Investigating Multimedia Connection Methods on Wi-Fi Networks through Different Generation Devices

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Abstract. *At the same time that information technologies are rapidly developing, communication and information exchange are also developing at a great speed. The role of communication tools in increasing the convenience of communication is incomparable. Because the quality of communication is closely related to the means of communication. Initially, communication was carried out only through wire connectors. These wires connected users to each other through communication centers, and thus communication between cities and countries was established.*

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Today, such wires are used in modern optical products. An example of these is fiber optic cables. It has several advantages. But even such fiber connections cannot meet the requirements of the time. Because this wired connection has its own disadvantages. Examples of these include pulling these wires to some communication centers, inconveniences in the placement of wires, etc.

In addition, there are financial inconveniences, such as the consumption of raw materials for the production of wires. In order to avoid such inconveniences and financial losses, new modern wireless communications have been developed. To give an example of this, first of all, mobile communication and wireless communication system, which is considered one of the most convenient communication methods. Wireless communication includes a number of communication technologies such as Wi-Fi, Wi-MAX, Wi-Bro and so on (Figure1).

Figure 1. Wireless communication networks

Wireless LAN technologies: past and future

The history of wireless technologies of information transmission began with the first radio signal transmission at the end of the 19th century, and the appearance of amplitude modulation radio

receivers in the 20s of the 20th century greatly influenced the development of these technologies. By the 1970s, the first cordless radiotelephones were created that transmitted sound over radio waves. Initially, these worked on analog networks, but in the early 80s, the GSM standard was developed, which marked the beginning of the transition to digital standards, providing better spectrum allocation, the best signal quality and the best security. In the 90s of the 20th century, the processes of strengthening the state of wireless networks took place, which led to the rapid development of these technologies. Today, wireless technologies are firmly entrenched in our daily lives, while providing high speeds, they provide new devices and services.

New CDMA (Code Division Multiple Access - channel code distribution technology), GSM (Global Systems for Mobile Communications - global system of mobile communication networks), TDMA (Time Division Multiple Access - channel distribution technology by time), 802.11, WAP (Wireless Application Protocol -wireless technology protocol), 3G and 4G (third and fourth generation technologies), GPRS (General Packet Radio Service, packet data transmission service), Bluetooth (medium and short-range network), EDGE (Enhanced Data Rates for GSM Evolution, improved GSM network) and the diversity of similar technologies means that a radical change is beginning in this field. The development of wireless local area networks (WLAN) and medium and short range networks (Bluetooth) is very promising. Wireless local networks are widely used in networks of airports, universities and institutes, hotels, restaurants, enterprises and organizations. The development of wireless network standards began in 1990 with the establishment of the 802.11 committee by the worldwide IEEE (Institute of Electrical and Electronics Engineers). The World Wide Web and the idea of working with wireless devices in this network serve as an important impetus for the development of wireless technologies. By the end of the 90s, WAP-service was provided to users.

It should be noted that at the beginning this service did not arouse much interest in many people. WAP-service provided a set of news, weather, daily and other services as the main information services. Also, Bluetooth and WLAN were used very little due to the high cost of these means of communication.

But the drop in prices caused an increase in demand and interest in these tools. By the middle of the first decade of the 21st century, the number of wireless Internet service users reached several tens of millions. With the emergence of wireless Internet communication, the issues of ensuring its security were raised in the first place.

Among the main problems that arise when using wireless networks, it is necessary to mention the following - interception of shipments of special services, commercial organizations and private entrepreneurs, interception of credit card numbers, theft of payment time for communication, disruption of the work of communication centers. These problems are being solved by improving communication standards [1] (Fig. 2).

Figure 2. Wireless communication tools

A significant aspect of the advancement of wireless technologies is that these technologies are easily accessible to home users. As the number of home network devices increases, the number of

wires connecting these devices to each other is becoming a major network problem. This, in turn, causes the transition to wireless technologies.

