



Learning Goal:

Students will be able to explain how the Internet works.



Scale Yourself

4	I can explain how the Internet works. I can teach these skills to others.
3	I can explain how the Internet works, without my notes
2	With help, (my notes, teacher assistance) I can explain how the Internet works.
1	I cannot explain how the Internet works.

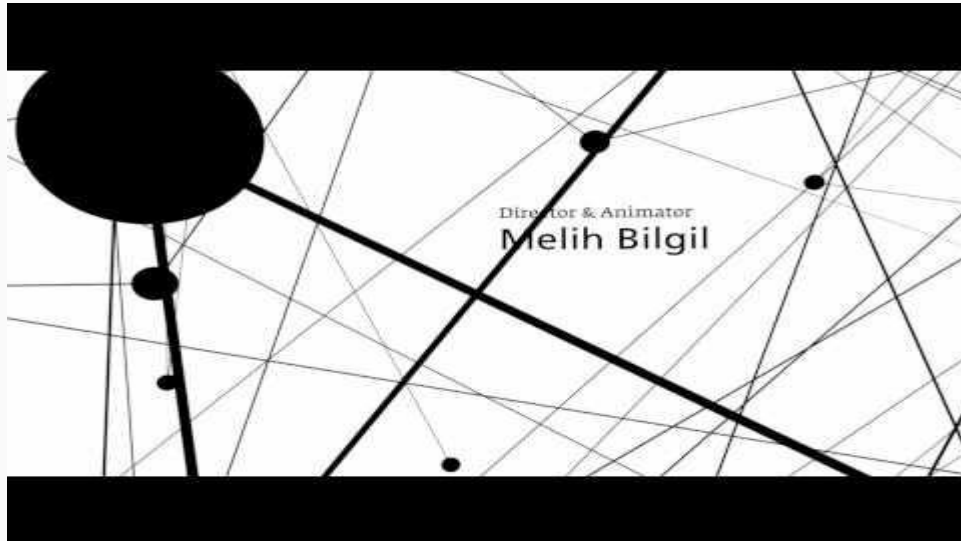
Learning Targets

- Explain how to access and connect to the Internet.
- Describe the communication between two computers using simple networks.
- Identify the six elements of how to connect to the Internet
- Describe the client/server model



Origin of the Internet

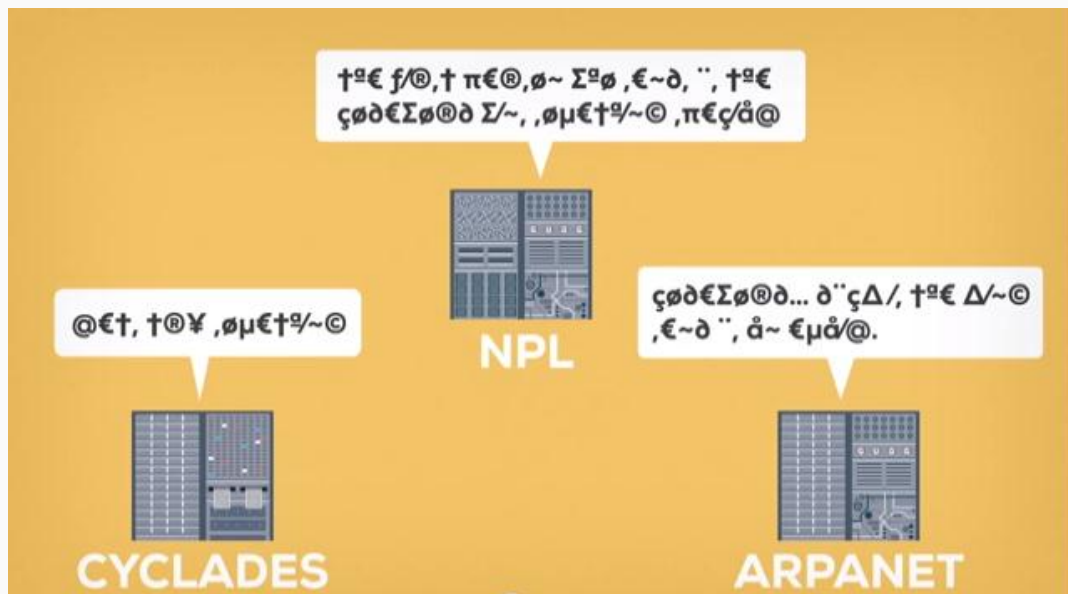
- The Internet is a vast **network** of computers (LANs and WANs) that electronically connects millions of people worldwide.



