

## CHAPTER 9

# HIGH SPEED NETWORKS: AN OVERVIEW

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### ABSTRACT

Several applications that demand high speed networking are becoming a reality. This paper presents an overview of new developments in the architectures and protocols for high speed networks. Comparisons are given between these architectures and protocols considering some typical guarantees that applications might want.

Typical new high speed networks are presented, discussed and compared in the light of the applications requirements.

## 3D Internet Content

- ★ VRML ( Virtual Reality Markup Language ) is used for creation of 3D Internet content, as opposed to the two dimensional content characterised by HTML.
- ★ Silicon Graphics has gathered the support of 56 Internet leaders for Moving Worlds, its proposed standard for the second generation of VRML ( VRML 2.0 ).
- ★ Navigator 3.0 from Netscape will support streaming audio and video using technology from InSoft Inc. It will also support 3D applications with VRML viewing technology and 3D extensions through Java and JavaScript in technology called Live3D.
- ★ VRML manufacturers on the WWW
  - WebFX for Netscape  
Navigator: <ftp://ftp.paperine.com/pub/webfx/windows/16bit/plugin/npwfx16c.exe>
  - Caligari Fountain: <http://www.caligari.com.ftp/pub/fountain.exe>
  - Silicon Graphics and Template Graphics WebSpace:  
<ftp://ftp.sd.tgs.com/pub/template/WebSpace/Win95/WEBSPC10.exe>
  - Intervista WorldView: <ftp://ftp.webmaster.com/pub/VRML/intervista/win32s.exe>
  - Chaco Communications VR Scout: <ftp://ftp.chaco.com/pub/vrscout/sc16-110.exe>
  - VRweb: [ftp://ftp.utdallas.edu/pub/Hyper-G/VRweb/Windows/VRW\\_WIN.ZIP](ftp://ftp.utdallas.edu/pub/Hyper-G/VRweb/Windows/VRW_WIN.ZIP)
  - Superscape VisNet: <http://www.superscape.com>

Netscape [Superscape New Home Page] Help

File Edit View Go Bookmarks Options Directory

Back Forward Home Reload Images Open Print Find Stop

Locations: http://www.superscape.com/index.html

What's New What's Cool Upgrades Net Search Net Directory Newsgroups Handbook

**SUPERSCAPE**  
VIRTUAL REALITY SOFTWARE

The World's Most Popular Virtual Reality Software

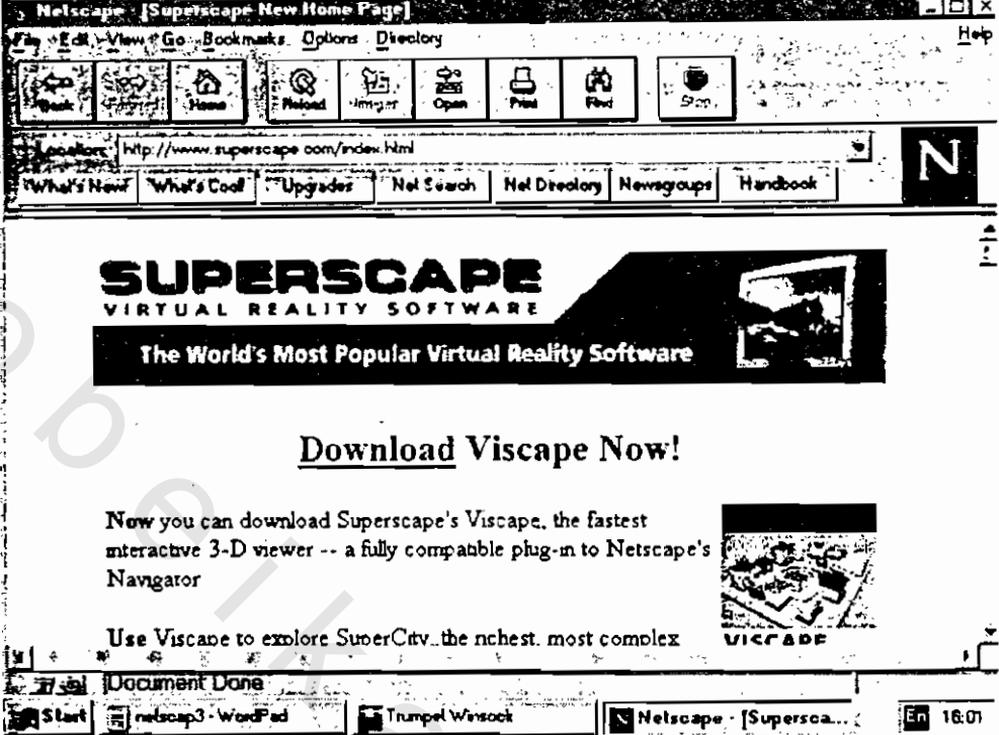
**Download Viscapc Now!**

Now you can download Superscape's Viscapc, the fastest interactive 3-D viewer -- a fully compatible plug-in to Netscape's Navigator

Use Viscapc to explore SuperCity, the richest, most complex

Document Done

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Netscape [FASHION NET] Help

File Edit View Go Bookmarks Options Directory

Back Forward Home Reload Images Open Print Find Stop

Locations: http://www.fashion.net/

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the easy way to find sites on the internet

**a2z** www.a2z.lycos.com

F A S H I O N  
N E T

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Netscape [Mayo Clinic] Help

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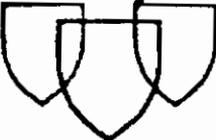
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Location: <http://www.mayo.edu/>

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# WELCOME TO MAYO

## mayo



**ABOUT**

**The best interest of the patient is**

Location: [http://www.mayo.edu/cgi-bin/mqemep/mayo\\_home?513,232](http://www.mayo.edu/cgi-bin/mqemep/mayo_home?513,232)

Start Netscape WordPad Trumpet Winsock Netscape - [M... Saving Location - [230] 18:20

Netscape Welcome to the BBC Help

File Edit View Go Bookmarks Options Directory

Back Home Reload Images Open Print Find Stop

Location: <http://www.bbcnc.org.uk/>

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 **RADIO**

 **TELEVISION**

 **EDUCATION**

 **WORLD SERVICE**

Location: [http://www.bbcnc.org.uk/images/homepage\\_mep?240,132](http://www.bbcnc.org.uk/images/homepage_mep?240,132)