While the number of individual users of wireless technology is significant, the fastest growing segment is its corporate users. Wireless data transmission is considered an important strategic tool, it ensures the increase of productivity in the enterprise (employees have constant and fast access to corporate information, they quickly learn about news), increases the quality of customer service (it is possible to receive and feel their complaints and wishes at the same time). , creates an advantage over competitors (increasing the speed of information exchange and decision-making). In a word, we can say that wireless technologies are technologies of the future (Fig. 3).

Figure 3. Wireless communication technologies

1. Wi-Fi technology

Wi-Fi technology is one of the most promising computer networks in the computer world today. Wi-Fi (Wireless Fidelity) is a combination of English words that means "wireless connection". Wi-Fi technology is one of the types of sending digital data through radio channels. When this technology was created, it was originally intended for corporate users and was predicted to replace the cable network. As we know, creating a wired computer network requires manually installing several thousand cables and setting up a special network topology. Wi-Fi is a standardized technology for wireless data exchange that operates at reduced control frequencies of radio frequencies. WLAN (Wireless Local Area Network — Wireless Local Network) networks are usually created through the Wi-Fi network. In this network, it will be possible to see communication and data exchange through high radio waves. This system is used as an extension of the cable network or as an alternative to it, in one office, an entire building or a territory of an area. Wi-Fi technology saves you money on the costly process of laying down thousands of cables, while the simplicity of installation saves time on complex technical installation processes, making this network superior to other networks. Because wireless networks use radio frequencies, radio waves can pass through walls or similar obstacles in buildings or offices in general, and nothing can get in the way (except distance, of course!). Wireless networks are inherently more reliable than wired networks. Most WLAN networks have a range or coverage area of 160 meters, which of course depends on the type and extent of obstacles in its path.
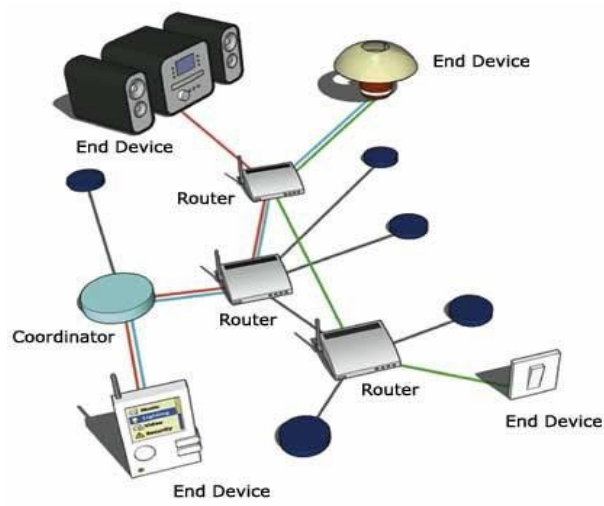
2. Structure and organizers of the Internet

Internet (International Network) is a global computer network covering the whole world. Currently, the Internet has 100 million subscribers in more than 150 countries of the world. Every month, the amount of the network is increasing by 5-10%. The Internet is the core of communication between various information networks in the world. The Internet once served only research and educational groups, but now it is spreading widely among production circles.

Companies are attracted by the speed of the Internet, cheap, wide-ranging communication, ease of cooperation, software that allows everyone to work, and a unique database. In return for the low price of the service (except for the fixed monthly fee for using the Internet or telephone), users can access commercial or non-commercial information services of the USA, Canada, Australia and many other European countries. In the freely accessible archive of the Internet, you can find information covering all aspects of human activity, from the latest scientific news to tomorrow's weather forecast.

Especially for individuals, organizations, and institutions that need communication, it is often cheaper to use the Internet infrastructure than direct communication by telephone. This is

especially convenient for companies with branches abroad, because the Internet's unique and confidential communications have worldwide access. The Internet is considered to have been created in 1983, a year in which a revolutionary change in computer communication software took place. The Internet's history is marked by the adoption of the TPC/IP protocols that form its basis. In order for computers to communicate worldwide, they need to understand each other.

