

Introduction to Computer Networks

Computer networks are defined as A network is a set of devices (often referred to as *nodes*) connected by communication links. A node can be a computer, printer, or any other device capable of sending and/or receiving data generated by other nodes on the network, Two computers are said to be interconnected if they are able to exchange information.

The advantages of computer networks:

1. File Sharing
2. Resource Sharing
3. Increased Storage Capacity
4. Increased Cost Efficiency

Disadvantages of Computer Networks:

1. Security Issues
2. Rapid Spread of Computer Viruses
3. Expensive Set Up
4. Dependency on the Main File Server

Network Components:

Network components are used to connect devices on different networks, to create and connect multiple networks or subnets. The components include:

NIC: (Network Interface Card) is used to enable a network device, such as a computer or other network equipment, to connect to a network.

Repeater: A repeater is an inexpensive solution that is at the OSI physical layer and enables a network to reach users in distant portions of a building .A repeater connects two or more cable segments and retransmits any incoming signal to all other segments.

HUB: A hub is a central network device that connects network nodes such as workstation and servers in a star topology. A hub may also be referred to as a concentrator, which is a device that can have multiple inputs and outputs all active at one time.

Bridge: A bridge is a network device that sends information between two LANs.

Router: Routers are devices that direct traffic between hosts.

GATEWAY: The term gateway is used in many contexts, but in general it refers to a software or hardware interface that enables two different types of networked systems or software to communicate.



NIC



repeater



hub



router

Data Flow

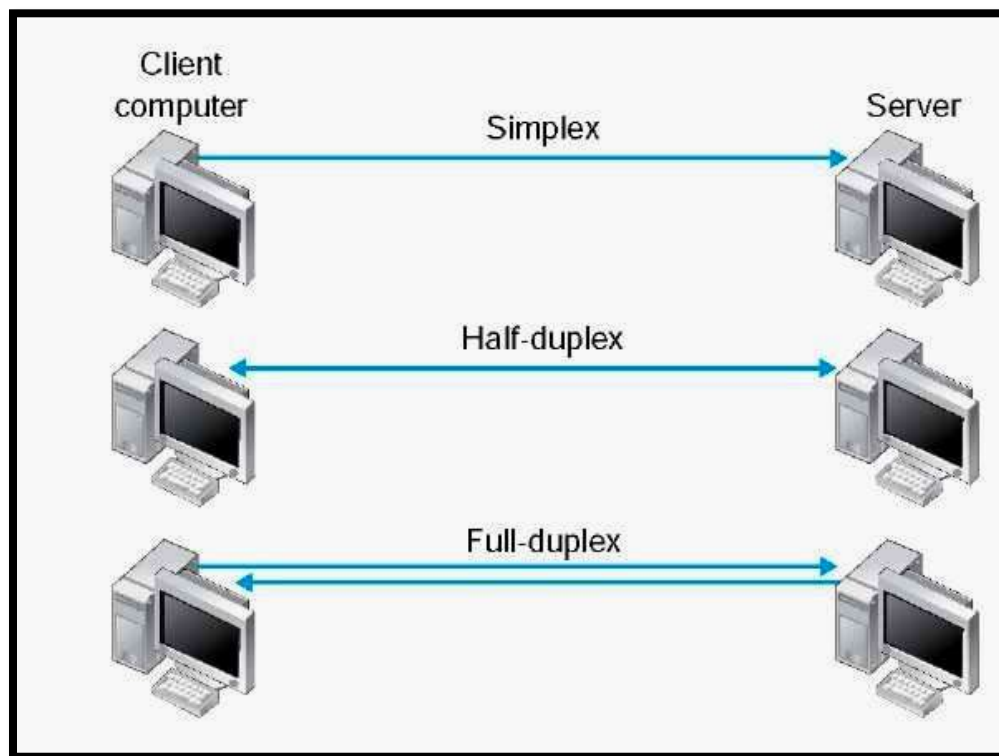
Communication between two devices can be simplex, half-duplex, or full-duplex as shown in figure:

1-Simplex:

In simplex mode, the communication is unidirectional, as on a one-way street. Only one of the two devices on a link can transmit; the other can only receive.

2-Half-Duplex: In half-duplex mode, each station can both transmit and receive, but not at the same time.

3-Full-Duplex: In full-duplex (called duplex), both stations can transmit and receive simultaneously



A figure represent a data flow types