Start Netscape WordPad Trumpet Winsock Netscape - [W... Saving Location - [239] 18:35

Netscape [RITSEC Home Page] Help  
 File Edit View Go Bookmarks Options Directory  
 Back Forward Home Reload Print Open Print Stop  
 Location: <http://ritsec.www.com.sg/>  
 What's New! What's Cool! Upgrades Net Search Net Directory Newsgroups Handbook

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# RITSEC

*Regional Information Technology & Software Engineering Center*



Start | Netscape - WordPad | Trumpet Winsock | Netscape - [RIT... | Saving Location - [278] | En 16:45

Netscape [Internet Business Center] Help  
 File Edit View Go Bookmarks Options Directory  
 Back Forward Home Reload Print Open Print Stop  
 Location: <http://home.lig.com/bc>  
 What's New! What's Cool! Upgrades Net Search Net Directory Newsgroups Handbook

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## The Internet Business Center

*where commerce and technology come together*



**Domains**  
Our Domain Name Database. It's big. It's searchable.



**Market Manager**  
Our complete Internet application management system



**BS Day**  
The Business Site of the Day

Start | Netscape2 - WordPad | Trumpet Winsock | Netscape - Internet ... | En 13:54

## The Internet Mail (TM) Shopping on the Information Highway

- ★ Active since 5 Sep. 95
- ★ Including over 4500 companies offering products and services through the Internet.



### ★ Organized by floors :

- ↪ First Floor : Media.
- ↪ Second Floor : Personal Items.
- ↪ Third Floor : Computer Hardware and Software.
- ↪ Fourth Floor : Services.
- ↪ Fifth Floor : Clothes and Sporting Goods.
- ↪ Sixth Floor : Furniture and Housewares.
- ↪ Top Floor : Food and Beverages.

### ★ Go there by using one of :

- ↪ WWW [http : //www.iw.com/imal](http://www.iw.com/imal)
- ↪ Gopher <peg.cwls.ucl.edu:7000> and look in pag / Internet Guides
- ↪ FTP <ftp.netcom.com> and look in pub/GU/Guides'
- ↪ Email [taylor@netcom.com](mailto:taylor@netcom.com) with SUBJECT "send mail"

## HOW CAN I SEND A FAX FROM THE INTERNET ?

★ There are Several Services for sending and receiving a fax via Internet mail ( Some are free while others are pay services ).

★ To send a fax by e-mail, send a message  
To : remote-printer.<info>@phonenumber.iddd.tpc.int  
Where <info> contains information for the cover page.  
In <info>, "/" is turned into a line break and " - " is turned into a space.

★ Example :

1. To : remote-printer.Arlo\_Cats/Room\_123@12025551212.iddd.tpc.int  
would send a fax to +1-202-555-1212 with the cover page :  
Please deliver this facsimile to :  
Arlo Cats  
Room 123

2. Another way ( work more reliable sometimes )  
To : remote-printer.Arlo-Cats/Room-123@2.1.2.1.5.5.2.0.2.1.tpc.int  
Note : the phone number is backwards.

★ There is a www page which provides information about TPC.INT fax service :  
[http : //linuxl.balliol.ox.ac.uk/fax/faxsend.html](http://linuxl.balliol.ox.ac.uk/fax/faxsend.html)

## Internet Phone from VocalTec

### ★ **Minimum Configuration Needed:**

- Sound Card and a microphone.
- 468 SX with 8MB of RAM.
- Full SLIP connection at 14.4 Kbps.
- TCP/IP Software with Winsock 1.1 Support.
- Download VocalTec program (<http://www.vocaltec.com/>).

★ **Internet Phone connects to a special server prepared to connect people together. You will choose a server then you will be able to call others who are connected to the same server and they will be able to call you.**

### ★ **When you run the program for the first time**

- You will be asked to type information about yourself.
- Adjust sound levels by testing your speaking through the microphone.
- choose a server to connect to, then a list of users who are connected to that server will be displayed along with information about them.
- choose one of them and his/her program will notify them that you are calling.
- Then you will be answered.
- Start your conversation and while you do it, fine tune again your volume levels.

★ **Internet Phone has a long way to go till it can compete with the real phone.**

## HOW CAN I USE THE INTERNET AS A TELEPHONE ?

### ★ You will need :

- A 28.8 K modem to get good quality
- An Internet SLIP or PPP Connection
- A fairly Speedy Computer ( at least 33 MHZ )
- A sound Card, Speakers and a microphone
- Internet audioconferencing software

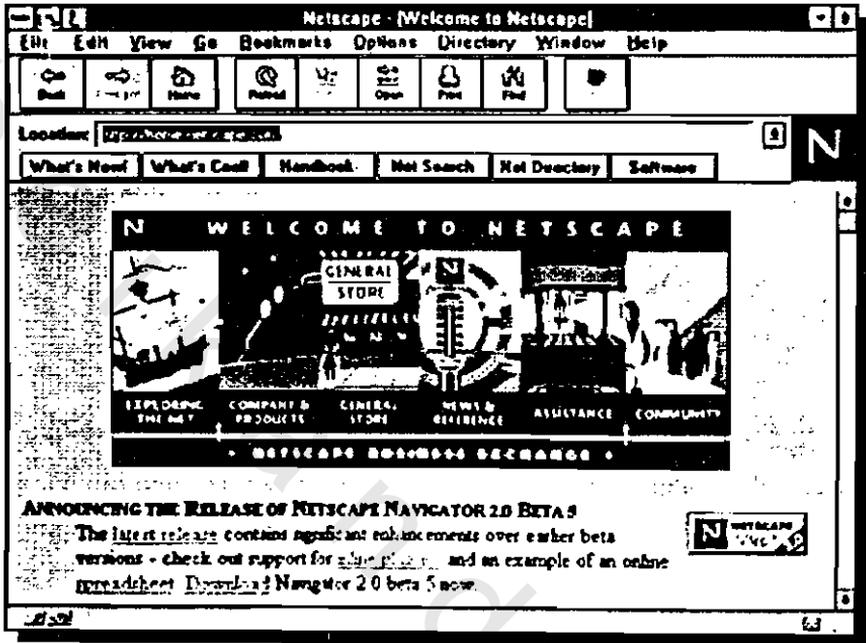
### ★ What Software is available ?

