Internet & E-mail : a User guide for Library Professionals

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Abstract

Intends to give a birds-eyed-view on Internet ranging from its origination to present day scenario. Emphasizes on the e-mail service of Internet. Highlights the utility and configuration of the mail server including its installation and maintenance. Discusses briefly the mechanism of client and server interaction for sending and receiving e-mail. Gives an account of overall features, functioning of e-mail.

1 Introduction

In the early 1980's, long before the Internet came into existence, William Gibson coined a term "Cyberspace". Then different Corporations had evolved into Superpowers, possessing more wealth than the world's governments, and they plotted sinister conspiracies against one another. Technology was readily available to everyone, including criminals and street gangs. Gibson called this place "Cyberspace," and the vast global computer network that powered it was called "the Matrix". Today, the setting for the most rapid advancement of technology in the history of mankind is called "Cyberspace" and the global computer network that powers this remarkable electronic universe is called "The Internet". At the touch of a key or the click of a mouse button, the color monitor on our desk can instantly become an incredible "window to the world". We can send a message to a friend in Afghanistan, upload a homework assignment to our college Professor in California, browse today's edition of the Telegraph, and download a free software program from an electronic library in Finland, can play a game of chess with someone in Zaire, get our horoscope for the day, and check out opening stock prices in Japan. Any one with a PC can instantly access over 100 million documents : literature classics, how-to books and courses on everything from dream analysis to mythology, to zoology; pending legislation; facts about the world, its history, cultures, religions, weather, and earthquake zones; useful pointers on stamp collecting, cooking, perfecting your tennis game, and many other hobbies and leisure interests.

2 Internet : Its Genesis

In 1969, the US government secretly embarked on a project code-named ARPANET (Advanced Research Projects Agency Network). The goal was to interconnect

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four computers in different parts of the country (Stanford Research Institute, University of Utah, and University of California at Los Angeles and Santa Barbara). The Internet was born! Long before the Department of Defense renamed the project DARPA (Defense Advanced Research Projects Agency) and the research turned into a new color, the goal was to keep this network connected no matter even if somebody dropped a bomb on one computer or blew up the telephone lines. The Cold War was in full bloom and an icy jet stream whipped through the steeples of Moscow and Washington D.C. as the two superpowers plunged into a chilling race for military superiority and ultimate survival. In 1972, the US government took the wraps off ARPANET. By now, some 50 universities and government facilities were connected, all engaged in military research. By 1975, the network had grown to 73 sites and in 1980, there were 205. Other networks soon began to appear UUCP (Unix to Unix) physical network linked machines running UNIX USENET (which stood for Users Network) BITNET CERFnet and the National Science Foundation's NSFnet. Then a funny thing happened -- desktop computers began rolling off assembly lines and found their way onto shelves at department stores and even toy stores. And average folks set sail for the Information Age.

