

# NETWORK CONCEPTS

## In this unit you are going to learn about

- network systems devices
- network security and the internet
- e-mail accounts and common network problems



### Activity 1: Network

Answer the two questions below.

a. What is a network? Write a definition below.

b. Think about a network's key components. Key component parts of a network are:

1. \_\_\_\_\_ 2. \_\_\_\_\_ 3. \_\_\_\_\_ 4. \_\_\_\_\_ 5. \_\_\_\_\_



### Activity 2: Using the computer network

Look at the 1-6 below. Decide each one is an advantage or a disadvantage in a computer network. Write A or D for each.

1. Virus attacks \_\_\_\_\_
2. Work can be backed up centrally by the network manager \_\_\_\_\_
3. Speed \_\_\_\_\_
4. Breakdown problems \_\_\_\_\_
5. Initial costs of equipment and cabling \_\_\_\_\_
6. Sharing hardware or software \_\_\_\_\_



### Activity 3: Types of network

Let's look at two types of network: **LAN** and **WAN**.

**LAN**  
Local  
Area  
Network

A local area network is within one building. It is not over a large geographical area.

**WAN**  
Wide  
Area  
Network

A wide area network is formed by a number of LANs being connected. A router or a modem is used together for constructing a WAN network.

Read the features of LAN and WAN and place them in the table on the left.

| Main Features  | LAN | WAN |
|----------------|-----|-----|
| Size of area   |     |     |
| Located in     |     |     |
| Equipment used |     |     |
| Cost           |     |     |

- ★A Single Building
- ★Small Area
- ★More Expensive Communication  
(like lots of different buildings, cities, countries)
- ★More Expensive
- ★Wide Geographical Area
- ★Cable, Wireless, Infra-red and Microwave Links
- ★Less Expensive

## Network Topologies

A NETWORK TOPOLOGY describes the arrangement of systems /sistemlerin düzenlenmesi/ on a computer network. The devices in a network may be arranged in different ways. Each way is called a **TOPOLOGY**.

### NETWORK TOPOLOGIES

#### Wireless Topologies

( Many networks are now set up without wires, making use of radio, infra-red or satellite links. )

#### Wired Topologies

( In a wired network the topologies show how the wires are connected. )

There are four main types of LAN NETWORK topologies.

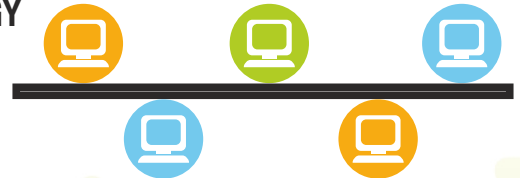
- a. Ring b. Bus c. Star d. Tree

#### RING TOPOLOGY



- ★Every computer in the network is connected in a ring, including the server.
- ★Ring networks work well under heavy loading.
- ★If there is a fault in the wiring between two computers then the whole network will fail.

#### BUS TOPOLOGY



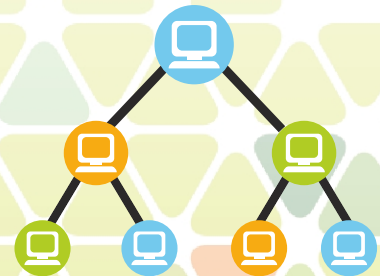
- ★Connected to a common shared cable called the backbone/central line.
- ★Lower cost because less cabling is needed.
- ★Easy to install.

#### STAR TOPOLOGY



- ★Uses a central connection point for all the devices on the network.
- ★Easy to add more computers without much loss in performance.
- ★Higher cost because larger amount of cabling needed.

#### TREE TOPOLOGY



- ★Combination of bus topology and star topology.
- ★Computers have access to their immediate network.
- ★Good for widely spread networks with lots of branches.
- ★Not suitable for small networks.



### Activity 4:

#### READING

Look at the picture and title of the reading text. What do you think it is about? Tick one circle below.



This text is about:

- Wired World
- Cell Phones
- The Internet



### A new report shows more people are online than ever before.

The Internet is a communications system that connects computers around the world. “Everyone who uses the Internet, please stand up!” If that message could be heard all over the world at the same time, how many people do you think would stand up? The answer is almost two billion, or nearly one-third of all human beings on the planet. That number comes from the International Telecommunication Union (ITU). Since 2005, the number of people who have access to the Internet through cell phones or computer use has doubled.

## Wireless LANs (WLANs)

WLANs are similar to LANs but there are no wires or cables. They:

- ★ provide wireless network communications over fairly short distances. (a few metres)
- ★ use radio or infrared signals instead of cables.
- ★ devices known as access points (APs) are connected into the wired network at fixed locations.

### ( Network DEVICES )



(Network Hub)



(Network Switch)



(Network Bridge)



(Network Router)

(HTTP Proxy Server)



### Activity 5:

Help your customer.

Your customer: Hello, Mr. Superfix! My home network is too slow!  
What's your suggestion?

