Initiative Japan (IIJ)	USA	155M 45M*2
	USA	45M 1.5M
Beokkoame Internet	USA	45M 1.5M
AT&T JENS	USA	45M
	Hong Kong	256K
PSINet	USA (After Aug 98)	45M*2
BT Network Information Service	U.K	1.5M
	USA	45M
	Hong Kong	256K
Tokyo Internet	MCI	45M

NEC	USA	45M
Global One	USA	4M*2
Mitsubishi Electric Information Network	USA	45M
Japan Telecom	USA Singapore Malaysia Taiwan	45M*2 4M 256K 128K 64K
Cable & Wireless Japan	USA Hong Kong	2M 256K 2M
NTT Data Communications	USA	6M
Microsoft	USA	45M*2
Cral Nissei	U.K	NA
KDD	USA  U.K  Korea  China Taiwan  Hong Kong  Singapore  Malaysia Indonesia Australia India  Italy Brazil Germany	45M*5 10M 10M 384K 6M 2M 256K 1.5M 512K 2M 128K 2M 256K 128K 128K 4M 1.5M 128K 1.5M 256K 384K

*Source: Internet White Book 1998*





## CONTENT INITIATIVES

When Internet started to capture the general public attention, many thought that the majority of its content was in English and created overseas, which was in part true. Since then, however, much effort has been made to create content in Japanese. In terms of scope, the coverage of subjects and fields in Japan today is comparable to that of the United States. In terms of quality and deepness however, it is fair to say that United States is still far ahead.

All major national newspapers, for example, have their own homepages and provide daily news summaries free of charge, but none of them is offering free archives. As a result, those who want to use all the aggregated information must become subscribers of very expensive online database services. There are few publishers offering the full-text articles from their commercial (or even non-commercial) print magazines, unlike in the US where you can easily get most of the full-text articles from Fortune, Forbes, Business Week and the likes over the Internet.

There are quite a few commercial 'portal' and search-service sites, such as Yahoo Japan, InfoSeek, Excite and Lycos licensed from or run as a joint-venture with the American originals. There are also similar Japanese sites such as the CSJ Index, goo and the NTT Directory.

To find English content concerning Japan, it is more efficient to use US-based directories and search services such as Yahoo and AltaVista.

Online shopping is also becoming popular. There are about 9000 shops on the Internet and it is estimated that the total revenue from these shops in 1998 may reach US\$80 million. Among them, direct sales of PCs, software and books, as well as online reservation services for hotels and airlines, are the most popular. Another popular trend in Japan is e-mail news. With a relatively low cost for subscription (around US\$50 per year), weekly news digests on the computer market or daily business news are delivered directly to the customer's mail-box. Online banking and stock trading is just beginning in 1998 and is expected to expand in 1999.

The national government has no central point of entry to government information so far. The Prime Minister's Office, Japan's first official government website, started in July 1994, ahead of the US White House, and offers comprehensive links to most of the government information web sites, both in Japanese and English.

## OTHER PROJECTS

Another significant factor that characterises Internet in Japan is the existence of strong community networking initiatives. Roughly speaking Japan can be divided into two different socio-geographic arenas. One is the large metropolitan cities: Kanto (Tokyo-Yokohama-Chiba-Saitama) and Kansai (Osaka-Kobe-Kyoto), and another is smaller cities, towns and rural villages. For convenience sake, let's call the former *The City* and the latter *The Remote*.

There are strong concerns among the residence of *The Remote*, in that most of the wealth and modern culture are produced and absorbed in *The City*. *The City* people earn much higher income and enjoy a higher quality of life, thus leaving *The Remote* people in a relatively

unsophisticated, poorer state of life. This trend has been spurred by the massive concentration of population, social capital and economic activities in *The City* in the '70s and '80s. In summary, very heavy centralisation has occurred in Japan.

To counter this trend, *The Remote* people have tried to devise relevant social movements, among them 'informatization'. Originally, informatization was defined as promoting the use of modern media such as television, newspapers and books to obtain as much information content as people get in *The City*. This was later extended to include cable and satellite TV. Starting from the mid-80s with the advancement of computer technology, 'informatization' has also included promoting the use of computerised networks such as information databases, teletext or PC-based online services.

Many local governments have adopted national government policy in line with this informatization promotion, and many local projects have been carried out. Yet with very few exceptions, not many have achieved the original goals.

In the mid-90s, when the boom of Internet emerged, *The Remote* people started to see its huge potential: to have global connectivity from their own local sphere.

Connecting them to the Internet became a social symbol that opens up a new game for the people in *The Remote*. No longer do they feel isolated or left out when they can get as much information as they like from the outside, and can disseminate information to anywhere in the world. This also gave rise to the many local ISPs, some of which were actually funded by local government to promote local industry and culture.

In some areas, grassroot citizens took the lead. Oita prefecture, which has a famous citizen's network called COARA (Computer-communication of Oita Amateur Research Association), has pioneered the online community since the mid-'80s and became the first community network to be connected to the global Internet in 1994. Another example is found in Yamada Village in Toyama prefecture. With a population of only 2300, the village government decided in 1996 to provide one computer for every household that wants one, free of charge, and connect them to the Internet. Today, many people young and old, men and women in the village are using Internet for day-to-day communications with neighbours, exchanging messages outside the village, making their own homepages, and enjoying a new lifestyle through the Internet. Children in schools are also enjoying a new style of education using the Net.

There are many more initiatives that promote community networking in Japan. In 1996, a new movement to link these different initiatives was started. It is called CAN (Community Area Network) Forum, with the slogan 'Yes, we CAN', and is making policy recommendations to the government with an emphasis on bottom-up approaches to building new communications infrastructure, taking the Internet itself as the model to follow rather than the telco-centric approach of 'Fibre-to-the-home'.



## SITE AND CONTACT LISTS

### WIDE Project

*Pioneering the Internet provision in Japan, with main emphasis on technical research.*

[www.wide.ad.jp](http://www.wide.ad.jp)

### JPNIC

*Administration centre for domain names and IP addresses provision in Japan.*

[www.nic.ad.jp](http://www.nic.ad.jp)

### Internet Association of Japan (IAJ)

*IAH website*

[www.iaj.or.jp](http://www.iaj.or.jp)

### Prime Ministers Official Residence

*Gateway to government information*

[www.kantei.go.jp](http://www.kantei.go.jp)

### COARA

*Spearheading Japan's community networking movement*

[www.coara.or.jp](http://www.coara.or.jp)

### Glocom (Centre for Global Communications, International University of Japan)

*Independent research institution focusing on Internet and information policy*

[www.glocom.ac.jp](http://www.glocom.ac.jp)

### Asia Network Research

*Provides resources and research related to Internet issues in Asia.*

[www.anr.org](http://www.anr.org)

### Yahoo Japan

*Portal site to information related to Japan, mostly in Japanese*

[www.yahoo.co.jp](http://www.yahoo.co.jp)

### CSJ Index

*Portal site to information related to Japan, mostly in Japanese but regular Internet user survey results in English can be obtained*

[www.csj.co.jp/English/index.html](http://www.csj.co.jp/English/index.html)

Asahi Shimbun

*Leading daily newspaper with  
some articles in English*

[www.asahi.com](http://www.asahi.com)

Japan Times

*English daily newspaper with  
many articles about Japan*

[www.japantimes.co.jp](http://www.japantimes.co.jp)

Institute of Development Economy

*Strong emphasis on Asian economic development*

[www.ide.go.jp](http://www.ide.go.jp)

Impress

*Internet-related publisher*

[www.impress.co.jp](http://www.impress.co.jp)

## CONTACT LISTS

AT&T Jens

No. 25 Mori Bldg. 1-4-30 Roppongi

Minato-ku, Tokyo 106-0032

T: +81 3 5561 3411

F: +81 3 3584 1127

E-mail: [webmaster@attjens.co.jp](mailto:webmaster@attjens.co.jp)

[www.attjens.co.jp/](http://www.attjens.co.jp/)

DTI

Telwel Akasaka

6-6-20, Akasaka, Minato-ku, Tokyo

T: +81 3 3505 8305

F: +81 3 3505 8304

E-mail:

[www.dti.ad.jp](http://www.dti.ad.jp)

Fujitsu/InfoWeb

Marunouchi Center Bldg. 1-6-1

Marunouchi, Chiyoda-ku,

Tokyo

T: +81 3 3215 5236

F: +81 3 3216 9365

E-mail: [pr\\_mailbox@hq.fujitsu.co.jp](mailto:pr_mailbox@hq.fujitsu.co.jp)

[www.infoweb.ne.jp](http://www.infoweb.ne.jp)

### IDC

5-20-8 Asakusabashi, Taito-ku

Tokyo 111-8061

T: +81 3 5820 0061 ,

F: +81 3 5820 5360

E-mail:

[www.idc.co.jp](http://www.idc.co.jp)

### Japan Telecom

7-1, Hatcho-bori 4-chome,

Chuo-ku,

Tokyo 104-8508

E-mail:[www-adm@japan-telecom.co.jp](mailto:www-adm@japan-telecom.co.jp)

[www.japan-telecom.co.jp](http://www.japan-telecom.co.jp)

### KDD

KDD Bldg., 2-3-2 Nishi-Shinjuku,

Shinjuku-ku,

Tokyo 163-8003

T: +81 3 3347 7111

E-mail:[www-admin@kdd.co.jp](mailto:www-admin@kdd.co.jp)

[www.kdd.co.jp](http://www.kdd.co.jp)

### Microsoft Japan/MSN

Sasazuka NA Building, 1-50-1, Sasazuka,

Shibuya-ku,

Tokyo 151-8533

T: +81 3 5454 8000

[www.microsoft.com/japan](http://www.microsoft.com/japan)

### NEC/Biglobe

7-1, Shiba 5-chome Minato-ku

Tokyo 108-8001

T: +81 3 3454 1111

F: +81 3 3798 1510

E-mail:[info@bcs.biglobe.ne.jp](mailto:info@bcs.biglobe.ne.jp)

[www.biglobe.ne.jp](http://www.biglobe.ne.jp)

### NIFTY

Omori Bellport A, 26-1,

Minami-Oi, 6-chome

Shinagawa-ku,

Tokyo 140-0815,

T: +81 3 5471 5800

[www.nifty.ne.jp](http://www.nifty.ne.jp)

Internet Initiative Japan

Takebashi Yasuda Bldg., 3-13 Kanda Nishiki-cho,  
Chiyoda-ku  
Tokyo 101-0054  
T: +81 3 5259 6000  
F: +81 3 5259 6001  
E-mail: [info@ij.ad.jp](mailto:info@ij.ad.jp)  
[www.ij.ad.jp](http://www.ij.ad.jp)

NTT/OCN

Opera City Tower  
3-20-2 Nishi-shinjuku, Shinjuku-ku  
Tokyo, 163-14  
E-mail :  
[info@ocn.ad.jp](mailto:info@ocn.ad.jp)  
[www.ntt.co.jp](http://www.ntt.co.jp)  
[www.ocn.ne.jp](http://www.ocn.ne.jp)

Internet Initiative Japan

Takebashi Yasuda Bldg., 3-13 Kanda Nishiki-cho,  
Chiyoda-ku  
Tokyo 101-0054  
T: +81 3 5259 6000  
F: +81 3 5259 6001  
E-mail: [info@ij.ad.jp](mailto:info@ij.ad.jp)  
[www.ij.ad.jp](http://www.ij.ad.jp)

Sony Communication Network /So-net

Gotenyama Mori Building 6F, Kitashinagawa 4-7-35,  
Shinagawa-ku  
Tokyo 140-0001  
E-mail: [info@so-net.ne.jp](mailto:info@so-net.ne.jp)  
[www.so-net.ne.jp](http://www.so-net.ne.jp)

Tokyo Net

Shinjuku Gyoen BLDG 5th FL, 2-3-10  
Shinjuku, Shinjuku-ku  
TOKYO 160-0022  
T: +81 3 3341 6301  
F: +81 3 3341 6305  
E-mail: [info@tokyonet.ad.jp](mailto:info@tokyonet.ad.jp)  
[www.tokyonet.ad.jp](http://www.tokyonet.ad.jp)

Copyright © International Development Research Centre, 1998

© All Rights reserved. No part of this web site may be reproduced, stored in a retrieval system or transmitted, in any form or by any means, electronic, mechanical, photocopying, or otherwise, without the prior permission of the International Development and Research Centre.

The material in this Yearbook has been peer-reviewed by in-country resource persons. The views expressed are those of the writers and do not necessarily reflect those of the International Development Research Centre.

Cite as follows :

The Pan Asia Networking Yearbook (1998).

Singapore: Asia Regional Office, International Development Research Centre.

[On-line serial, subscriber-based : <https://www.panasia.org.sg/ecomsec/bookshelf/user/webdriver>]

*(Date of publication : December 7<sup>th</sup> 1998)*

## **Abstract**

*The future plans for Korea's Internet infrastructure are in the making. Domestic Internet is being optimized through a number of Internet exchanges and a dedicated Internet backbone network will be implemented by 2002, allowing all citizens to access Internet at a local phone rate. Cable TV (CATV) facilities will also be utilized as Internet infrastructure and international capacity is expected to increase and forge links with ten countries for a total capacity of 350Mbps in 1998.*

---

## **Korea**

By Yong-Suk Lee  
and Hyuck Bae



## **OVERVIEW**

The Republic of Korea, also known as South Korea, is located in northeast Asia and has as its main neighbours North Korea, China, and Japan. It has had a long-running dispute with communist Northern Korea and the border area between the two countries is heavily controlled by the military.

South Korea's population is around 40 million, with 10 million concentrated in the capital city, Seoul. The total land area including islands is 220,847 sq km. Approximately 70 per cent of the land area is mountains or highlands.

The national language is Korean, which is spoken throughout the country. There are a number of main religions including Buddhism, Confucianism, Ch'ondogyo, Catholicism, and Protestantism, as well as hundreds of newer religions that have elements of the main ones. Education is well advanced and the literacy rate for adults is approaching 95 per cent.

Korea has a well developed general infrastructure and the government has in recent times partially opened up the country's telecommunications sector. The fixed network is dominated by Korea Telecom, one of the largest carriers in the world, while Dacom is a major player in the international sector. The government is also involved in building capacity through the Korea Information Infrastructure (KII). The KII is intended as a broadband infrastructure and comprises two networks: a Public Network (PN) for the private sector and a Government Network (GN) for governments or public institutions. Under plans from the Ministry of Information and Communications, this broadband infrastructure will be in place by 2010 through a combination of private and public sector investment. Both Korea Telecom and Dacom have been actively involved in the project to date. Korea Telecom has installed 11,667km of fibre optic and 143 units of optical transmission equipment, while Dacom has installed 6,842km of fibre optic cable and 146 units of optical transmission equipment. In addition Korea Telecom has installed pilot ATM (broadband) switches in Seoul, Pusan, Kwangju, and Taejon, while Dacom has installed pilot ATM switches in Seoul and Pusan.

The IT and electronics industries have been a successful part of the economy, with many large Korean high-tech manufacturers and exporters. The country is among the top ten trading nations in the world.





## REGULATORY ENVIRONMENT

The Ministry of Information and Communications is the regulatory authority covering Internet. ISPs are classified as a value added network business and require only registration and not a licence. The Korea Internet Association (KRIA), through its technical committee, coordinates operational and management matters. The technical committee has many groups dealing with specific issues. The NOG (Network Operation Group), Cache Group, and MBONE-KR are examples. The groups hold regular meetings to discuss status and issues. The allocation of Internet domain names is handled by the Korea Internet Information Centre (KRNIC). KRNIC is currently run by the National Computerization Agency but in the future it is expected to become an independent organisation. Protecting intellectual property will also be high on the government's policy agenda. This will include upgrading laws and regulations for creating a more suitable environment for Internet content. Privacy and advertising related laws are also set to be revised.



## INTERNET CONNECTIVITY

Korea's Internet history can be traced back to 1982, when the System Development Network (SDN) linking Seoul National University and KIET (currently ETRI, the Electronics & Telecommunications Research Institute) was implemented. The Korea Network Information Centre (KRNIC), which handles domain name registration, was set up in 1986 and run by the Korea Institute of Science & Technology (KIST). KRNIC was later transferred to the National Computerization Agency (NCA) in 1994. Commercial Internet services began in 1994 allowing ordinary citizens to access the Internet.

In 1994, the number of ISPs was four. The number increased to 11 in 1995, 16 in 1996, and 20 in 1997, with commercial ISPs numbering 16. The number of Internet hosts in Korea totalled 131,005 at the end of 1997, a 79 per cent increase from 1996. It is expected that by 2002, over 430,000 Internet hosts will be in Korea. The number of domain names totalled approximately 8000 at the end of 1997. This is expected to reach 108,000 in 2002. The number of Internet users was 2,500,000 at the end of 1997. It is expected that by 2002, Internet user numbers will be around 19,000,000.

There are currently 4 Internet exchange nodes through which ISPs are connected. Internet connectivity can be divided into domestic and global connectivity. In the early stages, domestic connectivity was achieved through the Internet backbone in the US, which led to many problems. For example, local users would be connected via the Internet backbone in the US, wasting precious network resources. A need for domestic Internet exchanges arose and the NCA implemented the nation's first exchange node. This linked 16 ISPs and helped solve problems such as delays in connect time and inefficient management of international lines, while also improving the domestic Internet environment. NCA is a non-profit organisation, which allows for the impartial operation of the Internet exchange node.

With the increase in Internet traffic, commercial ISPs built additional Internet exchange nodes, which were connected to the NCA's. NCA's node is currently connected mostly to non-profit organisations' networks. Commercial exchange nodes have been built by Korea Telecom (KT), Dacom, and Inet. The exchange nodes are connected to one another by T3(45Mbps) lines and traffic is continually increasing. Since September 1998, ISPs have been discussing new forms of Internet connectivity and there are plans for the implementation of a regional node for Korea. This would allow a more effective dispersion of traffic in Korea and contribute to the scalability and stability of the local Internet.

Global connectivity comes through about 20 ISPs, which have connections ranging from 2Mbps to 45Mbps with the backbone network in the US, as well as links with Japan and Europe. MCI, GlobalOne, and AT&T are examples of foreign companies doing connectivity business in Korea.

To manage traffic more efficiently most ISPs are implementing cache servers. Recently, instead of individual ISPs implementing their own dedicated international lines, some have been utilising services offered by companies that implement international lines and resell spare capacity. The advantage of this approach is that it is less expensive than leasing dedicated lines. Also, ISPs have thus far interconnected with the US Internet backbone through the Internet Access Point of the companies running international lines. More recently, ISPs have been interconnecting through Internet exchange nodes. This allows higher connect speeds and a more flexible environment for future network expansion. Tariffs concerning international lines are a common issue raised by many Asian countries and a debate for a more rational tariff structure is taking place locally and in international forums.

The future plans for Korea's Internet infrastructure are in the making. For domestic Internet, the network structure will be optimised through the Internet exchanges mentioned above and the subscriber loop will be upgraded so that a special 01414 service (a phone number which allows subscribers to pay lower phone tariffs for using data communication services) will be extended to 144 area codes. Also, a dedicated Internet backbone network will be implemented by 2002 allowing all citizens to access Internet at a local phone rate. Cable TV (CATV) facilities will also be utilised as Internet infrastructure. All new CATV infrastructure plans will look at the feasibility of two-way communications.

International capacity is also expected to increase and link to ten countries with a total capacity of 350Mbps in 1998, 15 countries with 1Gbps in 2000, and 20 countries with 5Gbps in 2002.



## **CONTENT INITIATIVES**

In advertising, there are approximately 10 active companies and many others preparing to enter online activities. In publishing, incumbent book stores are opening cyber bookstores while data communications companies are also opening cyber bookstores as part of cyber shopping mall initiatives. In the media, "Internet only" journals that do not publish regular paper journals are beginning to appear in numbers. In the games market, online service operators are diversifying

by providing Internet-based game services. In retailing, incumbent department stores and communications companies are operating online shopping malls and conventional open-air markets are also preparing to enter the online shopping mall market. In banking, there is a high degree of interest but due to security concerns, Internet banking is still in the planning stages.

Despite this activity, the domestic Internet content market is beset with a lack of content titles and little profitability. As a result, the government plans to nurture Internet content businesses by specialisation in shopping, entertainment, law, education, publishing, and finance. An Internet content development policy will be closely linked to the Software Industry Policy Plan. Government support will also be given to developing tools for content development.

Support for content start-up businesses will be done through the Multimedia Contents Promotion Centre. Development of economy-related content, especially for small to medium sized enterprises (SMEs) and traditional cultural content, will also be targeted for government support.

Cooperation between conglomerates that have efficient distribution systems and SMEs that have flexible content development capabilities is also being encouraged.

## OTHER PROJECTS

The Asia Pacific Advanced Network (APAN) is a testbed project linking research networks in the Asia-Pacific region with vBNS, the next generation Internet testbed in the US. APAN will provide an environment for experimenting with high speed Internet technologies and applications and Korea is one of the partner countries involved. Korea's participation includes building a Korea-Japan APII testbed and supporting interconnection between Korean testbed networks and APAN. During APAN's 1st stage (1997~1999), major hubs are to be connected at speeds of 45Mbps~155Mbps. During the 2nd stage (2000~2002), the lines are to be upgraded to at least 155Mbps. Major experiments scheduled are mbone, security, and various multimedia applications.



## SITE AND CONTACT LISTS

### Korean Education Network (KREN)

Computer Centre

Seoul National University

T: +82-2-880-5364 ,5

F: +82-2-887-0130

E-mail: [staff@ns.kren.nm.kr](mailto:staff@ns.kren.nm.kr)

[www.kren.nm.kr](http://www.kren.nm.kr)

Korea Research Environment Open Network

(KREOnet)

System Engineering Research Institute

T: +82 42 869 0576

F: +82 42 869 0599

E-mail: [staff@garam.kreonet.re.kr](mailto:staff@garam.kreonet.re.kr)

[www.kreonet.re.kr](http://www.kreonet.re.kr)

Korea Open System Information Network

(KOSINet)

National Computerization Agency

T: +82 331 2602682

F: +82 331 260 2753

E-mail: [kosimaster@nca.or.kr](mailto:kosimaster@nca.or.kr)

[www.kosinet.nm.kr](http://www.kosinet.nm.kr)

KORnet (ISP)

(Korea Telecom)

T: +82 080 014 1414

F: +82 2 7665093

E-mail: [helpme@kornet.nm.kr](mailto:helpme@kornet.nm.kr)

[www.kornet.nm.kr](http://www.kornet.nm.kr)

Inet (ISP)

(I\*NET Technologies)

T: +82 2 555 8114

F: +82-2-3453-9392

E-mail: [info@nuri.net](mailto:info@nuri.net)

[www.iworld.net](http://www.iworld.net)

BORAnet (ISP)

(DACOM)

T: +82 2 220-0210

E-mail: [bora@bora.dacom.co.kr](mailto:bora@bora.dacom.co.kr)

[www.bora.dacom.co.kr](http://www.bora.dacom.co.kr)

IVYNET (ISP)

(Hansol Telecom)

T: +82 080 2111242

F: +82 2 34575175

E-mail: [ivyinfo@hansol.net](mailto:ivyinfo@hansol.net)

[www.hansol.net](http://www.hansol.net)

KOLnet (ISP)

(Korea PC Telecom)

T: +82 2 513 2200

F: +82 2 513 2155

E-mail: [help@hitel.kol.co.kr](mailto:help@hitel.kol.co.kr)

[www.kol.net](http://www.kol.net)

NOWnet (ISP)

(NOWCOM Co., Ltd )

T: +82-2-590-3800

F:+82-2-537-3988

E-mail: [help@blue.nowcom.co.kr](mailto:help@blue.nowcom.co.kr)

[www.nowcom.co.kr](http://www.nowcom.co.kr)

SHINBIRO (ISP)

(HYUNDAI Electronics)

T: +82 2 720 1140

Fax: +82 2 398 4580

E-mail: [help-desk@shinbiro.com](mailto:help-desk@shinbiro.com)

[www.shinbiro.com](http://www.shinbiro.com)

ELIMnet (ISP)

(JCHYUN Systems)

T: +82 2 3149 4800

F: +82 2 365 4046

E-mail: [help@elim.net](mailto:help@elim.net)

[www.elim.co.kr](http://www.elim.co.kr)

INTERPIA (ISP)

(Doosan Information Communication)

Tel: +82 2 637 2323 2383

E-mail: [info@interpia.net](mailto:info@interpia.net)

[www.interpia.net](http://www.interpia.net)

NEXTEL (ISP)

(NEXTEL Company)

T: +82 2 202 9300

F: +82 2 202 3414

E-mail: [nextel@uriel.net](mailto:nextel@uriel.net)

[www.uriel.net](http://www.uriel.net)

UNITEL (ISP)

(SamSung Data System)

T: +82 080 909 3333

F: +82 2 528 0410

E-mail: [uniwww@unitel.co.kr](mailto:uniwww@unitel.co.kr)

[www.unitel.co.kr](http://www.unitel.co.kr)

KTnet (ISP)

(Korea Trade Network)

T: +82 2 551 8518

F: +82 2 551 2268

E-mail: [info@ktnet.co.kr](mailto:info@ktnet.co.kr)

[www.ktnet.co.kr](http://www.ktnet.co.kr)

KOTIS-NET (ISP)

(Korea International Trade Association)

T: +82 2 551 5094

F: +82 2 513 2088

E-mail: [help@kotis.net](mailto:help@kotis.net)

[www.kotis.net](http://www.kotis.net)

Copyright © International Development Research Centre, 1998

© All Rights reserved. No part of this web site may be reproduced, stored in a retrieval system or transmitted, in any form or by any means, electronic, mechanical, photocopying, or otherwise, without the prior permission of the International Development and Research Centre.

The material in this Yearbook has been peer-reviewed by in-country resource persons. The views expressed are those of the writers and do not necessarily reflect those of the International Development Research Centre.

Cite as follows :

The Pan Asia Networking Yearbook (1998).

Singapore: Asia Regional Office, International Development Research Centre.

[On-line serial, subscriber-based : <https://www.panasia.org.sg/ecomsec/bookshelf/user/webdriver>]

*(Date of publication : December 7<sup>th</sup> 1998)*

## **Abstract**

*Laos finally got a full connection to the Internet in late 1998. The service, called GlobalNet, is a joint operation between Phillipines satellite provider Globecom and the Ministry of Information and Culture. Despite the availability of full Internet services, their legality remains a grey area and the Prime Minister's office has yet to formulate its Internet policy.*

---

## **Lao PDR**

By Houmphanh Thongvilu  
and Geoff Long



## **OVERVIEW**

Lao PDR (Laos) is the only landlocked South East Asian country - a natural land hub interconnecting China, Burma, Thailand, Cambodia, and Vietnam. It has a population of just over 4.5 million and is a member of the socialist-communist block of countries. The country has suffered greatly as a result of war and has further been hampered by a significant post-war (1975) brain drain, with an estimated 300,000 people fleeing the country.

Today, Laos still depends largely on foreign aid, and since the communist block can no longer sustain its support the country is looking to other sources of assistance. The desire to catch up with the rest of the world has influenced many liberal reforms and the implementation of some market economy principles by the government, which are intended to attract much needed foreign capital investment. However, Laos remains a centralised government in terms of economic and political control.

With the reality of a changing world the government has adopted a more conciliatory position, slowly opening its doors and at the same time, gaining trust from the world community as well as the Lao expatriate community, which represents a significant well-educated and economically viable resource to contribute to development.

Laos suffers from a lack of human resources and modern practices that are critical in doing business with the world.

Business in Laos relies on more expensive communication tools such as telephone and fax, disadvantaging the Lao business community. The Internet is seen as a minimum set of tools required to fast-track Laos development. The IT industry lags behind most South East Asian countries because of neglect and the effects of the previous Western technology sanction against communist block countries. A massive effort in training and in technology transfer is needed to develop a self-sustainable Lao IT industry, and such help is readily available in the Lao expatriate and resident IT communities.

Lao information has been complicated by the inability of hardware to deal with Lao script, requiring users to have English language skills as a prerequisite. Microsoft Windows has

become the platform of choice because its Lao font capability broadens the availability of

applications and utilities. A critical lack of IT reading material in the local language further restricts the development of a user base, which depends largely on Thai materials.

Local computer support of IBM PC hardware is sufficient, although network knowledge is limited. Once the IT industry is developed in the capital, Vientiane, it is expected that local experts can spread their know-how to other parts of Laos. The national telecommunication microwave-based backbone can cater for such expansion of the Internet to outlying provinces.



## REGULATORY ENVIRONMENT

There are no laws directly relating to Internet and at present there is a great deal of confusion as to who is responsible for its introduction. A number of ministries have claimed responsibility, but ultimately, the Prime Minister's Office is yet to make a decision. Early in 1998, the government formally authorised the use of e-mail by the public with decree No.1044/STENO, under Science, Technology and Environment Organisation (STENO) guidelines. Full Internet access is now available in Laos but, unlike e-mail, it does not yet seem to be sanctioned by the Prime Minister's Office. According to STENO officials, a national committee will be formed to discuss issues relating to Internet. The committee will comprise members from STENO, the Ministry of Transport and Communications (MOTC), the Ministry of Information and Culture, and the Ministry of the Interior.

Presently, MOTC is responsible for licensing telecommunications services while the Ministry of Information is responsible for licensing users and controlling content. All Laos citizens must first register with KPL, the official Laos News Agency, before they are allowed to use Internet. Content is also controlled through a proxy server, which limits access to non-approved information.

The top-level country domain name is **.la**, which is administered by STENO and hosted by SingNet in Singapore. However, the domain is currently inactive because policies for applying for a domain name have not yet been formulated. STENO is currently drafting guidelines and application procedures for registering **.la** domains.





