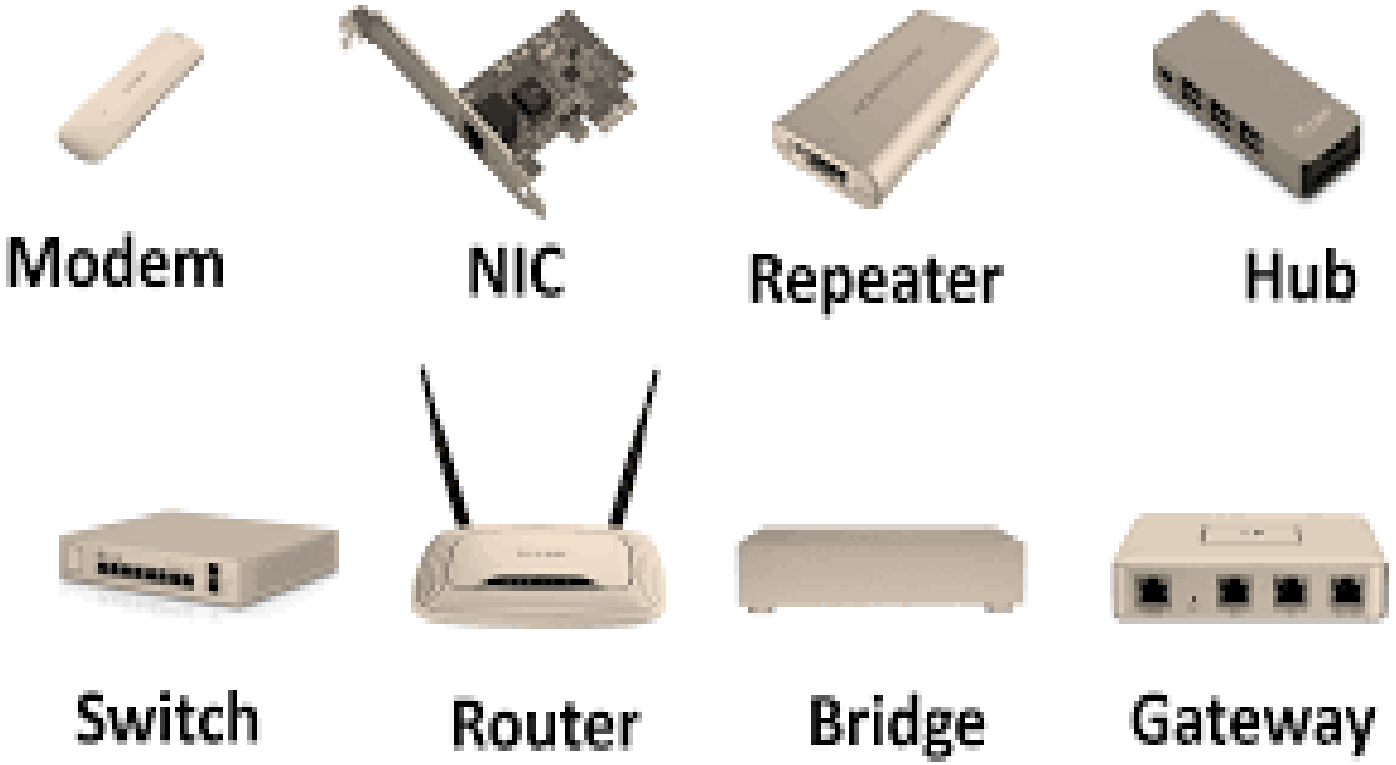
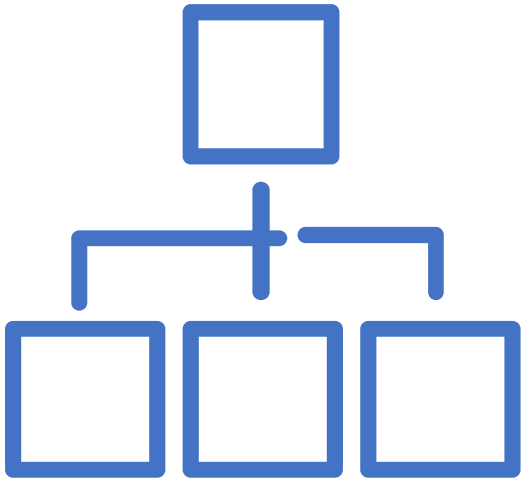
Lecture 4:
Information Networks