Your suggestion: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_



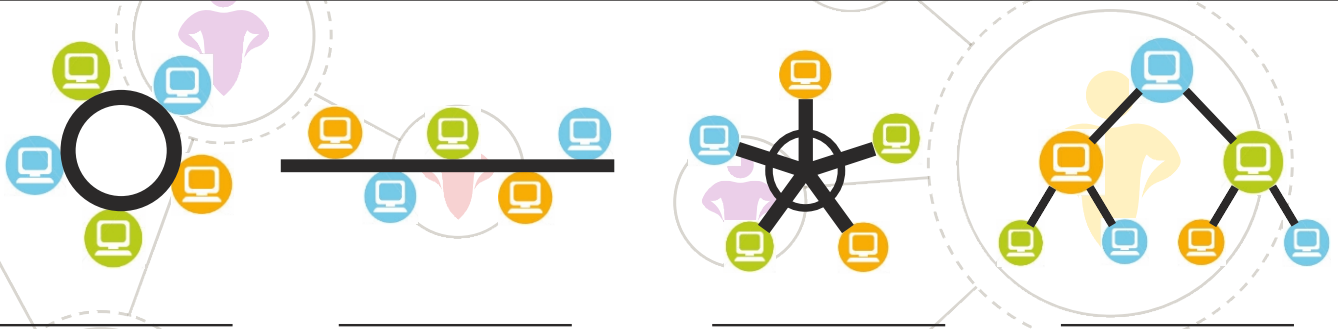
## Network Concepts



### Activity 6:

Match the network topologies with the four pictures.

**TOPOLOGIES:** \*bus topology \*tree topology \*ring topology \*star topology



## STUDY BOX

**LAN (Local Area Network)** is used for short-distance connections such as those in computer labs.

**WAN (Wide Area Network)** is used for wide-area connections like the internet.

**MAN (Metropolitan Area Network)** is used for metropolitan connections; such as universities in İstanbul.

**SAN (Storage Area Network)** is used for storing data such as a flash disc in a network.

**VPN (Virtual Private Network)** is only for private virtual connections such as those used in a bank.



### Activity 7:

Do the network quiz!

- Which network consists of more than one local area network and covers a large geographical area?
  - WAN
  - Internet
  - LAN
- What is the name of the cable used to transfer information for the Internet over long distances at high speed?
  - fibre optic cables
  - telephone lines
  - ethernet cables
- What is the name of the wireless technology that uses radio waves to transmit over short distances?
  - infra-red
  - bluetooth
  - cloud systems
- This is topology which all the devices are connected to the same circuit forming continuous loop.
  - star
  - ring
  - bus
- What is the technology called for building wireless LANs and public hotspots?
  - cellular Networks
  - Wi-Fi
  - ethernet cables



### Activity 8:

Match the correct definitions below with their network type abbreviation.

VAN      MAN      LAN      VPN      SAN

- \_\_\_\_\_ belongs to a private group or company.
- \_\_\_\_\_ used to store information.
- \_\_\_\_\_ combines two or more computers that are near each other.
- \_\_\_\_\_ belongs to a town, city or campus.
- \_\_\_\_\_ combines computers over wide areas.



### Activity 9a:

One of you is the technician; the other is the manager. Read the following conversation. The manager wants to get some information about how the network at the office works.

**Technician:** It's because all the computers or work stations in the office are connected to each other in a network. For our office, this network is called a **LAN**, which is an abbreviation of 'Local Area Network'



**Manager:** How is it possible that I can open the same word document on any of the **work-stations** in the office.



**Technician:** Yes, it is. Devices such as printers that are connected to the network are called **nodes**.



**Manager:** I know we need an **ethernet cable** and **ethernet card** for a computer to connect with the network. Everybody in the office sends their documents to the same printer. Is the printer a network device?



**Technician:** A **server** is the main computer that serves in a network.



**Manager:** What is the server's function in a network?



**Technician:** A **switch** is a device that connects the computers in a LAN, a **router** helps computers in a network to find their directions, and a **bridge** enhances (improves) /geliştirmek/ the networks and provides a connection with everything.



**Manager:** OK. And what about other devices?



### Activity 9b:

Read your answers in Activity 1 (page 16) and the words in bold in Activity 9a. Then complete the spaces below.

1. The 'computers' in a network are often called \_\_\_\_\_
2. A type of computer network that is normally used in an office or school is called a \_\_\_\_\_
3. A cable that is used to transport data from one computer to another on a computer network is called an \_\_\_\_\_
4. A device that connects the computers in a LAN is a \_\_\_\_\_
5. A powerful computer that is used on a computer network to store or save other computer's data and files is called a \_\_\_\_\_
6. A device that is connected to the network is called a \_\_\_\_\_
7. A device on a computer network that is used to move data between different computers and server is a \_\_\_\_\_
8. A device that enhances the network is called a \_\_\_\_\_