Creation of the Internet



- 3 separate inventions created the Internet.
 - ARPANET-US
 - NPL-Britain
 - CYCLADES-French



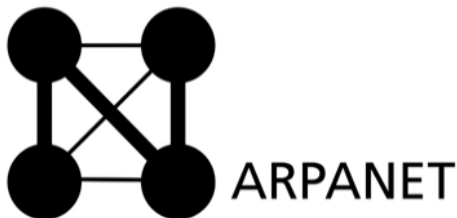
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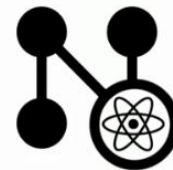
Creation of the Internet



- **ARPANET-US**
 - Focused on time-sharing (how to share data)
- **NPL-Britain**
 - Was a commercial network (money).
 - Came up with the idea of packet switching to avoid congestion on a network
 - breaking information into parts and put it together again when it gets the receiving computer
- **Cyclades-French**
 - focused on direct connection between computers.
 - Came up with the word Internet.



CYCLADES



Institut de Recherche
d'Informatique
et d'Automatique

NPL

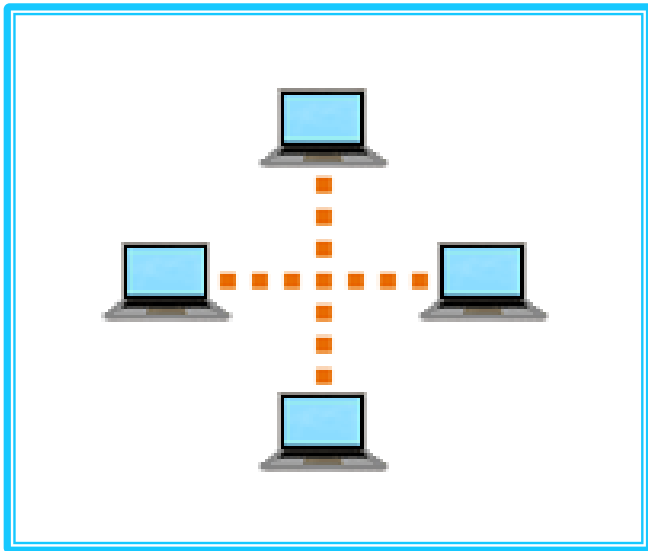


National Physical
Laboratory

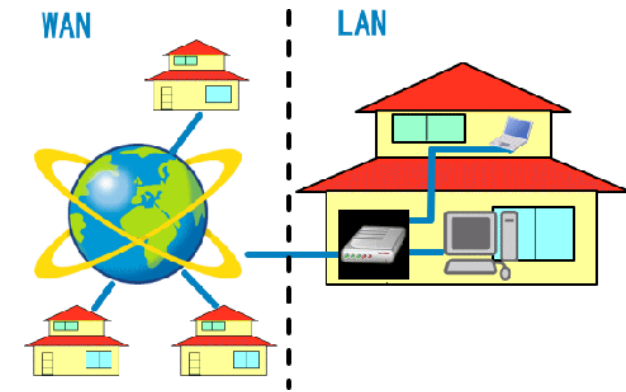
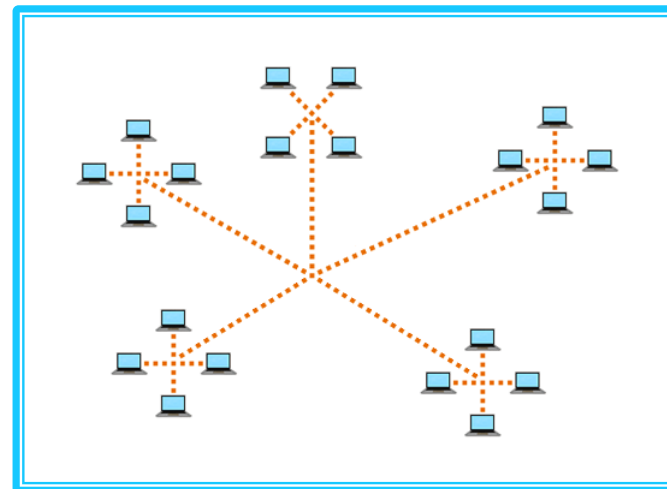
Computer Networks

