جـامعة المستقبـل
كـليـة العـلـوم

Computer Sciences

First stage

LECTURE 9

Computer network

By

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- Introduction
- Types of network
- Network basic terminology
- Types of network architecture

Introduction

Network – Computer Network – Advantages

Network

- WHAT?
  - ✓A group or system of interconnected people or things.
- Why?
  - ✓Connection
  - ✓Communication
- Where?
  - ✓When we need to transfer anything.

Computer Network

- A computer network is a set of devices (often referred to as node) connected by communication links.

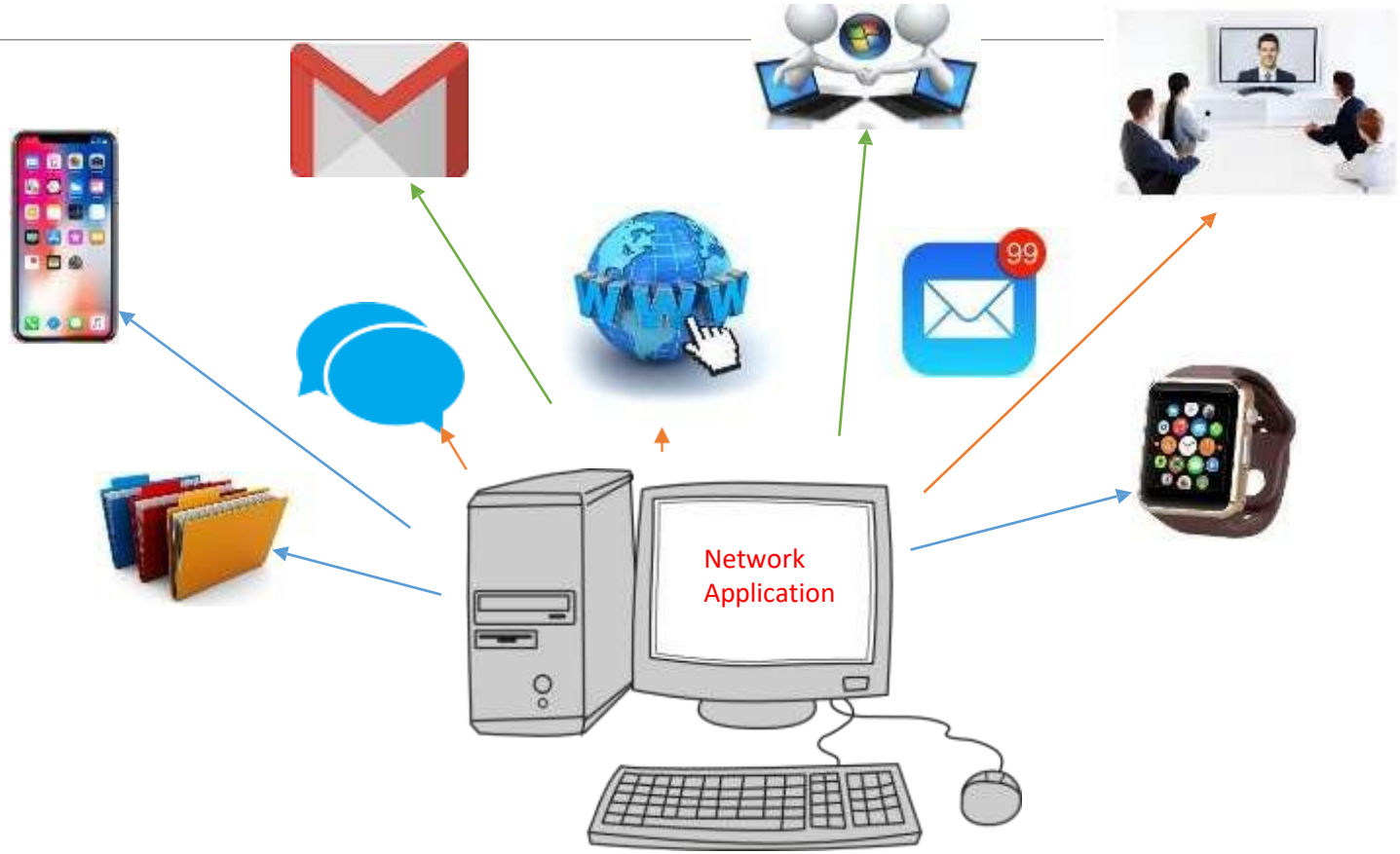
- A node can be a computer, printer or any other device capable of sending or receiving data generated by other nodes on the network.

Computer Network

Networking

- Networking is a process of communication between two or more remote parties, that involves the connection of computers, media and networking devices.

