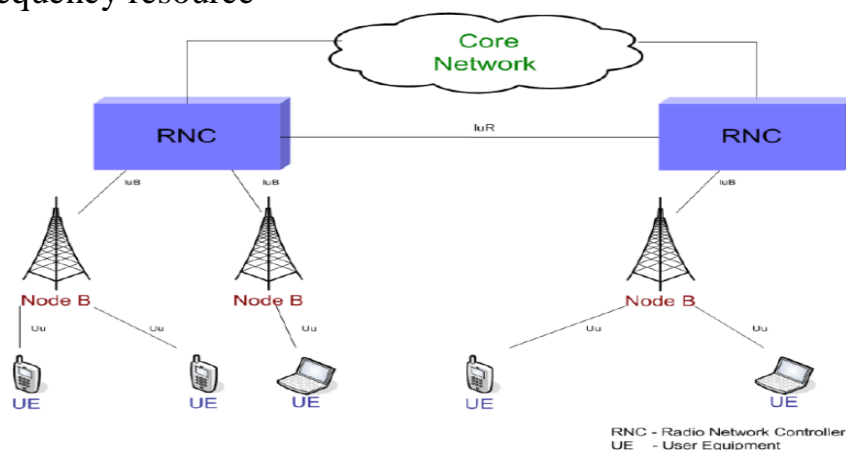


«Сейфуллин оқулары – 16: Жаңа формациядағы жастар ғылыми – Қазақстанның болашағы» атты халықаралық ғылыми-теориялық конференциясының материалдары = Материалы Международной научно-теоретической конференции «Сейфуллинские чтения – 16: Молодежная наука новой формации – будущее Казахстана». - 2020. - Т.1, Ч.3 - С.132-134

COMPARATIVE ANALYSIS OF THE RADIO ACCESS SUBSCRIBER NETWORK

Zholdangarova G.I.

Radio access (radio remote) or wireless connection (WLL - Wireless Local Loop) provides maximum mobility and efficiency of communication, is a fast way of organizing communication, a special effect is achieved if the cable laying is associated with significant costs, or is impossible (for example, in rooms with reinforced concrete floors and walls, etc.) or is impractical (for example, in a room removed for a short period of time). Bandwidth for radio access systems is also limited by frequency resource



Radio Access Network Basics. In a RAN, radio sites provide radio access and coordinate the management of resources across the radio sites. A device is wirelessly connected to the core network, and the RAN transmits its signal to various wireless endpoints, and the signal travels with other networks' traffic.

Two types of radio access networks are Generic Radio Access Network (GRAN), which uses base transmission stations and controllers to manage radio links for circuit-switched and packet-switched core networks; and GSM Edge Radio Access Network (GERAN), which supports real-time packet data. Two other types of radio access networks are UMTS Terrestrial Radio Access Network (UTRAN), which supports both circuit-switched and packet-switched services; and Evolved Universal Terrestrial Radio Access Network (E-UTRAN), which focuses only on packet-switched services. E-UTRAN also provides high data rates and low latency.

Radio Access Network Controller. The RAN's controller controls the nodes that are connected to it. The network controller performs radio resource management, mobility management, and data encryption. It connects to the circuit-

switched core network and the packet-switched core network, depending on the type of RAN.

Today's RAN architectures — particularly in digitally transformed networks — separate the user plane from the control plane into different network elements. In this scenario, the RAN controller can exchange user data messages through one software-defined networking (SDN) switch, and a second set with base stations via a second control-based interface. This separation of the control plane and data plane will be an essential aspect of the flexible 5G radio access network, as it aligns with SDN and network functions virtualization (NFV) techniques such as service chaining and network slicing. Radio Access Network Evolution. Radio access networks have experienced much evolution since their origins, to the point at which today's radio access networks support multiple-input, multiple-output (MIMO) antennas, large spectrum bandwidths, multi-band carrier aggregation, and so on — all of which bodes well for the 5G future.

When comparing the methods of organizing subscriber access, the following should be taken into account. WLL systems in comparison with the cable distribution network have: less labor intensity of construction and installation works, therefore shorter terms of commissioning; lower initial costs and short payback period; greater flexibility and easy transformation; undoubted advantages in the construction of the network on a highly rugged terrain with a large number of water barriers and reservoirs, as well as in the case of complex soils.

The concept of multichannel access is associated with the organization of sharing a limited portion of the spectrum by many users. The subject, organizing information exchange, independently chooses the degree of protection of information, can arbitrarily determine the location of subscribers; secure information exchange is organized with the same territorial access, with which the exchange is implemented unprotected; mutual trust is required only from interacting subscribers. In radio communication systems (wireless communication) widely used a variety of technologies of multiple (multi-channel) access, in particular, the following:

FDMA (Frequency Division Multiple Access) - multiple access with frequency division, while the spectrum allocated for a particular system is divided into frequency bands, which transmit channel information from different subscribers; TDMA (Time Division Multiple Access) - multiple access with time division, with a dedicated frequency band is provided for the transmission of channel information for a certain short period of time, in the next period of time is the transfer of information from another subscriber; CDMA (Code Division Multiple Access) - multiple access with code division, messages from subscribers are encrypted and transmitted at the same time, this method has certain advantages (for example, the secrecy of information), but at the same time a fairly wide frequency band is required for transmission, which can be a disadvantage with limited frequency resource.

During the Global Analytical Summit 2016, Huawei talked about its latest CloudRAN radio access network development strategy. Huawei CloudRAN takes

advantage of cloud technologies to help operators transform their networks and adapt them to work in the digital age.

List of references

1. Kartashevskiy V.G. and other mobile networks / Kartashevsky VG, Semenov S.N., Firstova TV - M: Ecotrends, 2018

2. Ratynsky M.V. Basics of cellular communication / Ed. D.Ye.Zimina. - 2nd ed., Revised and add. - M: Radio and communication, 2018

3. Telecommunication systems and networks: Tutorial. Volume 2. - Radio communication, broadcasting, television / Katunin G.P., Mamchev G.V., Popantonopulo V.N., Shuvalov V.P. ; by ed. Shuvalov V.P. - Izd.2-e, Corr. And add. - M: Hotline - Telecom, 2015.