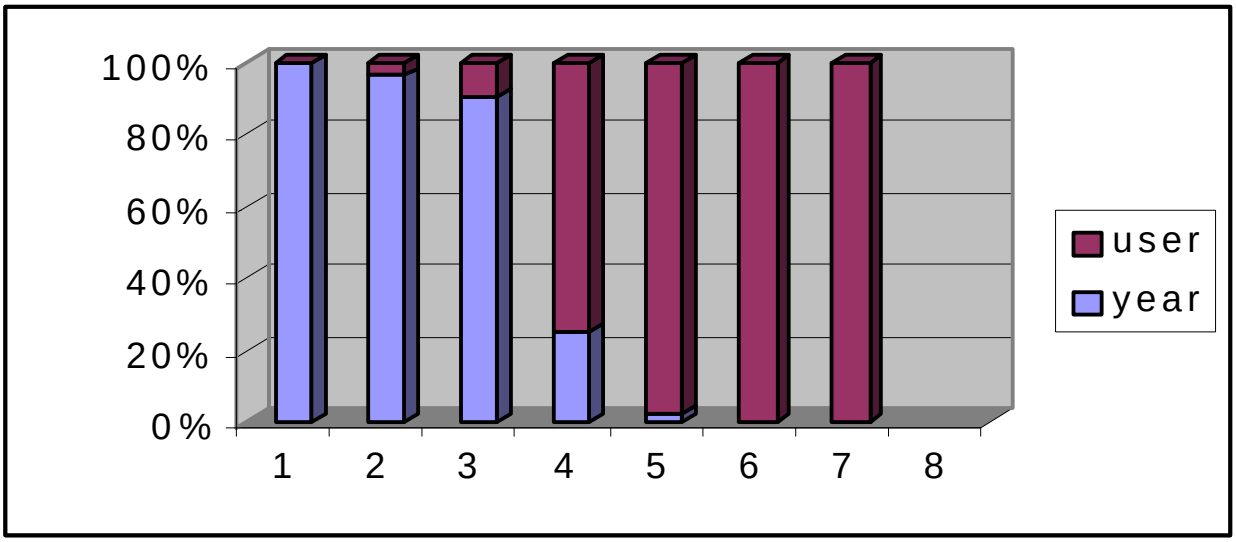

Fig 1 : The present scenario of computers connected to the internet

Year	User
1970	4
1975	73
1980	205
1985	5816
1990	80000
1995	1200000
2000	70000000
2001	4900000000

Today, the Internet is comprised of nearly 7,000 smaller networks spanning every continent including Antarctica, and connecting every city on the planet Earth. We can ride the information superhighway beyond the iron curtain and the great wall of China, to the war-torn frontiers of the middle East and Bosnia, past the great pyramids of Egypt,

down the foggy British coastline, across the scorching dunes of the Sahara and the steamy primordial jungles of Africa. Over two million computers and 30 million users are connected to the global Internet. Nobody *owns* the Internet. No government agency or corporation is "Incharge" or controls the airwaves (although the telephone lines that comprise the Internet backbone are commercially owned). There are no "rules" per se because there is no one to enforce such rules. This apparent anarchy has given rise to the notion that anything goes in cyberspace.

3 Facilities in Internet

Net gurus like Late John Postel by devising domain name system (DNS) regulated by the Internet Corporation of Assigned Names and Number (ICANN) find the ways to connect their networks to other computers. Any number of computers of different platform (e.g DOS , Windows, Unix based machine) can be connected .

What are in the Internet for us :

- Electronic Mail.
- Research
- Downloading Files
- Discussion Groups
- Interactive Games.
- Education & self-improvement
- Friendship & Dating.
- Electronic Newspapers and Magazines
- Job-Hunting.
- Electronic Commerce

What not !!!

4 E-Mail : an effective Internet Service

41 *Simple Mail Transfer Protocol (SMTP).*

This is the secret of e-mail on the Internet. In fact, there is nothing simple about "SMTP" -- unless you happen to be a UNIX guru. But here's the basic theory behind it: Within the Internet e-mail is delivered by having the source machine establishing a TCP connection to port 25 of the destination machine. Listing to this port 25 an mail demon that speaks SMTP. This demon accepts incoming connections and copies the message from them into the appropriate mailboxes. It is a simple ASCII protocol .After establishing the TCP connection to port 25, the sending machine, operating as a **client,** waits for the receiving machine operating as the **server** to talk first. The server starts by sending a line giving identity and tell whether or not it is prepared to receive mail. The SMTP assumes that every machine on the Internet is always just sitting around waiting for an e-mail message to arrive. An "SMTP domain" (a domain is a program that runs in the background) continuously polls for incoming mail and when a letter does arrive, the demon accepts and delivers it to the right mailbox. If all goes well as your message travels across the Network, it will be delivered within a minute or two. If delivery fails, your SMTP host assumes that the other machine will be back online shortly and it attempts to deliver the mail again in a few hours). Most SMTP hosts will keep trying for up to five days and if your message cannot be delivered after that time, it is bounced back to your mailbox. "SLIP" and "PPP" are the two most common methods for establishing a connection over a dial-up phone link. "SLIP" stands for "Serial Line Internet Protocol"

and "PPP" stands for "Point -to-Point Protocol." SLIP is a "network layer protocol" and PPP is a "link-level protocol" PPP is a newer and slightly faster protocol.

