Cyberspace and Internet – Indian Context

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Abstract

Cyberspace is not wires, cable and microwave, but it is an experience, in which computers and their contexts are available to users of any participating computers, anywhere in the world. It can be viewed under two main divisions: external cyberspace and internal cyberspace. External cyberspace is the vast collection of data and expertise available in the world outside, through electronic networks i.e. Internet and databases. Internet comprises thousands of networks lying allover the globe in different countries which can communicate with eachother using Internet protocol. The authors describe the Internet connectivities in India through VSNL, DOT and DOE, by mentioning the types. Internet succeeded in the U.S. because there is a systematic and sustained growth in interlinked networks of computers, whereas in India such interlink is not achieved so far.

Introduction

Cyberspace encompasses million of personal computers connected by modems-via the telephone system- to commercial on-line services, as well as million of high speed links to Local Area Networks (LANs), E-mail and so on. Cyberspace is not wires, cable and microwave, but it is an experience.

The word Cyberspace first of all was coined by science fiction writer William Gibson in his book entitled "*Neuromancer*" in 1984. He described it as some place one cannot see but knows it is there. In 1989, the term was borrowed by the on-line community to describe the increasingly interconnected computer network-the 'Internet'.

Ermel Stepp defines Cyberspace as "the space of interactive computational posibilities, where computers and their contents are available to users of any participating computers, any where"[1].

To make a point it is clear that such a Cyberspace already exists today with great avenues of communicating through it -it is nothing but 'Internet'. The important situation is that when one is communicating with others through his computer, it is said that he is in this space.

The External Cyberspace : The Internet

External Cyberspace is the vast collection of data and expertise available in the world outside, through electronic networks and database. First of all Cyberspace consists of the on-line databases in which we find all kinds of formalised and published knowledge. There are presently more than 6,000 on-line databases (not including CD-ROMS) available. As the database vendors use different search language and formats, so the expert help of information professionals certainly remains a necessity. For contextual knowledge live human experts are needed. These can be efficiently contacted through electronic networks such as the Internet.

Internet comprises thousands of networks lying allover the globe in different countries and which can communicate with eachother using Internet Protocol.

The complete Internet comprises several thousands of clouds or data networks. The IP protocol makes it possible to go from any cloud to any other cloud either directly over a direct interconnection or by traversing over another cloud or clouds till one reaches a cloud that has direct connection to the destination cloud. This is made possible by the Internet Protocol which allows the transmitted data packets to traverse diverse routes and still be able to unload their information content at the correct destination.

Generally analysed concept of Internet is

- a collection of a large number of data networks connected together,

- a collectioin of computers, routes, LANS and WANS,

- the largest network using TCP/IP protocol,

- the fastest growing network of networks, and

- biggest electronic reservoir of Information,

Internet Connectivity

Simply speaking, Internet connectivity in each country is handled by the so called Internet Service Providers (ISPs). These ISPs register themselves with Inter NIC (Internet Network Information Centre, U.S.) and obtain rights to allot Internet address to their customers. Besides the access code they also acquire connectivity to some 'Internet Access Point' (IAP). The ISPs establish an Internet Gateway (IG) and connect it to an IAP which is usually with a large international carrier like MCI or Sprint.

Videsh Sanchar Nigam Limited (VSNL), the international carrier of India and the Department of Telecommunication (DOT) are the two main ISPs in Inida.

The VSNL opened up its Gateway Internet Access Service (GIAS) to the people of Inida in August 1995 with 64 Kbps link at Mumbai Gateway. Presently, a lot has gone into enhancement of the entire network infrastructure, using 64 Kbps to multiple 2.0 Mbps parallel links. It has its international gateways at Delhi, Mumbai, Chennai and Calcutta, Bangalore and Pune. Traffic is being switched through the nearest gateway (Mumbai). A nodal centre is also operating at Ahmedbad, being managed by private company franchising a 64 Kbps link to VSNL's Mumbai Gateway. For the growing demands of Internet traffic at Lucknow, Kanpur and Hyderabad, high speed switched links to the nearest gateway have been deployed. The VSNL's gateway facilities at Ernakulam and Jalandhar have been recently announced.