Networks

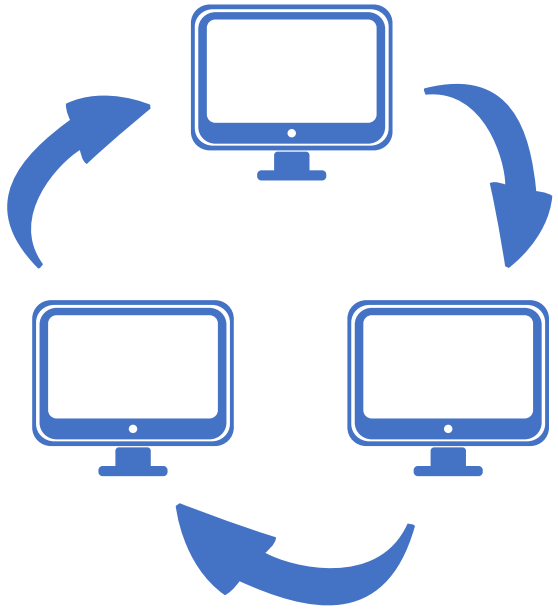


- NIC
- Hub
- Protocols (TCP/IP)

Network

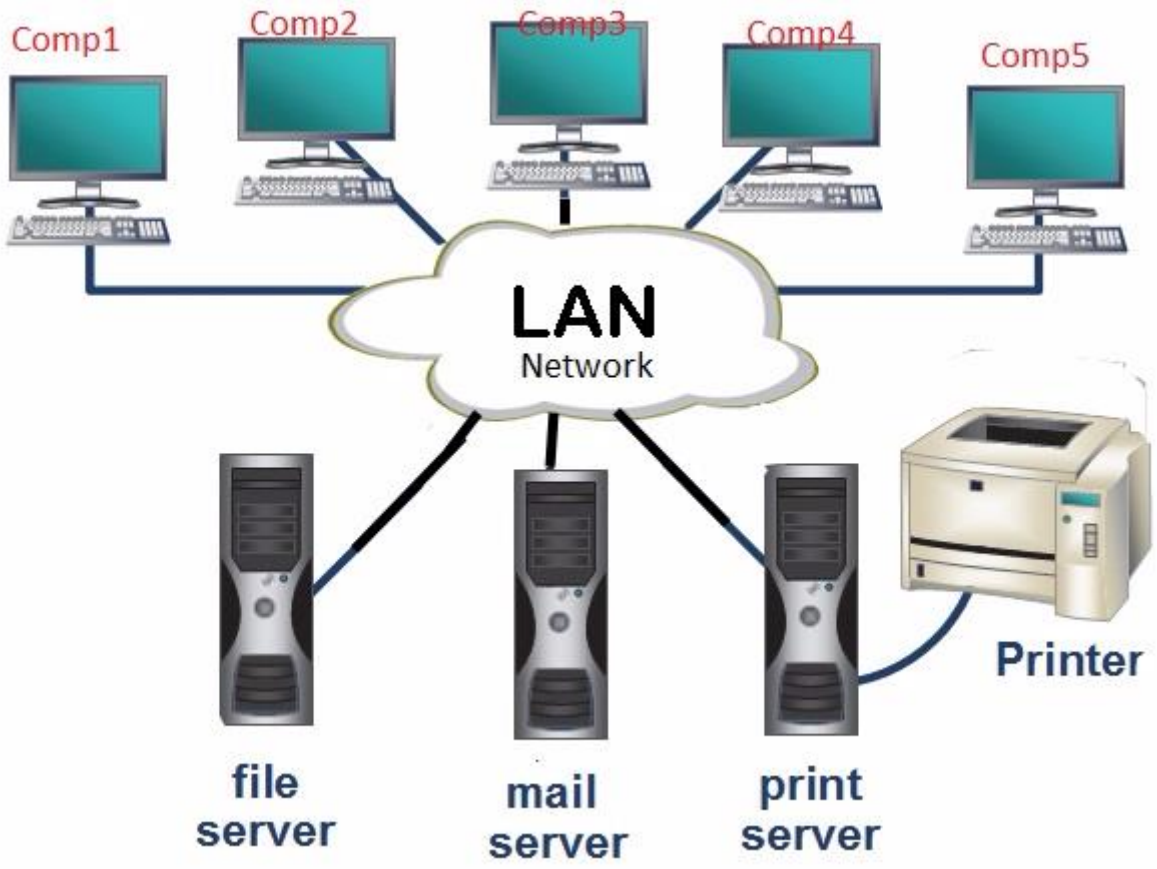


Client / Workstation - Server

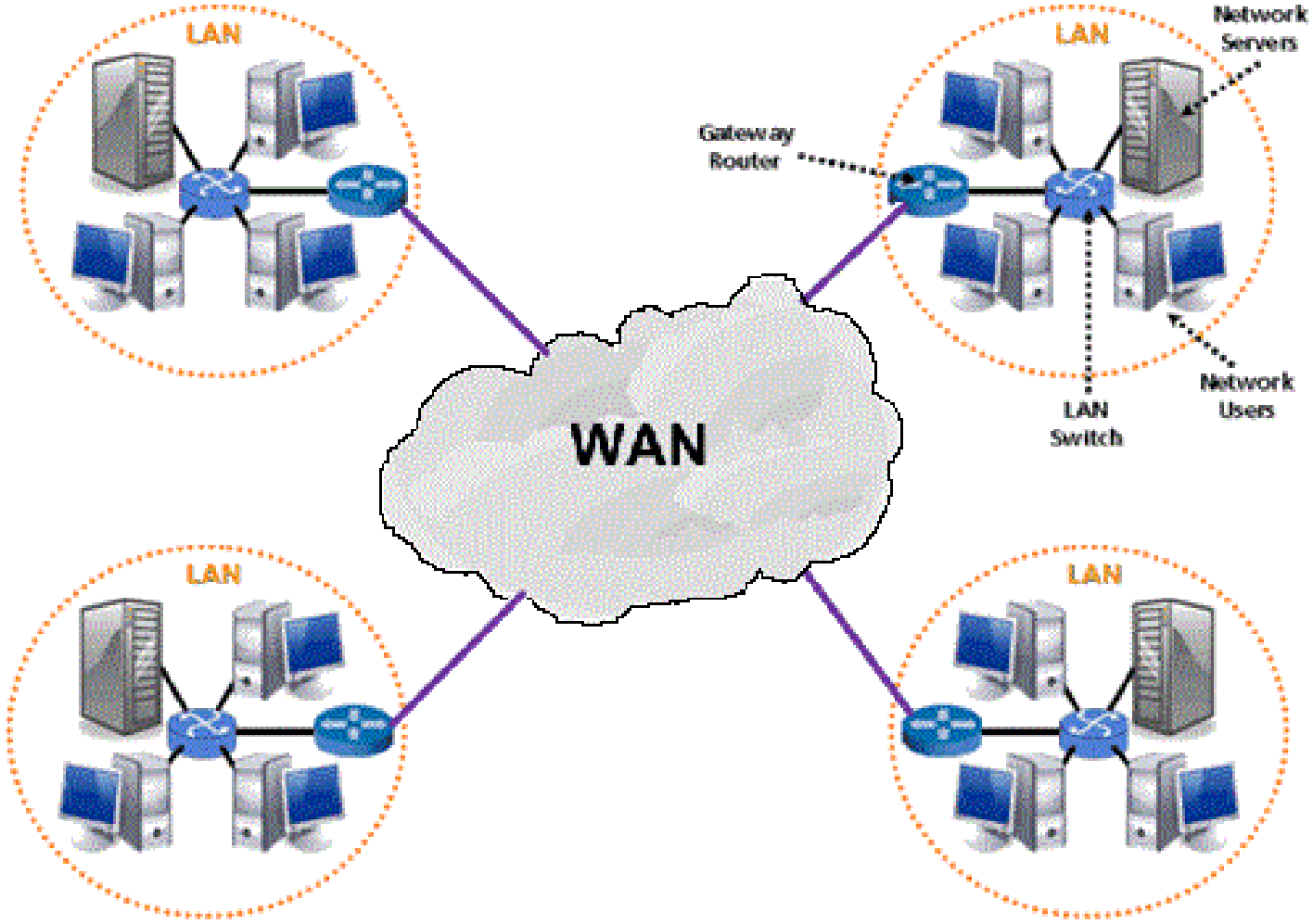


Peer - to - peer

LAN


Comp1
Comp2
Comp3
Comp4
Comp5
LAN
Network
Printer
file server
mail server
print server

WAN


LAN
LAN
Network
Servers
Gateway
Router
WAN
LAN
Switch
Network
Users
LAN
LAN

Servers

File Server

- Users can access their work from any workstation
- Exchange work with colleagues.
- Users can easily co-operate on tasks.