3. Internet resources and methods of their use

Internet resources consist of information in various forms. Their use is carried out with the help of various services of the Internet. Knowing the available services, being able to apply to specific services and correctly choosing the methods of solving the problem determines the effectiveness of working in the network.

Internet services can be divided into the following classes.

➢ Interactive services;

➢ correct referral services;

➢ services for later reading.

Further learning services are more common, more universal and less demanding on computer resources and communication systems.

The main feature of this class is that the gap between the request for receiving information and the time of receiving it can be large (for example, e-mail).

Correct referral services are characterized by the fact that information is returned immediately upon request. But such a service does not require the recipient of information to make a decision right away. To get a clearer picture of the above services, if we give an example of a simple communication service, we can show the interactive service as telephone service, fax service as direct reference service, and mail service as further study service. Uzbekistan is on the 184th place in the rating. It states that the average internet speed in our country is 1.02 Mb/s. As an example, it is shown that it takes more than 11 hours to download a 5GB HD video in Uzbekistan. If we compare, in the ranking, Russia occupies the 47th place (13 Mb/s), Kazakhstan occupies the 95th place (4.4 Mb/s), and Kyrgyzstan occupies the 163rd place (1.52 Mb/s). Only Tajikistan (188th place, 0.94 Mb/s) and Turkmenistan (198th place, 0.56 Mb/s) are lower than Uzbekistan [9] (Figure 6).
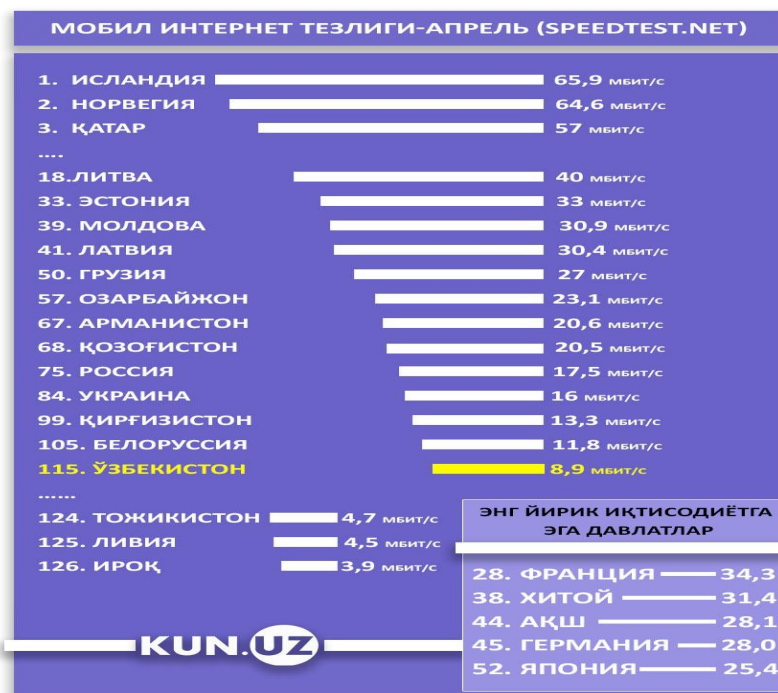
(kun.uz)

Summary

In conclusion, it should be noted that as a result of the development of wireless communication technology, expensive wired and satellite communication systems are used less and economic savings can be achieved. By using such technologies, the user can efficiently use communication exchange and other communication services both in mobile and stationary state, in arbitrary geographic environment, and time and economic gains are achieved. Taking this into account, it is an urgent and important issue before us to study the undiscovered aspects of Wi-Fi, WiMax and

Wi-Bro technologies, to find measures for their application, to optimize their parameters and to design new-look network topologies.

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