## INTERNET CONNECTIVITY

Laos finally got full access to the Internet in September 1998, although its introduction was very low-key and is in reality only operating through a loophole in the regulations. The service is operated by GlobeNet, a subsidiary of Philippines-based Globecom on behalf of the Ministry of Information and Culture. GlobeNet officially only operates an intranet (that is, internal Internet) service, with subscribers then given free access to Internet services. In reality, subscribers are signing up for full Internet access. Globe has for many years been providing satellite services to the Ministry of Information (MOI) and KPL (the Laos National News Agency). More recently, it trialed Internet services for the MOI before introducing it to the general public in late 1998. Since then, the number of subscribers has grown to about 1000, although recently the growth in new users has started to taper off. International connectivity is provided by satellite (AsiaSat), with a 196kbps downlink and 128kbps uplink to Globe's network in Subic Bay, Philippines. Globe then has a direct link to the US backbone from the Philippines. The only point of presence (POP) is currently in Vientiane, although Globe is planning to set up POPs in Luang Prabang, the country's second largest city, and Savannakhet.

Also connected to Globe's network are Internet access centres run by PlaNet Computers, a local hardware/software distributor and networking company, which gained the approval of the Ministry of Information and Culture to operate the service. It has one access centre in central Vientiane and another in Luang Prabang. PlaNet does not have permission to offer dial-up services but would do so if permitted in the future. Its network in Vientiane is connected directly to Globe via spread-spectrum radio technology known as BreezeNet, which can provide 4Mbps access at distances up to 7km.

Lao Telecommunications Company (Lao Telecom), a joint venture between the Lao government (51 per cent) and Thai telecommunications company Shinawatra (49 per cent), has also announced that it will offer dial-up Internet services in the future. However, its plans have already been delayed a number of times and it remains to be seen if they actually commence. According to Lao Telecom officials, Internet is currently being tested, although no agreements with satellite providers for international connections have yet been made. It issued a tender for Internet equipment in May 1998 and claims to have authority to offer services from the Ministry of Transport and Communications.

The remaining option for Internet access is the Science, Technology and Environment Organisation's (STENO's) e-mail only service.

The service was begun as a pilot project in January 1997 with financial and technical assistance through the International Development Research Centre's (IDRC's) Pan Asia Networking (PAN) program. Currently, it has around 340 subscribers, mainly in the government sector as well as consultants working on government projects. The number of STENO subscribers has fallen since the introduction of the GlobeNet service.

STENO's service is a not-for-profit venture, thus making internal communications within Laos cheaper than Globe's service. E-mail within the country is free and as a result, users in the provinces have remained with the service for internal communications. There are currently users in about 10 provinces including Luang Namtha, Oudonsay, Luang Prabang,

Xiengkhouang, Khammouane, Savannakhet and Champasak. E-mail to Internet users outside of the country is provided by a UUCP (dial-up) connection to Singapore. The system is scheduled to receive and send mail four times daily.

UN organisations such as UNESCO and UNDP are also involved with technical assistance programs in Laos. UNESCO recently gave a grant to the Institute of Information Technology to update its campus network. The Institute is looking at options for providing Internet access to its students and staff. Another educational institution is the National Polytechnic Institute, which was involved in an early experiment with Internet and which also has some experience with networking. In December 1994, it initiated an e-mail trial using Fidonet technology to connect to Washington DC in the US. However, the system was used mainly as a test and is no longer operational.

The local office of the UNDP, through its Asia Pacific Development Information Program (APDIP), provides technical advice, training, and other assistance. It is currently helping the ASEAN Department of the Ministry of Foreign Affairs to improve its e-mail and Internet capabilities.

The main sites for networked PCs in the country are UNDP, the Electricity Commission, Bureau of Statistics, and the National Polytechnic Institute.

The local telephone system also provides ISDN (digital) services within Vientiane. A national 64kbps microwave link covers major cities from north to south. Laos' second-largest city, Luang Prabang, also has IDD availability.



## PAN ACTIVITIES

In August 1995, IDRC and LaoNet (an online group of expatriate Laotians), in conjunction with STENO, organised the first Lao Internet Technology Seminar in Vientiane to raise the level of awareness and understanding of the Internet among potential users and policy makers. This led to STENO collaborating with IDRC's Pan Asia Networking (PAN) program in a two-year pilot project to bring Internet e-mail services to Laos. The initial project has now finished.

Infrastructure for the dial-up e-mail service was installed and commenced in 1996. Apart from the \$89,000CAD grant, PAN also provided technical assistance and its knowledge of developing and operating Internet services in other developing countries.

STENO established a PAN Laos Committee dedicated to managing the development, provision and operation of the Internet services. The committee comprises one full-time co-ordinator, who also acts as the technical manager, and part-time members drawn from STENO and cooperating institutions.

The committee's primary responsibilities are Internet services development, user-support, training, marketing and user representation.

The project was launched with the sourcing and installation of the necessary computer hardware and software at STENO by networking specialists from PAN. At about the same time, the technical manager and two system engineers from STENO began training on Unix at PAN's office in Singapore.

While the project team had encountered a number of teething problems common in setting up Internet services in developing countries, the service is now covering its running costs and has some 340 users in various provinces throughout the country. STENO is now concentrating on expanding the service throughout provincial areas and is also looking at possibilities for full Internet access.

### ***Vientiane is connected***

[Read about Lao PDR's connectivity to the Internet in Pan Asia Networking's Asian Network Update](#)



## **CONTENT INITIATIVES**

Owing to the recent introduction of world wide web access, there are only few examples of local content in Laos and many that do exist are based overseas. The best starting point is LaoNet, which has some good information and forums and provides links to most other sites that contain information on Laos. LaoNet was started by a group of expatriate Laotians in various parts of the world, who came together through the Usenet newsgroup Soc.Culture.Laos. The group was drawn together convinced of the value of Internet as a resource to be shared, which led it to investigate ways to realise connectivity for the country. The site has links to the Lao WWW Virtual Library, news and information on Laos, and links to Lao newsgroups and other sites.

More recently, GlobeNet the only full provider of Internet in the country has created a site at [www.laonet.net](http://www.laonet.net), which it intends to expand. To date, it has created sites for the Ministry of Information and Culture, the Lao Hotel Plaza, and a Swedish school in Vientiane. It also has a web-based bulletin board, which to date has not been very active.

The local English-language newspaper, the Vientiane Times, also has a web site.



## SITE AND CONTACT LISTS

### Alcatel

P.O Box 815  
Sibounheunag Rd  
Vientiane  
T: +856 21 213168  
F: +856 21 413993

### GlobeNet (ISP)

Lao Hotel Plaza  
63 Samsenthai Rd  
Vientiane  
T: +856 21 218841  
F: +856 21 313043  
E-mail: [services@laonet.net](mailto:services@laonet.net)  
Web site: [www.laonet.net](http://www.laonet.net)

### LaoNet

*Contains links to most resources available on Laos*  
Web site: [www.global.lao.net](http://www.global.lao.net)

### Lao Embassy

Web site: [www.laoembassy.com](http://www.laoembassy.com)

### National Polytechnic Institute

T: +856 21 313616  
F: +856 21 314382

### PlaNet Computers

201 Setthathirath Rd  
Vientiane  
T: +856 21 218972  
F: +856 21 216387  
E-mail: [planet@laonet.net](mailto:planet@laonet.net)

### Lao Telecom

Lanexang Avenue  
PO Box 5607  
Vientiane  
T: +856 21 216465  
F: +856 21 213493

Telstra

66 Setthathirath Rd  
P.O Box 4292  
Vientiane  
T: +856 21 212040  
F: +856 21 215992

National University of Laos

Web site: [www.canpub.com/nuol/](http://www.canpub.com/nuol/)

Vientiane Times

*Site for the main English language newspaper in Laos*  
Web site: [www.vientianetimes.com/Headlines.htm](http://www.vientianetimes.com/Headlines.htm) l

STENO

P.O. Box 2279  
Vientiane  
T: +856 21 217706  
F: +856 21 213472  
E-mail: [phon@steno.gov.la](mailto:phon@steno.gov.la)

UNDP

P.O Box 345  
Phonekheng Rd  
Ban Phonsaat  
Vientiane  
T: +856 21 213394  
F: +856 21 214819

Copyright © International Development Research Centre, 1998

© All Rights reserved. No part of this web site may be reproduced, stored in a retrieval system or transmitted, in any form or by any means, electronic, mechanical, photocopying, or otherwise, without the prior permission of the International Development and Research Centre.

The material in this Yearbook has been peer-reviewed by in-country resource persons. The views expressed are those of the writers and do not necessarily reflect those of the International Development Research Centre.

Cite as follows :

The Pan Asia Networking Yearbook (1998).  
Singapore: Asia Regional Office, International Development Research Centre.  
[On-line serial, subscriber-based : <https://www.panasia.org.sg/ecomsec/bookshelf/user/webdriver>]

*(Date of publication : October 12<sup>th</sup> 1998)*  
*(Revised: February 26<sup>th</sup> 1999)*

## **Abstract**

Malaysia is attempting to move to the forefront of the information economy with its ambitious Multimedia Super Corridor (MSC) project. This project incorporates two so-called "smart cities", Putrajaya and Cyberjaya; an advanced telecommunications infrastructure; and electronic commerce across government, education, medicine, finance, manufacturing, R&D, and marketing sectors. The country has also recently granted five new Internet Service Providers (ISPs) licences to existing telecommunications carriers.

---

## **Malaysia**

By Geoff Long



### **OVERVIEW**

Malaysia is in the heart of South East Asia adjoining both Thailand and Indonesia. It consists of the main island known as Peninsula Malaysia as well the states of Sabah and Sarawak on the island of Borneo. The country is divided politically into 13 states and two federal territories (Kuala Lumpur and the tiny island of Labuan). The government system is based on a parliamentary democracy.

Malaysia's population is a diverse mix of indigenous or aboriginal people, many of whom live in the Borneo states, and the main groups comprising Malays, Chinese, and Indians. The total population is around 20 million. The official language is Bahasa Malaysia, which is closely related to Bahasa Indonesia, but Chinese and Indian dialects are common and English is widely spoken.

In recent times the country has made a number of well-publicised initiatives that aim to place it at the forefront of the global information economy, particularly through its Multimedia Super Corridor (MSC) project. However, even before this initiative, the country has for a long time attracted investment in technology, particularly in the area of manufacturing, which is the largest component of the Malaysian economy.

The state of Penang, for example, has over the last two decades attracted multinationals in electronics and IT manufacturing and is one of the leading producers of semiconductors, disk drives, and other communications-related equipment. Like the proposed MSC, Penang provides tax and other incentives that have attracted companies such as Intel, Motorola, Hewlett Packard, Siemens and many other big names. In turn, this has also spawned a diverse range of local small-to-medium size supporting IT companies.

Nevertheless, the MSC project as outlined by the Malaysian government promises to be of much greater significance to the country if it goes ahead as planned (see Related Projects for a full description).

Malaysia's supporting infrastructure has also advanced in recent years following the liberalisation of telecommunications in 1994. There are now a number of operators building fixed infrastructure in Malaysia in addition to the former monopoly provider Telekom Malaysia, with fibre-optic trunks connecting most main centres. The country has also entered the satellite arena following the launch of the Malaysia East Asia Satellite (MEASAT) system for broadcasting and communications by Binariang in 1996.



## REGULATORY ENVIRONMENT

As part of its efforts to attract electronic commerce projects to the Multimedia Super Corridor (MSC), Malaysia is in the process of introducing a number of new legal bills, or cyberlaws as they are known, that aim to create a regulatory framework for information and e-commerce services. The latest of these is the Communications and Multimedia Bill 1998, which incorporates many other pieces of legislation that have already been passed, including existing cyberlaws. The proposed new legislation will provide a generic set of regulatory provisions covering electronic media and will repeal the existing Telecommunications Act 1950 and the Broadcasting Act 1988. It does not affect existing laws on national security, illegal content, defamation, and copyright.

Two cyberlaws that were passed last year are also incorporated in the new legislation. These are the Digital Signature Act 1997, which allows for the use of electronic signatures rather than hand-written authorisation, and the Computer Crime Act 1997, which provides a legal framework for illegal access to computer systems and required standards for service providers.

Other cyberlaws are being drafted to cover telemedicine, data protection, and electronic government, while the Copyright Act 1987 is also being amended.

Regulation of the communications sector, both telecommunications and Internet, is the responsibility of Jabatan Telekomunikasi Malaysia (JTM) which comes under the Ministry of Energy Telecommunications and Posts. JTM has also recently set up a Telecommunications Consultative Committee for Internet Service Provision (TCC-ISP), which is made up of representatives from JTM and each ISP. TCC-ISP was established to study the future growth of Internet services in Malaysia. It is also looking at the formation of an international Internet exchange.

More macro-level policy initiatives are guided by the National Information Technology Council (NITC), which aims to enhance the development and utilisation of IT through projects such as the MSC.

The **.my** country level domain is administered by the Malaysian Network Information Centre (MYNIC) located at MIMOS.



## INTERNET CONNECTIVITY

ISP licences by the Ministry of Energy, Telecommunications and Posts. The five new licences were awarded to existing telecommunications carriers Celcom, Mutiara, PrismaNet, Time Telecommunications and Bina Sat-Com. They will join the two incumbent ISPs, Jaring and TMNet, and are expected to commence services before the end of 1998. The government has stated that it does not expect to issue any further licences in the immediate future, however the value-added service provider market (ie, reselling from the licensed ISPs) is completely deregulated. At the end of 1997 Malaysia had approximately 205,000 Internet users, split evenly between Jaring and TMNet.

Jaring, the network provided by the Malaysian Institute of Microelectronic Systems (MIMOS), was the country's first Internet backbone and gateway. Its international connectivity is extensive and includes one T3 link and two E1 links to the US, multiple E1s to Canada, an E1 to the ABONE exchange in Japan and a 256kbps connection to SingNet in Singapore. Domestically, its backbone has 71 points of presence (POPs) throughout the country located in major towns. These are generally connected by 2Mbps links and in some cases 34Mbps links.

Both the country's Internet backbones (ie Jaring and TMNet) are linked together via a 10Mbps connection.

TMNet, a subsidiary of Telekom Malaysia Berhad, was introduced as a second ISP in 1996 and has quickly established itself alongside Jaring as a key backbone operator. Its international connections consist of a T3 to AT&T WorldNet in San Francisco, two E1s and a 512kbps link through MCI, and two links to Japan one 128kbps link to KDD and another 128kbps link to IDC.

Domestically, TMNet is promoting the use of ISDN to speed up access to the Internet, which many users still complain is too slow. ISDN lines are available through parent company Telekom Malaysia, with most of the other carriers yet to implement ISDN on a large scale.

In addition to the national backbones, many of the individual state governments are implementing their own networking projects, some of which involve extensive physical infrastructure while other are more content-based web projects. One of the more developed networks comes from the State of Sabah on the island of Borneo, which has created its own state-wide intranet for connecting the government and business with the general community. The network was built by Sabah-based KKIP Communications, although it is owned by the Sabah state government, and consists of a series of frame relay links connected through ATM switches. Remote dial-up access is through a toll-free number. The network does not yet allow full access to the Internet, although this is planned at a later stage. In the meantime, Sabah.Net is being used for access to electronic government systems as well as e-commerce and online education applications. The Sabah.Net web site is also accessible from the Internet and contains significant local information and services.

Similarly, the state of Selangor is setting up a network to connect its nine districts and two city councils. The first phase of the project is a local-area network at the state headquarters in Shah Alam. This is already being used for regular video conferencing sessions with district heads and utilises dial-up services through Jaring. The next stage will be to connect the offices via 2Mb links for direct access. The final goal will be to develop applications for electronic government.

Penang Network Services has also setup Penang.net, which is more content/information oriented. Penang Network Services is a state government-endorsed organisation that was set up primarily to assist Penang in preparing for a digital economy. It offers multimedia, LAN/WAN integration, and application development services while the site has detailed information on Penang.

In the other Borneo state of Sarawak, Telekom Malaysia has recently completed a study on a planned Sarawak Cyber Village. The proposed village is to be located at Kota Samarahan and aims to accelerate the development of information technology in the state. However, as yet the project is only in the early planning stages.



In the education section, a number of institutions have signed an MoU to establish a single network structure to support the needs of the higher education sector in delivering distance learning. Called MahirNet (Malaysian Higher Institutional & Research Network), the consortium members comprise Universiti Telekom, the International Islamic University, University Utara Malaysia, University Malaysia Sabah, Telekom Malaysia, and the Open Learning Agency. MahirNet will focus on delivering distance education through mixed-media but with a bias towards using telecommunications technology. The project will be managed by a joint venture company setup between Telekom Malaysia and the Open Learning Agency of Malaysia, which works in partnership with the Open Learning Agency of British Columbia (Canada). Learning centres are expected to be setup in various parts of the country for the benefit of remote students and other universities may be included at a later stage.

Another significant education initiative for furthering the Internet/IT sector is the Universiti Telekom (Unitele) in Malacca. Unitele was inaugurated in 1996 as the country's first private university. It was setup by Telekom Malaysia but stems from an earlier institution, the Institut Telekomunikasi dan Teknologi Maklumat (ITTM). More recently Unitele has been expanded to a twin-campus university following the decision to setup the Universiti Multimedia, which will shortly move from Malacca to a new base in the MSC. The multimedia component of Unitele, along with some 2000 students, will move to the new campus. The university offers both traditional courses in subjects in engineering, IT, management, and media arts and sciences, as well as a virtual university program where students do not have to physically attend classes.

Research into broadband networking technologies is being conducted by a project known as Testbed

Environment for Malaysian Multimedia Applications and Networking (TEMAN). TEMAN members include MIMOS, JTM, Celcom, and a number of leading universities.



## CONTENT INITIATIVES

As the first Internet provider in Malaysia, Jaring and parent company MIMOS have extensive content programs that act as a good gateway to Malaysian information, and in general Malaysia has a wide variety of local content in both Bahasa and English. The main Jaring homepage ([www.jaring.my](http://www.jaring.my)) contains news, country information on Malaysia, a directory of websites, and links to "Jaring's Mall of Malaysia" (its e-commerce shopping area). MIMOS itself has an attractive site that lists the many other research projects that the organisation is involved in. Other good gateways are the Cari site ([www.cari.com.my](http://www.cari.com.my)), which also includes a Malaysian search engine, and nasionet ([www.nasionet.net](http://www.nasionet.net)), which also hosts the National Association of Women Entrepreneurs of Malaysia (NAWEM) site.

For information about specific e-commerce projects and e-commerce news and resources, there is the Malaysia e-commerce hub ([www.ec.com.my](http://www.ec.com.my)), which includes discussion forums, a library of resources, and policy updates. A similar site is provided by the National Electronic Commerce Committee ([e.com.ec](http://e.com.ec)). The Malaysian Trade and Industrial Zone ([www.mtiz.com](http://www.mtiz.com)) provides information relating to products and services available in Malaysia together with associated trade and business information, while the MSC also has its own site.

The UNDP, which has its regional service centre (RSC) in Malaysia, has extensive development information, much of it related to regional rather than local issues. The UNDP's Asia Pacific Development Information Programme (APDIP) provides useful information ([www.apdip.net](http://www.apdip.net)) on Asia-Pacific Internet connectivity and has a site and newsletter dedicated to Internet governance issues.

The Third World Network is an independent non-profit international network of organisations and individuals involved in issues relating to development, the Third World, and North-South issues. Together with its sister sites Southbound a Third World-based publishing house and the Consumers Association of Penang, the group provides a wide range of information and resources produced by developing country scholars. The areas of focus are broken into selected categories and includes papers, feature articles, book extracts, and an online bookstore.

As one of the country's major industries, there is a lot of information related to rubber research. The Malaysia Rubber Board is the umbrella organisation for a number of groups including the Rubber Research Institute of Malaysia. Its site ([www.rrim.gov.my](http://www.rrim.gov.my)) has information on research activities and recent journal article abstracts.

A full listing of both federal and state government agencies is available on the Malaysian Civil Service Link ([www.mampu.gov.my](http://www.mampu.gov.my)). The site also has information about the Y2K issue in Malaysia and other nationally-significant content.



## **SITE AND CONTACT LISTS**

### **SITE LIST**

Asia Pacific Development Information Programme (APDIP)  
Connectivity and Internet governance resources  
[www.apdip.net](http://www.apdip.net)

E-commerce hub  
Links to ecommerce information and projects  
[www.ec.com.my](http://www.ec.com.my)

Cari  
*Malaysian search engine and directory*  
[www.cari.com.my](http://www.cari.com.my)

Jaring  
*Directory and shopping mall*  
[www.jaring.my](http://www.jaring.my)

Malaysian Civil Service Link

*A gateway to both federal and state government Internet sites*

[www.mampu.gov.my](http://www.mampu.gov.my)

Malaysian Network Information Centre

*Registration of .my domain names*

[www.mynic.net](http://www.mynic.net)

Malaysia Rubber Board

*Research material from groups including the Rubber Research Institute of Malaysia*

[www.rrim.gov.my](http://www.rrim.gov.my)

Malaysian Trade and Industrial Zone

*Business and trade information*

[www.mtiz.com](http://www.mtiz.com)

Multimedia Super Corridor

*The official MSC site*

[www.mdc.com.my](http://www.mdc.com.my)

nasionet

*Directory of local sites*

[www.nasionet.net](http://www.nasionet.net)

Penang Network

*Material from the state of Penang*

[www.penang.net.my](http://www.penang.net.my)

Sabah.net

*State network of Sabah*

[www.sabah.net.my](http://www.sabah.net.my)

Southbound

*Links to Southbound and the Third World Network*

[www.southbound.com.my](http://www.southbound.com.my)

## CONTACT LIST

### Jabatan Telekomunikasi Malaysia (JTM)

Kementerian Tenaga, Telekom dan Pos

Wisma Damansara

Jalan Semantan

50668 Kuala Lumpur

T: 60 3 2556687

F: 60 3 253 0508

E-mail: [jtmhq@tm.net.my](mailto:jtmhq@tm.net.my)

[www.jtm.gov.my](http://www.jtm.gov.my)

### Jaring (ISP)

Jaring NOC

MIMOS Berhad

Taman Teknologi Malaysia

57000 Kuala Lumpur

T: 60 3 966 1900

F: 60 3 966 1898

E-mail: [noc@jaring.my](mailto:noc@jaring.my)

[www.jaring.my](http://www.jaring.my)

### MIMOS

Technology Park Malaysia

Lebuhraya Sungai Besi-Puchong

57000 Kuala Lumpur

T: +60 3 966 5000

F: +60 3 966 0527

E-mail: [ccd@mimos.my](mailto:ccd@mimos.my)

[www.jaring.my/mimos/](http://www.jaring.my/mimos/)

### Multimedia Development Corporation

MSC Headquarters

63000 Cyberjaya

Selangor Darul Ehsan

T: 60 3 818 8477

E-mail: [info@mdc.com.my](mailto:info@mdc.com.my)

[www.mdc.com.my](http://www.mdc.com.my)

### Telekom Malaysia

Wisma Telekom

Jalan Pantai Baharu

59200 Kuala Lumpur

T: 60 3 208 9494

F: 60 3 232 1100

[www.telekom.com.my](http://www.telekom.com.my)

TMNet (ISP)

T: 1-800 881515

F: 60 3 707 4643

E-mail: [support@tm.net.my](mailto:support@tm.net.my)

[www.tm.net.my](http://www.tm.net.my)

UNDP

Wisma UN

Blok C

Jalan Dungun

Damansara Heights

50490 Kuala Lumpur

T: +60 3 255 9122

F: +60 3 255 2870

E-mail: [fo.mal@undp.org](mailto:fo.mal@undp.org)

[www.undp.org/undp/fomys](http://www.undp.org/undp/fomys)

Copyright © International Development Research Centre, 1998

© All Rights reserved. No part of this web site may be reproduced, stored in a retrieval system or transmitted, in any form or by any means, electronic, mechanical, photocopying, or otherwise, without the prior permission of the International Development and Research Centre.

The material in this Yearbook has been peer-reviewed by in-country resource persons. The views expressed are those of the writers and do not necessarily reflect those of the International Development Research Centre.

Cite as follows :

The Pan Asia Networking Yearbook (1998).

Singapore: Asia Regional Office, International Development Research Centre.

[On-line serial, subscriber-based : <https://www.panasia.org.sg/ecomsec/bookshelf/user/webdriver>]

*(Date of publication : November 5<sup>th</sup> 1998)*

## **Abstract**

*Mongolia is now ready to expand the reach of Internet to rural areas in the country through wireless technology. This is done by creating a wireless metropolitan network (MAN) in Ulaanbaatar and extending it to other centres. Meanwhile, content initiatives continue to flourish.*

---

# Mongolia

By Geoff Long



## **OVERVIEW**

Mongolia is a landlocked country neighbouring Russia and China comprising some 1.6 million square kilometers. It has a population of 2.4 million, almost 60 per cent of which is under 35 years of age.

Formerly part of the Soviet block of countries, Mongolia initiated a path toward democracy and a market economy in 1990. During the last eight years it has struggled economically with the adjustment, but still remains committed to its free market policies.

The country is divided into 20 *aimags* (provinces), which in turn are further divided into 365 *somons* (rural districts). There are three major cities in the country: Ulaanbaatar, Darkhan, and Erdenet. Ulaanbaatar is the capital and has 600,000 inhabitants.

Fourteen *aimags* and three cities are connected to Ulaanbaatar by microwave links. Telecommunications are underdeveloped in the *somons*, which are connected to the *aimags* via openwire lines that are unreliable for data communications.

A program of digitalisation is going on throughout the Mongolian telecommunication network. At present there are just over 100,000 lines in operation in the country. A digital exchange with 40,000 line capacity is installed in Ulaanbaatar, and digital exchanges have also been installed in the cities of Darkhan and Erdenet.



## **REGULATORY ENVIRONMENT**

The Mongolian Telecommunications Company (MTC) is the monopoly provider of telecommunications services and was privatised in 1995. Data communications services are completely deregulated.

Mongolian telecommunication legislation is covered under the Telecommunications Act of Mongolia (1995). A "Regulatory Body" exists to elaborate proposals for developing the communications sector, licensing operators, setting-up technical standards, and setting service charges.

The minister in charge of communications determines the composition of the Regulatory Body and its charter must be approved by the government.

The Mongolian top-level domain is *.mn* and administered by Datacom.



## INTERNET CONNECTIVITY

Full Internet access has been a reality in Mongolia since January 1996, however e-mail and messaging services date back to early 1994, when the [Datacom](#) company was first formed. At the time, it had developed its own PC-Mail system for providing messaging between several *aimags* and towns. In September 1994 IDRC and Datacom jointly embarked on a project that would lead to the country's first Internet connection.

The first phase of the project saw the creation of a domestic network with dial-up access to the Internet using UUCP technology. Successful completion of this first phase led to additional support being offered through the National Science Foundation (NSF) of the US. The NSF financed an international satellite link in 1996-97 and in return Datacom agreed to connect five Mongolian universities and research institutions to the Internet and provide them with free access. The transition to full Internet access was completed when a satellite earth station was purchased by Datacom using funds secured through a government loan. The Internet service is marketed under the name of [MagicNet](#).

The satellite link is provided through PanAmSat 2 and connects to SprintLink in the US. The link was recently upgraded from 128kbps to 512kbps and the equipment is capable of being upgraded in future to 2Mbps if necessary.

In the past two years, Datacom has been implementing further Internet projects within Mongolia, including connecting other Mongolian institutes and universities to the Internet through high speed radio modem links. Free network services have been provided to the users of over 70 scientific and research organisations. Datacom has also in the past found sponsors willing to supply Mongolian organisations with networking equipment. It is currently continuing these activities, with priority attention now focussed on equipment for secondary schools.

Secondary schools will also be the focus for an extension of networking services via satellite this year. The project is being funded by IDRC and will be jointly implemented by Datacom and the Ministry of Science, Technology, Education and Culture. It will introduce and operate the first Educational Web Centre for Mongolian provincial schools and provide technical assistance for the development of a national information broadcasting network for provincial schools. Four information Web centres will be established - one in Ulaanbaatar city, one in another provincial centre and two in remote secondary schools connected through a Satellite Data Broadcasting network.

Composition of the primary Web pages and necessary information will be prepared by training specialists in the education sector. Training will be organized at the public Internet centre in Ulaanbaatar and the project will have its own homepage.

In other projects for the coming year, Datacom is planning to expand the reach of Internet in Mongolia by creating a wireless metropolitan area network (MAN) in Ulaanbaatar and using VSAT technology to extend the service into other centres.

The wireless MAN project connects four central sites through 2 Mbps radio modem links, which in turn serve remote routers that can service up to 200 remote sites. The network covers 80 per cent of Ulaanbaatar territory.

At present, many Mongolian provinces are connected to the capital via analogue microwave links, which are not reliable for Internet data transmissions. As a result, Datacom has teamed up with the Mongolian Oil Import Company to piggyback Internet service onto its VSAT network. The network will extend to the centres of 18 provinces and some other settled areas. The network is reliable but the speed is slow, which will mean that e-mail only services will be introduced. However, in each province there will be mirror sites that will contain web pages from Ulaanbaatar that are updated in the evenings when the VSAT channels are not used.

The Mongolian Telecommunications Company is currently working toward digitalising the microwave network over the next five years. The Norwegian company, Nera, has already started work on a replacement link between Darkhan and Erdenet.

The Mongolian UNDP office also has a number of IT initiatives which focus on Internet. One of the most significant is the establishment of a government wide MAN/WAN to give information access to the government sector. The network uses DSL modems that can provide access at speeds up to 2Mbps for sites up to 3km apart. Most of the infrastructure is in place and users include Government House, the Statistics Office, the Supreme Court and the [Board of Foreign Investment](#), with the Standardization Agency, Ministry of Defense and the [Ministry of External Relations](#) to follow.

