Ministry of Higher Education and Scientific Research

Al-Mustaqbal University

College Of Engineering & Technology

Computer Techniques Engineering Department

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Computer Networks Fundamentals

Lecture 2:

Basic Concepts of Networking I

2.1- Applications

Some of the network applications in different fields are the following:

- Marketing and sales.
- Financial services.
- Manufacturing.
- Electronic messaging.
- Information services.
- Cellular telephone.
- Cable television.

2.2- Protocols and Standards

- ***Protocols***

In computer networks, communication occurs between entities in different systems. An entity is anything capable of sending or receiving information. Examples include application programs, file transfer packages, browser, and database management systems and electronic mail software. A system is physical object that contains one or more entities. Examples include computers and terminals. However, two entities cannot just send bit streams to each other and expect to be understood. For communication to occur, the entities must agree on a protocol. *A protocol is a set of rules that govern data communication. A protocol defines what is communicated, how it's communicated, and when its communicated.*

- ***Standards***

A standard provides a model for development that makes it possible for a product to work regardless of the individual manufacturer. Standards are essential in creating and maintaining an open and competitive market for equipment manufacturer and in guaranteeing national and international interoperability of data and telecommunications technology and processes.

Standards are developed by cooperation among a standards creation committees, forums, and

government regulatory agencies such as:

- The **I**nternational **S**tandards **O**rganization **(ISO)**
- The **I**nternational **T**elecommunications **U**nion **(ITU)**
- The **A**merican **N**ational **S**tandards **I**nstitute **(ANSI)**
- The **I**nstitute of **E**lectrical and **E**lectronics **E**ngineers **(IEEE)**

2.3 Basic Concepts of Networking

Before examining the specifics of how data are transmitted from one device to another it is important to understand the relationship between the communicating devices. Five general concepts provide the basis for this relationship.

- Line configuration.
- Topology.
- Transmission mode.
- Categories of networks.
- Internetworks.

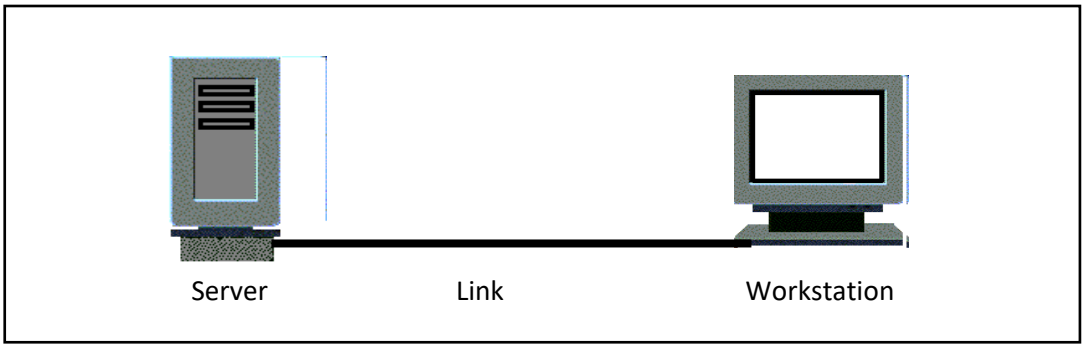
2.3.1- Line Configuration

Line configuration refers to the way two or more communication devices attach to a link. A link is the physical communication pathway that transfers data from one device to another. Line configuration defines the attachment of communication devices to a link. There are two possible line configurations:

Point-to-Point

A point-to point line configuration provides a dedicated link between two devices. The entire capacity of the channel is reserved for transmission between those two devices. Most point-to-point line configurations use an actual length of wire or cable to connect the two ends but other

options, such as microwave or satellite links are also possible (see Figure below) .



Multipoint

A multipoint (also called multidrop) line configuration is one in which more than two specific devices share a single link (see Figure below).

In a multipoint environment, the capacity of the channel is shared, either spatially or temporally. If several devices can use the link simultaneously, it is a spatially shared line configuration. If users must take turns, it is a time shared line configuration.