There are **two** main types of computer networks:

- **Local Area Network (LAN)**: A LAN is two or more connected computers sharing certain resources in a relatively small geographic location, often in the same building. Examples include home networks and office networks.



- **Wide Area Network (WAN)**: A WAN typically consists of two or more LANs. The computers are farther apart and are linked by telephone lines, dedicated telephone lines, or radio waves. The Internet is the largest Wide Area Network (WAN) in existence.





Internet

- The Internet is the largest computer network in the world, connecting millions of computers.
 - A network is a group of two or more computer systems linked together.
- The Internet is now maintained by the major Internet service providers such as MCI Worldcom, Sprint, GTE, ANS, and UUNET.
- Many people think the Internet and the World Wide Web are the same thing. They're not!
 - It is one of the many features of the Internet. E-mail, FTP, and Instant Messaging are also features of the Internet.





IMPORTANT



Connecting to the Internet

- Six elements are required to connect to the Internet:
 - Computer
 - Operating system
 - TCP/IP
 - Client software
 - Internet connection (direct through an ISP)
 - Internet address



How the Internet Works

Six elements

- Operating system
- TCP/IP
- Client software
- Internet connection (direct through an ISP)
- Internet address

- **Operating system-**

- the program that manages all the other programs (software and hardware) in a computer.

- **Examples:**

- Linux, Windows, VMS, **OS/400**



How the Internet Works

Six elements

- Operating system
- TCP/IP
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TCP/IP- the basic communication language or protocol of the Internet

- **TCP (Transmission Control Protocol)**-

- manages the assembling of a message or file into smaller packets that are transmitted over the Internet and reassembled into the original message

- **IP (Internet Protocol)**-

- handles the address part of each packet so that it gets to the right destination.



How the Internet Works

Six elements

- Operating system
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Client Software-software that enables users to communicate with and request information from the server.

Examples: Web browser, e-mail or news client program



How the Internet Works

Six elements

- Operating system
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Internet connection-connect through an ISP

- Internet Service Provider (ISP)
 - An organization that maintains a gateway to the Internet and rents access to customers on a per-use or subscription basis.