The next phase will extend the project to provide information to the public and aims to concentrate more on content development. A number of seminars being planned for this year by UNDP will attempt to showcase the institutions efforts at bringing information to the public.



## PAN ACTIVITIES

Mongolia was the first initiative of PAN's Asian networking program and was used, among other things, as a pilot to assess how assistance might also be offered to other developing countries in the region. By all accounts, the [three-year project was a success](#), with Mongolia firmly established within the global Internet community. The country now has full Internet access and is working on providing unique local content to users within and outside the country.



Mongolia was chosen as the pilot for a number of reasons: Having only recently made the transition to a market economy, it was in urgent need of information from the rest of the world and ready to reforge links with neighbouring countries. Datacom, the only domestic provider of data communications services, also had a team that could undertake the demanding technical requirements needed to become an Internet provider. And as a remote country without Internet access, it offered a chance to study the technical challenges that would be applicable to other countries in the region.

With an initial grant from IDRC, Datacom was able to purchase the necessary capital equipment, hire consultants, and plan research activities and training programs. This led, in late 1994, to the installation of a dial-up gateway system based on UUCP protocols that connected its domestic network to the Internet.

The system was compatible with Internet email and newsgroups, and initially these were transferred twice weekly by connecting to the Institute of Global Communications (IGC) in the US.

Successful completion of this first phase of the project attracted further support from groups such as the US National Science Foundation (NSF) and the Soros Foundation.

Satellite communications equipment from ComStream was installed in late 1995, along with a Sun Netra server and Sun workstation to host Web, FTP, and Gopher servers, culminating in the opening ceremony for the country's first permanent Internet connection in January 1996 and a Mongolian web site in March of the same year.

As a mark of the success of the project, PAN was able to hold its first All Partners networking conference in Mongolia in June 1997, showcasing the high standard of the country's Internet personnel and services in the process.

### *Mongolia Pioneers the Way*

[Read about Mongolia's transition from isolation to her present connectivity to the world via the Internet](#)



## **CONTENT INITIATIVES**

One of the goals of Datacom is to create rich Mongolian language content, which it is doing by partnering with local information providers. The biggest content providers to date are newspapers and other print media organisations. Cooperation exists between Datacom and media organisations to exchange services, for example web space in return for advertising space. Collaborators include Ardyn Erkh, Toli, and Zasgiin Gazryn Medee.

Free web space is also offered to about 20 other content providers as well as educational and scientific organisations, and for government departments. Montsame (the Mongolian News Agency), MN-Today, Email Daily News and a number of organisations take advantage of this arrangement.

[Email Daily News](#) was one of the first Internet initiatives in the country and offers an e-mail news service in English. Another permutation sends out news of Mongolia to people living outside the country, both Mongolian expatriates and interested foreigners.

Most web sites within Mongolia are accessible from the web directory located at [Mongolia Online \(www.mol.mn\)](#).

Organisations include airlines, banks, companies, institutions, government departments, hotels, traders, mining companies, travel agents, and universities.

The [United Nations](#) has an extensive web site with links to the various UN agencies, projects and development issues in Mongolia, as well as comprehensive information on Mongolia itself. Organisations included on the main UN site include UNDP, UNFPA, UNICEF, WHO, UNHCHR, UNESCO, the IMF and the World Bank.

The Mongolian UNDP office also has a lot of research and IT initiatives happening. One of the most significant is [The Mongolia Biodiversity Project](#), a joint project between the Mongolian Ministry for Nature and the Environment and UNDP. The project's web site has extensive resources on the biodiversity within Mongolia and other resources. Another project is [Mongolian Agenda 21](#), a strategy for sustainable development being implemented by the National Council for Sustainable Development (NCSD) and UNDP. The web site has a newsletter and extensive information on the program.

## **OTHER PROJECTS**

With financial assistance from the NSF and the Soros Foundation, Datacom has also established an Internet public access centre in Ulaanbaatar City Library. The centre was reorganised in January 1998 and is now run independently, but with a similar brief to allow the public, businesses and NGOs to create home pages and learn how to use the Internet. The centre has two class rooms and equipment includes 12 Acer Pentium multimedia computers, hand scanners, and a video projector. The centre has also produced an extensive number of training manuals and has a range of books and software on hand. A second public Internet access centre is being planned by UNDP and Soros Foundation and will be located in the UN library.

The Press Institute of Mongolia (PIM) also has Internet training facilities for Mongolian journalists through a project sponsored by the UNDP. The PIM conducts short training courses on subjects such as election coverage, newspaper layout, photo-journalism, legal issues and computer skills, with teachers coming from Denmark, the US and Germany. An Internet course has also been added, with part of its plans being to send news to the countryside. Other courses are on how to use computers, how to get news, how to send it and so forth. The PIM is forging links with other development agencies and similar institutions such as the Nepal Press Institute via the Internet.



## **SITE AND CONTACT LISTS**

*(Note to dial from outside Mongolia add +976-1 before the number)*

### Email Daily News

Tel: 372925

Fax: 320092

Email: [ganbold@magicnet.mn](mailto:ganbold@magicnet.mn)

### Datacom

Negdsen Undestnii Str. 49

Ulaanbaatar-46

Tel: 312063

Fax: 320210

Email: [info@magicnet.mn](mailto:info@magicnet.mn)

### Mongolian Telecommunications Company

Sq. Sukhbaatar – 9

Ulaanbaatar

Tel: 324855

Fax: 325412

Mongolia Online *A central site in Mongolia with over 100 local links*

[www.mol.mn](http://www.mol.mn)

### Public Internet Centre

Ulaanbaatar City Library

Tel: 329840

Fax: 320210

Email: [bor@magicnet.mn](mailto:bor@magicnet.mn)

### Press Institute of Mongolia

Email: [pressinst@magicnet.mn](mailto:pressinst@magicnet.mn)

UNDP

7 Erhuu St

PO Box 49/207

Ulaanbaatar

Tel: 327585

Fax: 326221

Email: [registry@undp.org.mn](mailto:registry@undp.org.mn)

United Nations

*Central site for all UN agencies working in Mongolia*

[www.un-mongolia.mn](http://www.un-mongolia.mn)

Copyright © International Development Research Centre, 1998

© All Rights reserved. No part of this web site may be reproduced, stored in a retrieval system or transmitted, in any form or by any means, electronic, mechanical, photocopying, or otherwise, without the prior permission of the International Development and Research Centre.

The material in this Yearbook has been peer-reviewed by in-country resource persons. The views expressed are those of the writers and do not necessarily reflect those of the International Development Research Centre.

Cite as follows :

The Pan Asia Networking Yearbook (1998).

Singapore: Asia Regional Office, International Development Research Centre.

[On-line serial, subscriber-based : <https://www.panasia.org.sg/ecomsec/bookshelf/user/webdriver>]

*(Date of publication : October 12<sup>th</sup> 1998)*

## **Abstract**

*In November 1998, the government opened up a number of telecommunications services to the private sector, a move which could result in a reduction of costs to the Internet industry. In particular the private sector is now permitted to operate VSAT satellite facilities, which will allow ISPs to obtain their own international bandwidth without having to go through the government-owned Nepal Telecommunications Corporation (NTC).*

---

**Nepal**

By Geoff Long



## **OVERVIEW**

The Kingdom of Nepal is a landlocked country in the Himalayas lying between China and India. Its 140,800 sq km area is home to some 23 million people and contains 10 of the world's highest mountains. With an average per capita income of around US\$165, a literacy rate of 26 per cent, and life expectancy of 54 years, Nepal is among the poorest and least developed countries.

Nepali is the official language but there are more than 30 other languages spoken as mother-tongue and about 70 languages or dialects in total. Hinduism is the official religion and accounts for 85 per cent of all Nepalis.

Agriculture is the base of the economy, providing a livelihood for over 90 per cent of the population and makes up 60 per cent of the GNP. Nepal also has the lowest road length in relation to area or population in any country of the world, which coupled with poor communications infrastructure means that many villages are isolated from the rest of the country. While the government has recently made rural communications a priority, by mid-1998 there were still only 1200 of 3995 Village Development Committee (VDC) areas with access to a telephone. Nepal had 230,000 installed lines by July of this year and around 90 telephone exchanges, giving it an overall tele-density of just 0.9 lines per 100 people. Nevertheless, the situation has improved dramatically in the last two years in 1996 there were only 50 exchanges in the country. By the year 2000, the government is planning to have 500,000 installed lines, which would give it a tele-density of around 2 lines per 100 people.

Since 1996, Nepal has had no fewer than four different governments, alternating between alliances dominated either by the National Congress (NC) or the communist CPN (UML) party. The change of government also affects communications policy plans to deregulate some areas of telecommunications and other policy decisions have in the past been shelved by a new administration.

The most recent national development plan (the 9th) is the first to incorporate some form of IT policy. One of the initiatives is to encourage software development and IT services, both to develop an export market but also to slow the flood of trained technical people that leave to work overseas.



## REGULATORY ENVIRONMENT

Telecommunications and Internet are regulated by the Nepal Telecommunications Authority (NTA), a new body which was formed in April 1998.

In November of this year, the government opened up a number of telecommunications services to the private sector, a move which could result in a reduction of costs to the Internet industry. In particular the private sector is now permitted to operate VSAT satellite facilities, which will allow ISPs to obtain their own international bandwidth without having to go through the government-owned Nepal Telecommunications Corporation (NTC). Previous attempts to introduce competition in 1996 had failed, however the new regulator has indicated that it could open up other sectors to competition in future. NTC still holds a monopoly on providing fixed network services.

There are three Internet providers with licences to offer services. The licence fee is 500,000 rp for five years and the government also gets 4 per cent of the ISP's revenue. Three more organisations have currently applied for ISP licences but must wait final approval from the government. Licences must also be obtained to run VSAT links but to date a tariff or conditions have not been set.

To date, the government is not willing to allow Internet voice services, but Internet to fax gateways are allowed.

The .np country level domain is jointly administered by local ISP Mercantile Communications and Australian ISP Connect.



## INTERNET CONNECTIVITY

First-time visitors to Nepal, particularly Kathmandu, are often surprised at the number of outlets offering e-mail and other Internet services. There are literally hundreds of walk-in centres, a pattern that has previously been established for telephone and fax services, where Public Call Offices (PCOs) offer walk-in services. There are more than 1500 PCOs throughout the country. However, unlike the PCOs, the Internet centres are largely catering to the tourist market and are priced accordingly.

While there are many Internet centres, there are currently only three ISPs Mercantile Communications, WorldLink, and the more recent ComputerLand Communications System (CCSL).

Mercantile was the first organisation to offer Internet in Nepal and still has the most dial-up customers, estimated at around 5000. It started experimenting with Internet at the end of 1993 with a UUCP connection to ERNET in Delhi, India. Later, a dial-up connection to Australia was used until it got a permanent leased circuit to Singapore in 1995. Mercantile now has two 64kbps links to Singapore. However, with the new regulations allowing private companies to operate VSAT networks, Mercantile, like the other ISPs, will look at alternative options that are likely to be cheaper and offer more bandwidth. The current link to Singapore through NTC costs about US\$17,000 per month, which is prohibitively expensive. Mercantile has previously implemented VSAT networks for the government and is involved in all forms of wide-area networking. It also has a team of 100 engineers doing software development, so its skills-base is significant. Domestically, Mercantile has points of presence in three cities outside of Kathmandu: Pokhara, Birgunj, and Chitwan, which are connected to Kathmandu through 64kbps microwave links. The biggest obstacle to further points of presence is obtaining the microwave links, which again must be provided by NTC and can take up to two years to obtain. Mercantile eventually has plans for a network covering 12 cities. In Kathmandu, it also runs the K@mandu Cybermatha Teahouse (a cybercafe), which is connected to its main office through a HDSL modem operating at 2Mbps.

The majority of customers in Nepal are shared between Mercantile and WorldLink, which started offering e-mail shortly after its competitor in 1994. It now has a 64kbps link to Montreal through Canadian carrier Teleglobe. WorldLink has three points of presence, Kathmandu as well as the cities of Biratnagar and Pokhara. It too has indicated that it will establish its own VSAT facilities once a licence is approved. WorldLink is also involved in a number of other networking initiatives. It is part of the UN Tradepoint network, which aims to encourage small to medium sized enterprises to use electronic commerce. As part of this it acts as the official host for the Trade Point mirror site in Nepal. It is also involved in the Global Young Entrepreneurs Network (GYENET), for which it is the focal point in South Asia.

The most recent ISP to start operations is ComputerLand Communications System Limited (CCSL), which due to its later arrival does not have as large a customer base as the other two ISPs. It started offering e-mail services in 1996 and has since upgraded to a full Internet service using a 64kbps leased line to VSNL, the major Internet backbone in India. Currently CCSL is only offering services in Kathmandu but has plans to expand to Biratnagar, and then possibly Pokhara and Birgunj. It could also become involved in other telecommunications services such as paging. In 1996 it was one of a number of companies that were to be awarded licences to start paging networks, however the licences were challenged in court and subsequently not issued.

NTC has also been making plans over the years to enter the Internet market but to date has not done so. However, it recently issued a tender for internetworking equipment and suggested that it will offer some form of service. This could be either running an Internet gateway or as a dial-up service provider in its own right. At this stage its plans are unclear, however they are likely to include providing the government with Internet access. According to some Nepali observers, it is also likely to enter the consumer dial-up market as well.

To date, there has not been much activity in the government or academic sectors regarding Internet. The biggest university is Tribhuvan University followed by Kathmandu University (KU). Both have limited Internet access via the NepalNet project (see PAN activities for details), but otherwise there is no academic network as such. There is great demand among academic staff for Internet access, however. The computing department of KU is looking into possibilities for connecting the campus local-area networks to the Internet and eventually having their own direct link to the backbone.

There are a number of industry associations that are lobbying the government on Internet issues. One of the most established is the Computer Association of Nepal (CAN), which has some 620 members made up of hardware vendors, software developers and IT users. CAN played a significant role in getting IT policy included in the government's five-year plan and is a member of the government planning commission. CAN had also been lobbying for the de-regulation of VSAT services, which has recently been achieved. Currently it is a key player on the Nepali Font Standardisation committee, which aims to introduce a standard for the encoding of Nepali languages.

A more recent organisation is the Nepal Internet Users Group (Nepal IUG), which was set up in 1997. Membership is currently around 300 people. Members of Nepal IUG are involved in training, workshops, and regular meetings with the aim to build the Internet capabilities and capacity of the local population. It also has a mailing list that discusses local Internet issues, a web and ftp site, and more recently has setup a Nepal Intranet. The Intranet service is available in the Kathmandu Valley only but allows users to dial-up to the main server for free and access various local information and research. While the Intranet has only just started, there are plans to extend the scope of it both in terms of the geographic reach and the content available.



## PAN ACTIVITIES

While Nepal has had Internet access for over three years, local content has been minimal. In an effort to change this, a group of more than thirty Nepali organisations is now networking together to provide local research and development information. The result is NepalNet, which also forms one of a number of regional Pan Information Servers (PINS-Nepal).

NepalNet is more than a collection of useful statistics. It combines the informational resources of some of Nepal's leading researchers, administrators, and development practitioners from government agencies, university departments, research institutions and NGOs. While these resources are freely available on the NepalNet web site, the project also allows the various members to network together in a traditional sense, sharing knowledge and know-how via the Internet.

The project was funded by the International Development Research Centre (IDRC) through its Pan Asia Networking (PAN) program, with management and technical support provided by the International Centre for Integrated Mountain Development (ICIMOD), a Nepal-based international organisation promoting the development of an economically and environmentally sound mountain ecosystem for the Hindu Kush-Himalayan region.



While there is no shortage of Nepali organisations involved in research and development, many did not have the resources to publish information on the Internet when the project first started in February 1997. For the two years of the PAN Nepal project, NepalNet members are given free access to the Internet and key resource people in each organisation are provided with training in Internet publishing technologies.

Those people are then dedicated to the project and are responsible for putting new and existing research and development information on the NepalNet site. As well as each member having its own home page, information in NepalNet is grouped into nine key development sectors appropriate to the wide range of research interests of each organisation. The nine key development sectors are: Agriculture; Ecology & Biodiversity; Education; Economy; Forestry; Sociology & Demography; Policy & Law; Technology & Infrastructure; and Water, Earth & Atmosphere.

Since the project many have been trained in using and publishing material on the Internet. The project team have also created a mailing list for members and conduct regular meetings and feedback sessions to encourage the organisations' Internet activities.

One of the current priorities for both project staff and members is to ensure its long-term sustainability. As part of that process, a local organisation will be appointed to manage and maintain NepalNet while individual members will take responsibility for each of the key development sectors.

Another aspect of the project is a "drop-in" Internet centre that allows visiting researchers, scholars, project partners as well as the general public to use the service. There are two access points within ICIMOD: one located in the ICIMOD library and the other in the documentation centre. The service is provided free of charge but priority is given to project members and researchers, who are encouraged to book ahead because of the demand. The ICIMOD library already attracts thousands of visitors per year and the drop-in centre is also attracting a daily stream of people.



## CONTENT INITIATIVES

The most significant content initiative is NepalNet (see PAN Activities section above). It is a joint effort of more than 30 Nepali organisations including government agencies, university departments, research institutions and NGOs. Information is grouped into nine key development sector: Agriculture; Ecology & Biodiversity; Education; Economy; Forestry; Sociology & Demography; Policy & Law; Technology & Infrastructure; and Water, Earth & Atmosphere. The UNDP/Nepal also has some development information and research information available on its web site.

Apart from NepalNet, there have not been many other content initiatives locally, although this is slowly changing. The Nepal Internet Users Group (Nepal IUG) has a web site with information on the local Internet industry including a newsletter, links, and other reports. It has also started a Nepal Intranet, where local people can dial in for free to access information. However, there are no plans to open this to the Internet itself. To encourage local content,

Nepal IUG is also offering free web site hosting. Each of the three ISPs are a good starting point for local content. All three have listings and information about local companies, travel information, places to stay and so forth. WorldLink's content site is called Nepal Online while Mercantile's is South-Asia.com. Mercantile also hosts web versions of many local print publications, including the Kathmandu Post and the monthly magazine Himal. In all it some 13 publications available.

Another useful general site is The Nepal Home Page, which is designed and maintained by Kathmandu-based web design company Yomari and includes good local search facilities.



## **SITE AND CONTACT LISTS**

### Computer Association of Nepal

PO Box 956  
Bagbazar  
Kathmandu  
T: +977 1 242069  
F: +977 1 249059

### ComputerLand Communications System (ISP)

ComputerLand Building  
New Plaza  
Ramshah Path  
Kathmandu  
T: +977 1 223226  
F: +977 1 225603  
E-mail: [ccsl@ccsl.com.np](mailto:ccsl@ccsl.com.np)  
[www.ccsl.com.np](http://www.ccsl.com.np)

### K@mandu Cybermatha Teahouse

Website of Mercantile's cybercafe  
[www.cybermatha.net](http://www.cybermatha.net)

### Nepal Internet Users Group

Local Internet news and other member facilities  
[www.nepaliug.org.np](http://www.nepaliug.org.np)

### ICIMOD

4/80 Jawalakhel

GPO Box 3226

Kathmandu

T: +977 1 525 313

F: +977 1 524 509

E-mail: [sangeeta@icimod.org.np](mailto:sangeeta@icimod.org.np)

[www.south-asia.com/icimod](http://www.south-asia.com/icimod)

### Nepal Online

Collection of local links from WorldLink

[www.nepalonline.net](http://www.nepalonline.net)

### The Nepal Home Page

Nepal information with search facilities

[www.info-nepal.com](http://www.info-nepal.com)

### Mercantile Communications (ISP)

Durbar Marg

Kathmandu

T: +977 1 220773

F: +977 1 225407

E-mail: [mail\\_publish@mos.com.np](mailto:mail_publish@mos.com.np)

[www.mos.com.np](http://www.mos.com.np)

### NepalNet

Content from more than 30 local organisations

[www.panasia.org.sg/nepalnet](http://www.panasia.org.sg/nepalnet)

### UNDP/Nepal

Info about local UNDP projects and research documents

[www.nepali.net/undp](http://www.nepali.net/undp)

### WorldLink (ISP)

Jawalakhel

Kathmandu

T: +977 1 523050

F: +977 1 526318

E-mail: [sales@wlink.com.np](mailto:sales@wlink.com.np)

[www.wlink.com.np](http://www.wlink.com.np)

Copyright © International Development Research Centre, 1998

© All Rights reserved. No part of this web site may be reproduced, stored in a retrieval system or transmitted, in any form or by any means, electronic, mechanical, photocopying, or otherwise, without the prior permission of the International Development and Research Centre.

The material in this Yearbook has been peer-reviewed by in-country resource persons. The views expressed are those of the writers and do not necessarily reflect those of the International Development Research Centre.

Cite as follows :

The Pan Asia Networking Yearbook (1998).

Singapore: Asia Regional Office, International Development Research Centre.

[On-line serial, subscriber-based : <https://www.panasia.org.sg/ecomsec/bookshelf/user/webdriver>]

*(Date of publication : November 7<sup>th</sup> 1998)*

## **Abstract**

New Zealanders are one of the biggest users of Internet per head of population of any country in the world. When the ratio of host computers is compared to GDP per capita, New Zealand is the second most wired nation behind Finland, and its one net host for every 20 people can be compared to one for every 208 in the US. The country is now implementing a number of options for broadband Internet access.

---

## **New Zealand**

By Craig Swanson



### **OVERVIEW**

The island nation of New Zealand (Aotearoa) lies in the middle latitudes of the Southern Hemisphere, some 1900km south east of Australia, and is the most physically isolated of the advanced industrialized countries. It comprises two main islands, the North Island (114,469 sq/km), and the South Island (150,660 sq/km), which are separated by the narrow Cook Strait, as well as Stewart Island (1,751 sq/km), and numerous tiny islands and islets. The North Island (described as the town) is home to 74 per cent of the population, while 25 per cent live in the South Island (known as the Country). New Zealand is generally mountainous, with only 30 per cent of land classified as flat or rolling, and over 20 peaks exceeding 3000m in the South Island alone. The society is bicultural, with people of European descent making up to 86 per cent of the total population, and 10 per cent made up of Maori settlers.

The capital of New Zealand is the city of Wellington in the North Island, which, according to the January 1998 survey by United States-based Network Wizards, is the world's most Internet connected city, with 4702 Internet-connected computers per 100,000 people. Other major cities are Auckland in the North Island, Christchurch and Dunedin in the South Island.

Telecommunications in New Zealand have come a long way in a short time, largely due to policies of deregulation and non-government interference. The major telecommunications providers are Clear Communications, BellSouth and Telecom New Zealand (TNZ). A New Zealand's principal provider, TNZ dominates the local call market, and to some extent toll calls. However, Clear Communications and BellSouth have attracted approximately 40 per cent of the toll call market. Over the past 10 years, TNZ has undertaken almost NZ\$6 billion of capital expenditure to make New Zealand's telephone network comparable to the best in the world, with 99 per cent of customers connected to digital exchanges. There are 1.8 million access lines, and 96 per cent of New Zealand homes have a telephone.



### **REGULATORY ENVIRONMENT**

Deregulation of the telecommunications industry in New Zealand was set into motion by the Ministry of Commerce in 1987 in an effort to create an efficient and competitive telecommunications environment. It was one of the first countries in the region to fully deregulate.

There is currently no industry-specific regulation for entry into the supply of services, including Internet. However, TNZ's domination of telecommunications has caused friction with competitors and ISPs, who complain that the government does little to create a level playing field. Although The Ministry of Commerce defends its policy of deregulation by claiming lower toll charges as a direct result, it is currently looking into any apparent monopolistic activity that might stifle competitiveness.

The Internet Society of New Zealand (ISOC-NZ), is an independent non-profit society established in 1995 to foster development of the Internet In New Zealand. ISOCNZ influences Internet policy by representing member views to government and industry leaders. It also owns The New Zealand Internet Registry Ltd, which manages the .nz domain and trades as Domains.

It is one of the two main bodies associated with the Internet; the other being The ISP Association of New Zealand (ISPANZ), which claims the support of 90 per cent of ISPs. The ISPANZ was formed to promote and facilitate the effective function of the Internet in New Zealand as an open system.

In 1997, at the request of the Minister of Communications, ISCONZ and IZPANZ developed an Internet code of practice to regulate Internet content. The Select Committee and Parliament subsequently replace the Technology and Crimes Reform Bill 1994, consider by many industry representatives to be heavy-handed and unworkable, with the new Voluntary Code of Practice put forward by ISCONZ and ISPANZ. The new code requires all ISPs to inform parents of options and precautions they can take to protect children from material considered harmful. It also requires them to make available links to material that will educate users and parents, and inform them of filter software used to restrict unwanted material.



## INTERNET CONNECTIVITY

New Zealanders are one of the biggest users of Internet per head of population of any country in the world. When the ratio of host computers is compared to GDP per capita, New Zealand is the second most wired nation behind Finland, and its one net host for every 20 people can be compared to one for every 208 in the US. In September 1998 there were 172,402 separate Internet addresses, and 15,766 organizations with TCP/IP connectivity listed in the NZ portion of the DNS. There is a further 6,070 distinct organizations with and e-mail connection.

Serving these users are some 70-odd ISPs, with the major players being TNZ's Xtra, the Internet Home Users Group (IHUG), Voyager, and Clear Communication's Clear Net, all of whom offer nationwide access. Some of the larger ISPs has bought into the forth coming Southern Cross cable, which is being jointly initiated by carriers TNZ, Optus and WorldCom to ease a looming shortage of bandwidth in the region. Currently, New Zealand's international Internet bandwidth totals approximately 50 Mbps, mostly to the US and Australai. Telstra New Zealand ( a subsidiary if Australia's Telstra) also has a 6Mbps link to the Telstra backbone in

Australia. The main international gateway is operated by NetGate, an arm of TNZ subsidiary Netway, which also links to the New Zealand Internet Exchange (NZIX), a neutral exchange point for any ISP, at the University of Waikato in Hamilton. A more recent neutral exchange point has also been established in Wellington at the premises of CityLink, a network setup with support from Wellington City Council.

While the available bandwidth is currently limited, the US\$1.2 billion Southern Cross cable will join Australia, New Zealand, the United States, Fiji and Hawaii with 29,000km of high capacity fibre optic submarine cable, offering up to 40 times the capacity of existing cables. The first half of a loop connecting Auckland and Sydney with base stations in California is due for completion by the end of 1999. Total completion is expected by the year 2000.

Domestically, apart from the standard dial-in connection at 33kbps, many ISPs offer ISDN connections, and a handful offer dedicated Digital Data Service (DDS) connections for 64kbps and above by leasing lines from TNZ. Clear Het and TNZ offer Asynchronous Transfer Mode (ATM) services, and TNZ also offers PacNet (X.25) and frame relay services. TNZ and the Tuia Society - a non-profit organization made up of all New Zealand universities, the Crown Research Institute and the National Library of New Zealand - have also been involved in a three-year trial of ATM (broadband) services known as OPERA (Organized Program of Experimentation and Research into ATM), including the testing of broadband Internet access.

IHUG (also known as The Internet Group) is the second-largest ISP in NZ, with 45,000 customers as opposed to TNZ's 90,000. It has recently withdrawn its dedicated line access service and replaced it with Starnet, a new service that utilizes bandwidth from the PanAmSat satellite. The Starnet service in Auckland uses a transmitter located near the top of Auckland's Sky City Sky Tower and a 45cm dish connected to the client's computer. Uploading, such as requests for files, still uses a standard modem, but downward traffic comes via the satellite at 400-500kbps. However, a direct line of sight to the transmitter is required, and when Starnet goes national in late 1998 users outside of Auckland will require a 90cm dish and a clear view of the sky.

Starnet marks the beginning of the race for high speed data transmission in New Zealand. This is reflected by initiatives like cable TV carrier Saturn Communication's cable modem service, which operates on its hybrid fibre-coaxial network, and successful trials of ADSL technology by TNZ, which should be available in 1999.

The New Zealand Internet Institute (NZII) is a division of Victoria University of Wellington and exists to provide access for business, government and the wider community to research information about applications and impacts of the Internet. Victoria University also operates its own ISP, Netlink. Together with Waikato University and 2020 Communications Trust, they administer the New Zealand SunSITE program, helping primary and secondary level schools with the development and application of Internet-related network services. Also associated with 2020 Communications Trust is NetDay98-an ambitious project that aims to install local area networks in 600 schools across New Zealand with the help of private organizations.

In terms of Community networking, the key player is PlaNet New Zealand-an Association of Progressive Communications (APC) member network-which specializes in networking national organizations and communities of interest. PlaNet NZ manages a program called APC Converge, which is intended to provide online services to community and NGO organizations,

in many cases free of charge. APC Converge is a joint initiative of PlaNet NZ Trust, the Association of NGOs of Aotearoa (ANGOA), the Council for International Development (CID) and Environment and Conservation Organizations (ECO).



## CONTENT INITIATIVES

New Zealand embraced the arrival of the Internet with great enthusiasm, and has subsequently evolved into a prolific contributor of web content. Web Designers of New Zealand (WENZ) was formed in 1997 to help raise the standards of web page design and promote web design as a skilled profession in New Zealand. The WENZ web site [www.wenz.org.nz](http://www.wenz.org.nz) has tutorials and an FAQ on web site design and creation. WENZ also maintains the "Keepin' it KIWI" campaign. Which endeavours to increase recognition of NZ content by asking local sites (especially ISPs) to include more links to NZ resources. The New Zealand Site of the Day Award (SODA) [www.soda.co.nz](http://www.soda.co.nz) is another web site aimed at increasing and encouraging better standards in web page design. It chooses a winning site every day, and explains in detail why that site was worthy of the award.

For development, NGO, community networking resources, the best starting point is the APC Converge site. It has a directory of NGOs and one of the best collections of links. More recently, it has begun hosting the Pacific development directory, which provides a comprehensive listing of the directory, and also has a useful site that provides information on development and global issues.