41 Protocol : Now what happens of different platform if two person own computers and they agree to connect their machines together by modem from time to time, and they further agree that a certain signal will have a certain meaning, no matter whose computer sends or receives it. And they have had to obey to some certain rule. That's a "protocol." The thousands of smaller networks comprising the Internet and all works on the same way. Data moves from one machine to the next in small globs or packets. A packet is usually 1,536 bytes but this varies depending on the network. In addition to data, each packet contains addressing information that identifies the sender and the receiver. On the Internet, most commonly protocol used to toss these data packets from one computer to the next has a name: the "Internet Protocol" or simply "IP". IP is used with other protocols, the best-known being "Transmission Control Protocol" or TCP. These two protocols are used so commonly today on the Internet that they have become known as TCP/IP. The TCP/IP network protocol requires no hardware. TCP/IP connection can be established using the serial port that is built into every compute

. A simple protocol used for fetching email from a remote mailbox is POP3 (Post Office Protocol). Which is defined in RFC(Request for comment) 1225 of IBM . It has commands for the user to login , log out , fetch message and delete the message. The protocol itself consists of ASCII text and has something of the flavor of SMTP. The POP3 is to fetch email from the remote mailbox and store it on the user's local machine to be read later.

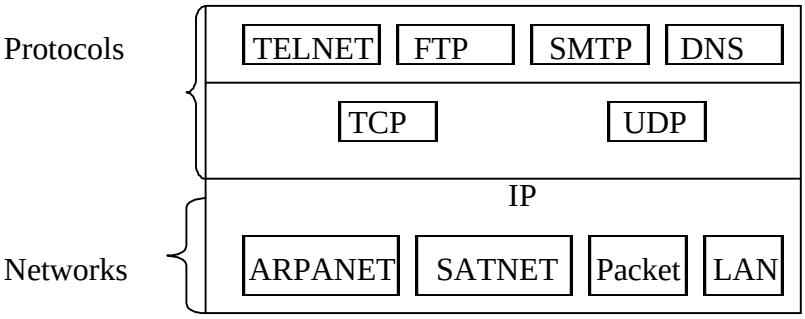

Fig Protocol and networks

42 *Internet Service Providers (ISPs).*

Most ISPs include an assortment of freeware and shareware on their start-up diskettes. (NetScape/ns-mail/SENDMAIL Apache HTTP Server etc.) Apache mail server brief configuration with Red Hat Linux 6.0 (Table - 1) loging as **root** then

```
# cd /etc
# vi sendmail.cf
```

```
  Apache HTTP server configuration file
 # Alias for this host
Cw your demon name
Cw localhost
# Virtual email domain
# who I masquerade as (null for no masquerading)
DM Main deamon name
# Smart host
DS Host
# Use this mailer to reach the Smart host
DN Server type
# Central host for local mail
DH
# class L: names that should be delivered locally, even if we have a relay
Clroot
# class E: names that should be exposed as from this host, even if we
masquerade
Ceroot
# Trust users
Troot
Tdaemon
Tuucp
# Database for special routing
# Not activated
# Restrict DNS to those domain only
CD
# /usr/lib/linuxconf/mailconf/stdmacros.cf
# There macros are generally never modified. Linuxconf does not
# manipulate them in any way. You are on your own.
# a class with just a left bracket (for identifying domain literals)
C[[
# dequoting map
Kdequote dequote  ..............................
```

Table - 1 : Apache server configuration 1.

43 ***Email Readers :*** To send e-mail to others and read your incoming messages, you'll need an e-mail reader. Two such programs are available on UNIX hosts: "**Elm**" and "**Pine**." You can use either of these whenever you are connected to your local Internet service provider. You don't need to install these programs on your own computer .A "mail reader" in its simplest form keeps track of your e-mail. It displays incoming messages and lets you reply conveniently to selected messages. Most email programs allow to save copies of important messages in convenient "folders" organized by topic. Besides Pine and Elm, various mail programs are available that can be run on Windows and Mac machines. "**Pegasus**" is an full-featured Windows program that's now available as freeware. "**Eudora**" is another popular mail reader that's available in Windows and Mac versions and it is often included on start-up diskettes for new SLIP/PPP accounts. It's quite adequate for most personal e-mail needs, and it's also free.**Yarn** is an offline e-mail reader that permits you to read and reply to e-mail offline. So you don't have to busy out your telephone line for long periods -- and you don't have to pay connect charges by the minute while you think of what to write. Nice! You can take your time and deal with your mail when you get around to it. A DOS-version of "Yarn" is also available The new

integrated packages such as "InternetSuite" offer built-in mail readers that let you to do all sorts of things including off- line mail reading, saving incoming and outgoing

