COMPUTER APPLICATION

Basic Concepts of Networking

By : Noor Razaq Obaid

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NETWORK

A network is a set of devices (nodes) connected by communication links, each node is capable of sending and/or receiving data generated by other nodes on the network.

1- Data Communication:

- When we communicate, we are sharing information. This sharing can be **local** or **remote**. ***Local communication*** usually occurs face to face, while ***remote communication*** takes place over distance.

- ***Data communication*** is the exchange of *data* (in the form of 0's and 1's) between two *devices* via some form of *transmission medium* (such as a wire cable).

- The effectiveness of a data communications system depends on three fundamental characteristics:

1: Delivery, 2: Accuracy 3: Timeliness.

1. Delivery. The system must deliver data to the correct destination. Data must be received by the intended device or user.

2. **Accuracy** . The system must deliver the data accurately. Data that have been altered (delay) in transmission and left uncorrected are unusable.

3. **Timeliness**. The system must deliver data in a timely manner.

 Data delivered late are useless. In the case of video and audio, timely delivery means delivering data as they are produced, in the same order that they are produced, and without significant delay. This kind of delivery is called ***real-time*** transmission.

2- Components:

A data communication system is made up of five components (see Figure 1).

1. Message: The message is the information (data) to be communicated. It can consist of text, numbers, pictures, sound, or video or any combination of these.

2. Sender: The sender is the device that sends the data message. It can be a computer, workstation, telephone handset, video camera, and so on.

3. Receiver: The receiver is the device that receives the message. It can be a computer, workstation, telephone handset, television, and so on.

4. Medium: The transmission medium is the physical path by which a message travels from-sender to receiver. It can consist of twisted pair wire, coaxial cable, fiber- optic cable, laser, or radio waves.

5. Protocol: A protocol is a set of rules that govern data communication. It represents an agreement between the communicating devices. Without a protocol, two devices may be connected but not communicating;
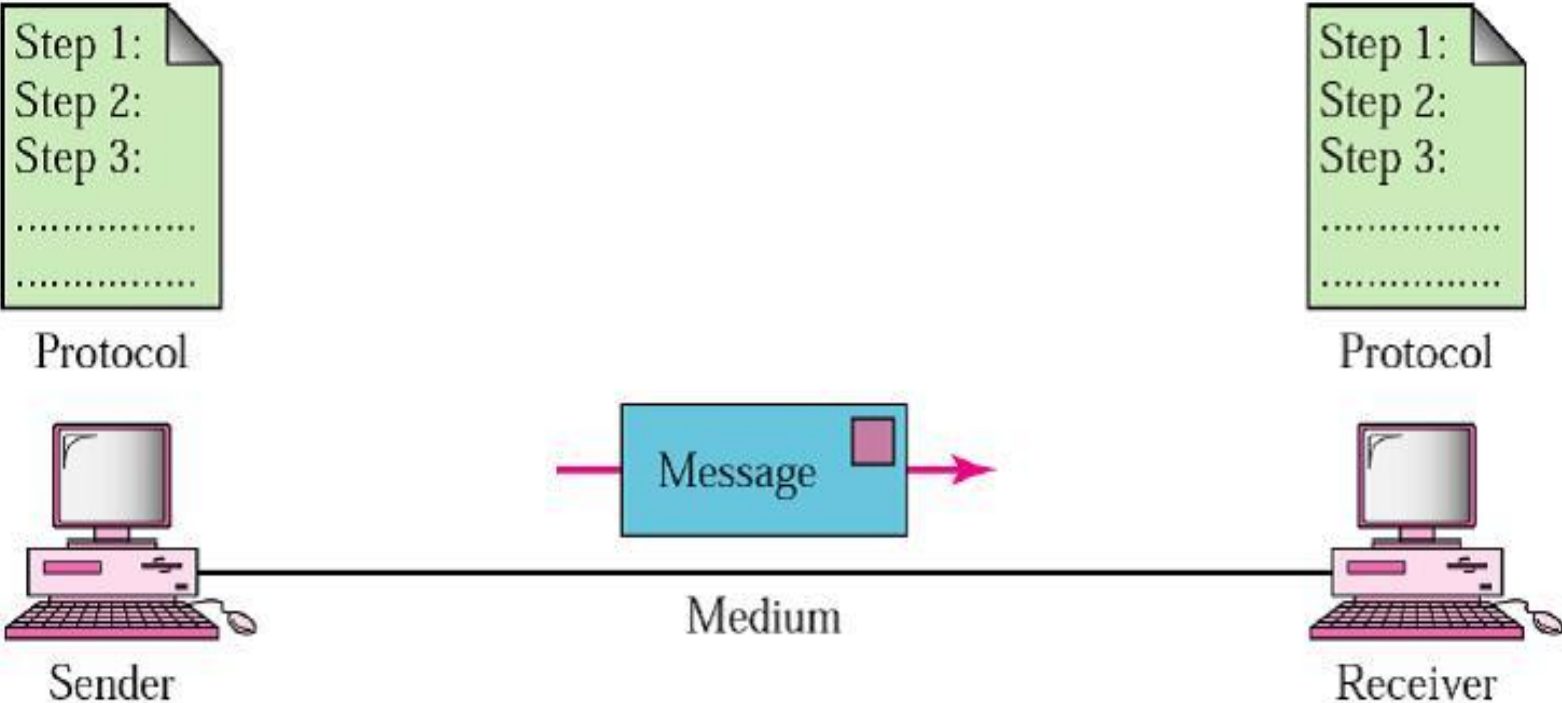
**Components of a Data Communication System**

3 - Network Criteria:

To be considered effective and efficient, a network must meet a number of criteria. The most important of these are **performance**, **reliability**, and **security**.