The Telecommunications Users Association of New Zealand (TUANZ) is a non-profit, incorporated society of over 500 telecommunications users. Its web site [www.tuanz.gen.nz](http://www.tuanz.gen.nz) has information on telecommunications usage and planned activities, and links to discussion forums and publications focusing on topics such as marketing on the Internet.

New Zealand Electronic Commerce (NZEC) is NZ's foremost organizations dedicated to EDI and electronic commerce and is affiliated with TUANZ. It has a comprehensive web site [www.nzec.org.nz](http://www.nzec.org.nz) with general information on e-commerce, as well as case studies, commentaries, events and links to other e-commerce related sites. Also Affiliated with TUANZ is an interactive media users association, known as Interactive New Zealand (INZ).

The INZ web site [www.inz.org.nz](http://www.inz.org.nz) has information on events and award programs set up by INZ for its members.

New Zealand's government web site [www.govt.nz](http://www.govt.nz) is a gateway to NZ government departments and ministries. It has a large amount of information on current government activities and consultations, and links to government-related sites and many other interesting local sites.

[Access NZ](#) and [Search NZ](#) are two search engines that deal with NZ content only. Access NZ is owned and managed by Webmasters LMT. It offers a breakdown of second level domain names for more accurate searching. Search NZ is an initiative from Nexial Systems running



locally-developed search software, Nexttrieve, and offers domain name searching, or standard searching with a fussy engine that matches a complete phrase. Another Australian search site is [ANZWEBS](#), while a good site offering a broad range of information on New Zealand is the [NZ.COM](#) site.

[Maori Organizations of New Zealand](#) provides links to information on Maori culture, including language, customs and legends. It also provides links to many sites containing Maori content, including the Maori online shopping site, [Hokomaha](#). Another informative site dedicated to New Zealand and Pacific cultures is [www.culture.co.nz](http://www.culture.co.nz), which offers in-depth material about the history of the Maori race and the Pacific Islands. [The Maori Net](#) is NZ's only Maori owned and operated ISP. Apart from offering basic Internet connections and web design, it is endeavouring to establish online courses.

Another project that reflects New Zealand's ongoing interest in Internet- related initiatives is the 1997 Interlink Project, whereby over 1000 students New Zealand and Britain worked on projects together by communicating over the Internet. A site has been set up to display results of Interlink as an inspiration to other schools.



## **SITE AND CONTACT LISTS**

### APC Converge

*Community networking and NGO resources*

[www.converge.org.nz](http://www.converge.org.nz)

### Access NZ

*Search engine for NZ content*

[www.access.co.nz](http://www.access.co.nz)

### DOMAINZ

*Manages NZ's domain name registration*

[www.domainz.net.nz/](http://www.domainz.net.nz/)

### CWA Education Web

*Resouces for education in NZ*

[www.cwa.co.na/eduweb](http://www.cwa.co.na/eduweb)

### Interactive NZ

*Internative Media Users Association*

[www.inz.org.nz](http://www.inz.org.nz)

Hokomaha

*Maori online shopping site*

[www.hokomaha.co.nz](http://www.hokomaha.co.nz)

ISOC-NZ

*Internet Society of NZ*

[www.isocnz.org.nz/](http://www.isocnz.org.nz/)

Interlink

*Information on the 1997 Interlink project*

[www.interlink.org.nz/](http://www.interlink.org.nz/)

Maori Organizations of NZ

*Gateway to Maori content*

[www.maori.org.nz](http://www.maori.org.nz)

ISPANZ

*Internet Service Provider Association of NZ*

[www.ispanz.org.nz/](http://www.ispanz.org.nz/)

New Zealand Electronic Commerce

*Affiliated with TUANZ*

[www.nzec.org.nz](http://www.nzec.org.nz)

Ministry of Commerce

*Oversees the NZ telecommunications industry*

[www.moc.govt.nz](http://www.moc.govt.nz)

NZ.COM

*General information about NZ*

[www.nz.com](http://www.nz.com)

NZ Government

*Main gateway to government departments*

[www.govt.nz](http://www.govt.nz)

Search NZ

*Search engine for NZ content*

[www.searchnz.co.nz](http://www.searchnz.co.nz)

OPERA

*Research into broadband networks*

[www.opera.net.nz](http://www.opera.net.nz)

The Maori Net

*Maori owned and operated ISP*

[www.maori.net.nz](http://www.maori.net.nz)

Site Of the Day Award

*Recognizes good local sites*

[www.soda.co.nz](http://www.soda.co.nz)

Victoria University of Wellington

[www.vuw.ac.nz](http://www.vuw.ac.nz)

TUANZ

*Telecommunications Users Association of NZ*

[www.tuanz.gen.nz](http://www.tuanz.gen.nz)

Web Designers of NZ

*Promotes professional web designer skills*

[www.wdnz.org.nz](http://www.wdnz.org.nz)

Waikato University

*Operates one of the country's main international gateways*

[www.waikato.ac.nz/](http://www.waikato.ac.nz/)

Development Resource Centre

6<sup>th</sup> Floor, Rossmore House

123 Molesworth St

Wellington

T: +64 4 472 9549

F: +64 4 472 3622

E-mail: [drc@apc.org.nz](mailto:drc@apc.org.nz)

[www.drc.org.nz](http://www.drc.org.nz)

Clear Net (ISP)

Private Bag 92 143, Auckland

T: 0800 777 765

f: 0800 777 432

E-mail: [question@clear.net.nz](mailto:question@clear.net.nz)

[www.clear.net.nz/](http://www.clear.net.nz/)

Telecom New Zealand  
Telecom Networks House  
68 Jervois Quay  
Wellington  
T: +64 4 801 9000  
F: +64 4 473 2615  
E-mail: [info@telecom.co.nz](mailto:info@telecom.co.nz)  
[www.telecom.co.nz/](http://www.telecom.co.nz/)

PlaNNet NZ  
PO Box 7578  
Christchurch  
T 64 3 364 5898  
E-mail: [inquiries@planet.apc.org](mailto:inquiries@planet.apc.org)  
[www.planet.org.nz](http://www.planet.org.nz)

The Internet Home Users Group (ISP)  
127-131 Newton RD  
Auckland  
T: +84 9 358 5067  
F: +84 9 358 4112  
E-mail: [sales@ihug.co.nz](mailto:sales@ihug.co.nz)  
[www.ihug.co.nz](http://www.ihug.co.nz)

Copyright © International Development Research Centre, 1998

© All Rights reserved. No part of this web site may be reproduced, stored in a retrieval system or transmitted, in any form or by any means, electronic, mechanical, photocopying, or otherwise, without the prior permission of the International Development and Research Centre.

The material in this Yearbook has been peer-reviewed by in-country resource persons. The views expressed are those of the writers and do not necessarily reflect those of the International Development Research Centre.

Cite as follows :

The Pan Asia Networking Yearbook (1998).  
Singapore: Asia Regional Office, International Development Research Centre.  
[On-line serial, subscriber-based : <https://www.panasia.org.sg/ecomsec/bookshelf/user/webdriver>]

*(Date of publication : November 10<sup>th</sup> 1998)*

## **Abstract**

*The number of companies providing some form of Internet service has grown considerably in the past few years, and according to the PTA there are now more than 50 providers of Internet or e-mail services that have been issued licences. Nevertheless most of the country's 45,000 are concentrated in Karachi and to a lesser extent Lahore and Islamabad, with the three cities accounting for 90 per cent of the market. It is expected that future developments will be concentrated in these cities because of their stronger economic base.*

---

## **Pakistan**

by Geoffrey Long



### **OVERVIEW**

The Islamic Republic of Pakistan came into being on 14 August 1947. Its 796,095 sq kms are home to a diverse range of landscapes, from the Himalayan peaks in the north (including K2, the world's second highest mountain) to the plains of the Indus Valley and the temperate coastal area in the south. Its borders extend to Iran and Afghanistan on one side and India and China on the other. The border area with India, in particular Kashmir and Jammu, has been the source of considerable friction and fighting between the two countries.

There are four main provinces Punjab, Sindh, the North West Frontier, and Baluchistan as well as the Federally Administered Tribal Areas. Islamabad is the national capital and other major cities include Karachi, Lahore, Faisalabad, Peshawar, and Quetta.

While there are many dialects spoken throughout the country, Urdu is the national language and English is the administrative language. However, the most common language is Punjabi, which is spoken by 52 per cent of the population, and the official literacy rate remains low at 37.8 per cent (24.4 per cent for females).

The population of 130 million is 95 per cent Muslim, with the remainder mainly Christian and Hindu. Almost half the working population are involved in agriculture, although this is declining and industry and services are now the largest component of the economy. Pakistan's foreign debt has grown significantly in recent years and the country relies heavily on foreign aid.

A lack of adequate telecommunications infrastructure is seen as an impediment to IT and Internet growth, with only 2.2 telephone lines per 100 people and more than 90 per cent of these in urban areas, particularly the cities of Karachi, Lahore, Faisalabad and Islamabad. The monopoly telecommunications operator, Pakistan Telecommunications Company Limited (PTCL), is currently being privatised although its monopoly status will continue until 2002. In the remote Northern Areas, as well as Jammu and Kashmir, telephone services are operated by the Special Communication Organisation (SCO) of the Pakistan army. Telecommunications as well as other basic infrastructure is particularly poor in the Northern Areas, which has a population of around one million scattered throughout small villages in mountain areas.

In terms of international links, many local observers have been critical of the government's failure to invest in a number of high-profile submarine fibre-optic cable schemes that have passed Pakistan's coastline. The country declined invitations to join the FLAG and SEA-ME-WE-2 schemes, and only acquired a partial, or "T-connection", to the latest SEA-ME-WE-3 cable after initially snubbing offers to join the scheme.



## REGULATORY ENVIRONMENT

Telecommunications services including Internet come under the control of the Pakistan Telecommunication Authority (PTA), which is responsible for granting licences, monitoring services and tariffs, and controlling the use of radio frequency spectrum. While Internet originally was classified under data communication services, it is now licensed separately (under a category called Electronic Information Services, which also includes electronic commerce initiatives).

Unlike basic telecommunications services the government has been pursuing an open policy for data communications and Internet, which it claims is to encourage and spread its use in Pakistan with the help of the private sector.

There are three categories of licence for Internet relevant to the size of the area of operation. A Big Citywide Service (Karachi, Lahore, Faisalabad, Islamabad) attracts a licence fee of Rs 300,000, while a Small Citywide Service costs Rs 100,000. Country-wide services have a licence fee of Rs 500,000. Further fees include an annual renewal fee equivalent to 20 per cent of the initial licence fee and 4 per cent of annual gross revenue as royalty to the PTA.

Regulatory conditions are set out in the Pakistan Telecommunications (Re-Organisation) Act 1996. The Federal Government, through the Ministry of Communications, provides the licensing policy framework.



## INTERNET CONNECTIVITY

The number of companies providing some form of Internet service has grown considerably in the past few years, and according to the PTA there are now more than 50 providers of Internet or e-mail services that have been issued licences. Further licences are pending approval.

Internet kicked off in Pakistan in 1993, when a number of organisations set up email-only services via UCCP connections to outside network providers. Early players included Brain Net, Imran Net, and the Sustainable Development Network Program (SDNP), a network set up by the UNDP office

in Pakistan to support projects related to education and sustainable development. The first full Internet service provider was Digicom in Karachi, which was connected via satellite to Singapore in 1995. Most of the early efforts appeared before a licensing regime had been put in place. In 1996 the first call for licences was invited, with 16 companies from some 80 expressions of interest chosen, and there have been numerous and continuing invitations for proposals since then.

There are an estimated 70,000 users in Pakistan, most of whom are in Karachi and to a lesser extent Lahore and Islamabad. The three cities account for 90 per cent of users and it is expected that future developments will be concentrated here because of the stronger economic base. Approximately 80 per cent of use is for business/professional purposes while 20 per cent is home-based use, but again predominantly professionals as well as some students.

All international circuits must be provided by Pakistan Telecommunication Company Limited (PTCL) as part of its continuing monopoly of basic and international telephone services. PTCL provides half-circuits through its international satellite gateways in Karachi and Islamabad, which utilise Intelsat satellites. The other half-circuit can be negotiated with other carriers. PTCL also provides ISDN connections in Karachi, Lahore, and Islamabad and digital n X 64kbps access in 31 cities through a DXX network.

In 1996, PTCL also entered the dial-up Internet market under the Paknet brandname and started offering services at much lower rates than the existing players. However, as many observers point out, it holds an unfair advantage as a monopoly operator of the telephone network and there are no regulations in place to prevent it from unfairly subsidising its Internet operations. As a result, Paknet is now the largest player both in terms of the number of users and the network coverage, which extends to 16 cities. While its charges are lower than other ISPs, it cannot provide the service support offered by many of them. Recently, Paknet has been spun out of PTCL and created into a separate corporate entity - a wholly owned subsidiary of PTCL which will undertake Internet, data communication and related services in competition with other licensed service providers.

Some of the other larger commercial ISPs include Asia Online, Brain Net, CompuNet, Cybernet, Digicom, Fascom, NexLinx, and Supernet, while COMSATS is an important non-profit Internet service.

The Commission on Science and Technology for Sustainable Development in the South (COMSATS) is playing a key role in expanding the Internet sector in Pakistan. Initiated in 1989 by Nobel laureate the late Professor Abdus-Salam, who was heading the Third World Academy of Sciences, COMSAT is headquartered in Islamabad and links 13 centres of excellence in countries of the south as well as having significant networking facilities in Pakistan. In 1997, COMSATS launched a network with points of presence in Islamabad, Karachi, Lahore, Peshawar, Sialkot, and Faisalabad. The network is dedicated to promoting education, science, and technology-related initiatives and offers discounted access rates to applicable commercial and non-commercial organisations in these fields, as well as normal dial-up services to the public. It also hosts the official web sites of the Government of Pakistan and many other subsidiary departments and organisations. COMSATS plans to computerise data relating to science and technology for its 20 member countries and the centres of excellence and has recently started an IT Training Institute in Islamabad. Its network has international satellite links in three cities: a 128kbps link in Lahore, a 2x 256kbps links in Islamabad, and a 512kbps link in Karachi, which are connected to the Internet backbone via Sprint and Teleglobe.

The Sustainable Development Network Program (SDNPK) set up by the UNDP is less involved in setting up Internet infrastructure now that commercial ISPs have appeared in large numbers. In future it will concentrate on providing indigenous sustainable development information, although it will still provide connectivity, particularly to NGOs in the development sector and educational institutions. It also still has one of the largest community of users, due mainly to its low-cost connections. One of the projects that it has supported is the Education Support Trust's EDUNET, the first educational computer network in the country. EDUNET is operational in Lahore and there are plans to expand to other cities. Its network provides databases, discussion forums, and mailing lists relevant to the education sector. SDNPK is also planning to upgrade its infrastructure and foray into ISP market as a full fledged Internet service provider as early as 1st Quarter 1999.

The university sector is not especially active when it comes to Internet. The Lahore University of Management Sciences (LUMS) was the first university in Pakistan to connect to the Internet, but there is no academic backbone and most universities have very little Internet-type activity.

Of the main commercial ISPs, Fascom provides Internet and other data communications services and claims to be the largest VSAT provider in Pakistan. It is the local agent for Hughes Network Services and lists many of the country's large banks as customers.

Supernet, a joint-venture between local company Arfeen, which has interests in trading, manufacturing, telecommunications and entertainment, and Sumitomo Corporation of Japan, is another data communication company in Pakistan. The Arfeen Group also has joint ventures in card phone, mobile phone network services, as well as telecommunications networks in regional countries. Brain Net has one of the widest networks, operating in six cities Lahore, Peshawar, Sialkot, Gujranwala, Multan, and Sahiwal as well as having its own cross border VSAT link in Lahore. Internationally it has a 128k link to SingNet in Singapore.

Most of the other larger ISPs have their own international leased lines and there has been no attempt to form an Internet Exchange, although some ISPs have begun to collaborate and share international links. There are a number of Internet associations that have formed from the ISP community to promote and lobby on local Internet issues, including the Internet Service Providers Association of Pakistan (ISPAK) and the Internet Society of Pakistan (ISOP).

One of the most successful lobbying efforts was exempting Internet usage from the recently introduced policy of metered charges on local calls. Internet usage will continue to be unmetered thanks to the lobbying of a number of key individuals and Internet organisations. To distinguish between Internet and voice calls, all ISPs were granted a universal Internet number (UIN), starting with the digits 131.

Country-level domain name registration was recently opened up to allow a number of Internet companies to act as co-delegates for the PK domain. The central authority for the PK domain is PKNIC, which previously was the sole administrator. PKNIC policy is now set by a committee that includes members from the ISP and IT community.





## CONTENT INITIATIVES

One of the most comprehensive and well-known places to start looking for Pakistani content is Jamal's Yellow Pages of Pakistan. As well as a searchable A-to-Z listing service, there is a good categorised collection of local web sites, an e-commerce site, and a guide to Islamic resources on the Internet. Pakistan Web Directory is a Yahoo-style set of local listings with a search engine, while "Pakistani websites" is also a good starting point from local web design and hosting company Net Access, whose clients are some of the bigger organisations in the country.

Another talented local design company is Aleph, who has designed some city guides to Pakistan as well as web sites for the likes of Pakistan International Airlines, the Internet Society of Pakistan. The Pakistani pop group Junoon site is hosted by another innovative company called JaalNet. Another artist who regularly crops up in Pakistani web sites is the late Nusrat Fateh Ali Khan.

For an official view of Pakistan, the government-sanctioned site is a good gateway to ministries and their departments. The site also gives useful factual information about the country. For trade-related information, try the Export Promotion Bureau.

The sustainable development networking programme (SDNPK) has had considerable and well-publicised success in providing specific information on environmental and development information. For example it has provided the authorities with information on disposing of toxic materials and other wastes that have prevented environmental damage, and has made available other information on sustainable technologies. However, at this stage it doesn't have a great deal of resources available in web format.

For science and technology information, COMSATS has links to many of its centres of excellence in the south as well as the publications and newsletters that it publishes. The Ministry of Science and Technology also has links to all the organisations that come under its control

For general news, most of the English-language Pakistan newspapers are now online and there is also a useful Internet news service called Pakistan News Service (PNS), a community-based volunteer group that was the first to start an online news service locally. News comes from a variety of sources, and its main web site also has other useful links and access to Pakistani newsgroups.

For information and software on using Urdu, the national language of Pakistan, there is a dedicated site called UrduWeb. The site also has a collection of Urdu websites. Another Urdu site is Urdu Internet, which is listed in the Best of Pakistan site. Best of Pakistan gives out awards for the best local web designs and content.



## SITE AND CONTACT LISTS

### SITE LIST

#### Best of Pakistan

Awards the best local content

[www.bestofpakistan.com.pk](http://www.bestofpakistan.com.pk)

#### Aleph

City guides and other links

[www.alephx.com](http://www.alephx.com)

#### IMRAN Internet

Broad range of content and news from a pioneer e-mail provider

[www.imran.com](http://www.imran.com)

#### Export Promotion Bureau

Trade-related information

[www.epb.jamal.com](http://www.epb.jamal.com)

#### Internet Society of Pakistan (ISOP)

News and issues regarding Pakistan Internet

[www.isop.org](http://www.isop.org)

#### Internet Service Providers Association of Pakistan (ISPAK)

Contains a regular newsletter of issues

[www.super.net.pk/ispak](http://www.super.net.pk/ispak)

#### Ministry of Science and Technology

Links to other S&T organisations

[www.most.gov.pk](http://www.most.gov.pk)

#### Jamal's Yellow Pages of Pakistan

Well known directory

[www.jamal.com](http://www.jamal.com)

#### Pakistan News Service

Online news service

[www.paknews.org.pk](http://www.paknews.org.pk)

Nusrat Fateh Ali Khan

Dedicated to the music of the late singer

[www.nfak.com](http://www.nfak.com)

Pakistani websites

A good collection of sites from local development company Net Access

[www.pakistaniwebsites.com](http://www.pakistaniwebsites.com)

Pakistan Official Site

Maintained by the Ministry for Information

[www.pak.gov.pk](http://www.pak.gov.pk)

UrduWeb

Information and software for writing in Urdu

[www.urduweb.com](http://www.urduweb.com)

PKNIC

Information on PK domain names

[www.pknic.net.pk](http://www.pknic.net.pk)

**CONTACT LIST**

Brain Net (ISP)

730 Nizam Block

Allama Iqbal Town

Lahore

T: +92 42 541 4444

F: +92 42 783 2039

E-mail: [info@brain.net.pk](mailto:info@brain.net.pk)

[www.brain.net.pk](http://www.brain.net.pk)

Asia Online Pakistan (ISP)

3/C, 3rd Floor

Lacasa Centre,

DHA, Karachi

T: 92 21 111 990000

E-mail: [webmaster@aol.net.pk](mailto:webmaster@aol.net.pk)

[www.aol.net.pk](http://www.aol.net.pk)

Cyber Internet Services (ISP)

A-904, Lakson Sq Building No.3

Sarwar Shaheed Rd

Karachi

T: +91 21 111 445566

F: +91 21 568 6745

E-mail: [info@cyber.net.pk](mailto:info@cyber.net.pk)

[www.cyber.net.pk](http://www.cyber.net.pk)

COMSATS

30 Attaturk Ave

G-6/4

Islamabad

T: +92 51 9206605

F: +92 51 9216539

E-mail: [webmaster@isb.comsats.net.pk](mailto:webmaster@isb.comsats.net.pk)

[www.comsats.net.pk](http://www.comsats.net.pk)

Fascom (ISP)

39/A Block 6

P.E.C.H.S

Karachi

T: +92 21 454 5725

F: +92 21 455 6701

E-mail: [sales@fascom.com](mailto:sales@fascom.com)

[www.fascom.com](http://www.fascom.com)

Digicom (ISP)

2/1,R Y-16, Old Queens Rd

Karachi

T: +92 21 111 200111

F: +92 21 241 9833

E-mail: [info@digicom.net.pk](mailto:info@digicom.net.pk)

[www.digicom.net.pk](http://www.digicom.net.pk)

Pakistan Telecommunication Company Ltd

Headquarters: G-8/4

Islamabad

T: +92 51 111 101010

F: +92 51 111 191919

[www.ptc.pk](http://www.ptc.pk)

Pakistan Telecommunications Authority

CTRL Building

H-9/4, Islamabad

T: +92 51 412754

F: +92 51 446983

[www.pta.gov.pk](http://www.pta.gov.pk)

Supernet (ISP)

75 East, Fazal-e-Haq Rd

Blue Area

Islamabad

T: +92 51 272860

E-mail: [info@super.net.pk](mailto:info@super.net.pk)

[www.super.net](http://www.super.net).

Copyright © International Development Research Centre, 1998

© All Rights reserved. No part of this web site may be reproduced, stored in a retrieval system or transmitted, in any form or by any means, electronic, mechanical, photocopying, or otherwise, without the prior permission of the International Development and Research Centre.

The material in this Yearbook has been peer-reviewed by in-country resource persons. The views expressed are those of the writers and do not necessarily reflect those of the International Development Research Centre.

Cite as follows :

The Pan Asia Networking Yearbook (1998).

Singapore: Asia Regional Office, International Development Research Centre.

[On-line serial, subscriber-based : <https://www.panasia.org.sg/ecomsec/bookshelf/user/webdriver>]

*(Date of publication : December 7<sup>th</sup> 1998)*

## **Abstract**

*Papua New Guinea recently celebrated its first year on the Internet. The country has five Internet service providers (ISPs) and is also looking at publishing some of the great wealth of research data available in the country following a recent grant from PAN to South Pacific Centre for Communication and Information in Development (SPCenCIID) at the University of Papua New Guinea (UPNG).*

---

# **Papua New Guinea**

By Geoff Long



## **OVERVIEW**

Papua New Guinea (PNG) occupies the eastern half of the island of New Guinea, with Irian Jaya located on the western half. Located a short distance north of Australia and east of Indonesia, the island is the second largest in the world after Greenland. It is also one of the richest areas in the world in terms of culture, biodiversity and resources -- features that have attracted a sometimes overbearing interest from researchers, scientists and exploration companies. Despite this interest, it can still be difficult to obtain research and other information within the country, leading some in the community to look at the Internet as an important source of local content creation and access to information.

The country is divided into twenty provinces but has more than 800 known cultural groups and more than 700 languages, many of which are in danger of being lost. Melanesian Pidgin is commonly used across the country, while English is the official language in education and widely spoken in business and government.

One of the reasons that PNG has remained so culturally diverse is because of the rugged terrain, which makes transport and any sort of road system extremely difficult.

This terrain is also responsible for making PNG one of the most difficult places in the world to build communications and other infrastructure. Government-owned Telikom PNG (formerly PTC, or Posts and Telecommunications Corporation) has a monopoly on telecommunication services in the country until 2002. Its network is made up of a series microwave links with about 100 repeater stations dotted throughout the country. In many areas the final link is provided by HF radio, which can be unreliable for data transmission. Each repeater station is only accessible by helicopter, making maintenance an expensive undertaking. Other problems include frequent outages because of bad weather, and land disputes at mountain top repeater stations that have led to damaged equipment. Telephone exchanges are gradually being upgraded, with 18 centres now offering digital exchanges.

A domestic satellite service is also being implemented to serve remote provinces and some mining and petroleum companies, as well as provide back-up services to the network.



## REGULATORY ENVIRONMENT

Internet and telecommunications are regulated by the government regulatory authority, PangTel. The country's telecommunications act precludes organisations other than Telikom from switching data, which means Telikom is the only company that can sell wholesale bandwidth.

The government is currently looking into content regulation but as yet has not formulated a policy. An existing policy that covers other media had previously been drawn up before the arrival of Internet.

The Office of Censorship is looking to see if censorship laws should be drawn up to cover Internet, while the Office of Information and Communication will prepare a position paper for the government on Internet. It should also be noted that there are no laws controlling copyright in Papua New Guinea.

The PNG country top-level domain space (.pg) is administered by the University of Technology in Lae.



## INTERNET CONNECTIVITY

Full Internet services commenced in Papua New Guinea in April 1997 with the licensing of five commercial Internet Service Providers (also known locally as Internet service distributors).

Before 1997 a number of organisations used e-mail services through CompuServe Pacific in Sydney, while the University of Technology (Unitech) had operated a 1200bps email-only UUCP connection dialling into Melbourne University in Australia.

Tiare, a subsidiary of Telikom PNG, is licensed to operate the country's Internet gateway, which is based in Port Moresby. The gateway is linked via satellite to AT&T in Sydney. Originally a 256kbps link was commissioned but this has recently been upgraded to 512kbps. ISPs are not allowed to commission their own international links.

The five ISPs currently licensed are Daltron Electronics, Datec, DG Computers, Global Technologies, and Online South Pacific (a division of networking company Data Nets). All five are involved in other IT-related activities in PNG, including networking, PC distribution, and service provision and are able to offer Internet as a value-added service to existing customers such as business organisations and the mining industry. A common set of services is offered including dial-up access, web site hosting and authoring, and domain name registration.

The number of users in the country is still modest and estimated at around 2000-3000. Because of competition, prices for access are reasonably low at around 2 kina per hour. Telikom also uses a timed charge for data calls, although at K3.00 per hour in peak time it is cheaper than for local voice calls, which are also time charged. ISP dial-up numbers are national, so the costs for accessing the Internet are the same across the country.

Tiare has also recently begun offering Internet services directly to customers, much to the dismay of the ISPs, who believe that Tiare's association with Telikom and its control of the Internet gateway give it a commercial advantage. However, at this stage Tiare is only planning to offer direct services to non-commercial organisations such as government departments.

While the five ISPs were initially granted 12 months free from competition, that period has expired and other organisations can now apply for a licence. A number of companies are believed to have responded to the government's call for expressions of interest, but at this stage there have been no further licenses granted.

Each ISP was originally linked to the gateway via a 64kbps leased line, however a number of ISPs have since upgraded to 128kbps links and all are looking at increasing their bandwidth.

Tiare is also looking at improving the Internet backbone in the country by upgrading links between four main centres: Port Moresby, Lae, Mt Hagen and Rabaul. The proposal is for frame relay links between the centres via microwave transmission, which would provide ISPs with "on-demand" services.

The ISP facilities are all located in Port Moresby. Because of the national dial-up number and uniform charges there is less incentive for ISPs to setup facilities in other centres, particularly as this would require a leased line to Port Moresby in each case. Despite this disincentive, a number of ISPs are planning to extend to other areas, particularly Lae, PNG's second largest city and home to many commercial organisations within the country.

Another perceived problem is that Telikom only has the ability to provide 64k leased lines across the country, so companies requiring 128k bandwidth must purchase two leased lines, with no discounts available for larger capacities. Most of the ISPs as well as the country's universities complain that Telikom charges too much for these lines and to connect to its gateway.

Despite obvious disgruntlement with Telikom, there is no ISP organisation to lobby for improved conditions. Meetings have been held between the ISPs but agreement on forming an association and other issues did not eventuate.

One of the biggest potential user communities for Internet is within the university sector. The two main institutions – [The University of Papua New Guinea \(UPNG\)](#) in Port Moresby and the University of Technology in Lae – have both recently commissioned fibre-optic campus networks that support Internet/Intranet services. UPNG has a 64kbps leased line connection to the Internet provided through Data Nets, while Unitech has a 9.6k line directly to Melbourne University. Both universities have complained of long-delays in receiving leased lines and Unitech is still waiting for a 64kbps line to Port Moresby after seven months. There have also been discussions to create some form of academic backbone (called ERNET), but this is still in the early stages of planning.