* It is brief configuration so if you find any problems mail to the authors for further clarification

messages to convenient folders with "drag and drop" ease, creating and maintaining personal address books and mailing lists, and forwarding copies of messages and even file attachments to other people.

44 ***Route of E-Mail***

Email use Electronic mail is a truly miraculous phenomenon. The speed at which a message travels from one part of the world to another -- and the fact that it travels at all -- is pretty amazing. E-mail works because certain things occur on the "client side" (your personal computer) and other things happen on the "server side" (the machine on your network that handles electronic mail or the UNIX host machine that answers your call when you dial up your Internet Service Provider). The magic on the server side is accomplished by means of a UNIX software program called SENDMAIL (or a comparable "mail transport" program -- there are several but SENDMAIL is probably the most widely used one). SENDMAIL sits on thousands of mail servers around the world, waiting for an incoming message to arrive or a local user to send an outgoing message. SENDMAIL then springs to life. Incoming mail is scanned for address headers and tossed into the addressee's mailbox. With an outgoing message, SENDMAIL actually calls up the mail server at the destination site and the two computers (e.g.**Compu1** and **Compu2**)"talk" back and forth using protocols **Compu1** says, "Hello Mr. , I've got a message for one of your user," and **Compu2** replies, "OK, For whom?" **Compu1** says, "I've got 1,206 bytes for kmajum. You ready?" And the **Compu2** answers, "Yeah, sure, go ahead and send..." (Fig 2)

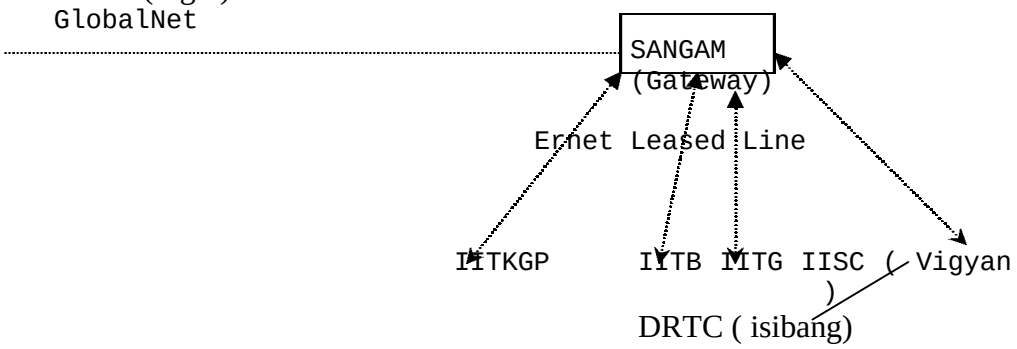

Fig: 2 : A sketch to demonstrate the transmission route of e-mail

```
Received: from iisc.ernet.in (iisc.ernet.in [144.16.64.3])( HEADER)  by
```

```
sangam.ncst.ernet.in ( HEADER)    (8.7.5) with SMTP id KAA17713 for
<kmajum@library.iitkgp.ernet.in>; Tue, 7 Jan 1997 10:31:36 +0530
(GMT+05:30)
Received: from postoffice.iisc.ernet.in by iisc.ernet.in (ERNET-
IISc/SMI-8.6.5) id KAA20826; Tue, 7 Jan 1997 10:27:03 +0530 ( HEADER)

Received: by vigyan.iisc.ernet.in (SMI-8.6/SMI-SVR4)
Id KAA01552; Tue, 7 Jan 1997 10:23:58 -0530
Id AA00619; Tue, 7 Jan 1997 10:25:54 GMT ( HEADER)

Message-Id: <199701071553.KAA01552@vigyan.iisc.ernet.in>
Received: by isibang; (5.65/1.1.8.2/06Jul95-1004AM) id AA00619; Tue, 7
Jan 1997 10:25:54 GMT Date: Tue, 7 Jan 1997 10:25:54 GMT

From: Durga Shankar Rath <dsr@isibang.ernet.in>
To: kmajum@library.iitkgp.ernet.in
```

Table - 2 : Automatically generate information to the route describe.