Network Applications



Advantages of Networking

- Easy communication
- File, data and information sharing
- Resource sharing (hardware)
- Increase storage capacity
- Reduce cost
- Save time

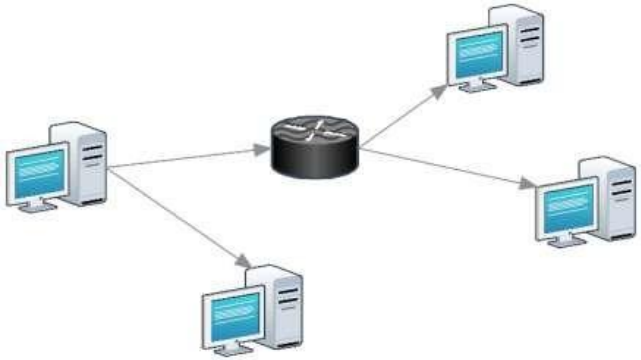
Types of Networks

Physical Structure – LAN – WAN – MAN

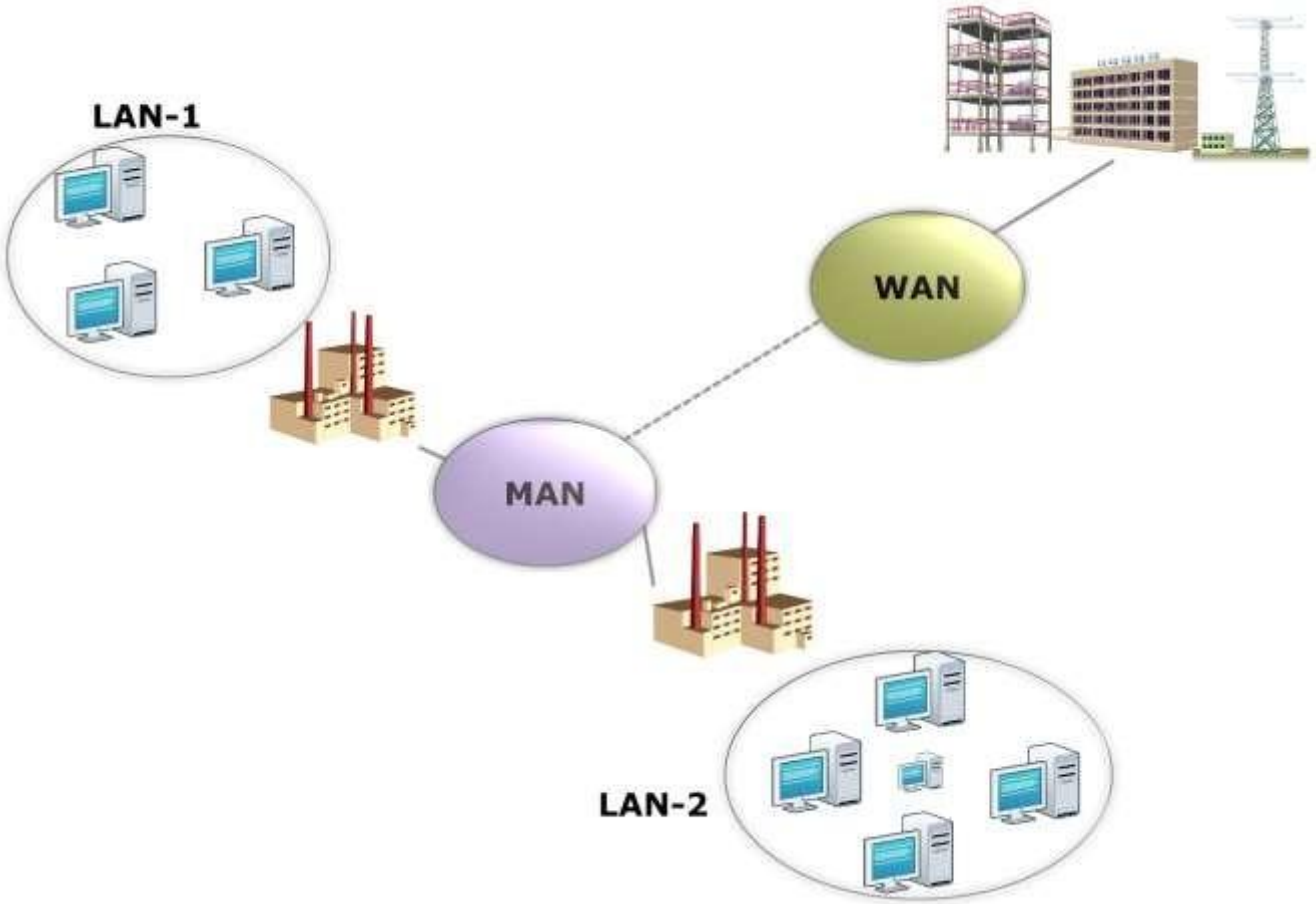
Types of Network

1. Point to Point:

2. Multipoint:



Categories of Network



Network Criteria

- Performance
  - ✓Transit Time
  - ✓Response Time
- Reliability
  - ✓Recovery from a failure
- Security
  - ✓Protecting data from:
    - Unauthorized User
    - Damage