For Windows	For UNIX	For Mac
Speak Freely	Speak Freely	Maven
CU-See Me	Cyber Phone	Net Phone
Internet Phone	NEVOT	PGP fone
Digi Phone	Vat	CU-See Me
Internet Global Phone	mtalk	
Web Phone	ztalk	
Internet Voice Chat		

### ★ You and the associate you are talking to need to be using software that can transmit and receive the same encoding / compression protocol.

### ★ Standard encoding / compression are : GSM, RTP, PGP, CVSD, DES

# NETSCAPE



- ✦ Netscape Navigator 2.0 & Netscape Navigator Gold 2.0
- ✦ Bringing Web exploring, email, newsgroups, chat, and FTP capabilities together
- ✦ It provides a superior platform for live online applications, supporting Live objects and other interactive multimedia content such as Java Applets, Frames, and Netscape inline plug - ins
- ✦ Netscape Navigator Gold 2.0 provides all the above mentioned capabilities plus integrated WYSIWYG document creation and publishing capabilities.

## **MOSAIC (Cont.)**

- ★ **A Mosaic session begins with a home page to get started.**
- ★ **On the home page, you'll notice :**
  - ❑ **specially colored ( or underlined, on a mono monitor ) text.**
  - ❑ **Images that have a thin colored lined around them.**

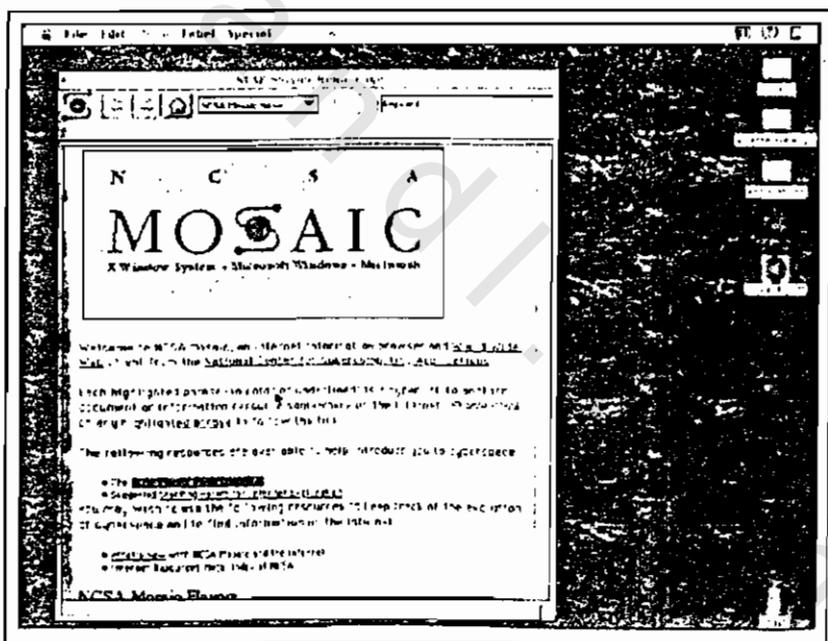
**These are ltnes that are hyperlinked to something else.**
- ★ **Click on highlighted text or outlined images, and you navigate to a related page, and so on.**
- ★ **Using Mosaic, you will be able to :**
  - ❑ **See text and In-line Images Inside the pages you are navigatlng**
  - ❑ **Listen to audio files**
  - ❑ **Playing video files.**
- ★ **New web browsers have come up. Netscape is a new browser which is an extension to Mosaic.**

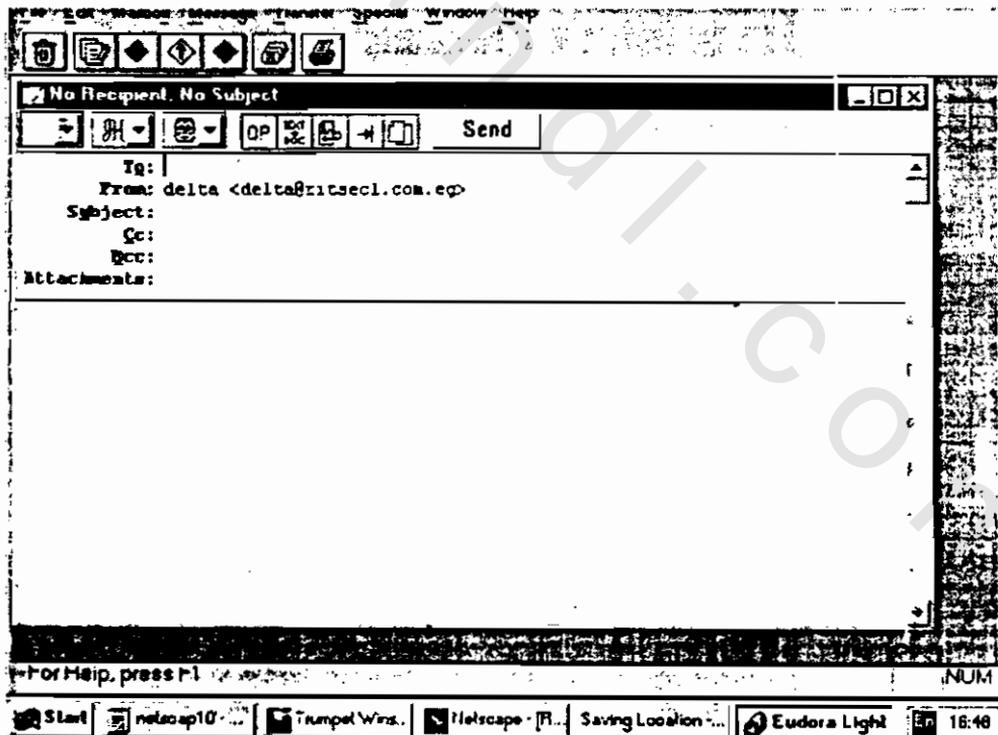
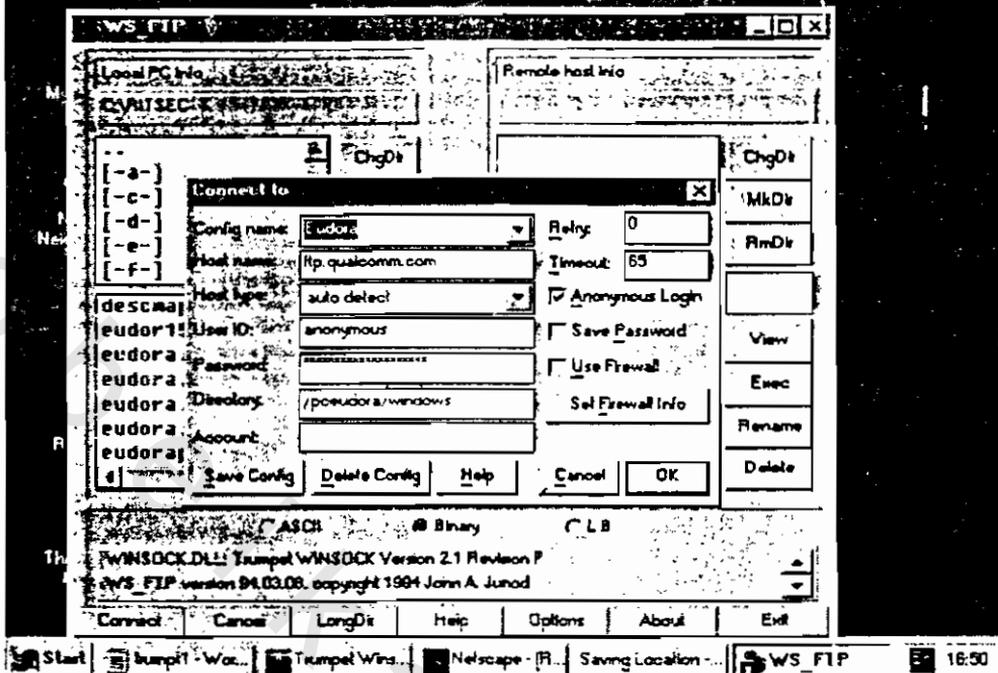
## MOSAIC (Cont.)

