ملخص المحاضرة الأولى. د/ علي حيدر

المقرر/ تراسل البيانات والشبكات.

Data communications

are the exchange of data between two devices via some form of transmission medium such as a wire cable..

FOUR FUNDAMENTAL CHARACTERISTICS

Delivery. The system must deliver data to the correct destination.

Accuracy. The system must deliver the data accurately.

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

Jitter. Jitter refers to the variation in the packet arrival time.

real-time transmission: means delivering data as they are produced, in the same order that they are produced, and without significant delay.

COMPONENTS

1. **Message**: is the information (data) to be communicated.
2. **Sender**: is the device that sends the data message.
3. **Receiver**: is the device that receives the message.
4. **Transmission medium**: is the path by which a message travels from sender to receiver.
5. **Protocol**: is a set of rules that govern data communications.

DATA REPRESENTATION

1. Text.
2. Numbers.
3. Images.
4. Audio.
5. Video.

DATA FLOW

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. : When one device is sending, the other can only receive, and vice versa.

3. Full-Duplex:

In full-duplex mode, both stations can transmit and receive simultaneously.

NETWORKS:

A network is a set of devices connected by communication links

DISTRIBUTED PROCESSING

Most networks use distributed processing, in which a task is divided among multiple computers.

NETWORK CRITERIA

1. 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, including the number of users, the type of transmission medium, the capabilities of the connected hardware, and the efficiency of the software.

• Performance is often evaluated by two networking metrics: throughput and delay.

2. Reliability

. network reliability is measured by the frequency of failure, and the time it takes a link to recover from a failure.

3. **security.**

. Network security issues include protecting data from unauthorized access, and from damages.

. Network security include implementing policies and procedures for recovery from breaches and data losses.

PHYSICAL STRCTURE

1. **Point-to-Point.**

A point-to-point connection provides a dedicated link between two devices.

2. **Multipoint**

multipoint connection is one in which more than two specific devices share a single link.

PHYSICAL TOPOLOGY

The term physical topology refers to the way in which a network is laid out physically.

Types of Topology

1. **Mesh**:

ويقصد بها أن كل جهاز متصل مع جميع الأجهزة الأخرى في الشبكة؛ لضمان والوصول للبيانات من أي جهاز في حال حدوث عطل أو خلل في أحد الأجهزة. وعيوبها أنها صعبة التركيب.

2. **Star**

وبها تكون كل الأجهزة متصلة من خلال جهاز متحكم, حيث أن كل الأجهزة تعتمد على هذا المتحكم .

3. **Bus**

وتعتمد على وجود كابيل ممدود تتصل به كل الأجهزة.

4. **Ring**

تعتبر نفس السابق لكنها متصلة بكيبل حلقي متصل بدايته في نهايته حيث يحدث فيه تجديد للموجات الكهربائية التي تحمل البيانات. وعيبها أن البيانات تنتقل في مسار واحد.

5. **Hybrid**

تجمع أكثر من نوع.