The transmission rute is → dsr@isibang.ernet.in → **isibang**. ernet. in (smtp **sangam** → . ncst.ernet.in(smtp) → .iitkgp.ernet.in(smtp) → **kmajum @ library.iitkgp.ernet.in**

5 Anatomy of E-mail :

Most e-mail messages that cross the Internet consist of simple text or ASCII characters. Millions of such messages are sent over the Internet every day. But it is also possible to send other kinds of files through email such as graphic images, digitized sound, and binary files (for example, software programs). Such nontext files require special handling. They are usually "attached" to a text message and the addressee's *mail reading software* must be able to extract and decode such attachments. A typical e-mail message basically consists of three parts: **" the header** and **the body the signature"** A header is found at the top of every raw message. This consists lot of cryptic data at the top. Certain fields such as "To:" and "From:" are self-explanatory. The information contained in a message header is used by mail transport programs such as SENDMAIL to efficiently route mail across the Internet. Without these headers, it would not be possible for the tens of thousands of mail servers on the global computer network to keep track of the millions of messages that are flying around at any given moment. Headers are also used by your own e-mail software to manage your incoming and outgoing messages. Every e-mail message must have a header. Even a blank message with no body or signature will have a header. Some of the data in these fields is generated by your own mail software. Other headers are inserted by the mail server that processes your message -- and by other servers that transport your mail along the way. A message may pass through four or five different networks, and these "hops" show up in the header. If, after all this, your message bounces, an experienced network administrator can often tell by looking at the headers why a message failed and how to fix the problem.

Depending on what e-mail software you have, your mail reader may show just a few of the most essential headers such as "To" "From" "Cc" "Date" and "Subject". If the

message includes a "Cc" header (which stands for "carbon copy") will be discursion details later stage . In Re 1 you will find the tag "Received" headers show the path of a message as it travels across cyberspace -- sort of like an electronic postmark. A message may contain several or more "Received" headers, usually one for each "hop" along the way. The "Message-ID" field is used by your mail reader to keep track of message threads so that you can follow an ongoing dialogue and figure out what message someone may be answering when they write "Good idea!" without giving any clue as to exactly what they are writing about.

6 E-mail address :

In the header, two fields 'To;" and 'From' Contain the e-mail address of the recipient and sender respectively. INTERNET E-MAIL w can be accessed through Internet browser Internet addressing is simple once you get used to a few basics. Every Internet address begins with a user name, followed by an "@" symbol, followed by the hierarchical name. When saying an e-mail address, the "@" is called the "at" and the "." is called a "dot". So an internet address kmajumdar@mailexcite.com is pronounced "kmajumdar at mailexcitedot com".

6.1 User name

What's in a name? : Everything! Every Internet e-mail address consists of a "user name" and a "hierarchical" name. Your user name might be something short and simple like "raghu123 " or it could be a confusing string of letters and numbers like those commonly found on Prodigy -- for example, "A17K4483" A typical user name is limited to 8 characters. Some service providers allow 10 character name also. Hierarchical names (the part that comes after the "@" symbol),on the other hand, can be any length.The "hierarchical name" identifies the address of the computer or sender where you have your Internet account. If your machine is on a network that also has a unique address then it is usually included in your hierarchical name. And every computer is classified in a particular "domain," designated by a 3-letter code appended to the end of the hierarchical name. A two-letter "country" may be take on to the e-mail address as well.For example: kmajum@cdserver.hdl.cdlibrary.org in this example, "kmajum" is the user name, "cdserver" is the name of kmajum's computer, "hdl" is the sub-domain or library network to which this machine is connected and it's located in the sub-domain "cdlibrary," which is in the domain "org". This machine been located in Kharagpur, where the country code is "in" it would have looked like this: kmajum@cdserver.hdl.cdlibrary.org.in