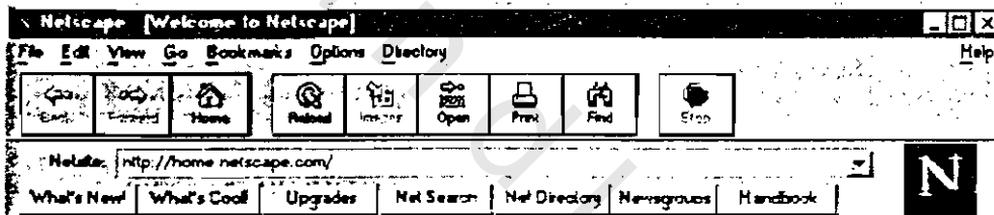
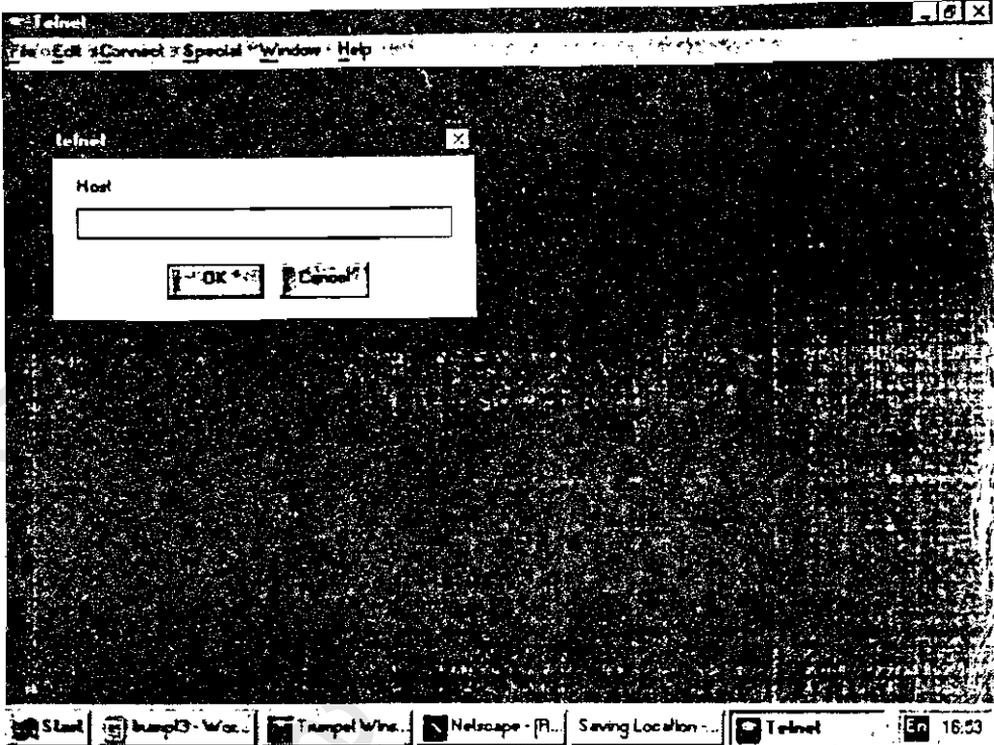
★ Mosaic comes all ready to run, all you need to do is :

- ❑ download the program
- ❑ uncompress it using uncompress command.
- ❑ make it executable using chmod command.

