Introduction to Computers & the Internet

Computer Science Dep.

Lecture 4

Computer Networks

Contents

- Definition of a network
- Network architecture & hardware
- Types of networks (distance)
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- Types of network (components)
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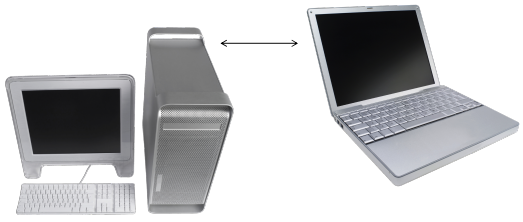
Definition of a Network

Network : is a set of two or more connected computers that share resources.



Main parts of Network Architecture

Client: is a computer connected to the network . It is a terminal, it hasn't any control privilege.

Server: is the most important device in the network. It is responsible for allocating network resources and controlling them.

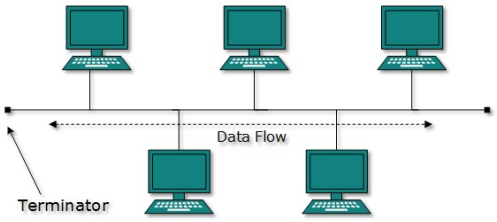
Resources: are all files, printers and any other hardware or software that the network users can share.

Network Hardware

1. Hub or switch
1. Cables.
1. Network Cards.
1. Modem / Internet connection

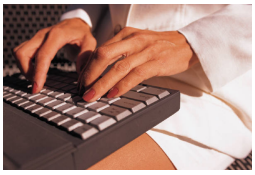
Types of Networks (distance)

LAN : stands for **L**ocal **A**rea **N**etwork: they are groups of computers connected together in the same region or a limited area.



Types of Networks (distance)

WAN : Stands for **W**ide **A**rea **N**etwork. This type of networks connects distant computers in (different buildings) or may be other countries using transferring medias such as (telephone line / satellite).



Advantages of Networks….

1. **Information Sharing** : Networks facilitate information sharing between users.
1. **Resources sharing** : Networks enable their users to share their devices as (storage units , printers , scanners etc.)
1. **Software Sharing** : Networks facilitate access to install programs remotely from the main computer which it is called the '**Server**'.
1. **Protection** : Using user name & password to login.
1. **E-mail :** Used to facilitate communication between internet users .

Types of Networks (Components)

Peer to peer Networks.

In this type of network there is no server. Thus is no controller in this type but each computer can use the resource in any other computer in the network. This type is mostly used in (net cafe) .

Advantages of Peer to Peer Networks:

- Easy construction and establishment.
- Client can control its resource
- It is cheap.
- Number of users is limited.

Disadvantages of Peer to Peer Networks:

1. Can't connect huge number of users.
1. Does not have shared storage unit to perform the back-up process.
1. Security is poor.

Types of Networks (Components)

Server Based Networks:

In this type of network the server is responsible for the security and it plays the main role in the network's task manager.

Advantages of Server Based Networks

1. Powerful information protection' control : any user should have a user' s name and password.
1. Shared central storage units: many users can use the same file and data in the same time.
1. Server has a full power to share with other users like first type (peer to peer clients).
1. Can connect and manage a huge number of users: operating system for server contain many program which supports networks users and recourses management.

Disadvantages of Server Based Networks

1. The cost of computers for this type of networks is very expensive (especially the server).
1. The cost of operating system for this type of networks is very expensive.
1. This type needs a controller to control the network and give privileges to the users.

Network Problems

- If the number of users is high the network
- will be slow.
- Difficulty in discovering the error/faults in
- the network.
- Faults with cables will break down the
- workability of network.

Internal vs External Networks

Intranet:
It is an abbreviation of the phrase (Internal Network) . It is a network used in companies, and doesn't require to be connected to a lan or a wan. It uses the PC's browser.

Extranet:
It is an abbreviation of the phrase (External Network) . This is when it offers a connection with the Internet to provide access to information.

What did we cover today…

- **Definition of a network**
- **Network architecture & hardware**
- **Types of networks (distance)**
- **Advantages of networks**
- **Types of network (components)**
- **Network problems**
- **Internal vs External networks**

Network Quiz – 15 minutes…..

1. What is a network?
2. What are the three main parts of a network architecture?
3. Name two types of networks (distance)
4. Name two types of networks (components)
5. Give 3 advantages of networks
1. What kinds of problems do networks sometimes have?
2. What's the difference between an Intranet and an Extranet?