- Backing up is centralized and can be placed under the control of experts

Print Server

- Printers only need be purchased for the print servers. This results in financial savings.
  • As there are fewer printers to look after, there is lower maintenance.
  • As far fewer printers need to be purchased better quality printers with advanced features can
  be purchased.

Application Server

- Software only needs to be installed on the applications server instead of each workstation.
- Software is configured in the same way for all.
- Upgrading only needs to be done on the server.
- Cost of licensing software for an applications server is less
- Centralizing simplifies the process of implementing policies. Software policies refer to what software may be installed on computers

Proxy Server

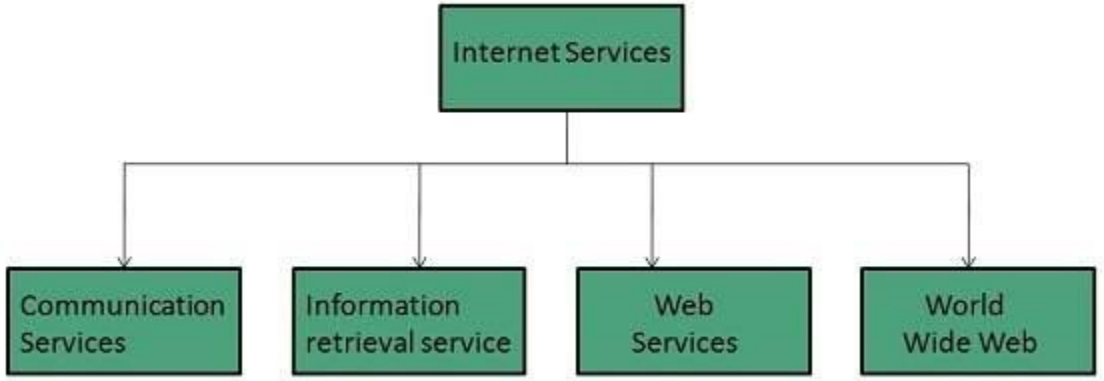
- can be configured with **firewall** software. To protect network from attack.
- Files can be filtered for computer viruses before being passed on to the network
- Organizations can control access of users to outside sites.
- Since there is only one point of communication, there is a large saving on line costs.