## PAN ACTIVITIES

The PAN Information Networking and Services Papua New Guinea (PINS-PNG) project aims to establish a country level information server that will carry PNG content. It is being co-ordinated in Port Moresby by the University of Papua New Guinea's (UPNG's) South Pacific Centre for Communication and Information in Development (SPCenCIID). While still in the preliminary stages, the project team has identified a number of potential content partners. These are: The Institute of PNG Studies, the University of Papua New Guinea, the National Parliament Library, the Government Office of Information and Communications, the Small Business Development Corporation, the National Association of NGOs (NANGO), and the Melanesian Institute.

The project will be run from the offices of SPCenCIID, where a training room will be setup for the use of each of the information partners. The training centre will be equipped with a number of multimedia PCs that allow each partner to publish electronically.

### [Webbing New and Traditional Knowledge](#)

[Read how a team of local researchers tackle the task of recording the traditional knowledge of PNG societies with the help of the Internet.](#)



## CONTENT INITIATIVES

For a relatively small country that has only been connected to the Internet a short time, PNG has some quite good examples of local content.

A good research site for issues to do with biodiversity and resource management is the [Conservation Resource Centre \(CRC\)](#), a program of the Department of Environment and Conservation and administered by the UNDP. The web site offers access to a number of CRC publications and research papers which can be downloaded from the site.

One of the first web sites in PNG started at the [University of PNG's Journalism Studies](#) department – a part of SPCenCIID – which has a quite comprehensive online directory of PNG sites. It also carries some good sources of independent online news relating to PNG including the Journalism departments own Papua Niugini Nius service.

Another good collection of links is available at [PNG Net Search](#), which has site listings and a search engine.

The Government has an official information site developed by the National Information Services and the Office of Information and Communication. It contains news releases, profiles of the prime minister and his cabinet, and general information such as holidays and events in PNG.

[Wantok's Forum](#) is a Papua New Guinea discussion group that is quite active and includes special chat sessions with high profile New Guineans.

The two mainstream newspapers, [The Post Courier](#) and [The National](#), also have web versions containing news. Of the ISPs, [Datec](#) has the best resources and houses a Papua New Guinea Information Site and some reasonable links.



## SITE AND CONTACT LISTS

### UPNG Journalism Studies

*Has a good collection of links and PNG media resources*

[www.journ.upng.ac.pg](http://www.journ.upng.ac.pg)

### University of PNG

Uni's main web site

[www.upng.ac.pg](http://www.upng.ac.pg)

### PNG Net Search

*PNG search engine and listing service*

[www.pngnetsearch.com](http://www.pngnetsearch.com)

### Datec

*Access to PNG info site*

[www.datec.com.pg](http://www.datec.com.pg)

### Conservation Resource Centre

*Research papers and information on conservation projects*

[ww3.datec.com.pg/CRC/default.html](http://ww3.datec.com.pg/CRC/default.html)

### Wantok's Forum

*Discussion group on PNG*

[www.niugini.com/wwwboard/](http://www.niugini.com/wwwboard/)

### The Tanorama Network

*Specialises in development projects*

[www.tanorama.com](http://www.tanorama.com)

### Official Government Site

*News releases and information from the government*

[www.tiare.net.pg/pnggov/](http://www.tiare.net.pg/pnggov/)

### Virtual Library of PNG

*A good listing of PNG sites by John Burton of the Australian National University*

[Coombs.anu.edu.au/specialproj/PNG/wwwvl-png.html](http://Coombs.anu.edu.au/specialproj/PNG/wwwvl-png.html)

### Village Development Trust

*NGO specialising in eco-forestry and conservation*

[www.global.net.pg/c&c/vdt/](http://www.global.net.pg/c&c/vdt/)

## CONTACT LIST

### Daltron Electronics

Cameron Rd, Waigani

Tel: 325 6766

Fax: 325 6558

Website: [www.daltron.com.pg](http://www.daltron.com.pg)

### Conservation Resource Centre

PO Box 165

Waigani NCD

Tel: 325 4900

Fax: 325 9192

Email: [CRC@datec.com.pg](mailto:CRC@datec.com.pg)

Website: [ww3.datec.com.pg/CRC/default.html](http://ww3.datec.com.pg/CRC/default.html)

### DG Computers

PO Box 1887

Boroko

Tel: 325 3800

Fax: 325 1115

Website: [www.dg.com.pg](http://www.dg.com.pg)

### Datec

Waigani Drive

Port Moresby

Tel: 325 9022

Fax: 325 9066

Website: [www.datec.com.pg](http://www.datec.com.pg)

### National Cultural Commission

PO Box 7144

Boroko

Tel: 323 5111

Fax: 325 0531

### Online South Pacific (Data Nets)

Tel: 3200 633

Fax: 3200 611

Website: [www.online.net.pg](http://www.online.net.pg)

Datec

Waigani Drive

Port Moresby

Tel: 325 9022

Fax: 325 9066

Website: [www.datec.com.pg](http://www.datec.com.pg)

SPCenCIID

Box 320

University PO, NCD

Fax: 3267187

Small Business Development Corporation

Section 53, Lot 19

Ume St

Gordon NCD

Tel: 325 0100

Fax: 325 3725

Copyright © International Development Research Centre, 1998

© All Rights reserved. No part of this web site may be reproduced, stored in a retrieval system or transmitted, in any form or by any means, electronic, mechanical, photocopying, or otherwise, without the prior permission of the International Development and Research Centre.

The material in this Yearbook has been peer-reviewed by in-country resource persons. The views expressed are those of the writers and do not necessarily reflect those of the International Development Research Centre.

Cite as follows :

The Pan Asia Networking Yearbook (1998).

Singapore: Asia Regional Office, International Development Research Centre.

[On-line serial, subscriber-based : <https://www.panasia.org.sg/ecomsec/bookshelf/user/webdriver>]

*(Date of publication : October 12<sup>th</sup> 1998)*

## **Abstract**

*The number of organisations providing Internet access in the Philippines has increased markedly in the past 18 months although there are signs that some Internet service providers (ISPs) will merge or fold. By May 1998 there were more than 145 ISPs, most in Metro Manila but also some with local dial-up access in regional towns throughout the country.*

---

## **The Philippines**

By Geoff Long, Merlita Opena and  
Danilo Pedragosa



### **OVERVIEW**

The Republic of the Philippines is an archipelago of some 7,107 islands, which can be conveniently clustered into three main groups: Luzon in the north, Mindanao in the south, and the Visayas group of islands in the middle. Volcanic activity, typhoons, and severe flooding are constant reminders that the Philippines is located in an area vulnerable to natural elements and reliable communications networks are an essential part of disaster mitigation and preparedness.

The population of around 70 million is spread over 2000 inhabited islands, but almost half of the country live in urban centres, with more than 10 million people in Metro Manila.

As a result, communications infrastructure is concentrated around Manila and other profitable urban centres. However, coverage is being extended to areas not yet served, as directed by government policy. In 1997, the teledensity figure (number of lines per hundred people) almost doubled to 8.06, according to figures from the National Telecommunications Commission.

The national language is Filipino but English is widely used. As a result, the majority of local Internet sites are in English. There are also about 80 local dialects used throughout the country.



### **REGULATORY ENVIRONMENT**

In an effort to accelerate the buildout of communications infrastructure, the government de-regulated much of the telecommunications sector in 1993. The National Telecommunications Commission (NTC), a body within the Department of Transport and Communications (DOTC), is responsible for regulating and supervising all aspects of the telecommunications and broadcasting industry within the Philippines. This includes Internet, which is classified as a value-added service, as well as public telecommunications, broadcasting, cable television networks, satellite and radio frequency spectrum. Regulations relating to the delivery of telecommunications services are set out in Republic Act No 7925, also known as the Public Telecommunications Policy Act of the Philippines, which was passed in July 1994.

The act permits any organisation to offer Internet or other value-added services, although these organisations are not allowed to build their own network and therefore must use that of a licensed telecommunications carrier. However, telecom carriers are permitted to offer their own value-added services including Internet access. All Internet Service Providers (ISPs) are expected to register as a value-added provider with the NTC, but this regulation is at present not enforced.

In the long term, RPWEB will lead to the interlinking of over 12,000 government offices and schools through the Internet. Under the RPWEB strategy, the private sector is encouraged to set up network access points (naps) or Internet exchanges. ISPs desiring to service government offices may interconnect to such naps/Internet exchanges.

It is government policy that public telecommunications be provided by private enterprise so as to encourage competition within this sector. As a result, there are more than 100 private Internet providers and 60 licensed telecom carriers in the Philippines. Many of these are large foreign telecommunications carriers with ambitious objectives to bring basic communications coverage to all cities, municipalities and prime *barangays*. There have also been a number of highly publicised disputes regarding the interconnection of different carrier's networks, which has resulted in some areas being effectively isolated from the main public switched telephone network (PSTN) until interconnection agreements have been made. More recently, the Department of Transport and Communication (DOTC) has outlined plans for all carriers to have direct access to international satellite, such as Intelsat, and emerging satellite technologies. In future, wireless technologies including satellite could be an important transmission medium for Internet providers, especially to service remote areas.

Late last year, President Fidel V. Ramos signed Administrative Order 332 directing all government agencies and instrumentalities including local government units to undertake electronic interconnection through the Internet in a project to be known as the RPWEB (Republic of Philippines WEB). The bill was originally proposed by congressman Leandro Verceles and is claimed to be the most significant and concrete government measure so far in the area of Philippine information technology.



## INTERNET CONNECTIVITY

The number of organisations providing Internet access in the Philippines has increased markedly in the past 18 months although there are signs that some ISPs will merge or fold. By May 1998 there were more than 145 ISPs, most in Metro Manila but also some with local dial-up access in regional towns throughout the country. Only about 15 ISPs had their own international leased line to provide direct access to the Internet -- mostly to the United States, but also to Hong Kong, Singapore and Australia -- with the remainder using the larger providers to obtain access to overseas Internet sites.

In line with the flourishing interest in Internet has been a number of related initiatives, including: the formation of the country's first formal Internet association as well as an electronic commerce association and a local chapter of ISOC; a growing number of walk-in Internet centres that allow relatively cheap, casual access; the formation of a Philippines Internet Exchange for connecting local

ISPs; plans to connect 5000 schools across the country as well as another to encourage all government agencies to put their information on the Web; and a number of other local content projects, including PAN Information Networking and Services Philippines (PINS Philippines, see Pan Activities for details).

The Internet first came to the country in 1994 through the Philippine Network Foundation Inc (PFI), a non-profit foundation formed by a consortium of Philippines universities and institutions. Its network, PHNET, is still the most significant in terms of capacity and future backbone plans. PHNET was created with the support of the [Department of Science and Technology \(DOST\)](#) and the Industrial Research Foundation (IRF) along with eight of the country's universities, all of whom were initially linked by 64 kbps leased lines and one shared 64 kbps international leased line to the US. The initial list of 10 members has now grown to a national network of 60 institutions in the major cities of the Philippines, with international leased line capacity increased to E1 to the US. The E1 link was provided by United Network Access (UNA), a BayanTel company which sells bandwidth wholesale. PHNET is also a member of the Asia Pacific Advanced Network (APAN) consortium and has a 768 kbps frame relay link to Japan that is used for APAN traffic.

PHNET is also proposing to expand the coverage of the network to 2000 schools by the end of year 2000 in what will become The Philippine National Science, Academe, and Research Network (RP-SARNET). The network will cover all regions and provinces in the country and form a high-bandwidth national communications backbone for science, academic, and research institutions, with a E1 (2.048 mbps) international leased line to the US backbone.

The proposed network will be made up of a number of regional hubs connected to each other and the existing PHNET to collectively form an academic backbone. Schools in an area will form a local consortia and share the hub facilities to minimise costs, with the PFI providing training and technical help. PFI thus becomes a consortium of regional consortia. While PHNET has in the past provided service to private organisations it will in future concentrate on educational institutions and government agencies. In the long term, PFI envisages the Internet in the Philippines operating around several national backbones, one for government, one for schools, and one commercial, with each interconnected to the other.

PHNET administers all **.edu.ph** domain names while DOST is responsible for the **.gov.ph** domain. All other domain names are administered privately (see Contact List for details).

The first commercial ISP in the Philippines, [Mosaic Communications \(MosCom\)](#), was formed in June 1994 and is one of a small number of ISPs that is establishing a network of access points in most areas of the country. MosCom claims the widest geographic reach in the Philippines with more than 25 sites across the three main island groups. It also has a T1 and a 256 kbps link to the US.

[Infocom](#) (formerly Sequel Net) is another main ISP planning nationwide access. Infocom was formed by US-based Filipino-American company Sequel Concepts and is now 51 per cent owned by the Philippines Long Distance Telephone Company (PLDT), the country's main telco. It will use the PLDT's network and resources to offer Internet throughout the Philippines and claims to have the only E1 (2.048 Mbps) international leased line among the ISPs.

Other Internet providers also have affiliations with telecom carriers, for example [G-Net](#), which is backed by Globe Telecom and has international lines to both the US and Singapore, and [Sky Internet](#), which is backed by carrier BayanTel and cable television operator SkyCable. These and other ISPs

with strong carrier or foreign backing hold a distinct advantage in a market that is suffering from low margins, and as a result some smaller ISPs have already closed their operations.

While the larger ISPs boast international links to the Internet, there are very few links between the various ISPs themselves. As a result domestic traffic from one provider to another is usually routed via the US, further burdening the already congested international links. It also means that it can be quicker to access information from overseas than it is to get local information. To counter this, the PLDT proposed a local Internet exchange to the 15 ISPs that had their own gateway to the Internet. Internet exchanges have been successfully used in other countries to make more efficient use of available bandwidth and consist of an interconnection or access point that allows ISPs to exchange local traffic. Five ISPs – [Infocom](#), [IPhil](#), [MosCom](#), [Virtualink](#) and [WorldTel Phil](#) – have since joined the Philippine Internet Exchange (PHIX), which links their facilities at PLDT's network centre in Manila.

Another Internet Exchange, operated by PHNET, is open to all ISPs that have their own international links. It operates on bilateral peering rather than the multilateral peering followed by the PLDT PHIX. Thus, every qualified ISP can drop their own leased line in the PHNET IX, connect to the PHNET router, and have a bilateral peering agreement with the other ISPs of their choice. PHNET merely provides a neutral place for peering to take place.

Another significant co-operative project has been the formation of the [Philippines Internet Service Organisation \(PISO\)](#), an industry body for ISPs. PISO was formed in mid-1996 with an initial 30 members and has since responded to a number of issues affecting Internet in the Philippines.

One of the most contentious of these is the introduction of metered calls for local telephone service, which is being considered by the NTC following a submission by PLDT. One of the main arguments for local call metering, and the extra revenue it is expected to generate, is that international call rates are dropping and these have traditionally subsidised local rates. However, like other carriers elsewhere in the world, PLDT also claims that the Internet puts extra load on its network due to the longer average call length of users. In response, PISO says that metered calls will inhibit the fledgling Internet sector and its promise as an affordable tool that might allow the Philippine information technology sector to catch-up. As a result, it proposed that the NTC defer metering until carriers have demonstrated that their billing systems can cope with the new system and put on hold any rate increases that will adversely affect the nascent Internet industry.

PISO has also taken a position against censorship of the Internet and is in favour of self-regulation for the industry.

Finally, it should be recognised that a lot of the current Internet industry draws on the experience of earlier bulletin board systems (BBSs) and distributed networks such as Fido, which were previously very active in the Philippines. Many of these low-cost systems still exist and have gateways into the Internet itself, making this form of networking technology a useful adjunct. The [Philippine Cybernet Association \(CyberPhil\)](#), a non-profit organisation formed in 1995, aims to continue the work of the former Philippine Fidonet. Its stated goal is the establishment of a low-cost nationwide network that provides access to the world through international Fidonet and the Internet. CyberPhil has a gateway to the Internet and uses Fido technology to transmit email-only to and from various BBSs to the CyberPhil gateway. It uses a UUCP connection to transmit between the gateway and the Internet. CyberPhil also operates a free Internet e-mail to fax service through its volunteers.



There are a number of other organisations that specialise in low-cost access, including walk-in Internet centres in the cities and some regional areas, and email-only providers. The Email Center, which has been offering networking services since 1992 and which is an Association of Progressive Communications (APC) partner, is also well known for offering low-cost services, particularly to the Philippine NGO community.



## PAN ACTIVITIES

The Pan Asia node of the Philippines is known as [PINS Philippines](http://www.pins.ph.net/tabooan) and its URL is [www.pins.ph.net/tabooan](http://www.pins.ph.net/tabooan). PAN Information Networking and Services Philippines (PINS Philippines) is a five-year project that will allow local organisations involved in social and development issues to put their resources on-line and exchange information with others in the region. The PINS Philippines server will be one of a number of regional information nodes containing unique content that is combined within the Pan Asia framework.

The initial PINS Philippines content partners are Approtech Asia, Philippines Business for Social Progress (PBSP), [Micro Impacts of Macroeconomic Adjustment Policies \(MIMAP\)](#), the Corporate Network for Disaster Response (CNDR), and the APEC Senior Women Leader Network. Technical assistance is provided by the Philippines Department of Science and Technology's Philippine Council for Health Research and Development ([DOST-PCHRD](#)), which is jointly leading the project with Approtech Asia.

While each of the content partners involved has a distinctive area of expertise, they also have some essential common elements, in that each group is a Philippines-based NGO with partners in other Asian countries; promotes the objectives of sustainable and equitable development; and has access to the necessary communications infrastructure and trained personnel.

Each of the PINS members will provide a key component of what is hoped will be an "information village" on social development, using the Internet and the World Wide Web as the means to exchange the information with others, both in the Philippines and regional partners in Asia and the rest of the world.

The first year of the PINS Philippines project, 1996, involved strengthening the technology base of Approtech Asia and selecting the other content providers.

Now in the second year, PINS Philippines members have already undergone training in HTML and the other technical formats that are necessary to create a presence on the World Wide Web. Each organisation already has the equivalent of an electronic brochure on the web and is now preparing the specialised information that will form the basis of the site.

In terms of content, each of the organisations has a unique angle. Approtech Asia is a regional network of institutions and individuals in eleven countries whose goal is the promotion and transfer of appropriate technology for the benefit of poor rural communities in the region. Philippine Business for Social Progress (PBSP), an organisation with more than 25 years experience in development work, promotes the concept of "corporate citizenship" by the business community in the Philippines and the Asia-Pacific. Micro Impacts of Macroeconomic Adjustment Policies (MIMAP), another IDRC-funded project, has developed models for determining the impact of macro economic policies on different sections of the population, which it hopes to share with similar organisations in the region. While the Corporate Network for Disaster Response, formed in 1990 as a response to the *Baguio* earthquake, will bring with it hard-earned research and experience in disaster prevention and management.

Through the project funding, Approtech Asia has hired an information network manager who will lead the way in content development and, in conjunction with DOST-PCHRD, provide support and training to relevant people in the other organisations. Each of the partners already has people in place to handle the different tasks associated with publishing online, including creative, content, and technical personnel. The project grant also provided funds for a Sun Netra server, to be managed by DOST-PCHRD, that will host the PINS-Philippine web site, while DOST-PCHRD will provide free dial-up access to the Internet for each of the content partners.

### [Philippines Wide Web](#)

[Read about the spread of Internet access throughout the Philippines in Pan Asia Networking's Asian Network Updates](#)



## CONTENT INITIATIVES

There is a recognition in the Philippines that content initiatives are needed to promote the local Internet industry and allow it to become less reliant on overseas sources of information. A growing number of these initiatives are already underway.

The [Philippine Council for Health Research and Development \(PCHRD\)](#), one of five councils within DOST, is involved in a number of these along with the PINS Philippines project. Following a three-year grant from IDRC in 1987, PCHRD was able to create a series of local databases for the health research community. These and other related databases are now accessible through its Health Research and Development Information Network (HERDIN). PCHRD is also the national node and regional secretariat for the Asia Pacific Information Network on Medicinal and Aromatic Plants (APINMAP), a 14-country network that aims to develop resources and facilitate research into local medicinal and aromatic plants. The DOST web site also has links to many government departments, universities, institutions and other national organisations.

[The Filipinas Heritage Library](#) is planning to disseminate its collection of materials via the Internet in future. The library began as a donation of materials from the **Ayala Corporation**, one of the biggest business groups in the Philippines, in 1974. It is now positioning itself as an electronic research centre

linked to local and foreign libraries. The library offers public Internet access through its BiblioTech Internet Cafe in Manila, and its web site also includes an on-line bookstore dedicated to Philippine books, music, and multimedia.

[EDInet](#), also owned by Ayala in conjunction with Singapore Network Services (SNS), specialises in electronic document interchange (EDI) products. EDI is a standard way of transferring business documents used in trading, especially for customs, shipping and other forms. EDInet has created a number of EDI products and specialises in electronic commerce.

The other main content initiatives come from the ISPs themselves, with many providing local news, entertainment guides and links to Philippine websites. In addition, a number of local search engines have been developed to track Philippine websites, such as [Yehey](#), a local version of the popular Yahoo search facility that lists thousands of Philippine sites in a well organised format. Some of the better sites for local information are contained in the Site List section that follows.

## OTHER PROJECTS

Other major government policy specifically relating to the information technology section includes the Science and Technology Agenda for National Development, or STAND Philippines 2000. STAND was approved by President Ramos in 1993 and contains a series of measures aimed at leading the Philippines towards becoming a newly industrialised country (NIC) by the end of the century. Part of that strategy is the utilization of emerging technologies, such as information technology, and increased private sector participation in utilizing such technologies. The program is promoted by DOST but is intended to be implemented by a network of institutions in private industry and other government departments, academe, and NGOs.

In February 1998, President Ramos launched IT21 Philippines, the I.T. Action Agenda for the 21st Century. The document was prepared by the National Information Technology Council, now chaired by the Secretary of Science and Technology and co-chaired by a private sector representative. At the same time the President also created the E-Commerce Board, chaired by the Secretary of Trade and Industry, which will formulate recommendations and guidelines to speed up E-Commerce applications in the country.

Another project is the [Science and Technology Advisory Council \(STAC\)](#), an organizational network sponsored by the Department of Foreign Affairs, which has the goal to use expatriate human resources in key development programs of the

Specifically, STAC can advise agencies on the scientific and technological merits of particular programs and projects; transmit relevant information from journals and research papers; and arrange volunteer consultancy work in particular Philippine-based projects. A chief component of STAC will be the proposed STACnet project, which aims to establish an electronic network that will facilitate e-mail and Internet node access to help fulfill the goals of STAC. STACnet also has a number of discussion lists available where members can discuss relevant issues.

At the APEC level, the Philippines initiated the establishment of the APEC Centre for Technology Exchange and Transfer for Small and Medium Enterprises (ACTETSME), which is located at the University of the Philippines at Los Banos, Laguna. ACTETSME provides information on small and medium enterprises to clients and interested individuals and institutions through the use of the Internet.

In May 1998, the Department of Transportation and Communications, in cooperation with the Canadian International Development Agency (CIDA), sponsored the first Philippine Information Infrastructure Conference. The conference addressed four issues that are currently under study: Interconnectivity of Networks and Universal Access; Information and Knowledge Access; Government Use of Information and Communication Networks; and Regional and International Connectivity for the PII.



## **SITE AND CONTACT LISTS**

### CyberTambayan

*Local content site of DPSI, an ISP, multimedia developer, and Apple reseller.*

[www.cybertambayan.com](http://www.cybertambayan.com)

### PINS-Philippines

*The Pan Asia Philippine information server.*

[www.pins.ph.net/tabooan](http://www.pins.ph.net/tabooan)

### EDInet

*Information about electronic document interchange (EDI) products.*

[globe.com.ph/~edi001/](http://globe.com.ph/~edi001/)

### DOST

*Contains a good collection of links to govt, institutions, universities, and other Philippines sites.*

[www.dost.gov.ph](http://www.dost.gov.ph)

### Filipinas Heritage Library

*Details of the library plus an on-line bookstore of Philippine literature.*

[www.fillib.org.ph](http://www.fillib.org.ph)

### Evoserve

*The web site of ISP Evoserve, which includes the EDSA local search facility for Philippine web pages and email addresses, as well as a job listing site and other local resources.*

[www.evoserve.com](http://www.evoserve.com)

### Philippine Council for Health Research and Development

*Contains the Herdin and Apinmap databases and links to other health related and general sites within the Philippines*

[www.pchrd.dost.gov.ph](http://www.pchrd.dost.gov.ph)

### Philippine Computer Society

*Information about the activities of the Philippine Computer Society*

[www.worldtelphil.com/~pcs](http://www.worldtelphil.com/~pcs)

### Philippine Internet Commerce Society

*Details on the society and its aims*

[www.infotech.com.ph/pics.htm](http://www.infotech.com.ph/pics.htm)

### Philippine Cybernet Association

*Details of Cyberphil's activities*

[www.cyber.org.ph/cyber/](http://www.cyber.org.ph/cyber/)

### Philippine Java Users Group

*FAQ and contact details of PHILJUG*

[www.philjug.org](http://www.philjug.org)

### Philippine Internet Service Organisation

*Information on PISO's charter, list of members, and views on the industry*

[www.piso.org.ph](http://www.piso.org.ph)

### The Sky I-site

*An information site presented by Sky Internet, which draws on the resources of Sky Cable television to bring up to date local news and information.*

[www.sky-isite.net](http://www.sky-isite.net)

### Sentro

*A site from Web Philippines that aggregates a lot of local content and includes around 2500 local sites. Categories include new sites, government and laws, education, business, arts and entertainment which are further broken down into several sub-categories.*

[www.sentro.com](http://www.sentro.com)

### Yehey

*A local search engine along the lines of Yahoo.*

[www.yehey.com](http://www.yehey.com)

## CONTACT LIST

### Asian Development Bank

6 ADB Avenue, Mandaluyong

Metro Manila

Tel: 632-4444

Fax: 636-2444

Email: [www@mail.asiandevbank.org](mailto:www@mail.asiandevbank.org)

Web: [www.asiandevbank.org](http://www.asiandevbank.org)

### Approtech Asia

Philippines Social Development Centre Bldg

Magallanes corner Real Street

Intramuros, Manila

Tel: 527 6514

Fax: 527 3744

### Dept of Science and Technology

General Santos Avenue

Bicutan, Tagig

Metro Manila

Tel: 837 2071

Fax: 837 3161

Web: [www.dost.gov.ph](http://www.dost.gov.ph)

### Corporate Network for Disaster Response

A Soriano Aviation Hangar

Andrews Ave, Pasay City

Tel: 834 0873

Fax: 833 8681

### Iphil Communications (ISP)

Penthouse

V.A. Rufino Building

Ayala Avenue

Makati City

Tel: 893 0850

Email: [info@iphil.net](mailto:info@iphil.net)

Web: [www.iphil.net](http://www.iphil.net)

### EMail Center

108 V.Luna Road Extension

Sikatuna Village 1101

Quezon City

Tel: 921 5165

Fax: 433 1133

Email: [rverzola@phil.gn.apc.org](mailto:rverzola@phil.gn.apc.org)

Infocom (ISP)

2<sup>nd</sup> Floor, Trafalgar Plaza  
Delacosta St, Salcedo Village  
Makati  
Email: [info@mnl.sequel.net](mailto:info@mnl.sequel.net)  
Web: [www.info.com.ph](http://www.info.com.ph)

G-Net (ISP)

20<sup>th</sup> Floor, BPI Paseo de Roxas  
Condominium Center  
Salcedo Village, Makati City  
Tel: 750 4638  
Email: [helpdesk@globe.com.ph](mailto:helpdesk@globe.com.ph)  
Web: [www.globe.com.ph](http://www.globe.com.ph)

MIMAP

Rm 309, Neda sa Makati Bldg  
106 Amorsolo St  
Legaspi Village, Makati  
Tel: 857 385  
Fax: 816 1091

The Internet Society of the Philippines

G/F Suite 300, Island Plaza Building  
105 Alfaro St. Salcedo Village, Makati City  
Tel: 893 6695  
Fax: 893 6696  
Email: [members@webkard.com](mailto:members@webkard.com)  
Web: [www.webkard.com](http://www.webkard.com)

National Telecommunications Commission

NTC Building  
BIR Road, near East Avenue  
Quezon City  
Email: [ntc@mail.ph.net](mailto:ntc@mail.ph.net)  
Web: [max.ph.net/~ntc](http://max.ph.net/~ntc)

Mosaic Communications (Moscom) (ISP)

Suite 2103, The Peak Tower  
107 Alfaro Street, Salcedo Village  
Makati City  
Tel: 810 1760  
Fax: 840-4434  
Email: [info@mozcom.com](mailto:info@mozcom.com)  
Web: [www.mozcom.com](http://www.mozcom.com)

Philippine Business for Social Progress  
Philippines Social Development Centre Bldg  
Magallanes corner Real Street  
Intramuros, Manila  
Tel: 527 7741  
Fax: 527 3740

Ph Domain Names  
C/o E-Mail Company  
PO Box 12054  
Ortigas Center Post Office  
Pasig, Metro Manila  
Tel: 631 2909  
Fax: 632-7319  
Email: [jd@fc.emc.com.ph](mailto:jd@fc.emc.com.ph)  
Web: [www.hypertech.com.ph/phdomain/](http://www.hypertech.com.ph/phdomain/)

Philippine Network Foundation (PHNET)  
Unit 112, Chateau Verde Condominium  
Gate 2, Valle Verde I, E. Rodriguez Jr, Ave.  
Pasig City, Metro Manila  
Tel: 6718046  
Fax: 671 8047  
Email: [info@ph.net](mailto:info@ph.net)  
Web: [www.ph.net](http://www.ph.net)

Philippines Institute for Development Studies  
Neda sa Makati Bldg  
106 Amorsolo St  
Legaspi Village, Makati  
Tel: 857 385  
Fax: 816 1091  
Web: [www.pids.gov.ph](http://www.pids.gov.ph)

Science Technology Advisory Council  
Department of Foreign Affairs, 9/F DFA,  
Roxas Boulevard, Metro Manila.  
Tel: 8343100  
Fax: 8341451  
Email: [uoffice@attmail.com](mailto:uoffice@attmail.com)  
Web: [www.europa.com/~jra/stac/](http://www.europa.com/~jra/stac/)



WorldTel Philippines (ISP)

118 Gamboa St, Legaspi Village

Makati City

Tel: 840 4166

Fax: 894 5083

Email:[info@worldtelphil.com](mailto:info@worldtelphil.com)

Web: [www.worldtelphil.com](http://www.worldtelphil.com)

Virtualink (ISP)

Suite 1102, One Magnificent Mile Condominium

13 San Miguel Avenue, Ortigas Center

Pasig City, Metro Manila

Tel: 637 5626

Fax: 637 5631

Email:[sales@v-link.net](mailto:sales@v-link.net)

Web: [www.v-link.net](http://www.v-link.net)

Copyright International Development Research Centre, 1998

All Rights reserved. No part of this web site may be reproduced, stored in a retrieval system or transmitted, in any form or by any means, electronic, mechanical, photocopying, or otherwise, without the prior permission of the International Development and Research Centre.