★ The Mosaic screen







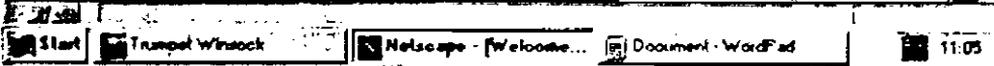
**NETSCAPE NEWS: MAY 18-19**

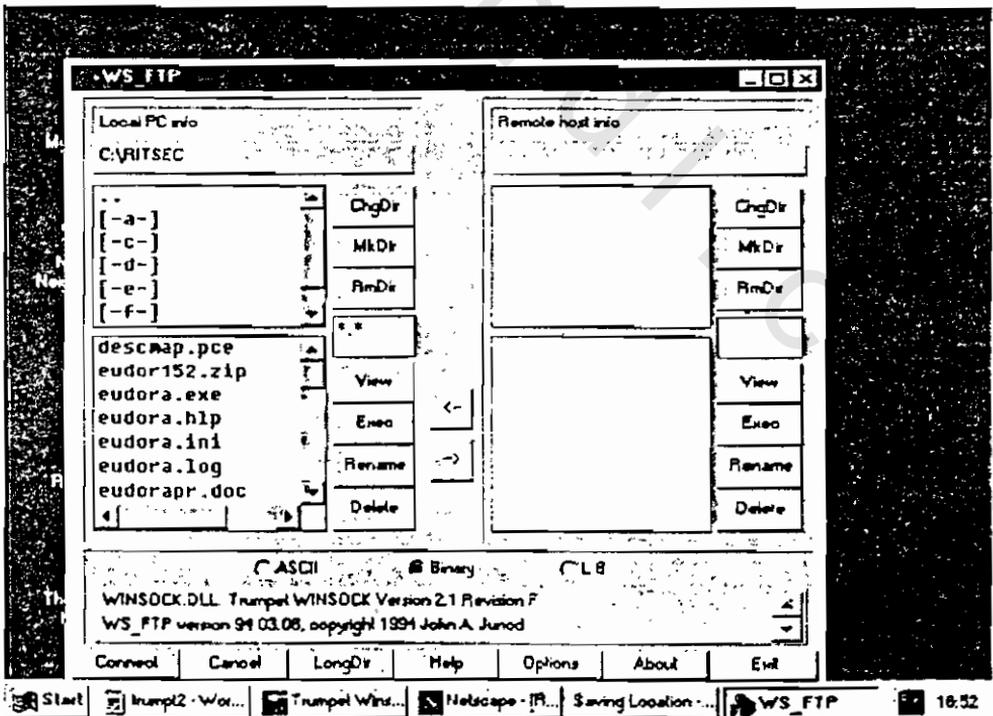
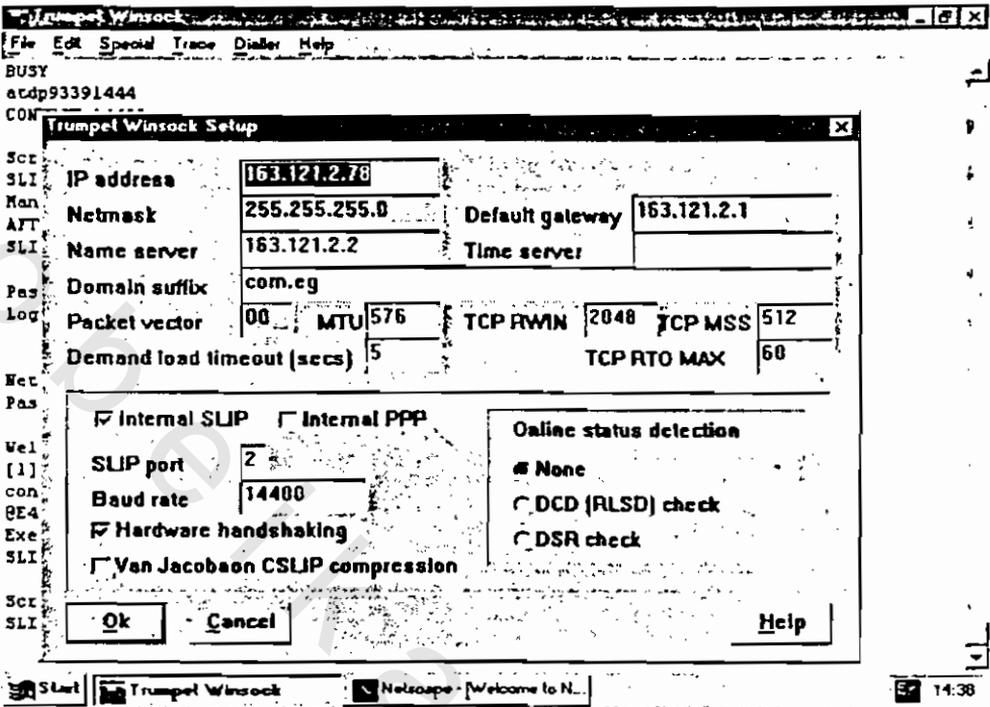
**NETSCAPE NAVIGATOR 2.02**



Announcing Netscape Navigator 2.02, which offers security enhancements, Daylight Saving

[Download](#) the newest release of Netscape Navigator and read about recent [enhancements](#). Upgrade [patches](#) for Windows, Macintosh, and [Unix](#) are also available.





# WORLD WIDE WEB (WWW)

## (cont.)

- ★ The first part of an URL (the stuff before :) tell the browser how to access that particular file (protocol).
- ★ The common protocols are :
  - ftp --- File Transfer Protocol
  - file --- File Transfer Protocol (same as ftp)
  - news --- Internet News Protocol (Usenet)
  - gopher --- Gopher
  - telnet --- Telnet
  - http --- Hypertext Transport Protocol
- ★ The main site for www is  
nxoc01.cern.ch                      switzerland
- ★ The two slashes (//) after the colon indicates a machine name or address.
- ★ When using the http protocol, this file is the HTML (HyperText Markup Language) file --- the coding language used to create Hypertext documents for use on WWW.
- ★ HTML file has the extension (.html) for non-DOS servers or (.htm) for DOS-based servers.  
EX. [http://ritsec\\_www.com.eg:8080/mieg/mieg.html](http://ritsec_www.com.eg:8080/mieg/mieg.html)
- ★ Several types of browsers
  - txt-based ( Lynx )
  - graphics-based ( Mosaic,Netscape,Cello,MS Internet Explorer, I-comm,and Slipknot )
- ★ Both Lynx and Mosaic are freeware

# WORLD WIDE WEB (WWW)

- ★ **The World Wide Web is based on hypertext.**
- ★ **Hypertext Generally, any text that contains "links" to other documents-words or phrases in the document that can be chosen by a reader and which cause another document to be retrieved and displayed.**
- ★ **You can access the web through something called a "browser" (web clients).**
- ★ **A browser can read documents, fetch documents, access files by FTP, read usenet newsgroups, telnet into remote sites, and travel around Gopherspace.**
- ★ **A web address is called URL (Universal Resource Locator), It looks like**  
`<protocol>://<Internet address>[: port]/<file specifications>`  
**( the default port number is 80 )**
- ★ **Here are a few basic URLs :**  
`file://wuarchive.wustl.edu/mirrors/msdos/graphics/gifkit.zip`  
`file://wuarchive.wustl.edu/mirrors`  
`http://www.w3.org/default.html`  
`news: alt.hypertext`  
`telnet://dra.com`

## INTERNET ADDRESSES (cont.)

### ★ EXAMPLES :

← - - -  
yoko.suzuki.com.jp



Japan. commercial sector. suzuki company. computer yoko

← - - -  
iserv.zamalek.ritsec.com.eg



Egypt. commercial sector. RITSEC organization. Zamalek site.  
the computer named iserv ( Internet services ).