Internet, Intranet, Extranet

- **Internet i**s the collection of all computers across the world which can access each other in some way.
- **Intranet** similar to the Internet in operation. However, it is limited to an organization. Users may browse computers within an intranet using a browser but will usually not be able to access the wider Internet. In the same way, outsiders will not be able to access the intranet of an organization. An intranet can be thought of as a private Internet
- **Extranet** is an extension of a organization's intranet to include outside users outside organizations or individuals are allowed access to certain parts of the intranet. This access is usually controlled by means of passwords and access rights. The purpose of the extranet is to facilitate business transactions with other organizations.

Internet usage

- Integrate the operations of multinational corporations.
- Provide access to and share information and databases.
- Transfer and share files between computers.
- Facilitate business transactions.
- Share resources.
- Promote scientific co-operation between research institutions.
- Provide a communications channel for the military.

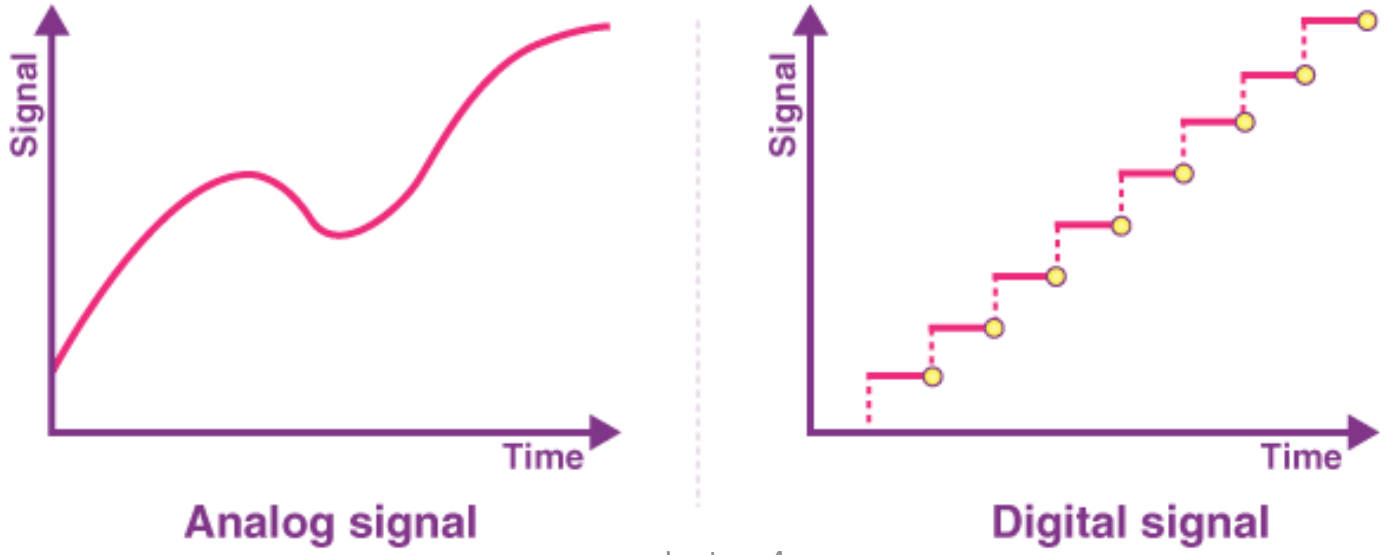


World Wide Web (www)

