УДК 004.732
Nikita Rebrikov[1], Olha Kalantaieva[2]
[1]student of group RT-818 ZNTU
[2]teacher ZNTU

LOCAL NETWORKS (LAN)

Ethernet technology was developed with many other projects of Xerox PARC. Ethernet was invented on May 22, 1973, when Robert Metcalfe compiled a memorandum for the head of PARC about the potential of Ethernet technology. But Metcalfe received the legal right to technology in a few years.

In the standard of the first versions (Ethernet v1.0 and Ethernet v2.0) it is indicated that a coaxial cable is used as the transmission medium, then it became possible to use twisted pair and optical cable.

The reasons for the transition to twisted pair were: low cost of twisted pair cable; higher reliability of networks with cable faults; greater noise immunity when using a differential signal; the ability to power cable low-power nodes, such as IP; phones (standard Power over Ethernet, POE). The reason for switching to the optical cable was the need to increase the length of the segment without repeaters.

When creating local area networks, the most commonly used hardware architecture is called Ethernet. In its simplest form, an Ethernet network consists of a single cable, to which all network nodes are connected using connectors, connectors and transceivers. One of the drawbacks of Ethernet technology is the limitation on cable length, which allows using Ethernet only when creating local area networks. However, several Ethernet network segments can be connected to each other using repeaters, bridges or routers.

If there are several computers in the same room, building or complex of nearby buildings, the users of which must jointly solve some problems, exchange data or use common data, then these computers should be combined into a local network. A local network is a group of several computers interconnected by means

of cables (sometimes also telephone lines or radio channels) used to transfer information between computers.

To connect computers to a local network, you need network equipment and software. Local networks allow you to provide: collective data processing by users connected to the network; computers and data exchange between these users; program sharing; sharing printers, modems and other devices.

Network topology is a logical diagram of the connection channels of computers or network nodes. The most commonly used basic topological structures are of the following nature: common tire; ring-shaped; star-shaped.

The choice of electrical connection topology significantly affects many characteristics of the network. For example, the availability of backup links improves network reliability and makes it possible to balance the load on individual channels. The simplicity of connecting new nodes inherent in certain topologies makes the network easily expandable.

A network with a common tire topology uses one communication channel, connecting all the computers on the network.

The ring-shaped topology network uses as a communication channel a closed ring from receiving transmitters connected by a coaxial or optical cable.

The star-shaped topology network has an active center - a computer (or other network device) that connects all the computers on the network. The active center completely controls the computers connected to it through a hub, which performs the functions of distribution and amplification of signals.

There are two main types of solutions that are used to prevent local network security problems.

Hardware solutions: Use of a switched network, because with the help of a switch the network is divided into different segments and through this we can prevent snooping. Use different types of filters, such as bridges or routers. Ethernet LANs can also be protected using a LAN security architecture (LSA), it prevents incoming messages.

Software Solutions: Data encryption (this software encrypts data and provides confidentiality to it). Authentication process: using a username or password for authentication. Some technologies are also used in which a combination of the above two technologies.

Currently, global networks provide the exchange of information between all computers connected to them. Proper use of network capabilities allows you to increase your productivity.

In conclusion, it should be noted that modern computer technologies are closely connected with network technologies. The battery life of computers and users has passed. At the same time, this fact puts forward new qualitative requirements for the training of users, since reliable and safe operation of the entire network often depends on the skill level of each.