The material in this Yearbook has been peer-reviewed by in-country resource persons. The views expressed are those of the writers and do not necessarily reflect those of the International Development Research Centre.

Cite as follows :

The Pan Asia Networking Yearbook (1998).

Singapore: Asia Regional Office, International Development Research Centre.

[On-line serial, subscriber-based : <https://www.panasia.org.sg/ecomsec/bookshelf/user/webdriver>]

*(Date of publication : October 12<sup>th</sup> 1998)*

## **Abstract**

*At the heart of Singapore's push to become an "Intelligent Island" is its nationwide broadband network, Singapore ONE. The backbone of the network uses state-of-the-art asynchronous transfer mode (ATM) switches connected via fibre-optic trunks that thread through the central business districts and residential neighbourhoods.*

---

## **Singapore**

By Geoff Long



## **OVERVIEW**

The Republic of Singapore is an island nation with a population of around three million. Despite its small size and population, Singapore is one of the most technologically advanced countries in the region and is positioning itself, in competition with Hong Kong, Taiwan, and others, as the region's information hub.

The population is made up primarily of three groups – Chinese, Malay, and Indian – with official languages from each group plus English. Malay is the national language and English the language of administration. Mandarin is being promoted as the official language among the Chinese community in place of other Chinese dialects.

Singapore's economy has grown rapidly in recent years and the country is now ranked as one of the region's largest investors.

In recent years it was among the top three foreign investors in Malaysia, Vietnam, Indonesia, and the Philippines and is also a major player in Thailand and China.

More recently, the government has pushed information technology as the key to Singapore's future success. As part of that push, the [National Computer Board](#) released its "IT2000 – A Vision of an Intelligent Island", a masterplan for the introduction of IT into every aspect of Singaporean society. Initiatives such as the Singapore ONE broadband network are part of IT2000 and aim to turn the country into an IT hub.

Telecommunication liberalisation measures have also been announced to end the monopoly of Singapore Telecom in the public network. TAS will award up to two more licences for local and international services this year, with operations to commence from 1<sup>st</sup> April 2000.



## REGULATORY ENVIRONMENT

The Singapore government has adopted a relatively hands-on approach to regulating the Internet, particularly in relation to content, which is in keeping with its regulatory approach to broadcast and print media. The main organisations for regulating the Internet are the [Singapore Broadcast Authority \(SBA\)](#) and the [Telecommunications Authority of Singapore \(TAS\)](#). In addition, the National Internet Advisory Committee (NIAC) was formed as an advisory body to advise on regulation and the development of the Internet industry.

Basically, TAS is the body that regulates the provision of the network while SBA is the body that regulates content on the Internet (and other media). Prior to 1995, Singapore Telecom's [SingNet](#) was the only commercial ISP licensed by TAS to provide commercial Internet services. Limited competition was introduced in 1995 when TechNet, a non-commercial provider established by the National Science and Technology Board, was privatised and renamed [Pacific Internet](#). A third ISP, [Cyberway](#), was licensed in 1996. In October 1998, TAS announced that any interested party can apply for an ISP licence. The duration of the licence will be five years and will attract a one-time fee of \$450,000 and an annual recurrent fee of one per cent of gross turnover. Each ISP will also be required to execute a \$1 million performance bond, which suggests that any new players will have to have significant resources behind them.

The market for reselling Internet services has been opened up somewhat, although resellers are subject to set conditions in areas such as price. TAS also permits the carriage of Internet fax and voices services if they are provided as an Internet application and not a separate telecommunication service. Phone to phone Internet telephony for non-Internet subscribers is not allowed.

Singapore is also one of the few countries in the world that has minimum quality of service (QoS) requirement for Internet providers. ISPs are required to have their network running for more than 98 per cent of the time and there are fines – which have been applied by TAS in the past – for non-compliance.

The SBA regulates both Internet Service Providers (ISPs) and Internet Content Providers through the Internet Class Licence Scheme, which forces all providers and resellers to follow the SBA's Internet Code of Practice. Under the obligations of the code, Internet providers are required to deny access to sites that have been prohibited by the SBA. All sites must go through the ISP's proxy server, which can then be used to block access. ISPs must also deny access to newsgroups, chat areas, and other areas if it is likely to contain prohibited material. Prohibited material is defined as material that is objectionable on the grounds of public interest, public morality, public order, public security, national harmony, or is otherwise prohibited by Singaporean laws.



## INTERNET CONNECTIVITY

At the heart of Singapore's push to become an "Intelligent Island" is its nationwide broadband network, [Singapore ONE](#). The backbone of the network uses state-of-the-art Asynchronous Transfer Mode (ATM) switches connected via fibre-optic trunks that thread through the central business districts and residential neighbourhoods. ATM networks can carry all types of traffic including voice, data, and video as well as IP (Internet) traffic. The Singapore ONE backbone can transport data at throughputs of up to 622Mbps and uses switched virtual circuits (SVCs) to offer connections on demand of between 45Mbps and 155Mbps. Access to the network for individual users will be via asymmetric digital subscriber line (ADSL) modems and hybrid fibre-coaxial (HFC) cable modems, both of which can deliver Internet access at bandwidths of 2Mbps or better. Officials claim that the network is available to 9 out of 10 homes. A network of terminals, or Internet kiosks, will also be installed in public places throughout the island, many of which are currently available in libraries, community centres, and schools.

The Singapore ONE backbone is operated by a consortium called 1-Net Singapore, whose members include many of the main communication interests in Singapore: SingTel, Singapore Cable Vision (SCV), Singapore Communications Investments (a subsidiary of the TAS), and ISPs Cyberway and Pacific Internet.

At the launch of Singapore ONE on the 3rd June 1998, a range of applications intended to exploit the broadband capabilities of the network were available following pilot testing from around 10,000 users. Applications are in areas such as Internet banking, electronic commerce, distance learning, and video on demand.

The push for Singapore ONE has come from the public rather than private sector, with an estimated \$150 million spent on the project by the government leading up to its launch, and further plans to finance application development to ensure a critical mass of users. Government agencies behind the project are primarily the [National Computer Board](#), the [National Science & Technology Board](#), the [TAS](#), the [Economic Development Board](#), and the [Singapore Broadcasting Authority](#). These agencies will partner with private sector companies to continue development of Singapore ONE. By the end of 1999 the government wants to have 100,000 users connected to the network.

The [Singapore Advanced Research and Education Network \(SingAREN\)](#) is a virtual private network utilising Singapore ONE to provide a broadband network for academic and research organisations. Within Singapore the network links the two universities and several local research organisations. SingAREN also has a 14Mbps link to the US, where it is connected to the vBNS (very high performance Backbone Network Service), and a 2Mbps link to Japan, where it connects with various R&D networks. SingAREN was setup and funded by the National Science and Technology Board (NSTB) and the TAS.

The three commercial ISPs – [SingNet](#), [Pacific Net](#), and [Cyberway](#) – had approximately 270,000 dial-up subscribers at the end of 1997. Including corporate and academic users, the total number of Internet users in Singapore is estimated to be around 380,000. The three ISPs equally share a 45Mbps (T3) link to the US, located at the Singapore Telecom Internet Exchange (STIX), and each has its own international bandwidth as well. In October, Singapore and China signed a memorandum understanding

to set up a direct 2Mbps link between the two countries, the cost of which will be shared between the 3 ISPs. Each of the ISPs is connected to each other via Singapore ONE, which replaces the 2Mbps links that were previously in place.

STIX has an additional 45Mb link that is used by its regional customers and SingNet. Some 15 regional ISPs connect to the Singapore Internet exchange, which has links to Brunei, India, China, Bangladesh, Pakistan, Cambodia, Philippines, Malaysia, Indonesia, Taiwan, Australia, Korea, Nepal, Sri Lanka, and Japan.

Pacific Internet is a shareholder in the A-Bone regional Internet hub, which links 9 Asian countries. It has a 4Mb link to the A-bone hub in Japan and additional links to the US. Pacific Internet also has a regional presence, with Internet operations in Hong Kong, the Philippines, and Indonesia.

Cyberway also provides the Internet bandwidth, a 2.5Mbps link, for Singapore Cable Vision's (SCV's) cable modem service. The cable Internet service utilises SCV's hybrid-fibre coaxial (HFC) network that delivers cable television. The service is still in a trial-phase and its rollout is not yet complete. Currently 1500 users are connected, with an estimated 5000 to be connected by the end of the year.

In competition with the cable modem service is Singapore Telecom's asynchronous digital subscriber line (ADSL) technology, which each of the ISPs is offering to individual and corporate users.



## PAN ACTIVITIES

Singapore is the base IDRC's Asian operations and home of the [Pan Asia Networking web site](#), which has links to many research and development resources as well as up-to-date information on PAN projects throughout the region. The Singapore office responds to the needs of Southeast and South Asian countries from India to the Pacific Islands.

Resources on PAN and IDRC activities and from the Centre's library are available, as well as information on IDRC research programs throughout Asia. The PAN website hosts Asian R&D information and resources from many partner institutions and organizations and is used as a "one-stop location" by researchers. The centre also hosts regular workshops and training courses.



## CONTENT INITIATIVES

Singapore has a wide and varied selection of Internet sites and funding for further innovative content is being provided as a result of the Singapore ONE project. Every government ministry and department now has its own website and is accessible via the [Singapore government web site](#). The site has information on all aspects of the government, relevant country data, and an index of online government services. For an introduction to Singaporean culture and various local sites of interest, the Singapore Internet Community (Sintercom) has a well established forum providing news, views and information. It also has archives of the soc.culture.singapore newsgroup.

[NetNet](#) is a local search engine that has an index of some 200,000 web sites in Singapore as well as sites grouped under various categories.

Each of the three ISPs also aggregates content, with SingNet having the most comprehensive listing, while [Nanyang Technological University](#) also has an up-to-date directory. Another useful resource is the [Singapore ONE site](#), which showcases the sites and applications developed for this broadband network.

Technonet Asia, a regional organization promoting the efficiency and competitiveness of small micro and medium enterprises (SMME), has research and resources pertaining to SMMEs and a good collection of links. Technonet is a PAN information partner. Many other PAN information partners are available through its Singapore-based "mother" website.

## OTHER PROJECTS

Singapore is also the centre for a number of regional bodies involved with Internet governance and infrastructure issues. One of the most influential bodies has been the [Asia Pacific Networking Group](#)(APNG), which is dedicated to the advancement of networking infrastructure and the research and development of all associated enabling technologies.

APNG has also spun off several other Asia Pacific organizations, such as the Asia Pacific Network information Centre (now located in Australia); the Asia Pacific Policy and Legal group; the [Asia Pacific Internet Association](#); and the annual Asia Pacific Regional Internet Conference on Operational Technologies (APRICOT).



## SITE AND CONTACT LISTS

### Asia Pacific Centre for Environmental Law

*Database of material on environmental law in ASEAN countries*

[sunsite.nus.sg/apcel/](http://sunsite.nus.sg/apcel/)

### Asian Mass Communication Research and Information Centre

*Long-standing regional research organisation*

[irdu.nus.sg/amic](http://irdu.nus.sg/amic)

### Asia Pacific Networking Group

2D Ayer Rajah Crescent #07-01

AOS Building

Singapore 139938

T: 779 6692

F: 7771132

E-mail: [apng-sec@apng.org](mailto:apng-sec@apng.org)

Website: [www.apng.org](http://www.apng.org)

### Asia Pacific Internet Association

7th Floor, RELC Building

30 Orange Grove Rd

Singapore 258342

T: 738 6929

F: 738 7839

E-mail: [apia-inquiry@apia.org](mailto:apia-inquiry@apia.org)

Website: [www.apia.org](http://www.apia.org)

### Cyberway (ISP)

82 Genting Lane

News Centre

T: 843 4800

F: 841 1653

Website: [www.cyberway.com.sg](http://www.cyberway.com.sg)

### Centre for Environment, Gender and Development (ENGENDER)

49 Tao Payoh Rise

Singapore 298105

T: 258 3022

F: 227 7897

E-mail: [info@engender.org.sg](mailto:info@engender.org.sg)

Institute of Southeast Asian Studies

*Research centre for scholars of modern Southeast Asia*

[merlion.iseas.ac.sg](http://merlion.iseas.ac.sg)

Economic Development Board

250 North Bridge Rd #24-00

Raffles City Tower

Singapore 179101

T: 336 2288

F: 339 6077

Website: [www.sedb.com.sg](http://www.sedb.com.sg)

Nanyang Technological University

Nanyang Avenue

T: 791 1744

F: 791 1604

[www.ntu.edu.sg](http://www.ntu.edu.sg)

Kent Ridge Digital Labs

*Newly formed national applied research and development organisation*

[www.krld.org.sg](http://www.krld.org.sg)

National Science and Technology Board

*Information on R&D initiatives*

Website: [www.nstb.gov.sg](http://www.nstb.gov.sg)

National Computer Board 71 Science Park Drive

NCB Building

Singapore 118253

T: 778 2211

F: 778 9641

Website: [www.ncb.gov.sg](http://www.ncb.gov.sg)

Pacific Internet (ISP)

89 Science Park Drive

#0409/12 The Rutherford

Singapore Science Park

T: 872 5055

F: 872 6347

Email: [info@pacific.net.sg](mailto:info@pacific.net.sg)

[www.pacific.net.sg](http://www.pacific.net.sg)



National University of Singapore

10 Kent Ridge Crescent

T: 775 6666

F: 778 6371

[www.nus.edu.sg](http://www.nus.edu.sg)

SEAMEO Regional Language Centre

30 Orange Grove Rd

Singapore 258342

T: 737 9044

F: 734 2753

E-mail: [srelc@singnet.com.sg](mailto:srelc@singnet.com.sg)

PAN Asia Networking

International Development Research Centre

Asia Regional Office

Tanglin PO Box 101

Singapore 912404

T: 235 1344

F: 235 1849

E-mail: [PanAsia@idrc.sg](mailto:PanAsia@idrc.sg) Website: [www.panasia.org.sg](http://www.panasia.org.sg)

Singapore Network Information Centre (SGNIC)

71 Science Park Drive

NCB Building

Singapore 118253 T: 772 0477

F: 774 7525

Website: [www.nic.net.sg](http://www.nic.net.sg)

Singapore Broadcasting Authority

*Regulator of Internet Content*

Website: [www.sba.gov.sg](http://www.sba.gov.sg)

Technonet Asia

291 Serangoon Rd

#05-00 Serangoon Rd

Singapore 218 107

T: 291 2372

F: 292 2372

E-mail: [ansmed@singnet.com.sg](mailto:ansmed@singnet.com.sg)

SingNet (ISP)

20 Pickering St

#32-00 Pickering Operations Complex

T: 838 3899

F: 535 8191

Email: [sales@singnet.com.sg](mailto:sales@singnet.com.sg)

[www.singnet.com.sg](http://www.singnet.com.sg)

Telecommunications Authority of Singapore

*Singapore's telecommunications regulator*

Website: [www.tas.gov.sg](http://www.tas.gov.sg)

Copyright © International Development Research Centre, 1998

© All Rights reserved. No part of this web site may be reproduced, stored in a retrieval system or transmitted, in any form or by any means, electronic, mechanical, photocopying, or otherwise, without the prior permission of the International Development and Research Centre.

The material in this Yearbook has been peer-reviewed by in-country resource persons. The views expressed are those of the writers and do not necessarily reflect those of the International Development Research Centre.

Cite as follows :

The Pan Asia Networking Yearbook (1998).

Singapore: Asia Regional Office, International Development Research Centre.

[On-line serial, subscriber-based : <https://www.panasia.org.sg/ecomsec/bookshelf/user/webdriver>]

*(Date of publication : October 12<sup>th</sup> 1998)*

## **Abstract**

*In general, most Sri Lankan ISPs (Internet Service Providers) belong to large parent organizations and the requirement for a licence payment of Rs 3 million has kept a lot of potential small players out of the market. According to some observers, smaller ISP's would be better suited to starting up in regional or niche markets, which to date have largely been ignored in Sri Lanka.*

---

## **Sri Lanka**

By Geoff Long



### **OVERVIEW**

Formerly known as Ceylon, the island of Sri Lanka is located just below the Indian subcontinent. It is only 66,000 sq km in size but home to 18 million people. The country obtained independence in 1948 and became a republic in 1972. Prior to 1948 it had been colonized by the British, who took over from the previous Dutch and Portuguese colonizers.

The majority of the population (74 percent) are Sinhalese, predominantly Buddhist. The second largest group are the Tamils, which make up around 20 per cent of the population. The civil war that has been going on in Sri Lanka for the past decades is largely between the separatist Tamils in the East and the North and the Government forces. Other ethnic groups include Muslims, Chinese, Burghers (Eurasians descendant from the Portuguese and the Dutch) and the indigenous Veddahs.

The country is noted for its varied landscape, which includes hill country, coastal plains, rainforest, and an arid dry zone. This landscape is home to an equally diverse range of flora and fauna. The economy is mainly agriculture-based, with finished garments being the largest foreign exchange earner, followed by tea exports.

Telecommunications are dominated by Sri Lanka Telecom, which still has a monopoly on providing international services until 2002. In the domestic sector, limited competition was introduced to satisfy unmet demand. Two companies, Lanka Bell and Suntel, entered the telecommunications market in 1996, however both are restricted to providing local services via wireless technologies only. Both Suntel and Lanka Bell must install 100,000 lines each by the year 2000 to satisfy the licence requirements put forward by the Telecommunications Regulatory Commission.

Telecommunications in the war-torn northern regions of the country are severely limited and strictly controlled for security reasons. In recent years the government has actively promoted information technology as a way of boosting the economy. 1998 was officially named IT Year and the government is pushing this sector as a major development area. The Computer and Information Technology Council (CINTEC), the main body for promoting IT&T, has used IT Year to successfully lobby the government for some concessions. These include the removal of duty and turnover tax on computers and related products, and incentives for the industry, although individual customers still have to pay a 12.5 per cent goods and services tax (GST) when buying PCs and related products from vendors.



## REGULATORY ENVIRONMENT

Telecommunications and Internet are regulated by the Telecommunications Regulatory Commission. Licence conditions are laid out in the Sri Lanka Telecommunications (Amendment) Act, No. 27 of 1996. Internet Service Providers (ISPs) must pay a one-time licence fee of Rs. 3 million as well as an annual fee equivalent to one per cent of annual gross turnover (Minimum of Rs. 100,000). Licence holders are not allowed to build their own infrastructure but are required to use the infrastructure of other licensed operators. However, some ISPs have successfully applied for licences to build their own networks.

To date, the regulator has refrained from trying to control other Internet conditions, such as content.

CINTEC is responsible for advising the government on IT matters and implements government policy. It has also set up a National EDI (Electronic data interchange) Committee and an IT Law Centre. The .lk country top-level domain is administered from the University of Moratuwa.



## INTERNET CONNECTIVITY

The Internet sector has expanded significantly in Sri Lanka in the past year, with the resulting competition causing access prices to fall dramatically and many ISPs to suffer falling profit margins. There are currently eight licensed Internet Service Providers in Sri Lanka and many more value-added resellers, although only an estimated 12,000 users by June 1998.

Commercial Internet services began in Sri Lanka through Lanka Internet Service in 1995. Prior to this the University of Moratuwa had a UUCP connection to Stanford University in the US that provided e-mail services to a number of Sri Lankan universities. The eight licensed ISPs currently in operation are Sri Lanka Telecom Internet (SLT Internet), ITMIN Internet, Pan Lanka Networking, Lanka Communication Services, Lanka Internet Services, Ceycom, Electroteks, and Eureka. Others companies are also expected to start up following government advertisements in the mainstream press calling for potential new entrants. In general, most of the ISPs belong to large parent organisations and the requirement for a license payment of Rs 3 million has kept a lot of potential small players out of the market. According to some observers, smaller ISPs would be better suited to starting up in regional or niche markets, which to date have largely been ignored in Sri Lanka.

Due to its monopoly status in telecommunications, SLT Internet has quickly become one of the largest ISPs in terms of coverage, although many people are suspicious about the company's ability to offer good customer service, having had bad experiences with Sri Lanka Telecom in the past. Nevertheless, SLT Internet is a major player and has the largest international Internet capacity, with four links to the US that give a combined total bandwidth of about 1 Mbps. Another major player is Lanka Internet Services, which has taken advantage of its lead-time in the market to corner the largest share of users (approximately 3000). It has two international links, 128 kbs and 64kbs, both to the US.

Pan Lanka Networking [see Pan Activities section for more details], through its tie-up with Suntel, the country's second-largest telecommunications carrier, was the first ISP to offer ISDN-based Internet access. SLT Internet and other ISPs were expected to follow with similar services. ISDN services were first introduced by Suntel less than six months ago but have not been widely promoted. SLT has also recently announced that parts of its network are ISDN- ready, although the country's third carrier, Lanka Bell, does not yet offer the service. Under a joint agreement, Pan Lanka will be the exclusive Internet partner for Suntel for ISDN and lease line connections. Standard dial-up Internet connections will also be offered to all Suntel customers. Pan Lanka will provide the set-up free of charge and the two will jointly market services.

To offer the service, Suntel will provide Pan Lanka with 2 E1 lines initially, which will be configured to provide both dial-up ISDN connections and dedicated leased lines. Pan Lanka also has plans to set up a cyber cafe at one of Suntel's centers in Colombo.

One potential drawback is that Sri Lanka Telecom, which has a monopoly on international services until 2002, cannot provide international ISDN services until it upgrades its gateway. Services such as international video conferencing via ISDN, for example, are not possible.

Pan Lanka uses a 128 Kbps link to Singapore, which is provided by Lanka Communications Services, a joint venture between Singapore Telecom International and the Capital Development and Investment Company of Sri Lanka. Lanka Communications Services also provides Internet access but restricts its services to predominantly corporate and large clients and has no intention to offer basic dial-up services to the general public. Other services it offers include private networks, frame relay, international leased circuits, facilities management, and a packet-switched public data network. Its main locations are Colombo, Katunayake, Ratmalana and Kandy.

Two other large organizations are Eureka and Ceycom. Eureka is a subsidiary of Uniwalkers, a group of companies with interests in communications, media, hotels, packaging and ceramics. It is also the sole local agent for Japanese giants Matsushita Electronics and Daihatsu. Eureka has a direct 128Kbps link to the US via MCI.

Ceycom is part of the Ceylinco group, which has been part of Sri Lanka's financial sector for the last fifty years and has domestic and overseas interest in telecommunications, energy, finance, property and diamond processing. Ceycom also holds a licence to operate a domestic communication network using VSAT (very small aperture terminal) satellite technology. Its Internet and communication service is backed by Hughes Network Systems, Hong Kong-based Hutchison Corporate Access, and British Telecom. Ceycom's wider plans are to establish an island-wide data network using VSAT technology, which will be largely geared to the financial service sector. At present though, its network is mainly in Colombo and its main customer is the Seylon Bank, which is also a part of the Ceylinco group. Ceycom also has a number of content initiatives (see Content Initiatives section), including a joint venture with ITMIN to provide e-commerce services.

ITMIN is an interesting company in that it is a pilot project between the United Nations (UNDP/UNIDO), the government, and the private sector that was formed to provide business information as a commodity. The private sector (namely the Development Finance Corporation, National Development Bank, Lanka Ventures, Lanka Ceramic, and the Golden Key Credit Card Company) holds 51 percent of the company, while the remainder of the shares are held by the Board of Investment, the Export Development Board, and the Ceylon Institute of Scientific and Industrial Research. ITMIN Internet is one of three divisions, the others being ITMIN Training and ITMIN

Information (see Content Initiatives for more details). The company is heavily geared toward the investment and export sectors. It has a 64Kbps link to Sprint in the US.

Electroteks Network Services (ENS) is a Sri Lankan company formed in 1980 to manufacture electronics equipment. It now provides X.25 packet data services, as do Sri Lanka Telecom and Lanka Communications Services, and is the predominant provider of Data communications to the banking sector. ENS Internet has a 64kbps international satellite link to the UK to provide Internet services, which it operates through its own commercial earth station.

In the academic sector, the University of Moratuwa is a leading institution for technology and has a fibre optic network connecting most buildings on campus as well as a 10Mbps fibre link to the nearby Arthur C. Clarke Institute for Modern Technologies. Colombo University. The institution is also in the process of installing a fibre-optic campus-wide network and its Institute of Computer Technology is a major training institute. The University of Moratuwa first experimented with Internet in 1990, when it had a UUCP connection to Stanford University in the US. Other universities could then dial-up and also receive Internet mail, and a loose coalition of universities later formed the Lanka Academic Network (LACNet).

This has now evolved to become Lanka Education and Research Network (LEARN) and comprises seven universities and two research institutions. There are plans to connect the remaining learning institutions in the next couple of years. Each of the existing institutions is connected via a 64kbps leased line and six of the universities plan to move to 2Mbps links early in 1999, with funding provided by Swedish and agency SIDA.

LEARN started as informal body but was semi-formalised and is now a committee appointed by the University Grants Commission. There are plans to incorporate it next year. The network is still run on a cooperative model and expertise is shared between members, with training programs conducted every month. At present, LEARN is connected to the Internet through Sri Lanka Telecom but there are plans to have an independent link through funding from SIDA. There have also been talks with some commercial ISPs regarding the sharing of a link, highlighting the good relationship that exists between the academic and commercial sectors.

CINTEC has had discussions with various interest groups regarding the possibility of establishing an Internet exchange and is also looking at the issue of Tamil and Sinhalese characters for content. At present there is no standard that is widely used and there are many incompatibility issues. There has been a standard (ISO) code developed but it has not been implemented and there are still some bugs.



## PAN ACTIVITIES

Pan Lanka Networking is the PAN Internet node in Sri Lanka. IT is a joint venture between Canada's International Development Research Centre (IDRC) and Norway's Worldview International Foundation (WIF). WIF received funding for the project through the Norwegian Agency for Development Cooperation.

Since its launch on 5<sup>th</sup> April 1997, Pan Lanka Networking has forged a reputation as an innovator in bringing Internet services to Sri Lanka. It is the only organization to have a presence in the troubled city of Jaffna and it was the first ISP to offer mobile Internet services through a partnership with a mobile phone operator, Dialog GSM. Now it is leading the way in the corporate sector by being the first to offer ISDN Internet access in conjunction with telecommunications carrier Suntel.

In Jaffna, Pan Lanka has started a service that allows people without a computer or phone line to send mail to the south, as a basic letter to other parts of the island can easily take three weeks to deliver.

To send mail, the sender simply turns up with a handwritten letter with the address of the recipient written at the top of the page. It is then scanned into the computer and sent as an attachment to the office of Colombo. From there it is printed and sent to its final destination by standard post.

With no advertising, Pan Lanka is now delivering more than 20 handwritten letters a day, with overseas Sri Lankans also using the service to communicate with relatives in Jaffna and other parts of the north. Two special e-mail addresses, *jaffna@pan.lk* and *colombo@pan.lk*, are used to receive the mail.

The service is part of Pan Lanka Networking's goal to reach parts of the population that do not have access to communications technologies such as the Internet. However, while Pan Lanka has a clearly defined research and development focus, it is also a major player in Sri Lanka's corporate sector. In Colombo, Sri Lanka's main commercial centre, Pan Lanka has been successful in attracting a host of blue-ribbon clients including government departments, embassies, and the business sector.



## CONTENT INITIATIVES

ITMIN Internet, a pilot between the Sri Lankan government, the UNDP/UNIDO, and the private sector, has made a significant attempt at creating local content for the business sector. Some of its information resources include: a business intelligence unit that provides trade listing, recruitment matching, and information from a number of commercial databases; a reference library that can be accessed online; links to industry-wide information resources; and an online forum/conference section known as The Elephant Club. Most of the information is in the form of access to databases and services that must be purchased.

ITMIN is also a partner with Ceycom in an electronic commerce shopping mall known as Avakasa Kade. The mall - marketed by the Golden Key Credit Card Company and jointly hosted by ITMIN and Ceycom - offers some 1500 products and services as well as bill payment services.

Ceycom is also involved in a tie-up with Australian-based Cespa to mirror the Ceycom main web site in Australia. The site is said to be the only tri-lingual Sri Lankan site, with information in Sinhala, Tamil and English. It is one of a number of general sites that act as directories to Sri Lankan information. Many of the other ISPs also have a good collection of links. Some of the better general sites are Lanka Internet ([www.lanka.net](http://www.lanka.net)) - which hosts some popular local newspaper and

other media, the Ceylon Tourist Board, and a business directory - and the Sri Lankan web window (www.lk), also called the National web site, which has links in a number of categories including a comprehensive gateway to government departments.

Web terminal (lankaonline.com/terminal/) from Lanka Online has a directory and search facilities, while Pan Lanka Networking has a directory of sites as well as links to other Asian research and development organizations and the PAN Asia Networking program.