How the Internet Works

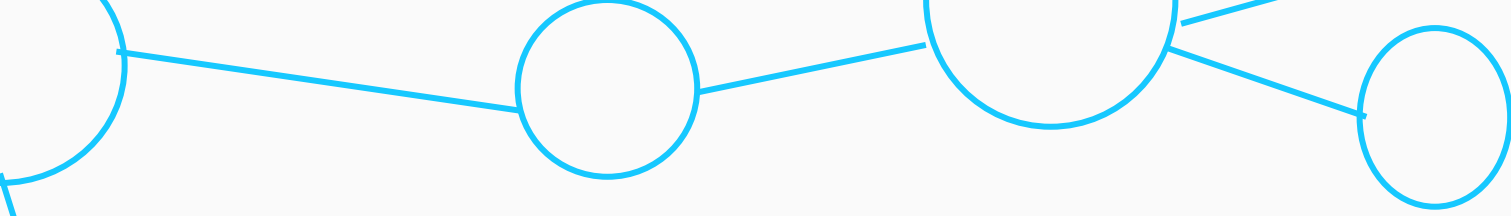
Six elements

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Internet address

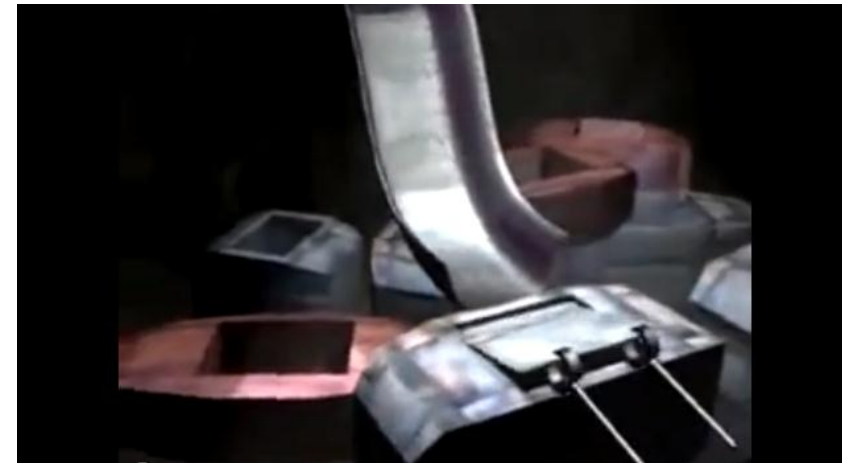
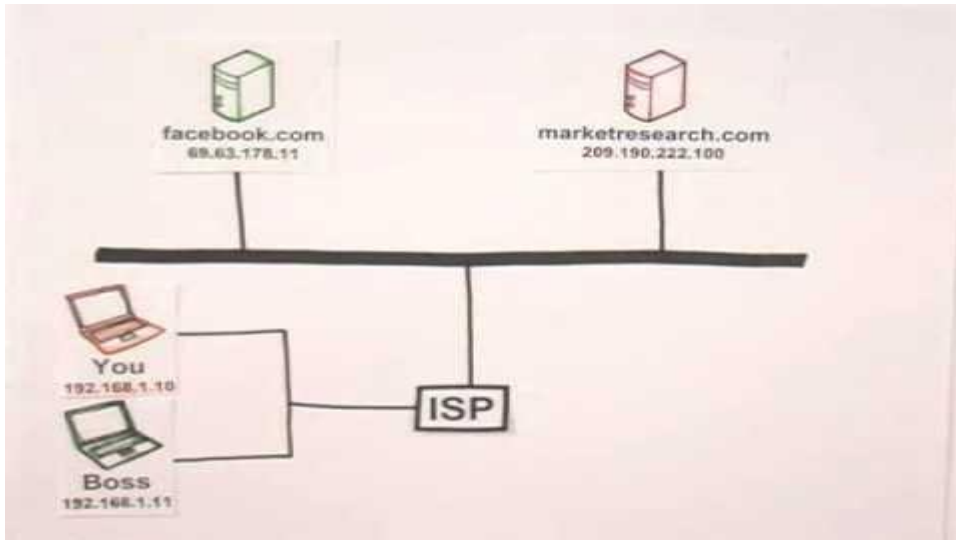
- Web address (e.g., www.CIWcertified.com)
- e-mail address (e.g., student1@class.com)
- server address (e.g., ss1.ciwcertified.com)