Network Terms

Host– Workstation– Server– Client– Node

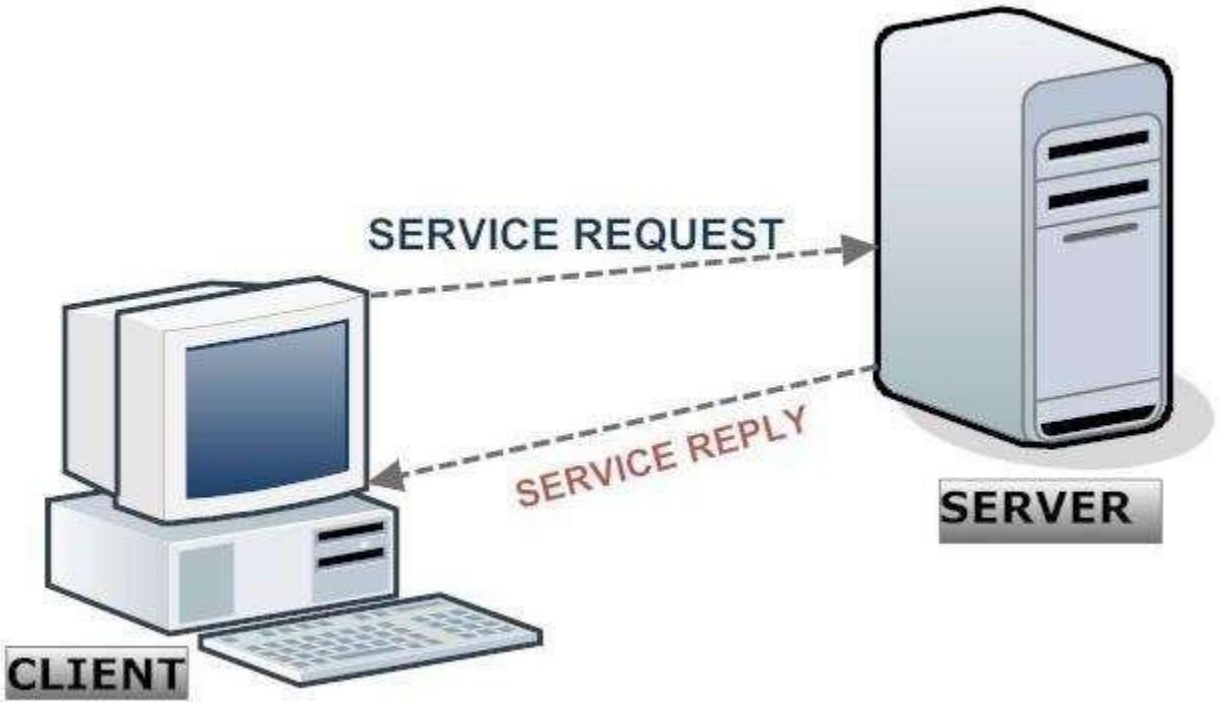
Host

- A **network host** is a computer or other device connected to a computer network.
- A network host may offer information resources, services, and applications to users or others nodes on the network.

Workstation

- A **workstation (WS)** is a computer dedicated to a user or group of users engaged in business or professional work.
- It includes one or more high resolution displays and a faster processor than a personal computer (PC).
- Useful for Distributed Computing.
- Different from PC:
  - Faster
  - More capable

