# ***TOPIC 6***

## *PART 1. NETWORKING BASICS.*

1. **definition of a network and its main characteristics;**

Network includes 2 or more devices and allows them to exchange information, data and peripherals.

1. **classification of networks based on size and scope: PAN, LAN, MAN, WAN;**

There are 4 types of networks: LAN, PAN, MAN, WAN.

First of them is LAN - a local area network. In LAN computers are usually located in the same building. Computers in LAN use the same protocol and devices are connected through wires. Also there are WLANs - it is a kind of LANs. They use wireless technologies and devices are connected by radio waves.

The next is PAN. It stands for Personal Area Network. PAN connects devices in the same area. The size of a PAN ranges from a few centimetres to a few metres. One of the most common examples of a PAN is Bluetooth technology. It is the smallest type of network.

MAN is a metropolitan area network. It is a computer network that connects computers within a metropolitan area, for example in a large city or town. A MAN is larger than a LAN but smaller than a WAN.

The last one is a WAN - wide area topology. It has no space limits and it is the biggest type of network. Devices in WAN linked by satellites or telephone lines. The largest WAN is the Internet.

1. ***communication channels and their main types;***

A router is an electronic device, it forwards a packet of data and we need it to connect a LAN to another network, for example to the Net.

Most networks are connected with cables or wires but new Wireless fidelity or wi-fi technology allows networks to connect with radio waves. It facilitates the creation of a new type of network - WLAN - wireless local area network.

To build a WLAN you need an access point - radio waves receiver-transmitters, that are connected to the LAN and wireless adapters installed in your PC.

Hotspots are WLANs available for public use e.g. in airports or university campuses.

1. **network topology;**

There are 3 main types of topology: star, bus and ring. In star topology there is one central device - it’s a server and other devices are connected to it.   
In a bus topology all devices are connected to the main cable called a bus. And in a ring topology devices are connected in a loop configuration.

Also there are some combinations, for example tree. Tree topology is a group of stars connected to a main cable.

1. **network architecture: client server and peer-to-peer;**

There are 2 many types of architecture: client server and peer-to-peer. In client-server 1 computer is a server with the main hard disk and controlling the other workstations. And in peer-to-peer architecture all computers have the same capabilities.

1. **network protocols.**

To interact with each other computers need one language - it’s a protocol. TCP / IP - transmission control protocol / internet protocol - the most common of Internet protocols. And each computer is given an IP number - it’s a way to identify a computer. And Ethernet is the most common LAN protocol

## *PART 2. WEB BASICS.*

1. **definition of the Internet;**

The internet is an international computer network. It consists of thousands of networks connected to each other. And all computers in it share information and resources. They need TCP/IP protocol. And each computer is given an IP number - it’s a way to identify a computer ON the Internet.

1. **types of the Internet connection (pros and cons);**

There are 2 basic types of connection - external and internal. In external we plug a cable into a USB port and in internal we put an expansion card into the PC.

Firstly computers used dial-up telephone connection which worked through telephone lines. But now broadband connection has become more popular. In my opinion

1. **definition of the World Wide Web;**

WWW is a network of documents that works using hypertext - text containing a link to another document or page.

The Web gives u access to all sort of information and has become a real information highway.

1. **components and technologies of the Web;**

In this network server is a computer where files and web pages are stored. You need to use a web-browser - a special program to get access to these files. Web pages are organized in websites - groups of pages located on the Web and supported by web-master (manager of a website).

*/\*There are a lot of components and technologies. You can use it to exchange messages and attachments in your email. Also u can sort your emails by topics. Mailing lists (listservs) can facilitate u.   
Also u can call smbd via Internet Telephone or create a video conference with your colleagues.   
You can exchange files between computers using file transfer protocol.*

*You can public or learn some news in news groups.*

*Also u can use TELENET - it is a program which allows u to work on your PC remotely. \*/*

1. **process of accessing a website;**

To surf on the Web u need a computer with a web-browser. Computer should be connected to the internet. In a web browser you should type a website address or URL - uniform resource locator.   
URL consists of name of the protocol (http - hypertext transmission protocol), www, domain name, way where a web page is located and a filename. Parts are separated by dots and slashes.

To make your research more effective you can use search engines where websites information is compiled by spiders, special programs that collect information by keywords and organised into categories.

There are some web portals - websites that contain all types of services. You can search on them.

You can save your favourite links using bookmarks.

## *PART 3. WEB BASICS.*

1. **definition and scale of the IoT;**

IoT - internet of things - it is a network of things, which can exchange data between each other through the internet. It can be usual household devices or conception smart factory. So its scale varies from 2 devices to a global network.

1. **applications of the IoT today;**

There are some applications already installed on your phone when you buy it. It is application home on apple devices, applications for mothers with little kids and for car drivers. You can manage some devices (signalization, heating, light etc) - send them instructions.

All devices are divided into 2 groups: command initiators - they send signals, and command receivers - they get signals.   
These systems can be wired and wireless. Wired LANs use cables and wireless use bluetooth and radio waves. They create a PAN in your house.

1. **benefits that IoT brings;**

Houses with IoT are safer and comfortable. It is really hard to lose a device if it is connected with IoT. Houses with IoT use fewer resources, so they are more ecological. There are numerous assistive technologies, so it makes the life of people with disabilities easier.

1. **problems related to the IoT and their solutions;**

For example if you lose your device you can not manage the functions of your smart house for a long time. Also using a big number of devices connected to one network reduces network bandwidth. If a company stops supporting some devices or stops supporting old version you also lose control on functions of your house.

The most popular problem now is security. IoT also use your personal data. You need to make sure that it doesn’t send them to different companies.

1. **future of the IoT;**

In the future the IoT network will be wider and it will include more devices. As the result it will become available for all people. Also it will support voice commands.