(A) Performance:

Performance can be measured in many ways, including transit time and response time. The performance of a network depends on a number of factors:

- Number of users:
- Type of transmission medium:
- Hardware:
- Software:
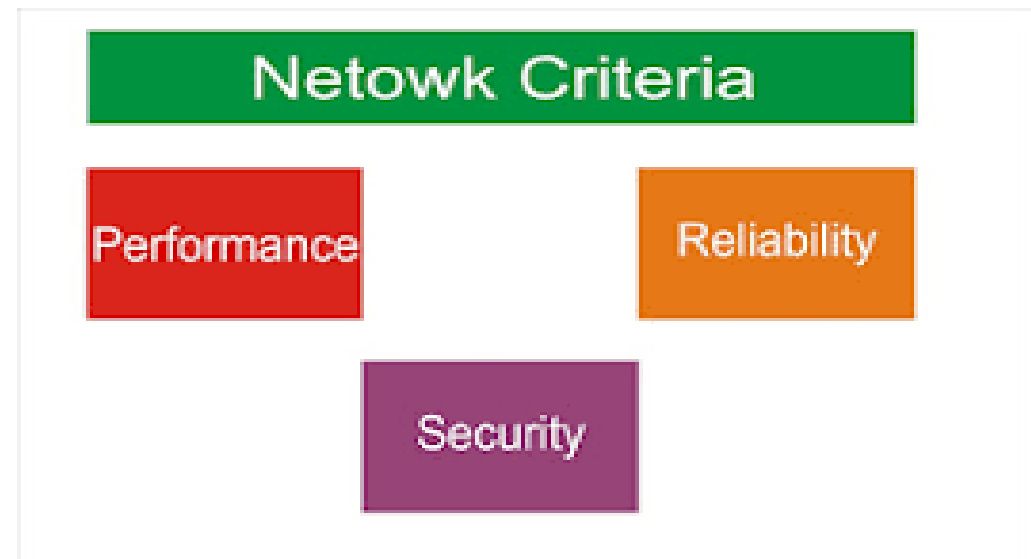
(B) Reliability :

In addition to accuracy of delivery, network reliability is measured by frequency of failure, the time it takes a link to recover from a failure, and the network's robustness.

1. *Frequency of failure*:

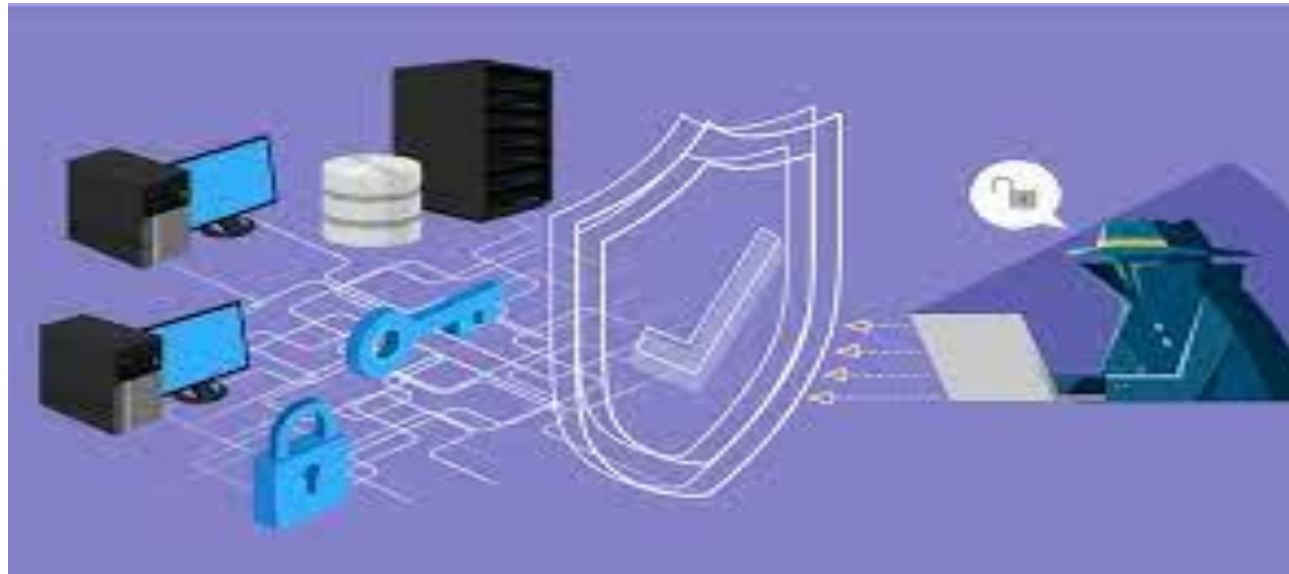2. *Recovery time of a network after a failure*:

3. *Catastrophe*:

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(C) Security :
Network security issues include protecting data from unauthorized access and viruses.

1.Unauthorized access:
2. Viruses

Network Criteria

Performance

-Number of users

-Type of transmission medium

- Hardware & Software

Reliability

-Frequency of failure

-Recovery time

-Catastrophe

Security

-Unauthorized access

-Viruses

Any Question…..?