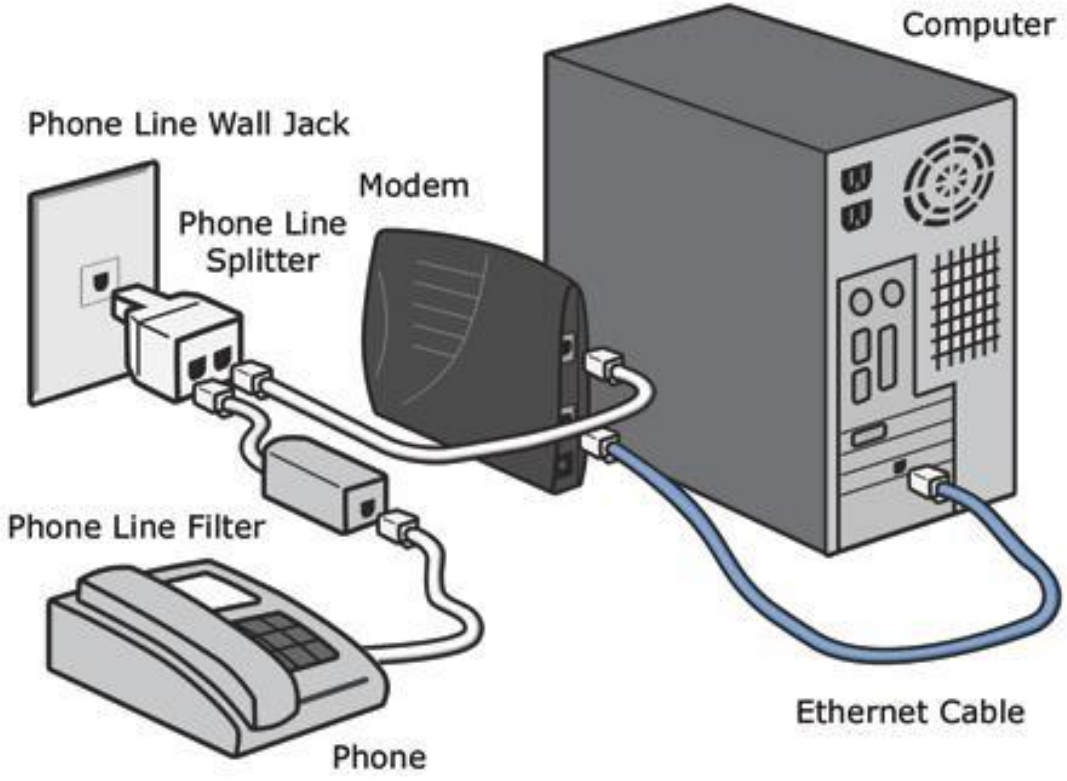
Part of the Internet. The WWW consists of all the sites that can be accessed using a **web browser** such as Mozilla, Netscape, Chrome, or Opera. In order for a browser to access a web site, the web site must contain files that have a particular format constructed using **HyperText Markup Language** or **HTML**. These sites are developed using special web development applications. It is possible to create simple web sites using a word processor by saving the document in HTML format.
The HTML documents are stored as **web pages** on special servers known as **web servers**. These run special web server software such as **Apache Web Server** or **Internet Information Services**.

Analog / digital

- **Analogue signals** is one which varies continuously as, for example, in ordinary speech
- **Digital Signals:** are two state signals corresponding to a switch which is on or off. The same two
  state signal can also represent TRUE and FALSE or 1 and 0.



A **modem** or **modulator-demodulator** is a device connected between a computer and a telephone line. Its function is to convert the digital signals of the computer into a form suitable for transmission over a telephone line.



Data Transfer Rates

- speed is measured in kbps or Mbps or Gbps
  1 kbps = 1 000 bps
  1 Mbps = 1 000 000 bps
- 1 Gbps = 1 000 000 000 bps

Internet Speeds

Internet Speed	Summary	Supported Devices
1 Mbps	Very Slow	1
10 Mbps	Slow	1-2
50 Mbps	Below Average	1-4
100 Mbps	Average	2-8
250 Mbps	Fast	5-20
500 Mbps	Very Fast	10-40
1000 Mbps	Extremely Fast	20-80