The DOT could not set up clear-cut guidelines for Internet service for some times. It played strong, and blocked every possible loop-hole for private organisations, thus protecting the VSNL as a sole ISP in India, which in turn assumed its monopoly.

Some other ISPs, for example, Education and Research Network (ERNET) of Department of Electronics (DOE); National Informatic Centre Network (NICNET) of Planning Commission of India and India Network (I-Net) of DOT have also proved to be effectie ISPs besides the VSNL. They already have a penetrative reach. ERNET is now permitting Internet access to students, institutional members and research personnel. Initially it was supposed to link up the entire educational institutions in the country but it could connect so far only the elitest universities on the circuit. NICNET is the ERNET equivalent for linking all the government agencies, institutes and offices via a computer network. I-Net is first PSPDN (Packet Switching Public Data Network) to provide communication units across major metropolis of India; connections facility to other national network and allowing subscriber to form a private network within I-Net. The irony is, all these networks which between themselves are doing a laudable job of providing Internet access, are not linked with one another. To mention, for example, message from ERNET to NICNET had to be rerouted through the U.S. This anomaly is to be checked seriously to take full advantages of Internet in India.

It is quite obvious that most of the developments of Internet have taken place in United States. The ISPs buy international leased line connectivity to someone or the other American long distance carrier who

in turn are connected to Internet exchange. The moment ISPs connect to any one of such carriers they are on Internet and their customers also get connected to the Internet.

There are generally five kinds of users connectivities, They are grouped in two groups :

a) Direct connectivity to the ISP

b) Indirect connectivity, i.e, connectivity through another data network.

The group that is directly connected to the ISP are sort of direct customers on Internet where as the group that is connected through an interim data network are memebrs of another data network which may either be Packet Switched Public Data Network (PSPDN) or Integrated Services Digital Network (ISDN).

They are indirect customers of the Internet. The types of connectivity are :

(i) Shell Account Connectivity

It is the cheapest type of connectivity provided directly by ISPs. This connectivity allows only textbased access on Internet using telephone lines for accessing the Internet Host of the ISP. Shell account does not allow the full range of Internet services. Some ISPs may allow only E-mail service while others may permit use of text-based browsers as well.

(ii) TCP/IP Connectivity on Dial-up Basis

This is a next higher type of connectivity which permits direct connection of user computer to the Internet. All user operations performed in the connectivity result in down load of information directly on user's PC. TCP/IP account permits full graphics-based access. The SLIP/PPP (Serial Line Internet Protocol) protocols support this TCP/IP operation for facilitating the connection of a user's computer directly on the Internet.

(iii)   TCP/IP Connectivity Using Leased Lines

.   This is the highest level of connectivity possible through an ISP. It supports high data speeds like 64 Kbps and 128 Kbps. Under this User's Host or PC is directly connected to the Internet Host of the ISP by specially build-up leased lines. It is an expensive account.

(iv)Shell Account Through PSPDN/ISDN

It is an indirect connectivity case where the Internet account holder is a dial-up member of another network like PSPDN or ISDN. In this case the parent network's ability limits the access facilities to the clientele.

Many times the PSPDNs do not support full TCP/IP access and thus the users of such account have to content with Shell account only. But the networks like ISDNs fully support TCP/IP and accordingly are able to provide better access to their customers. The users have to register separately with the ISP for Internet access in either of the case.

(v) Leased Line Connectivity though PSPDN/ISDN

It is also the case of indirect connectivity where the leased line connected subscribers of another network get connected to the IG of the ISP. The dial-up connection related limitations are eliminated here but those related to the capabilities of parent network still remain.

Conclusion

In India Internet service provision show is mainly handled by VSNL which presently operates in seven major metros- New Delhi, Calcutta, Madras, Bangalore, Hyderabad, Pune and Mumbai, The membership rules are controlled by VSNL in India. It has its own lease lines to America where the Indian network is connected to the main Internet network. Serious steps should be taken to have a strong national network of networks which should be the backbone for the Interent to take off in the country. To make a point, the Internet succeeded in the U.S. because there is a systematic and sustained growth in interlinked networks of compuer, whereas, we in India are not interlinked in the same manner so far.

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