Client and Server

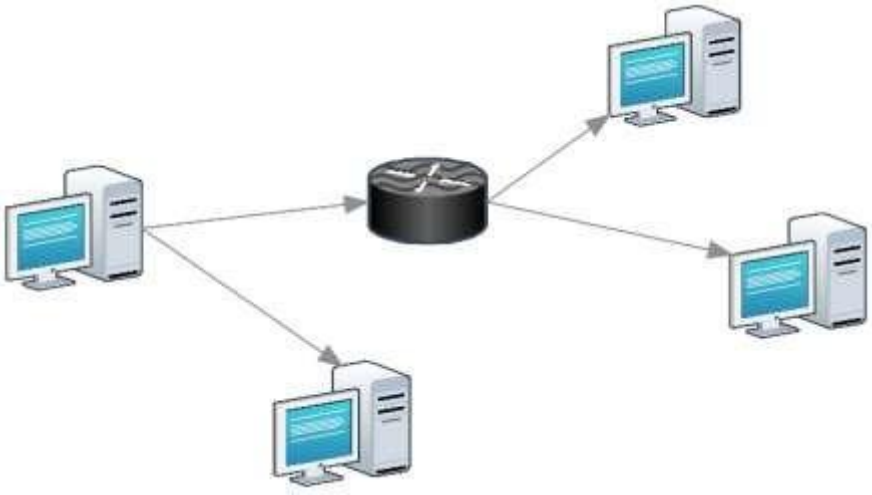


Client and Server

- For process to process commutation we need Client Server Paradigm.
- A process on local host, called a client, needs services from a process usually on the remote host called a server.
- So, a **server** is an a computer program that accepts and responds to requests made by another program, known as a **client**.

Node

- A node can be a computer or some other device such as printer that can receive, create, store or send data along distributed network routes.



Types of Network Architecture

Peer to Peer – Client Server Model

Peer-to-Peer Network

- A **peer-to-peer** network is one in which two or more PCs share files and access to devices such as printers without requiring a separate server computer or server software.

Client-Server Network

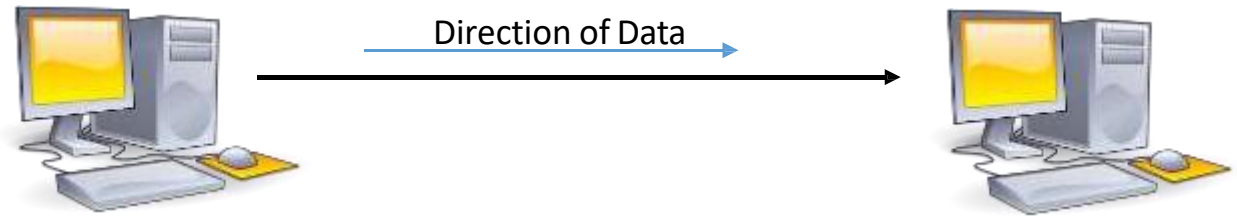
- In **client-server model**, where client request for a service to a server and server replies according to client request.

Data Flow

Simplex – Half Duplex – Full Duplex

Simplex Mode

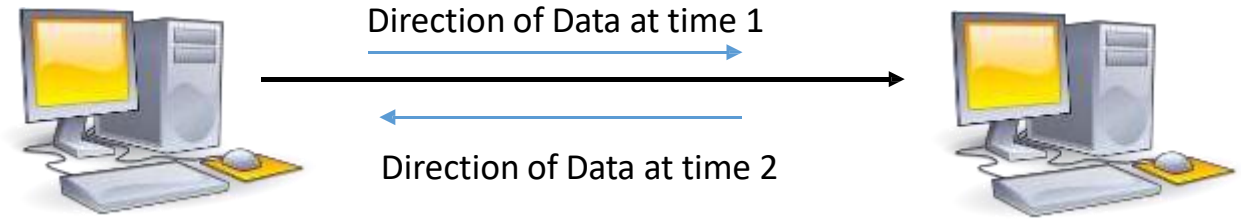
- In Simplex mode:
  - Communication is unidirectional,
  - Only one can transmit and other can receive.
  - Ex: keyboard and monitor



Simplex Communication Structure

Half-Duplex Mode

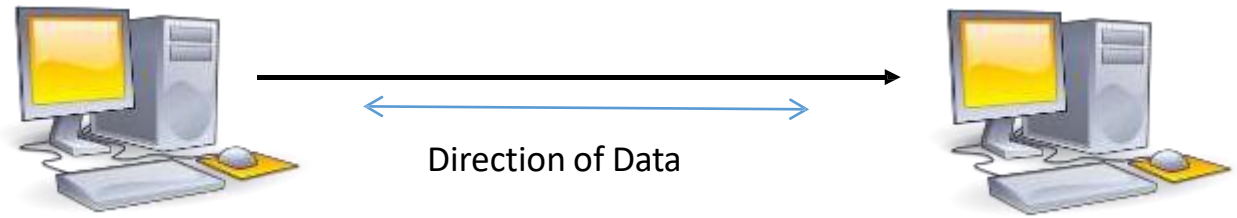
- In Half Duplex mode:
  - Both can transmit and receive,
  - But not at a same time.
  - At a time, only one can send or receive.
  - Ex: Walkie-talkies



Half Duplex Communication Structure

Full-Duplex (Duplex) Mode

- In Full Duplex mode:
  - Both station can transmit and receive simultaneously,
  - But at a same time.
  - Ex: Telephone Networks



Full Duplex Communication Structure


Thank you