The National Science Foundation (formerly the Natural Resources Energy and Science Authority) has good links to local research papers and projects. Some of the research areas include topics such as forestry, environment, information technology, and agriculture. There are good links to other Sri Lankan research institutes as well.

TamilNet is a news and feature service that focuses on issues concerning Tamil people. It is not clear who is behind this service, which provides news reports from the war-torn north eastern parts of Sri Lanka as well as book reviews and conference proceedings on related issues. Kalaya, another site giving what itself proclaims is the "Sinhala Nationalist point of view", is published by Chintana Parshadaya.

The Lanka Academic Network (LacNet), is a non-profit organization that evolved from the Sri Lankan Network (SLNet), an e-mail discussion list that has news and information on Sri Lankan issues. LacNet aims to improve electronic communication within and outside the country as well as enhance educational facilities. Its web site has online editions of local newspapers, links to various academic institutions, a virtual gallery of Sri Lanka art, and information on various LacNet and SLNet supported projects.

## **OTHER PROJECTS**

One of Sri Lanka's most famous residents, science fiction writer Arthur C. Clarke, is also the patron of an Institute named in his honour. The Arthur C. Clarke Institute for Modern Technologies was started in 1984 by an Act of Parliament and aims to accelerate the introduction and development of modern technology in the field of communications, computers, energy, space technologies, and robotics through training and research. The institute is also engaged in research work related to satellite communications and remote sensing through a Space Application Centre.





## **SITE AND CONTACT LISTS**

### Avakasa Kade

*Online shopping mall*

[www.avakasakade.com](http://www.avakasakade.com)

### Arthur C. Clarke

Centre for Modern Technologies

*Information on the centre  
and its programs*

[www.naresa.ac.lk/instit/accmt.htm](http://www.naresa.ac.lk/instit/accmt.htm)

### Electroteks (ISP)

*Web site for ENS Internet*

[www.ens.lk](http://www.ens.lk)

### CINTEC

*State body for IT policy*

[www.lk/cintec](http://www.lk/cintec)

### LAcNet

*Academic Network site*

[www.lacnet.org](http://www.lacnet.org)

### Kalaya

*Sinhala Nationalist news site*

[Infolanka.com/org/kalaya](http://Infolanka.com/org/kalaya)

### Lanka Online

*Good collection of links  
and search engine*

[www.lankaonline.com](http://www.lankaonline.com)

### LEARN

*The Lanka Educational*

*and Research Network* [www.learn.ac.lk](http://www.learn.ac.lk)

### SLNet

*Sri Lankan discussion group*

[www.lacnet.org/slnet](http://www.lacnet.org/slnet)

National Science Foundation

*Good research links*

[www.naresa.ac.lk](http://www.naresa.ac.lk)

TamilNet

*News reports on Tamil affairs*

[www.tamilnet.com](http://www.tamilnet.com)

Sri Lankan Web Window

*The "national" site of Sri Lanka*

[www.lk](http://www.lk)

**CONTACT LISTS**

Ceycom (ISP)

E-mail: [champike@lanka.ccom.lk](mailto:champike@lanka.ccom.lk)

Eureka (ISP)

1 Alfred House Gardens

Colombo 3

T: +94 1 598703

F: +94 1 440904

E-mail: [webmaster@eureka.lk](mailto:webmaster@eureka.lk)

[www.eureka.lk](http://www.eureka.lk)

ITMIN Internet Services (ISP)

121 Independence Square

Colombo 7

T: +94 1 683948

F: +94 1 683945

E-mail: [itmin@itmin.com](mailto:itmin@itmin.com)

[www.itmin.net](http://www.itmin.net)

Lanka Internet Services (ISP)

156 1/1 Walukarama Rd

Colombo 3

T: +94 1 565071

F: +94 1 565080

E-mail: [info@lanka.net](mailto:info@lanka.net)

[www.lanka.net](http://www.lanka.net)

Pan Lanka Networking (ISP)

26 Collingwood Place

Colombo 6

T: +94 1 596828

F: +94 74 514 527

E-mail: [info@panlanka.net](mailto:info@panlanka.net)

[www.panlanka.net](http://www.panlanka.net)

Sri Lanka Telecom

SLT Headquarters

Lotus Road

Colombo 1

T: +94 1 329711

F: +94 1 440000

E-mail: [info@slt.lk](mailto:info@slt.lk)

[w3.slt.lk](http://w3.slt.lk)

Telecommunications Regulatory Commission

276 Elivitagala Mawatha

Manning Town

Colombo 8

T: +94 1 689336

F: +94 1 684865

E-mail: [dgtsl@slt.lk](mailto:dgtsl@slt.lk)

[www.trc.gov.lk](http://www.trc.gov.lk)

Copyright © International Development Research Centre, 1998

© All Rights reserved. No part of this web site may be reproduced, stored in a retrieval system or transmitted, in any form or by any means, electronic, mechanical, photocopying, or otherwise, without the prior permission of the International Development and Research Centre.

The material in this Yearbook has been peer-reviewed by in-country resource persons. The views expressed are those of the writers and do not necessarily reflect those of the International Development Research Centre.

Cite as follows :

The Pan Asia Networking Yearbook (1998).

Singapore: Asia Regional Office, International Development Research Centre.

[On-line serial, subscriber-based : <https://www.panasia.org.sg/ecomsec/bookshelf/user/webdriver>]

*(Date of publication : November 19<sup>th</sup> 1998)*

## **Abstract**

*The Taiwan government is taking a hands-on approach in constructing an electronic high-tech island. Its main goals are promoting the use of Internet to reach three million Internet users in three years); putting every middle school and primary school on the Internet; developing Taiwan as an Internet hub in the Asia Pacific area; establishing a "Global Chinese Network Information Center"; and developing a network multimedia industry.*

---

## **Taiwan**

By Erik Chia-Yi Lee  
[cyberik@geocities.com](mailto:cyberik@geocities.com)



## **OVERVIEW**

Taiwan, or the Republic of China, is an island situated in East Asia and covers an area of 35,980 sq km. Located 160 km off the southeast coast of the China mainland, Taiwan borders the East China Sea, Philippine Sea, South China Sea, and Taiwan Strait.

The population is around 21.7 million and the majority live or work in cities like Taipei (the capital city in the north with a population of over 2 million), Taichung (the biggest city in the central area), and Kaohsiung (an international harbour city in the south with a population of over 1 million). The proportion of the urban to the rural population is 74.7 per cent to 25.3 per cent. Though there are still rural areas on the island, especially along the eastern strip, urbanization is well entrenched and a factor in the general public recognition of the Internet's importance.

The GNP of Taiwan is estimated at around US\$298 billion (US\$13,819 per capita) and the average household income is US\$36,470, figures that point to the steady economic progress in the past few decades.

In recent years, the electronics, telecommunications, and computing industries have been major contributors to the overall economic growth of Taiwan and are central to the construction of its national information infrastructure.

Basic telecommunications infrastructure is well advanced and dominated by Chunghwa Telecom Co, which is in the process of being privatised. There are over 9 million telephone sets, extensive microwave radio relay trunk systems on the east and west coasts for domestic connections, satellite earth stations (2 Intelsat 1 in Pacific Ocean and 1 in Indian Ocean), and submarine cables to Japan (Okinawa), Philippines, Guam, Singapore, Hong Kong, Indonesia, Australia, Middle East, and Western Europe. In August 1997, the first commercial satellite, ST-1, was successfully launched.

Taiwan has a high literacy rate at around 90 per cent, and the government is active in reinforcing existing education systems with the aid of Internet connections.



## REGULATORY ENVIRONMENT

The main body for regulating Internet and telecommunications is the Directorate General of Telecommunications (DGT), a body within the Ministry of Transportation and Communication. Generally speaking, companies interested in becoming an ISP must abide by administrative rules for Type II telecommunications enterprises. Under these rules, the company has to rent lines from Type I telecommunications carriers and focus its business on services rather than infrastructure. There is no limit on the number of ISPs that can enter the market. International links are also generally not constrained (connections even to mainland China have never been prohibited).

The general regulatory environment, particularly in regards to content is more obscure and the government is taking a careful attitude in considering the Internet until a suitable regulatory model can be found. So while the Internet in Taiwan on the one hand guarantees almost complete free speech, especially in political terms, on the other hand pornography and copyright infringements can still attract strong law enforcement efforts. The DGT is encouraging the ISPs to establish a committee for the self-regulation of content. Other efforts are being made to study and evaluate the legal situation regarding the Internet, and in future provide concrete laws to regulate it.

From 1995 to 1996, under the initiative of the Ministry of Interior, the Trust Law Firm conducted a comprehensive study of legal issues and, following this, a report on how copyright law can be written anew in face of the challenges presented by developments such as NII-GII constructions, satellite transmissions, and high-tech multimedia products. This project was then extended to a one-year study (from 1997 to 1998) by the Science & Technology Law Center of the Institute for Information Industry. The topics have also broadened to cover a wider area including reproduction, dissemination, and transmission on the Internet, the legal use and application of the Internet, copyright law in terms of contributory infringements, vicarious infringements, multimedia products, satellite transmissions, exclusive licensing, as well as the copyright protection of computer generated works. While there is still a lack of any definite regulations regarding those issues, a consensus has been reached among the public and the government to continue to pursue a suitable regulatory framework.



## INTERNET CONNECTIVITY

Internet connectivity in Taiwan is generally divided between two groups: one is the Taiwan Academic Network (TANet) and the academic sector and the other the commercial ISPs.

In making Taiwan one of the first countries in the Asia-Pacific region to connect to the Internet, TANet plays a significant role. As early as 1990, TANet had already built a link to the US Internet via JVNC of Princeton University. Since then, TANet has been one of the major networks in the Asia-Pacific region. Currently, there are over 500,000 users from around 400 academic institutions, colleges, and universities in Taiwan who benefit from TANet's free services to promote academic research. First aided by the Ministry of Education and then by the National Science Council, TANet keeps growing through cooperation with local ISPs as well as the recent USA-TANet cooperative project. This project

will upgrade the network from its current two DS1 links to the US to a DS3 link, of which two-thirds will be preserved solely for higher education and research use.

In future, TANet plans to create TANet/I2, which will connect to the US Internet-2/vBNS backbone. Its backbone will be further upgraded to a speed of OC-3 (155Mbps) after two years, and to OC-12 and possibly OC-48 at the end of the 5-year USA-TANet cooperative project.

Aside from TANet's connectivity outside the country, its domestic connection is also well established with, for example, multiple high bandwidth links to SeedNet and HiNet, the two major ISPs on the island.

In 1998, apart from higher education, over 300 K-12 schools are connected to the Internet via TANet in an effort to provide students with better and easier access to distance learning and data sharing.

In the public sector, local ISPs play a critical role in promoting overall Internet connectivity and service. Of over 50 ISPs in Taiwan, HiNet and SeedNet are without question the most prominent service providers. The members of the two ISPs have grown from around 100,000 to nearly 1 million in the past three years. HiNet's global connection at the moment includes T3 x 1, T2 x 1, and T1 x 6 to USA, DS1 x 2 to Japan, 768kbps x 1 to Hong Kong, 256kbps x 1 to Singapore, 512kbps x 1 and 128kbps x 1 to Korea, 512kbps x 1 to Australia, and a backbone of 45Mbps. Locally there is also a 45Mbps link to SeedNet as well as its connection to TANet.

For SeedNet, there are T3 x 1 and T1 x 1 links to the US, 512kbps x 2 to Japan, and other links to both HiNet and TANet.

While other smaller ISPs are abundant in the bigger cities of Taiwan (like Taipei, Taichung, and Kaohsiung), HiNet and SeedNet have nationwide networks around the island to ensure coverage in other locations.

Almost all ISPs in Taiwan are now using the K56 v.90 standard for dial-up connections, and some (particularly HiNet and SeedNet) also offer ISDN and leased lines connections.

Both HiNet and SeedNet have been successfully privatised after initially being funded and controlled by the government sector. HiNet belonged initially to the national telecommunications bureau and after privatisation is a subsidiary of Chunghwa Telecom. SeedNet was first funded by and under the supervision of the Institute For Information Industry, but after privatisation is part of Digital United Inc.

Recently, HiNet has also joined the SET (Secure Electronic Transaction) standard, aiming to play a leading role in promoting and encouraging e-commerce in Taiwan. It also co-funded with Singapore the first commercial satellite of Taiwan, ST-1.

In general, the government and industry constantly monitor future developments of the Internet in both local and global terms. On the one hand, Taiwan's NII plan was issued in 1994 with the main directions as follows: network construction, education and training, electronic government, electronic commerce, social welfare, life-long learning, Chinese cultural relics online, the study and revision of related laws and regulations, easing the impact on society, and internationalization of Chinese networks. Presently, the plan has established the following five goals: promoting the use of Internet (to reach three million Internet users in three years); putting every middle school and primary school on

the Internet; developing Taiwan as an Internet hub in the Asia Pacific area; establishing a "Global Chinese Network Information Center"; and developing a network multimedia industry. In 1997, under the lead of Taiwan's National Center for High-Performance Computing, a bill was passed to join the NGI (Next Generation Internet) plan announced by the USA in 1996. As one of the first five countries in the world to participate actively in the NGI project, Taiwan is intent on being at the front of future Internet developments.



## CONTENT INITIATIVES

As with other aspects of Internet, Taiwan's content initiatives can be found in the government, academic, and commercial sectors.

On the government side, the Online Government Service provides a detailed online directory of government offices and sectors with an intelligent search engine. Services that are already online comprise tax payment with electronic authentication, checking records of vehicle registration, and the ordering of train tickets. The government is also planning to institute the use of a National Multi-Purpose IC Card to digitalize in one the existing ID and the health insurance cards. Aside from the official government web sites, other government funded institutions and organizations also have well-documented sites. The vast network of medical and teaching hospitals island-wide has a Traditional Chinese Medicine and Pharmacy Information System, maintained by the Taiwan government, which is open to the public for inquiries and consultation. Most of the content is bilingual in Traditional Chinese and English.

From the education sector, almost all education and research institutions and schools have their own online content, some also equipped with well designed search engines. The web sites also serve to disseminate research results, archive cultural, educational, and academic data, as well as build a constant link between the local academia and others around the world. Most notable of these are Academia Sinica's full-text searchable database on Chinese classics, including the 25 Books of History and other philosophical and literary texts; the National Library's various online services, such as online data archiving, multimedia versions of Chinese classics, and maintenance of the Center for Chinese Studies; and the National Taiwan University Digital Library/Museum Project, which intends to provide a test-bed for building a virtual museum of archaeological sciences and research findings (of which the recent exhibition of the aboriginal Ping-Pu ethnic races is a good example). Another example is the web site co-built and maintained by the National Palace Museum and the Computer & Communications Research Labs, which displays well-categorized sections of ancient Chinese artefacts, calligraphy, and paintings not only for public access, but also for academic research in the field of sinology.

On the commercial side, web content has received a boost from the rapid development of Taiwan's information infrastructure. Leading Taiwanese computer peripherals companies have extensive sites which are used for promotion and end-user services, such as providing online software driver updates and technical help. Several commercial search engines with the ambition to become Chinese portal sites have also emerged. These combine search services with web space renting, free web-email accounts, online chat systems, bulletin boards, streamlined and personalized online news services and

the like. Kimo, Yam, and Chinese Yahoo are the most prominent of these. And following the development in other countries, a few major TV stations and newspapers in Taiwan are also online and offer 24 hour news in Chinese. Basically, most of the services provided by commercial sites remain free and are tackling the same doubts and ambitions shared by the world over the promise of e-commerce in the near future.



## **SITE LIST**

### Ministry of Education

*Information on Taiwan's education and the entry point to TANet*

[www.edu.tw](http://www.edu.tw)

### The Office of the President

*Direct link to the office of the president in both Chinese & English*

[www.oop.gov.tw](http://www.oop.gov.tw)

### Ministry of Transportation & Communication

*Link to government and political sites in Chinese & English*

[www.motc.gov.tw](http://www.motc.gov.tw)

### Industrial Developmental Bureau, Ministry of Economic Affairs

*Y2K Service Center*

[www.moea.gov.tw](http://www.moea.gov.tw)

[www.y2kmfg.gov.tw/y2k/main.htm](http://www.y2kmfg.gov.tw/y2k/main.htm)

### Research Development & Evaluation Committee

*In charge of Plan E (electronic government)*

[www.rdec.gov.tw](http://www.rdec.gov.tw)

### The Taiwan Network Information Center

*Domain name registration and ISP information*

[www.twnic.net](http://www.twnic.net)



National Center for High-Performance  
Computing

*Introduction to NII, Act, News, &  
Journals*[www.nchc.gov.tw](http://www.nchc.gov.tw)

Government Information Office

*News & information on Taiwan affairs in  
Chinese, English, French, Spanish, German,  
Japanese, and Russian*  
[www.gio.gov.tw](http://www.gio.gov.tw)

Government Service Network

*Government domain name registration &  
information*  
[www.gsn.gov.tw](http://www.gsn.gov.tw)

Science & Technology Law Center

*Information on Internet copyright laws in  
Chinese & English*  
[www.stlc.iii.org.tw](http://www.stlc.iii.org.tw)

Taipei City Hall

*Official site linking bureaus & information on  
city activities*  
[www.taipei.gov.tw](http://www.taipei.gov.tw)

Government Service Online

*Link to government and political sites with  
search engine*  
[www.service.gov.tw](http://www.service.gov.tw)

National Central Library

*Provides distance library service &  
information on held publications*  
[www.ncl.edu.tw](http://www.ncl.edu.tw)

Kaohsiung City Hall

*Official site linking bureaus & information on  
city activities*  
[www.kcg.gov.tw](http://www.kcg.gov.tw)

Eye Witness Ancient China

*Digital museum exhibiting ancient Chinese treasures in Chinese, Japanese & English*

[npm.ccl.itri.org.tw](http://npm.ccl.itri.org.tw)

National Palace Museum

*Digital museum exhibiting ancient Chinese treasures in Chinese & English*

[www.npm.gov.tw](http://www.npm.gov.tw)

Committee on Chinese Medicine & Pharmacy

*Traditional Chinese medicine information system in Chinese & English*

[www.ccmp.gov.tw](http://www.ccmp.gov.tw)

Committee of Cultural Architecture

*Information on cultural activities and a culture-net of other sites*

[www.cca.gov.tw](http://www.cca.gov.tw)

Academia Sinica

*Downloadable essays in Chinese & English*

[www.sinica.edu.tw](http://www.sinica.edu.tw)

Industrial Technology Research Institute

*Research on technical problems and various projects*

[www.ccl.itri.org.tw](http://www.ccl.itri.org.tw)

National Taiwan University

[www.ntu.edu.tw](http://www.ntu.edu.tw)

National Taiwan University Digital Library/Museum

*An experiment virtual museum on aboriginal Ping-Pu ethnic races in Chinese & English*

[ntudlm.csie.ntu.edu.tw](http://ntudlm.csie.ntu.edu.tw)

National Tsing Hwa University  
[www.nthu.edu.tw](http://www.nthu.edu.tw)

National Cheng Chi University  
[www.nccu.edu.tw](http://www.nccu.edu.tw)

National Cheng Kung University  
[www.ncku.edu.tw](http://www.ncku.edu.tw)

National Sun Yat-sen University  
[www.nsysu.edu.tw](http://www.nsysu.edu.tw)

Tung Nan Junior College of Technology  
[www.tnjc.edu.tw](http://www.tnjc.edu.tw)

National Chiao Tung University  
[www.nctu.edu.tw](http://www.nctu.edu.tw)

China Television Co.(CTV)  
*One of the main television stations*  
[www.chinatv.com.tw](http://www.chinatv.com.tw)

Chunghwa Telecom Co  
*The largest and main telecommunication company*  
[www.cht.com.tw](http://www.cht.com.tw)

TVBS Inc.  
[www.tvbs.com.tw](http://www.tvbs.com.tw)

Chinese Television System(CTS)  
*One of the main television stations*  
[www.cts.com.tw](http://www.cts.com.tw)

Min-Shen Daily News  
*Entertainment & sports newspaper*  
[www.msdn.acer.net](http://www.msdn.acer.net)

China Times  
*Major newspaper*  
[www.chinatimesl.com.tw](http://www.chinatimesl.com.tw)

### Kimo

*A commercial search engine*

[www.kimo.com.tw](http://www.kimo.com.tw)

### Yam Web Navigator

*The largest Chinese search engine (in Chinese & English)*

[www.yam.org.tw](http://www.yam.org.tw)

## CONTACT LIST

### Biglobe (ISP)

15F, #37, Sec. 3

Min Chuan E. Rd

Taipei

T: +886 2 25045888

F: +886 2 25004172

E-mail: [service@biglobe.net.tw](mailto:service@biglobe.net.tw)

[www.biglobe.net.tw](http://www.biglobe.net.tw)

### Acernet (ISP)

T: +886 2 26964688

F: +886 2 26964699

E-mail: [webmaster@acer.net](mailto:webmaster@acer.net)

### Hinet (ISP)

#21 Sec.1

Hsin-yi Rd

Taipei

T: 0800 80412

E-mail: [info@ms1.hinet.net](mailto:info@ms1.hinet.net)

[www.hinet.net](http://www.hinet.net)

### FICnet (ISP)

7F, #50, Min Chuan Rd

Hsin Tien

Taipei County

T: +886 2 29173877

F: +886 2 29112091

E-mail: [service@ficnet.net](mailto:service@ficnet.net)

[www.ficnet.net.tw](http://www.ficnet.net.tw)

Research Development & Evaluation Committees

6F, #2-2, Sec. 1,  
Chi Nan Rd., Taipei  
T: +886 2 23419066  
[www.rdec.gov.tw](http://www.rdec.gov.tw)

Htnet (ISP)

8F, 9F, #31, Sec. 3  
Chung Shan N. Rd  
Taipei  
T: +886 2 25941212  
F: +886 2 25941515  
E-mail: [service@ht.net.tw](mailto:service@ht.net.tw)  
[www.ht.net.tw](http://www.ht.net.tw)

Seednet (ISP)

3F, #293-3, Sec. 2,  
Fu-sing S. Rd  
Taipei  
T: +886 2 27336454  
F: +886 2 27370188  
E-mail: [Service@tpts1.seed.net.tw](mailto:Service@tpts1.seed.net.tw)  
[www.seed.net.tw](http://www.seed.net.tw)

Science & Technology Law Center

T: +886 2 27398171  
F: +886 2 23782709  
[www.stlc.iii.org.tw](http://www.stlc.iii.org.tw)

Taiwannet (ISP)

T: +886 2 27822990  
F: 0800 36868  
E-mail: [webmaster@ttn.net.tw](mailto:webmaster@ttn.net.tw)  
[www.ttn.net.tw](http://www.ttn.net.tw)

Seedernet (ISP)

8F-2, #152, Sec. 1  
Chung Hsiao E. Rd  
Taipei  
T: +886 2 23946878  
F: +886 2 23942768  
E-mail: [service@seeder.net](mailto:service@seeder.net)  
[www.seeder.net.tw](http://www.seeder.net.tw)

Copyright © International Development Research Centre, 1998

© All Rights reserved. No part of this web site may be reproduced, stored in a retrieval system or transmitted, in any form or by any means, electronic, mechanical, photocopying, or otherwise, without the prior permission of the International Development and Research Centre.

The material in this Yearbook has been peer-reviewed by in-country resource persons. The views expressed are those of the writers and do not necessarily reflect those of the International Development Research Centre.

Cite as follows :

The Pan Asia Networking Yearbook (1998).

Singapore: Asia Regional Office, International Development Research Centre.

[On-line serial, subscriber-based : <https://www.panasia.org.sg/ecomsec/bookshelf/user/webdriver>]

*(Date of publication : December 3<sup>rd</sup> 1998)*

## **Abstract**

*Thailand has one of the most developed Internet infrastructures in the region and despite the economic downturn in the country, private and public sector Internet initiatives continue to expand. While the number of new users has tapered off, Internet usage remains constant. Some Internet service providers (ISPs) are struggling because of the increased costs associated with the drop in the Thai baht - equipment and leased line costs must usually be paid for in US dollars - but overall, the Internet sector has continued to mature.*

---

## **Thailand**

By Geoff Long and Thaweesak  
Koanantakool



## **OVERVIEW**

The Kingdom of Thailand is situated in the heart of Southeast Asia and covers an area of 514,000 sq km. Bordering Laos, Cambodia, and Myanmar, Thailand is the only country in the region never to have been colonised by the west. The population is estimated at around 60 million, with over one-sixth of these in Bangkok, the largest city. As a result, Bangkok has by far the largest concentration of infrastructure within the country, and also shows the most visible signs of associated growth problems such as severe pollution and traffic congestion. Prior to the recent economic downturn, growth had been running at up to 10 per cent per annum.

Topographically, Thailand can be divided into four distinct areas: the mountainous region of the north, the fertile central plains, the semi-arid plateau of the northeast, and the southern peninsula. Telecommunications infrastructure exists in all provinces of Thailand but there are many villages in remote parts of the country still without basic telephone service. The [Telephone Organisation of Thailand \(TOT\)](#) has recently expanded its rural area telephone project and is targetting all of the country's 60,000 villages. As well as the TOT, other fixed network operators include the [Communications Authority of Thailand \(CAT\)](#), and private companies TT&T and TelecomAsia, each of which is designated a set service area within the country.

There are a total of 7,239,419 telephone lines in the country, with more than 4 million of these in the metro area. The overall teledensity is around 12 lines per one hundred people.

Thailand also has its own satellite industry and to date has launched three ThaiCom satellites. In 1999, Thailand will be linked to other countries in Asia by two new advanced submarine fibre optic cables: the Asia Pacific Cable Network (APCN) and SEA-ME-WE 3.

National IT initiatives are formulated within the IT-2000 plan, which was put forward by the National IT Committee and approved by the National Economic and Social Development Board as part of its eighth national development plan. The three broad aims of IT-2000 are to build an equitable national infrastructure, invest in people, and enhance government services and the information industry. National projects such as the academic Internet backbone, the government information network, and the Thailand Software Park are all part of the IT-2000 plan and outlined below.

The monarchy also plays a major part in the country's development, and the King has taken a central role in championing information technology. A number of IT projects have been initiated by the King and other members of the royal family. In fact, the monarchy has a history of patronising

science and technology in Thailand dating back to King Rama IV, known as the Father of Thai Science. He correctly predicted the time of a total solar eclipse in Thailand on August 18, 1868, which has subsequently been designated National Science Day.



## REGULATORY ENVIRONMENT

Internet in Thailand is regulated by the Communications Authority of Thailand (CAT), which issues licences to operate Internet services and obtain international links. Both the CAT and TOT perform regulatory functions related to telecommunications. However, there are plans to privatise both organisations and create a new regulatory body, which will be known as the National Telecommunication Committee.

Laws relating to electronic commerce are currently being drafted by the National Information Technology Committee (NITC) in conjunction with experts from both the private and public sectors. When the drafts are complete they will be presented to the public and to NITC for comments before being sent to the parliament for the remaining legislative process.

Many observers believe that these laws are necessary before e-commerce can succeed in Thailand. The NITC is involved in many Internet-related policy debates and is formally chaired by the prime minister. NITC was setup in 1992 to promote and develop IT usage in Thailand.

The Internet Society of Thailand (ISOC-TH) was recently shut-down by the Internet Society for attempting to draft Internet laws, which is a violation of its charter. Some of the draft laws promoted censorship of the Internet, which many in the Thai Internet community had objected to.

Thailand's top-level domain (*th*) is administered by a number of long-standing members of the Thai Internet community under the banner of TH-Net.



## INTERNET CONNECTIVITY

Thailand has one of the most developed Internet infrastructures in the region and despite the economic downturn in the country, private and public sector Internet initiatives continue to expand. While the number of new users has tapered off, Internet usage remains constant. Some ISPs are struggling because of the increased costs associated with the drop in the Thai baht – equipment and leased line costs must usually be paid for in US dollars – but overall the Internet sector has continued to mature.



Thailand's university sector was the first to start experimenting with Internet. Prince of Songkla University and the [Asian Institute of Technology](#) started an e-mail connection from the University of Melbourne back in 1987, which was known as the Thai Computer Science Network. Chulalongkorn University was the first to receive a dedicated leased line for Internet use in 1992, and was shortly followed by a number of academic and research institutions who collectively formed the Thai Social/Scientific, Academic and Research Network, or ThaiSARN. Today, ThaiSARN provides Internet access to more than 40 sites and has 2Mb (E1) links to both the US and Japan. Internal links between the universities have also been significantly upgraded, with 2Mbps links existing between some institutions. For example, there are high-speed links between the [National Electronic and Computer Technology Centre \(Nectec\)](#) and Kasetsart University, King Mongkut's Institute of Technology, and [Thammasat University](#). Most of the links between Nectec, which provides the ThaiSARN backbone, and the other institutions are 64kbps or higher.

### [NECTEC's Official Collection of Reports and Statistics about Internet in Thailand](#)

Further funding to improve ThaiSARN was approved in October 1997, however recent budget cut-backs have now put this on hold. The ThaiSARN-III initiative, as it is known, is intended to create an ATM backbone that can transmit data at speeds of 155 to 620Mbps and allow for the use of state-of-the-art multimedia applications for distance learning and other research activities.

The Ministry of University Affairs launched a distance learning project called IT Campus in 1996.

A pilot project was conducted covering 15 campuses in 11 provinces but like the ThaiSARN-III project, it has also been affected by recent budget cut-backs.

All secondary schools in Thailand are offered free access to the Internet through the [SchoolNet Thailand](#) project. Over 200 schools are connected but capacity exists for all of Thailand's 1500 schools. A single nationwide telephone number is provided for schools to access SchoolNet. Both the CAT and TOT have recently agreed to subsidise the access costs and provide more than 400 lines in every province of Thailand for the project, while Nectec has provided the network servers, routers, and POPs throughout the country and maintains the network. The CAT also provides the 512kbps international link to the SchoolNet hub. The equipment for all SchoolNet nationwide access nodes was donated by Her Royal Highness Princess Maha Chakri Sirindhorn through the Knowledge Distribution Network. In addition, schools in rural areas and under privileged people also receive equipment and training materials from the Princess's IT Project.