Thursday

How the Internet Works



https://www.youtube.com/watch?v=7_LPdttKXPc

<https://www.youtube.com/watch?v=HOalqQAeaiik>



Six elements

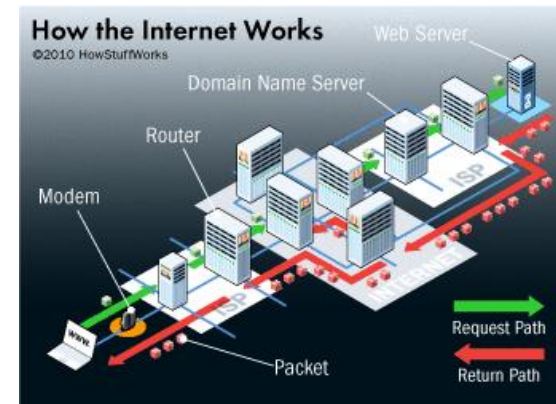
- Operating system
- TCP/IP
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How the Internet Works

- Network protocols and packets:
 - **Protocol** – an agreed-upon format for transmitting data between two devices
 - **Packet** – a fixed piece of information sent across a network
- Every computer connected to the Internet uses *Transmission Control Protocol / Internet Protocol (TCP/IP)*
 - TCP/IP – software that makes Internet communication possible

How the Internet Works (cont' d)

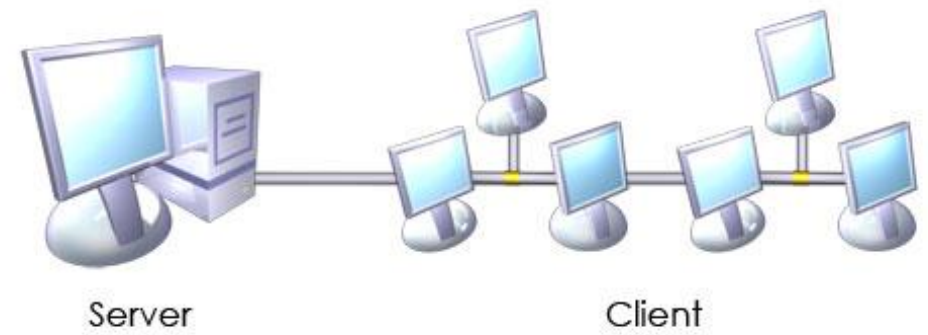
- Computers access information from the Internet as follows:
 - You request data from an Internet server
 - The request is divided into packets
 - The packets are routed from your LAN to the Internet backbone
 - The packets are routed from the Internet backbone to the destination server
 - The destination server sends the requested information using the same process