6,2 Domain Name

There are six top-level "domains" on the Internet. These domain names usedin every e-mail address and the meaning :

- EDU Education
- COM Commercial Organization
- GOV Government (non-military) site
- MIL Military

- ORG Non-profit organization
- NET Network Resource or machine
- IN , UK Country name

The top-level domain in your e-mail address is determined by the organization's activities or mission. Most Internet Service Providers (ISPs) are in either the "COM" or "NET" domain.

A mail with wrong address should not be sent at all. It doesn't matter what mail reader program or computer you have or what kind of Web browser you use. Typing the right e-mail address on the "To" field is mandatory . While there is no guarantee that a message will ever arrive, it is a sure bet that it won't if you don't address it correctly. And sometimes, the mail server does bounce mail (this can occur when the machine is offline, or Network traffic is heavy, or when some other Network glitch causes an "e-mail traffic jam".) But more often, when the cause of bounce of mail is incorrect address .

7 How to send a carbon copy

E-mail is modeled after "land mail" and even has a "carbon copy" option built in. Many popular e-mail programs such as "Pegasus" and "Eudora Light" provide this useful feature. The "Cc:" header at the top of the message stands for "Carbon Copy". Just type a valid e-mail address at this header and an exact copy of your message will go to that person as well as the person listed on the "To" line. You can send carbon copies to more than one person if you wish. In fact, you can type any number of e-mail addresses on the "Cc:" line. Each address must be separated by a comma