Other non-commercial access in Thailand includes the [Kanchanapisek Network](#), which began service at the end of 1996 to celebrate the King of Thailand's golden jubilee. As well as unique Thai content (see Content section later), the Kanchanapisek Network has nationwide access points in 20 provinces for Thai residents to access free of charge. The network was designed, in part, to ensure the rural population has some access to Internet.

There are two Internet exchanges within Thailand: the National Internet Exchange (TH-NIX) and the Public Internet Exchange (PIE). TH-NIX is a commercial venture owned and operated by the CAT

and to which most of the larger ISPs are connected. PIE was initiated as a pilot R&D project for one-year and is a non-profit venture operated by Nectec. PIE also provides newsgroups and a time server linked to atomic time which ISPs can use to synchronise their servers. R&D carried out on PIE, including traffic statistics and usage patterns, is made available to commercial ISPs. Commercial Internet services began in 1995 through [Internet Thailand](#), a joint venture between Nectec, the Communications Authority of Thailand (CAT) and the Telephone Organisation of Thailand (TOT). Internet Thailand is today the largest ISP in the country with 8Mbps of international capacity via Canadian carrier TeleGlobe. Domestically it also has a 10Mbps connection to the public Internet exchange (PIE) and a 512kbps link to the National Internet Exchange. National access is available through ThaiPak, Thailand's x.25 packet switching network. The company also provides wholesale bandwidth to a number of smaller ISPs. Some major ISPs, such as LoxInfo and Samart, started their initial operations through Internet Thailand. The company plans to be partially privatised by the end of 1999.

So far 16 ISPs have a licence from CAT to operate their own service, all of which are joint ventures with the CAT and many backed by Thailand's large telecommunications groups. Some of the largest ISPs include [LoxInfo](#), backed by the Loxley Public Company and [KSC Internet](#), which is backed by Jasmine International. Both of these have 4Mbps international links, with Loxinfo also having a 2Mbps link to the commercial Internet exchange. [World Net](#) (under the brand name Apricot), which is backed by telecommunications group UCOM, [Samart CyberNet](#), which is backed by another telecommunications group in Samart, and [A-NET](#) are also major players. Most of the larger ISPs have a nationwide network of local access points, with most provinces and cities in Thailand covered.

An informal association of Internet providers called the ISP Club meets to discuss issues relating to the ISP community. Nectec is not a member of the ISP Club but is usually invited to its meetings.

In addition to the commercial ISPs, a large number of Internet Cafes, or public access centres, has sprung up in recent years, particularly in Bangkok, Chiang Mai, and tourists areas such as Koh Samui. Unfortunately, most of these are aimed at foreigners and are priced accordingly.

A three-year plan to deliver government services and information via the Internet was begun at the end of 1997 under the banner of the government information network (GINet). The network to be setup will utilise a high-speed ATM backbone with 2 Mbps links to each district. Ten provinces are expected to be connected during the first stage of the project, with links to all 76 provinces targeted after 18 months. In the third year it is envisioned that all 680 districts would be connected. A Government Information Technology Service (GITS) will be established to initiate and manage the network. In addition to basic network services, GITS will help develop standards for the government network, provide consultation services, support application development, and support common standards for systems development. GINet and GITS are seen as keys to reforming and creating more efficient government agencies.



## PAN ACTIVITIES

There is no PAN node in Thailand but PAN/IDRC has been involved in other projects within the country.

For example, PAN is working in conjunction with the Asian Forum for Human Rights and Development (Forum-Asia) on a number of Internet initiatives. Forum-Asia was established in 1991 to promote collaboration between human rights organizations in Asia and to develop a regional response for the promotion of human rights and democracy. It is a partner organisation of CIDA's South-East Asian Fund for Institutional and Legal Development (SEAFILD). PAN will assist Forum-Asia in a number of areas including training in Internet use and web page creation; hosting of public material such as lists of publications produced by the Forum; provision of internal list serves for member discussions; and virtual conferencing.

Another project is the integrated information system for Thailand's Rural Development Program, which has been funded by IDRC. The project involved several research partners in Thailand, including the National Economic and Social Development Board (NESDB) and Thammasat University. All the data collected under the project and a summary of information by province is available, in Thai only, on a web site at [Thammasat University](#). However, IDRC will provide further funding to make the summary of information available in English. The web site has already been used as a source of information for national government administrators for provincial planning and by some Japanese institutions.



## CONTENT INITIATIVES

There are a number of initiatives to make available Thai content and resources, both in Thai and in English. Significant resources are made available on servers maintained by Nectec, which contain links to many projects of national significance. One of the earliest projects is called [Thailand the Big Picture](#), which houses a collection of Thai directories that is sub-divided into government, commercial, academic, organisations and a number of other headings. It also includes a search engine. Thailand The Big Picture was initiated as part of ThaiSARN and funded by Nectec, with the content maintained by volunteers. Links to other national information servers and projects can also be accessed from the Nectec site.

The [Kanchanapisek Network](#), which was begun as part of the King's Golden Jubilee celebrations in 1996, has a collection of web pages relating to projects initiated by the royal family as well as resources about Thailand, its culture and history. Much of the information can be accessed in either Thai or English. A significant sub-project of the network is the Junior Encyclopedia, an electronic encyclopedia in Thai that is being enlarged at the rate of one volume per month. The Kanchanapisek Network also includes the Knowledge Distribution Network, which is a collection of online courses both from within Thailand and abroad, and has pointers to other resources, many of which were produced as part of the golden jubilee celebrations.

The [Southeast Asian Software Research Centre \(SEA/SRC\)](#), based in Bangkok, does research in computing, linguistics and natural language processing with a focus on Thai, Lao, Khmer, and Burmese languages. Its Thai Internet Education (TIE) project develops online resources for education, which are placed in the public domain. Resources developed include online guides to Thai pronunciation, a library of Thai-English translations, and on-line dictionary tools.

Another research institute with good resources is the [Thailand Development Research Institute](#), which conducts research projects on economic and social development issues.

Recently, in collaboration with Samart Corporation, TDRI launched its first information service program via the Internet and it is now offering its information via both print and electronic means. Included are many articles, publications and a database of theses in both Thai and English. TDRI has searchable databases and offers six-monthly subscriptions to its information service. The site also has links to other development-related research organisations.

From the public sector, a recently announced project is the National Multimedia Institute (NAMMI), which plans to speed up the local creation of multimedia content, particularly for educational needs. The project is currently being planned by the National Information Technology Committee with advice from MIT, local content producers and the Office of the National Education Commission. The initial aim of NAMMI will be digital archiving of Thai content and some infrastructure for Thai language processing.

Many of the universities also have useful content on their servers. [The Asian Institute of Technology](#) has information on Thailand's heritage while Mahidol University has a comprehensive site covering Thai history, religion, the monarchy, institutions, economy and other areas. [Chiang Mai University](#) has information on Chiang Mai as well as Northern Thailand and links to other academic and research sites.

Internet Thailand maintains a directory of organisations that provide non-commercial information such as NGOs and research groups and another listing of useful sites and organisations. Samart CyberNet also has some innovative content via its CyberNet Town, a collection of sites organised using a graphical city as its theme.

Upcoming events and recent information is available at the [Tourism Authority of Thailand site](#).

## **OTHER PROJECTS**

In an attempt to develop the local software industry, the government is in the process of setting up a Thailand Software Park. The park will be located in Bangkok and tenders have already been issued for the Software Park Building. However, the budget for the project was recently pushed back to 1999. The software park is seen as a centre for software development, high speed communications, training, and consultancy and aims to attract both local and international businesses. The Board of Investment of Thailand is providing economic advantages to companies involved, including permission to bring in foreign technical staff and tax incentives.

Nectec is also coordinating the country's broadband initiatives through the Information Superhighway Testbed. Also involved in the testbed are the CAT, TOT, universities and private telecommunications companies.

The project looks at various applications of ATM technology including virtual reality, distance learning, and multimedia. Already video-on-demand has been trialled between Nectec and other parties as well as IP video conferencing across an ATM link early this year.

The software park will contain six centres: A Business Information Centre, a Training Centre, an Information Technology Centre, a Software Tool Application Centre, a Validation and Verification Centre, and a Telecommunications and OSI Compliance Testing Centre.

Another public-private sector joint venture is the EDI-TradeSiam project, which was setup to operate electronic data interchange (EDI) applications. TradeSiam will be run by the private sector and deliver EDI services to the Thai Customs Department in an effort to streamline import/export procedures.



## **SITE AND CONTACT LISTS**

### Chiang Mai University

*Information on Thailand's northern region*

[www.chiangmai.ac.th](http://www.chiangmai.ac.th)

### Asian Institute of Technology

*Information on Thai heritage*

[www.cs.ait.ac.th](http://www.cs.ait.ac.th)

### Human Settlements in Asia

*A guide to urban and rural regional development in Asia*

[www.hsd.ait.ac.th](http://www.hsd.ait.ac.th)

### Field Crops Research Institute

*Information on field crops in Thailand*

[www.inet.co.th/org/fcri/](http://www.inet.co.th/org/fcri/)

### SchoolNet Thailand

*Resources for secondary schools*

[www.school.net.th](http://www.school.net.th)

Royal Development Projects Board

*Information on various projects initiated by the King*

[www.rdpb.go.th](http://www.rdpb.go.th)

Southeast Asian Software Research Centre

*Research site including the Thai Internet Education Project and other language tools*

<http://www.cyberc.com/crcl/tie/index.htm>

South East Asia AIDS project (SEA-AIDS)

*Information support services for people living or working with AIDS*

[www.inet.co.th/org/un aids](http://www.inet.co.th/org/un aids)

Thai Red Cross Society

*Good links to Thai medical resources and activities of Red Cross*

[Kanchanapisek.or.th/kp7](http://Kanchanapisek.or.th/kp7)

Thai Parliament

*Official Parliament site with links to other government and political sites*

[www.parliament.go.th](http://www.parliament.go.th)

Thailand The Big Picture

*The most comprehensive content listing in Thailand*

[www.nectec.or.th](http://www.nectec.or.th)

Thailand Network Information Centre (THNIC)

*Domain name registration and information*

[www.thnic.net](http://www.thnic.net)

Thammasat University

*Rural Development information in Thai*

[www.tu.ac.th](http://www.tu.ac.th)

Thailand Research Fund

*Research granting agency covering all areas of research* [www.inet.co.th/org/trf](http://www.inet.co.th/org/trf)

Tourism Authority of Thailand

*Upcoming events and general information*

[www.tat.or.th](http://www.tat.or.th)

The Kanchanapisek Network

*Contains information about Thailand in both English and Thai.*

[Kanchanapisek.or.th](http://Kanchanapisek.or.th)

## CONTACT LIST

### Asia Pacific Telecommunity

12/49, Soi 5  
Chaengwattana Rd  
Bangkok 10210  
Tel: 573 0044  
Fax: 573 7479  
Email: [apthq@mozart.inet.co.th](mailto:apthq@mozart.inet.co.th)  
Web: [www.inet.co.th/org/apt/](http://www.inet.co.th/org/apt/)

### A-net Internet (ISP)

23 ANEW Building  
Soi Charoen Nakorn 14  
Klongsan Bangkok  
T: 861 1555  
F: 861 1544  
Email: [info@a-net.net.th](mailto:info@a-net.net.th)  
Web: [www.a-net.net.th](http://www.a-net.net.th)

### Economic and Social Commission for Asia and the Pacific (ESCAP)

The United Nations Building  
Rajadamnern Nok Avenue  
Bangkok 10200  
T: 288 1234  
F: 288 1000  
Email: [webmaster@unescap.org](mailto:webmaster@unescap.org)  
Web: [unescap.org](http://unescap.org)

### Communications Authority of Thailand

99 Chaeng Wattana Rd  
Donmuang, Bangkok  
T: 573 0099  
F: 573 6054  
Email: [prcat@siamese.cat.or.th](mailto:prcat@siamese.cat.or.th)  
Web: [www.cat.or.th](http://www.cat.or.th)

### Internet Thailand (ISP)

T: 642 7065  
F: 640 0456  
Email: [info@inet.co.th](mailto:info@inet.co.th)  
Web: [www.inet.co.th](http://www.inet.co.th)

Internet KSC (ISP)

333 Laksi Plaza  
12<sup>th</sup> Floor, Tower 1  
Changwattana Rd  
Donmuang, Bangkok  
T: 576 0899  
F: 576 0900  
Email: [info@ksc.net.th](mailto:info@ksc.net.th)  
Web: [www.ksc.net.th](http://www.ksc.net.th)

Samart CyberNet (ISP)

T: 937 0800  
F: 937 0810  
Email: [cybernet@samart.co.th](mailto:cybernet@samart.co.th)  
Web: [www.samart.co.th](http://www.samart.co.th)

LoxInfo (ISP)

304 Suapah Rd  
Pomprab Suttruphai, Bangkok  
T: 622 5678  
F: 622 5666  
Email: [info@loxinfo.co.th](mailto:info@loxinfo.co.th)  
Web: [www.loxinfo.co.th](http://www.loxinfo.co.th)

Thailand Environment Institute

210 Sukhumvit Soi 64  
Prakanong, Bangkok 10260  
T: 331 0047  
F: 332 4873  
Email: [info@tei.or.th](mailto:info@tei.or.th)  
Web: [www.tei.or.th](http://www.tei.or.th)

Thailand Development Research Institute

565 Ramkhamhaeng 39  
Bangkapi, Bangkok 10310  
T: 718-5460  
F: 718-5461  
Web: [www.info.tdri.or.th](http://www.info.tdri.or.th)

WorldNet/Apricot (ISP)

Email: [webmaster@wnet.net.th](mailto:webmaster@wnet.net.th)  
Web: [www.wnet.net.th](http://www.wnet.net.th)



Copyright © International Development Research Centre, 1998

© All Rights reserved. No part of this web site may be reproduced, stored in a retrieval system or transmitted, in any form or by any means, electronic, mechanical, photocopying, or otherwise, without the prior permission of the International Development and Research Centre.

The material in this Yearbook has been peer-reviewed by in-country resource persons. The views expressed are those of the writers and do not necessarily reflect those of the International Development Research Centre.

Cite as follows :

The Pan Asia Networking Yearbook (1998).

Singapore: Asia Regional Office, International Development Research Centre.

[On-line serial, subscriber-based : <https://www.panasia.org.sg/ecomsec/bookshelf/user/webdriver>]

*(Date of publication : October 12<sup>th</sup> 1998)*

## **Abstract**

Vietnam is a relatively latecomer to the Internet, with the government authorities finally approving commercial Internet services in late 1997 following more than 18 months of indecision. Four companies were awarded licenses to become Internet Service Providers (ISPs) : NetNam, Vietnam Data Communications (VDS), Financing and Promoting Technology (FTP) Corporation, and Saigon Post Company.

---

## **Vietnam**

By Geoff Long



### **OVERVIEW**

The Socialist Republic of Vietnam occupies a long, narrow strip of land that lies in the eastern part of the Indochina region. It is bordered by China in the north and Laos and Cambodia to the West. Three-quarters of Vietnam consists of mountains or hill regions, while its coastline stretches more than 3000 km and includes nearly 3000 islands, most of which are uninhabited. The country is divided into 61 provinces for administrative purposes.

The unification of the North and South to create the present-day Vietnam occurred in 1975 following a long and well-documented period of war, one of many in the country's history. A US trade embargo that followed the creation of the socialist state was only lifted in 1998.

The French have also played a major role in the country in recent times, beginning in 1858 when they took over Danang in southern Vietnam and gradually encroached on more territory. French colonial control ended in 1954 following the Indochina war, although French is still spoken in parts of the country and there are many French words in the Vietnamese language.

The population of more than 70 million is made up primarily of the Kinh (or Viet) people, who make up 90 per cent of the total. There are also about 54 ethnic minority groups, each with its own language and culture. The Viet language is the official language and is spoken across the country.

The written language was originally derived from Chinese but the script has since been romanised. However, there is no unified standard for the display of Vietnamese characters and there are up to ten different standards in use.

War, trade embargoes, and inefficient state-run utilities have all contributed to Vietnam having a poor level of general infrastructure and high cost for services such as telecommunications and power. However, the government through the Ministry of Science, Technology, and Environment has recently put more emphasis on developing a science and technology strategy to take it up to the year 2020. Concrete plans to improve the telecommunications infrastructure have also been laid out to boost capacity significantly by 2000. Plans include ensuring that 100 per cent of coastal villages have access to telephones and boosting the teledensity to 5-6 lines per 100 people (20-25 for major cities Hanoi and Ho Chi Minh City). A Thai-Vietnamese-Hong Kong cable as well as a cable network along the main power line are also due for completion, while Vietnam has plans to launch its own telecommunication satellite for domestic purposes.

The main telecommunications carrier is Vietnam Posts and Telecommunications (VNPT), which until recently held a monopoly. The military-owned Viettel and the Saigon Post Company have both been granted licences to build and operate networks, but neither has made much in-roads into VNPT's market and it remains to be seen whether they effectively will.



## REGULATORY ENVIRONMENT

Internet services are regulated by the Directorate General of Posts and Telecommunications (DGPT), the same body that controls telecommunications services. A regulatory framework (Decision 697/1997/QD-TCBD) was finalised in November 1997 that sets out regulations for access provision, as well as for potential service providers and users. Only Vietnamese owned and controlled entities are granted licences to provide Internet services commercially – foreign organisations can only provide non-profit services for their internal needs. ISPs must also go through the monopoly gateway operator, Vietnam Datacommunications Company (VDC), for international connections and are not allowed to obtain their own leased lines. Pricing is fixed by the regulator in conjunction with VDC, which is both a service provider and access provider to the other ISPs and therefore holds an unfair commercial advantage according to most industry observers. A basic 64kbps leased line to the gateway costs more than US\$3500 per month.

Authorities have also made attempts to censor content that is deemed objectionable to the State.

In general it is forbidden to transfer anti-communist material and to access culturally harmful information. A number of firewalls put in place by VDC block access to prohibited web sites, but there have been a number of reported technical problems with the system. Only web, email, FTP and Telnet service ports are allowed, so there is no way, for example, to synchronize two Lotus Domino servers through the firewall, while objectionable sites such as pornography are still open. The firewall also detrimentally affects performance, according to local technical people.

VDC also controls the Vietnam Network Information Centre (VNNIC), which is responsible for allocating IP address space to the other ISPs, and the .vn country-code top-level domain (cc-TLD). The .vn domain was previously administered by NetNam but was transferred to VDC as part of the conditions for obtaining an ISP licence.



## INTERNET CONNECTIVITY

Vietnam is a relative latecomer to the Internet, with the government authorities finally approving commercial Internet services in late 1997 following more than 18 months of indecision. Four companies were awarded licences to become Internet Service Providers (ISPs): NetNam, Vietnam Data Communications (VDC), Financing and Promoting Technology (FTP) Corporation, and Saigon Post Company. VDC, a subsidiary of telecommunications carrier VNPT, also controls the country's two international gateways in addition to its role as an ISP. The other three ISPs are not permitted to obtain their own international leased lines.

The two gateways are located in Hanoi in the north and Ho Chi Minh City (HCMC) in the south. In Hanoi a 2Mbps (E1) link is connected via Hongkong Telecom and another more recent 256kbps link goes to Australia via Telstra. The HCMC gateway also has an E1 link and a 64kbps link, which is connected to Sprint in the US.

The number of users is estimated at 11,000, with user growth of about 20 per cent. VDC has the most users with 6000, a lot of which are government subscribers. However, NetNam has the most experience with Internet, with many of its staff having experimented with Internet since 1991, when the Institute of Information Technology (IOIT) trialed a dial-up connection with the University of Karlsruhe in Germany. In early 1993 a UUCP-link with the Australian National University (ANU) was established and the IOIT setup VARENET – the Vietnam Academic, Research, and Education Network. This network is still the main academic backbone in the country.

NetNam itself was established in 1994 as a not for profit service but was allowed to charge a service fee in order to expand the system. Up until November 1997 NetNam again used a UUCP connection to ANU in Australia to provide Internet mail to its predominantly NGO, academic and research clients. It also had a local BBS service that contained a number of file libraries and locally-oriented material, which are now moving over to the web. When the government partially opened up Internet access in late 1997, NetNam moved to a full Internet service and changed to become a commercial organisation under the ownership of IOIT.

NetNam also has a branch in HCMC with a few thousand users. In total it has about 1500 full users and about 3000 intranet users with e-mail access. In HCMC it is linked to the international gateway via a 64k leased line and to the gateway in Hanoi by a 128k line, although this is expected to be upgraded soon.

Apart from VDC and NetNam, the other two ISPs are FPT Corporation and Saigon Posts. FPT originally stood for Food Processing Technology, which was its main business interest. It is a state-owned business and did very well by re-exporting computers to the former Soviet Union. They later changed their name to Financial Promotion and Technology, although it is still known as FPT. It has mainly commercial organisations as its customers.

Saigon Posts is the newest ISP to begin operations and has only been up and running since 1<sup>st</sup> June 1998. It also has a telecom licence but its infrastructure is minimal because of obstacles from VNPT and a lack of expertise. Its net users are mainly local government authorities in HCMC, where its operation is located.

Apart from the four commercial ISPs, the National Centre for Scientific and Technological Information and Documentation (NACESTID) also has plans to become a non-commercial ISP in order to serve its own user community. Non-commercial ISPs are not allowed to earn money even if it is put back into the network, although they can recover the cost of providing the service. NACESTID's own dial-up network connects information centres in 61 provinces and has its own 64kbps connection to the national backbone. Its main centre in Hanoi has a staff of 170 people and more than 70 workstations on the network.

To guide the continued introduction of Internet into Vietnam, a National Co-ordination Board for Internet has been setup and is headed by the MOSTE minister. The committee has representatives from the Ministries of Security, Culture and Information, Education and Training, and MOSTE, as well as the Directorate General of Posts and Telecommunication and the National Centre for Natural Sciences and Technology.

There is also a National Program of Information Technology 2000, which will come under a new department to be known as the Dept of IT and also be overseen by MOSTE.



## PAN ACTIVITIES

PAN projects are currently underway to both help develop sustainable infrastructure through its ISP partner, NetNam, as well as to develop local content through a PAN Information Server (PINS-Vietnam), which is also being coordinated by NetNam. A recently held workshop in Hanoi brought together information professionals from some of the country's main government and research organisations in an effort to kick-start web publishing initiatives.

Despite Internet services being in their infancy, NetNam is relatively well established. Already it is hosting local resources that it generates itself as well as information created through collaboration with organisations such as the National Centre for Scientific and Technological Information and Documentation (NACESTID) and the Ministry of Culture and Information.

NetNam also publishes some its content on CD-ROM so that it can be used offline in information centres and universities. And in conjunction with the Ministry of Culture, it is planning to have mirror sites available in all Vietnam provinces.

A significant problem in presenting local information on the World Wide Web is the lack of a unified coding standard for the Vietnamese character set. To counter this, one of the first tasks NetNam undertook when it received a grant from PAN Asia Networking was to design a utility that would

recognise the various codes that were in use to display Vietnamese text. Now, when NetNam users view Vietnamese web pages they generally don't have to worry about incompatible formats, as the utility can detect the six most common formats (out of about 10) that are in use.

As a major partner in the PAN project, the National Centre for Scientific and Technological Information and Documentation (NACESTID) has been working in close collaboration with NetNam and the Institute of Information Technology (IOIT) on a common approach to designing its network structure. Its network, known as VISTA (Vietnam Information for Science and Technology Advancement), can share information with NetNam and another IOIT-run network, VARENet (Vietnam Academic, Research and Education Network).

NACESTID is creating one huge databank on science and technology that consists of many databases. It then plans to serve small enterprises with this information and promote the competitiveness of the enterprises.

NACESTID's databases include such information as R&D reports, science and technology conference papers, information from forums and workshops, dissertations, information on indigenous technology, and equipment catalogues and procedures. They are also a coordinating centre, or focal point, for an ASEAN databank on technology as well as for the Asian Science and Technology Network, another ASEAN project. All of the databases have been created from within NACESTID, which is renowned as one of the richest content sources in Vietnam for science and technology information. Its print library alone boasts some 400,000 books and 1400 periodicals.

Information that can already be viewed through a standard web browser on VISTA includes a weekly electronic bulletin covering science, technology, environment, and economics; a bi-weekly e-bulletin of international news condensed from print periodicals; a bi-weekly bulletin on environmental and sustainable development; a bi-weekly newsletter on development strategies for decision makers; an ASTNET newsletter; and an occasional bulletin that covers rural development.

Topics such as rural development are important in the context of Vietnam, where some 80 per cent of the population live outside urban areas. For this reason, making the information available on the Internet is only a first step. Each province has a network centre that is able to access the information. It is then photocopied and distributed to as many districts as possible and made available through traditional means, such as noticeboards. The provincial centres can also add some local information to the bulletins before they are distributed.

Other forthcoming projects include a NACESTID-developed search engine and multimedia titles from a newly-formed multimedia unit.



## CONTENT INITIATIVES

NetNam is a good starting point for Vietnamese content. It aggregates a lot of technical information, both local and overseas, and for socio-cultural information mirrors the Culture Information Network (CINet), which is produced by the Ministry of Culture. CINet contains daily news, social happenings, literature, leisure activities, and information on topics such as economics, history, politics. It is currently available only in Vietnamese but an English version is coming. NetNam's site also contains a local bulletin board-type forum and a good collection of links to other content.

For development-related issues, the UNDP Vietnam site has a number of reports and publications available online in both English and Vietnamese. It has also recently launched a forum area for discussing development activities and issues.

For an overview of Vietnam, its history and culture the Vietnamtourism site ([www.vietnamtourism.com](http://www.vietnamtourism.com)), from the Vietnam National Administration of Tourism, has extensive information in English, French, and Vietnamese.

It has categories for history and culture, tourism, useful facts and figures, and business and economic information. Another useful general site is Vietnam Online ([www.vietnamonline.net.vn](http://www.vietnamonline.net.vn)), which has searchable business and travel information, taxation and legal information, the online version of local business publication the Vietnam Investment Review, and discussion forums.

Internet Vietnam ([www.vnn.vn](http://www.vnn.vn)) is the web site from VDC, while another ISP, FPT Corporation, also has a web site ([www.fpt.vn](http://www.fpt.vn)). Both have daily news, a yellowpages-type directory of companies, and some links to other sites. News services that have jumped online include the People newspaper (in Vietnamese [www.nhandan.org.vn](http://www.nhandan.org.vn)), the Vietnam News Agency (VNA) at [www.vnagency.com.vn](http://www.vnagency.com.vn), and the Vietnam Economic Times ([www.vneconomy.vn](http://www.vneconomy.vn)).



## SITE AND CONTACT LISTS

### Vietnam Datacommunication Company (ISP)

258 Ba Trieu

Hai Ba Trung Dist.

Hanoi

T: +84 4 8252564

F: +84 4 8250097

E-mail: [KHKD.VDC@vnn.vn](mailto:KHKD.VDC@vnn.vn)

[www.vnn.vn](http://www.vnn.vn)

FPT Internet (ISP)

75 Tran Hung Dao

T: +84 4 8223100

F: +84 4 8223111

E-mail: [marketing@fpt.vn](mailto:marketing@fpt.vn)

[www.fpt.vn](http://www.fpt.vn)

Vietnam Datacommunication Company (ISP)

258 Ba Trieu

Hai Ba Trung Dist.

Hanoi

T: +84 4 8252564

F: +84 4 8250097

E-mail: [KHKD.VDC@vnn.vn](mailto:KHKD.VDC@vnn.vn)

[www.vnn.vn](http://www.vnn.vn)

Internet Vietnam

The main website of VDC:

[www.vnn.vn](http://www.vnn.vn)

Vietnam Economic Times

Online version of business publication

[www.vneconomy.vn](http://www.vneconomy.vn)

Institute of Information Technology

Nghia Do Cau Giay

Hanoi

T: +84 4 8346907

F: +84 4 8345217

[www.varenet.ac.vn](http://www.varenet.ac.vn)

Vietnam Posts and Telecommunications (VNPT)

18 Nguyen Du St

Hanoi

T: +84 4 8263008

F: +84 4 8226590

National Centre for Scientific & Technological Information and Documentation

24 Ly Thuong Kiet Str.

Hanoi

T: +84 4 8246320

F: +84 4 826 3127



Vietnam News Agency  
Online daily news  
[www.vnagency.com.vn](http://www.vnagency.com.vn)

NetNam (ISP)  
Nghia Do Cau Giay  
Hanoi  
T: +84 4 8346907  
F: +84 4 8345217  
[www.netnam.vn](http://www.netnam.vn)

Vietnam Tourism  
*Govt site with history, culture, and tourism info*  
[www.vietnamtourism.com](http://www.vietnamtourism.com)

Vietnam Online  
Business, travel and legal information  
[www.vietnamonline.net.vn](http://www.vietnamonline.net.vn)

Copyright © International Development Research Centre, 1998

© All Rights reserved. No part of this web site may be reproduced, stored in a retrieval system or transmitted, in any form or by any means, electronic, mechanical, photocopying, or otherwise, without the prior permission of the International Development and Research Centre.

The material in this Yearbook has been peer-reviewed by in-country resource persons. The views expressed are those of the writers and do not necessarily reflect those of the International Development Research Centre.

Cite as follows :

The Pan Asia Networking Yearbook (1998).  
Singapore: Asia Regional Office, International Development Research Centre.  
[On-line serial, subscriber-based : <https://www.panasia.org.sg/ecomsec/bookshelf/user/webdriver/>]

*(Date of publication : November 5<sup>th</sup> 1998)*