The client/server model



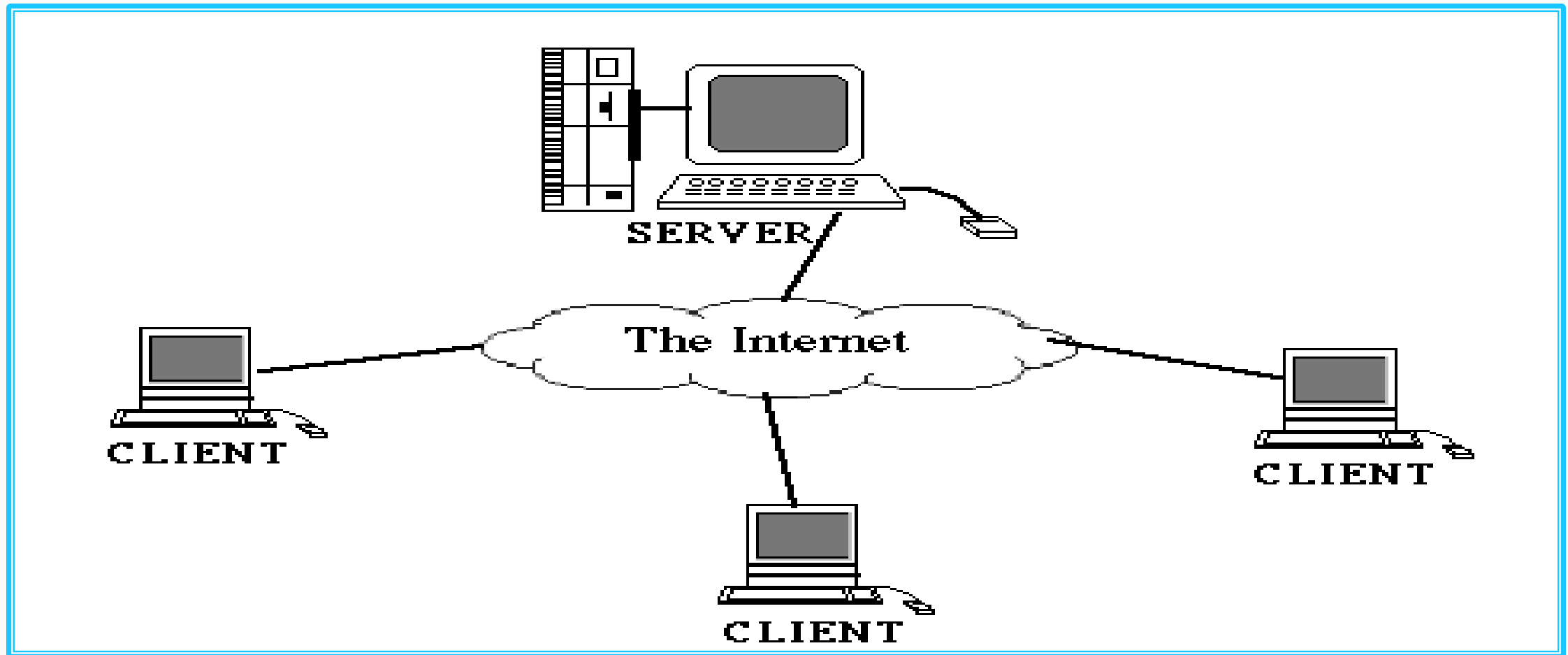
- Many networks are structured using the client/server model, in which individual computers and devices, called **nodes**, interact with one another through a central server to which they are all connected.
- The client/server model divides processing and storage tasks between the **client** and the **server**.
- **Client**-an individual computer connected to a network
- **Server**-A computer in a network that manages the network resources and provides, or serves, information to clients



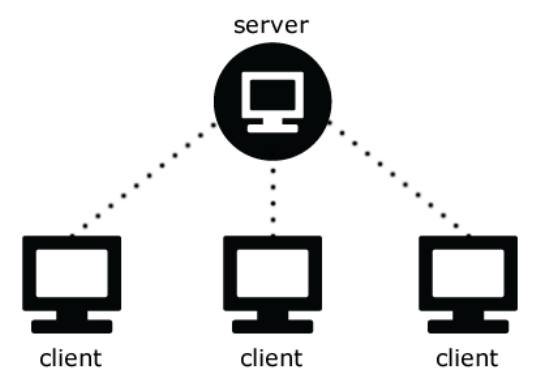
The client/server model

- The server is more powerful than the individual computers, or clients, connected it.
- The server is responsible for storing and presenting information.
- Client/server model processes information as follows:
 1. A client requests information from a shared file stored on the server
 2. The server processes the request, locates the requested information and sends the information to the client
 3. The client uses or processes the data as needed

Client/server relationship



The client/server model



- In a client/server environment, client programs run on the computer nodes and interact with a server program running on the server.
- A network can accommodate more than one server.
- Specific servers can be dedicated to making certain resources available to clients.
- These resources can included printers, applications and documents.
- Types of servers include:
 - Network servers, which manage the flow of data between them and client nodes
 - Print servers, which store shared data
 - Web servers, which manage access to the World Wide Web
 - Email servers which manage electronic mail



Client/server model example

- Email is a technology that uses the client/server model.
- To use email you must
 - Install and configure an email client/program on your computer
 - You can type an email, edit it repeatedly before sending, and work offline until your ready to access the network connection (Internet) and send
 - When you send the message, the email client computer connects to the network or Internet, transmit the message to an email server, and close the connection,
 - The message recipient can connect to his or her email server through a network or the Internet to retrieve the message