From: Bobby Joshi <bob@informindia.com> **Save Address Block Sender**
To: "'K Majumdar'" <kmajumdar@hotmail.com>
CC**: "'infocal'"** <infocal@cal.vsnl.net.in>**, "'infopune'"** <grover@giaspn01.vsnl.net.in>**, Sanjay Grover** <sanjay@informindia.com>
Subject: RE: Please help regarding jukebox
Date: Sat, 21 Aug 1999 09:52:54 +0530

```
Dear Mr. Majumdar

Thank you for your mail below and the continuous interest and support
that you have shown in our products and services. With regards to you
BObby Joshi
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Table - 3 : Sending Carbon copies

'infocal'<infocal@cal.vsnl.net.in>,'infopune'grover@giaspn01 .vsnl.net.in>, Sanjay Grover <sanjay@informindia.com> on the "Cc:" line will be mirrored in the original message and all copies. So everyone here infocal of Calcutta, infopune of Pune, sanjay of infromindia will see where the mail message has been sent as carbon copies.

8 Forwarding a message

Some e-mail software, including Pegasus and Eudora Light, let you forward a copy of a message you've received to someone else. Forwarding can be as simple as

pressing "F" or clicking the appropriate icon and typing in an e-mail address. One can forward a message to as many addresses as he/she wishes.

Privacy factor

An "encrypted" message is typed in the usual way and then passed through an encryption program that makes the message unreadable. Only someone that knows the code will be able to decipher the resulting code and read the original message. Several popular encryption programs are available in the public domain. These programs are free for the asking. "PGP" which stands for "Pretty Good Privacy" is perhaps the best known. Although there are stakes and argument that if one isn't doing anything wrong, he/she won't need to encrypt his/her e-mail.

Privacy through it is surprising that e-mail is not very private at all! Depending on the network routing and other factors, the e-mail could easily pass through a dozen or more computers route to its destination. Anyone, at any one of these network intersections could pursue the message with an ordinary text viewer. Within the library, e-mail is not likely to very private. Anyone who knows where the "mail spool" is located on the hard drive can, without much difficulty at all, poke around through all there supposedly private communications. If one wants privacy, stick a postage stamp on his message and use "land mail" or "Snail-Mail" as it is called on the Net.

09 How to start :

Till today it has assumed that all users work on machines that are capable of sending and receiving email in reality this situation is false. For example at many libraries, users work at desktop PC,s that are not on the Internet and are not capable of sending or receiving email from outside the library. Instead, the Libraries have one or more email servers that cam send and receive email. To send and receive messages, a PC must talk to an email server using some kind of delivery protocol

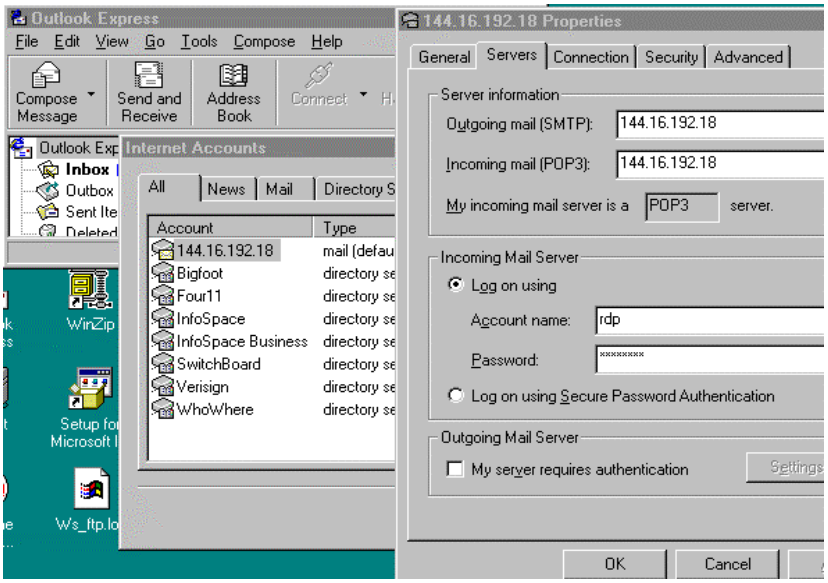

Fig 3 : From your Desktop Click on Outlook express - Tool –Account – Set your server and login / passwd

A more sophisticate delivery protocol is IMAP(Interactive Mail Access Protocol), which is defined in RFC 1064. It is designed to help the user who uses multiple computers, perhaps a workstation in the office, a PC at hone and a laptop on the road. The basic idea behind IMAP is for the email server to maintain a central repository that can be accessed from any machine.

Yet a third delivery protocol is DMSP (Distributed Mail System Protocol) which is part of the PCMAIL system and described in RFC 1056. This one does not assume that all email is on one server, as do POP3 and IMAP. Instead it allows users to download email from the server to a workstation, PC, a laptop and then disconnect.

All most interesting feature of email is VACATION DEMON. This is a program that examines each incoming messages and sender as insipid reply such as: *Hi , I'm on leave. I'll back on the 24th of August. And will then reply. Have a nice day.*

As most of us are slow typists there is an informal system of "electronic shorthand" has been evolved on the Internet , which is found during mailing session. Here are a few of the most common:

- BTW By the way
- TIA Thanks in advance
- FWIW For what it's worth,
- RTFM Read the ******* manual
- IMHO In my humble opinion
- KISS Keep it short
- WYSIWYG What you see is what you get
- MYOB Mind your own business
- FYI For your information,

Important tips for Using E-MAIL

- Address e-mail carefully
- Learn how to use your mail reading program
- Keep track of important correspondence . ALWAYS keep a copy of your outgoing mail in case you need to resend it.

09.1 **Conclusion :**

We feel it is right time to mention that some of the library professionals are of presently three groups. One group of library professionals are much interested only in Information Technology rather than in tools and techniques of Library Science. They forget that IT is only a tool subject to library and information profession because they are over enthusiastic to present themselves as IT professionals than library professionals. However, they belong neither to IT profession nor to Library profession. The another group is afraid to encourage the use of computer in the library field. Neither they have

interest to develop themselves nor they encourage other professionals to do so. However fortunately there are a group who are much confident on its own tools and techniques of library profession and are also interested to use computer and /or modern technology as another tool to the profession.

The internet and email has become so popular today, we can not avoid our responsibility or making all professionals well aware. We conclude with a great hope that this small and simple presentation will help to grow interest among unaware professionals , refresh and enrich the knowledge of all professionals working in the field

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