★ The minimum you should include is the country domain ( other than US ) and the sector subdomain.

## **INTERNET ADDRESSES (Cont.)**

- ✦ Every machine that is on the Internet has a unique IP number.
- ✦ IP addresses and name addresses are equivalent and exist together.
- ✦ The translation of name addresses into numeric addresses is handled by machines on the Internet, called name servers.

- ✦ you can use either type of address

mfahmi @ ritsec.com.eg



mfahmi@163.121.2.3

- ✦ There are three classes in address allocation, namely:

- class A : allow user to allocate any address in parts B,C,D

126.\*.\*

- class B : allow user to allocate any address in parts C,D

163.121.\*

- class C : allow user to allocate any address in the part D.

193.227.1.\*

## **INTERNET ADDRESSES (Cont.)**

- ✦ **The Internet name addressing is a flexible process**
- ✦ **The user name is usually defined at the host level.**

 mfahmi @ ritsec.com.eg



**this address is of the user whose account name is mfahmi and is on the computer whose address is ritsec.com.eg**

- ✦ **The actual address is a numerical address, called IP address or number. Some times called a “ dotted quad “. A unique number consisting of 4 parts separated by dots, e.g.**

**A.B.C.D**

**each part have a number ranging from 1 to 254**

**e.g.**

**165.113.245.2**

# INTERNET ADDRESSES

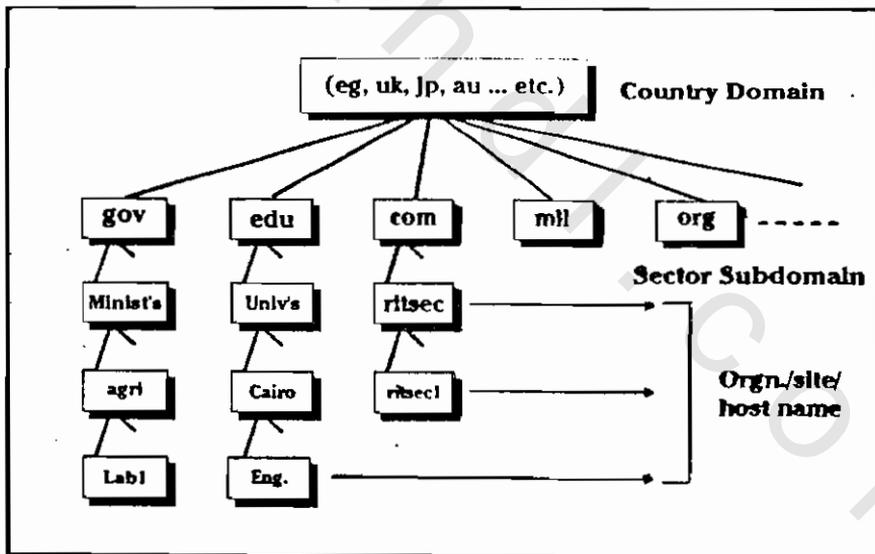
- ★ Are generally in two parts :

<User name>@<domain or hierarchical name>

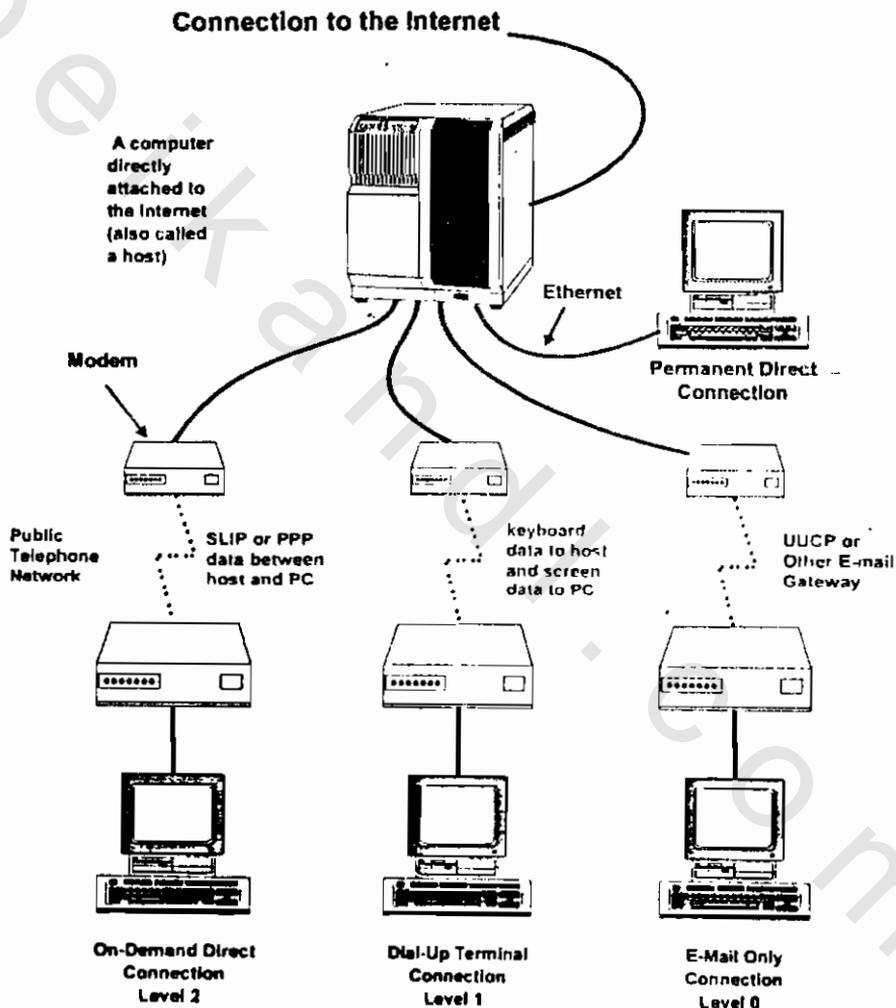
or

<site/host address>

- ★ Generally, the hierarchical name may look like this

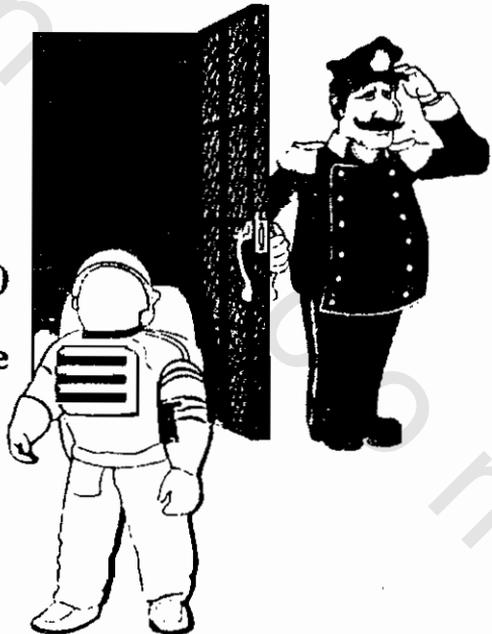


# GETTING CONNECTED TO THE INTERNET



# INTERNET MAJOR TOOLS

- ★ **Telnet**
- ★ **Electronic mail & LISTSERV**
- ★ **File Transfer Protocol (FTP) & Archie**
- ★ **Gopher, Veronica & Jughead**
- ★ **Finger, Whois & Netfind**
- ★ **IRC & USENET**
- ★ **WAIS**
- ★ **World Wide Web (WWW)**
- ★ **Lynx, Mosaic & Netscape**
- ★ **MUDs and MOOs**



## Catalog on Internet Resources

Agriculture  
Archeology  
Art  
Astronomy  
Automobiles  
Aviation  
BBS  
Biology  
Bizarre  
Books  
Business and Finance  
Calculators  
Chemistry  
Children  
Computer Culture  
Computer Hardware  
Computer Literature  
Computer Networks  
Computer Technology  
Computer Vendors  
Consumer Services  
Cyberpunk  
Economics  
Education  
Environment  
Food and Drink  
Fun  
Games  
Games (Video)  
Geoculture  
Geography  
Geology  
Government  
Health  
Historical Documents  
History  
Hobbies  
Humanities  
Humor  
Humor Archives  
Internet  
Intrigue  
Languages  
Law  
Libraries  
Literature: Authors  
Literature: Collection  
Literature: Titles  
Locks and Keys  
Magazines  
Mathematics  
Medicine  
Military  
Movies  
MUDs  
Music  
News  
Oceanography  
Operating Systems  
Organizations  
Pets  
Physics  
Pictures and Sound  
Politics  
Programming  
Publications  
Religion  
Science  
Sex  
Software  
Software: Archives  
Software: Internet  
Software: Macintosh  
Software: Utilities  
Space  
Sports and Athletics  
Technology  
Telephones  
Television  
Travel  
Trivia  
Unix  
Usenet  
Weather



## WHAT WE CAN DO ON THE INTERNET ? (cont.)

- X500 :  
Searchable phone book of people or services.
- Archi :  
Searching and retrieval of document archives.
- Veronica :  
Gopher server searching.
- WAIS :  
allows the indexing of huge quantities of information,  
and then making those indices searchable across  
networks such as the Internet.

### ★ Play Games :

Play games and join simulations

### ★ Using it as telephone and Fax.

### ★ Electronic shopping, Banking, Commerce, Learning, etc. ...



# WHAT WE CAN DO ON THE INTERNET ?

(cont.)

## ★ Integrating Services :

By collecting various information forms into a usable interface, the following services are user - friendly ways to organize and access Internet data :

### - Gopher :

Menu - based information organization and retrieval

### - World Wide Web :

Hypertext document based linking and retrieval.

## ★ Information Searching :

considering the size of the Internet and the uneven distribution of valuable resources, automated services provide useful interfaces for locating such data with little or no time investment is essential :

### - Figer :

Information about a particular user on a computer system.



## WHAT WE CAN DO ON THE INTERNET ?

- ★ **Electronic Mail :**  
Message exchange between individuals or groups.
- ★ **File Transfer :**  
Exchange of files between Internet sites ( hosts or servers / clients ) FTP.
- ★ **Network News :**  
Public message and response bulletin board.
- ★ **Run Programs on other computers :**  
Remote Login-Telnet (Server/Client communication protocol).
- ★ **TALK :**  
Two person text - based communication.
- ★ **Internet Relay Chat ( IRC ) :**  
Multi - person text communication organized by channel.
- ★ **CU - See Me :**  
Multi - person audio / video communication.

## INTERNET SERVICE PROVIDER'S (cont.)

### ★ Jordan

- National Information Center (NIC), <http://petra.nic.gov.jo>

### ★ Lebanon

- DM, <http://www.dm.net.lb>
- AUB, <http://www.aub.ac.lb>
- IncoNet, <http://www.inco.com.lb>

### ★ Qatar

- InterGulf ( later, service not yet available )

### ★ Morocco

- Al Akhawayn University, <http://www.alakhawayn.ma>
- ONPT, <http://www.maghreb.net/morocco>

### ★ Saudi Arabia

- KFUPM (e-mail & usenet), <http://www.ccse.kfupm.edu.sa>

### ★ Palestinian autonomous Areas

- Palnet ( e-mail ) , <http://www.palnet.com>

### ★ Oman

- Sultan Qaboos University ( SQU ) , e-mail only

## INTERNET SERVICE PROVIDER'S

### ★ Egypt

- FRCU
- IDSC / RITSEC
- InTouch ( 3376407 )
- RITE ( 3403114 )
- VIDEO ON LINE ( 3372041 )
- MASH ( 3362335 )
- IBM Egypt ( 3492533 )
- Soficom ( 3421952 )
- StarNet ( 3930915 )
- Dr. Ahmed Bahgat & Co. ( 3562882 )
- PACC ( 3455951 )
- NTG ( 5874557 - 5877604 )
- DATUM ( 2903501 )
- EGYPT ON LINE ( 3490133 - 3405952 )
- AT&T ( 5703266 )

### ★ Kuwait

- GulfNet Kuwait, <http://www.kuait.com>
- GulfNet International, <http://www.moc.kw>

### ★ United Arab Emirates

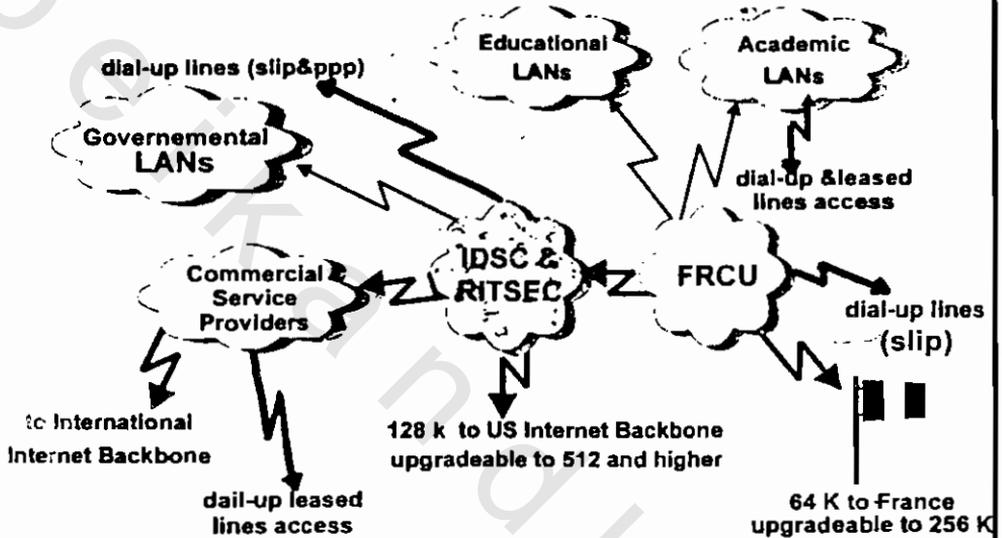
- Etisalat, <http://www.emirates.net.ae>

### ★ Bahrain

- batelco, <http://www.batelco.com.bh>

# INTERNET IN EGYPT

## ★ Current Configuration



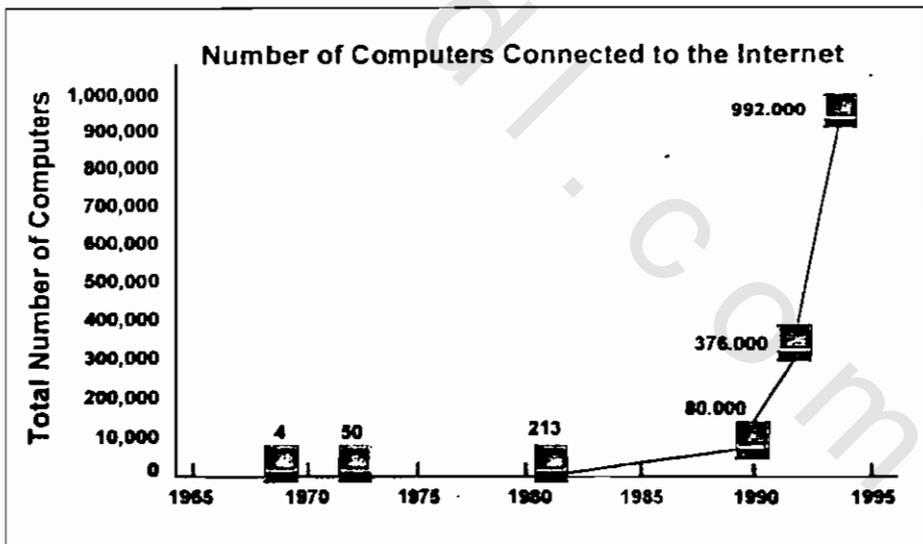
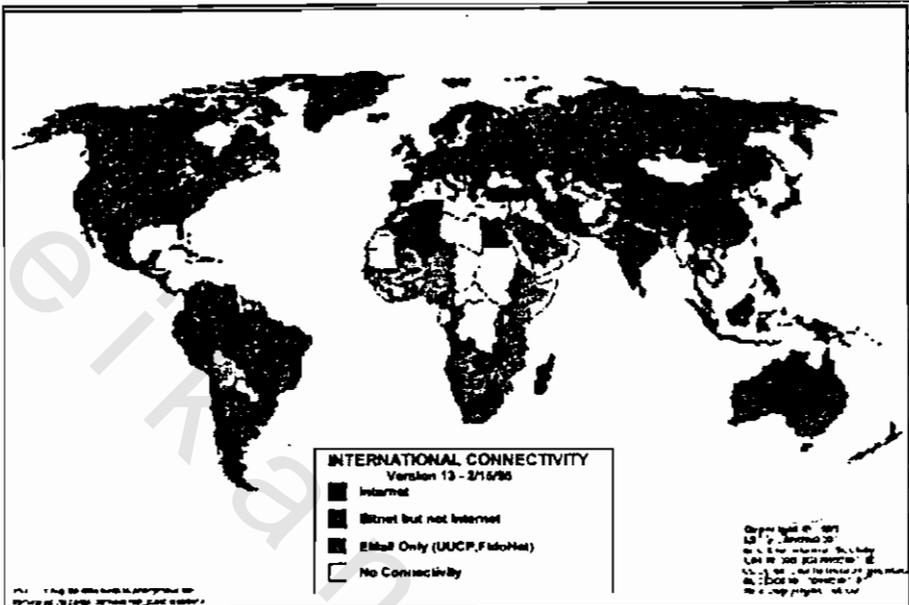
## ★ Current Users Community ( May 1996 )

Commerical	~7,000 Users
Academic	~7,000 Users
Governmental	~1,500 Users
Non-Governmental	~200 Users

## AMAZING INTERNET FACTS

- 1** It is estimated that the Internet now connects roughly more than **21,000** independent networks into a vast global Internet.
- 2** More than **1000** computers are added to the Internet each day.
- 3** The amount of data crossing the Internet grows by **10 %** per month. That's **214%** per annum !.
- 4** Each day , worldwide, around **10 million** people directly ( and some **25 million** indirectly ) use the Internet to send and receive electronic mail.
- 5** By the year **2000** all schools and colleges in the United States will be linked to the Internet, just as all universities are today.
- 6** Internet growth predictions

Number of	1995	2000
Networks	21,000	1,000,000
computers	2,000,000	100,000,000
Service providers	1,000	10,000
Direct users	10,000,000	1,000,000,000



## **WHAT IS THE INTERNET ?**

- ★ **The simplest way to describe the Internet is with one word, Communication. The shortest definition is " The network of information networks ".**
- ★ **Today , the Internet is a web of different, intercommunicating networks funded by both commercial and Government organizations. It also has spread overseas to connect to networks in most of the countries.**
- ★ **The Internet has grown rapidly in the last few years. There are now over 15 million computers connected, and about 1000 more join each day !**
- ★ **Computers of every kind are connected to the Internet. There are PCs, Macintoshes, UNIX machines, LANs, Various minicomputers, Various mainframes, and Supercomputers.**