

5G Wireless Technology

Ashwitha A. Shetty

Assistant Professor

Department of Computer Science & Engineering

Sahyadri College of Engineering & Management, Mangalore, India

Abstract— The 5G is fifth generation mobile networks or fifth generation wireless system symbolizes the major revolution in the field of mobile telecommunications. The 5G technology provides high-bandwidth user accesses on their phone. The main objective behind its development are data rate should be several megabytes per second, it should provide several hundreds of thousands of simultaneous connection, coverage and signal efficiency should be improved. This technology provides the services in the following field: documentation, product engineering, electronic transaction. This technology is design is based on user centric mobile environment.

Key words: Wireless Technology

I. INTRODUCTION

5G means fifth generation which refers to the next, newest mobile wireless standard. It is based on the IEEE 802.11ac broadband technology standard. It is called as real wireless world. This concept is not implemented yet. If it gets implemented then it will have incredible transmission speed. According to the group of Mobile association in order to get this connection should meet the following criteria's:1.It should have one to ten GBPS connections to the end points.2. It should have end to end round trip delay of 1 millisecond.3. The bandwidth per unit area should be 1000x.4. The number of devices that should be connected are in the range of 10 to 100x.5. It should have 99.9% availability and 100% coverage.6. It should have battery life up to 10year for low power machine type devices7. Network energy usage must be reduced by 90%.

II. EVOLUTION FROM 1G TO 5G

1G came to existence in early1990.It was constructed based on analog system. Its speed was ranging up to 2.4Kbps.It was used in only one country.2G came to existence in late 1990's. It was constructed based on digital system and its speed ranges up to 64kbps.It provides the digital voice and SMS with more clarity. Most of the countries used this facility. Even today some are using this devices.3G was developed between late 1990's and early 2000 until the present day. The transmission speed was ranging between 125kbps to 2Mbps; it has superior voice quality, very good quality of video conferencing. It provides additional facilities such as online shopping, online banking, PDA, E-mail, surfing etc. It is used by the people all over the world.4G came to exist in 2010.It is fast and reliable compared to all other generations. The speed ranges up to 100Mbps.The benefits provided by 4G are high performance, easy roaming and low cost.5G is that which has no limitation, which has incredible transmission speed. But this concept is not yet implemented.

III. HARDWARE & SOFTWARE OF 5G

A. Hardware of 5G

At low energy level it uses ultra-wide band with high bandwidth. It has bandwidth of 4000Mbps which is 400 times faster than 4G. This uses smart antenna. It also uses code division multiple access.

B. Software of 5G

It will be wireless technology including LAN technologies, AN/WAN, Worldwide wireless web unified IP & software defined ratio. It provides flexibility and antivirus.

IV. ARCHITECTURE OF 5G

OSI layer1 and layer 2 defines this type of wireless technology because these two layers are based on open wireless architecture. Open wireless architecture is combination of physical and data link layer.

5G mobile terminals have transport layer that is possible to be downloaded and installed in the open transport protocol which is a combination of transport layer and session layer. Application layer provides intelligent quality of service management over variety of networks and possibility for service quality testing, storage measurement information in the information database in the mobile terminal.

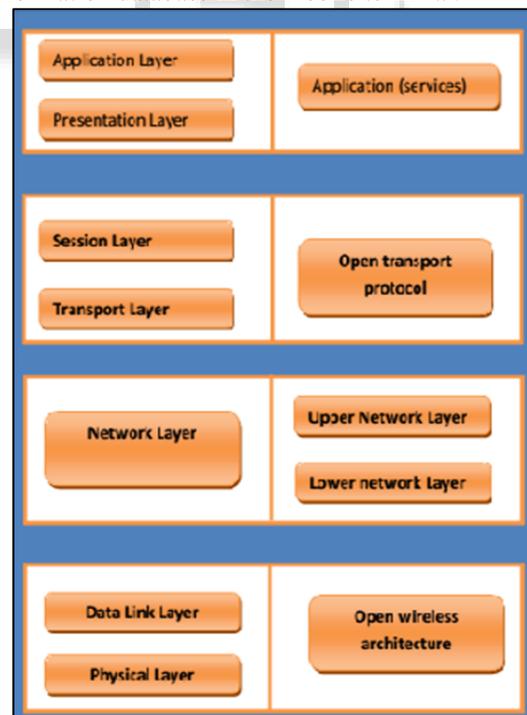


Fig. 1: Architecture of 5G Wireless Network

A. Application (service) Layer

Application and presentation layer are clubbed together to form application (service) layer. In its data base it holds total

number of delay, bandwidth, and losses. It is an intelligent system which provides best quality of services over variety of network. For the given service it selects the best wireless connection.

B. Open Transport Protocol

Session layer and transport layer together forms the open transport protocol. The main difference between wired and wireless network is based on the transport layer. In the 5G mobile terminal has a transport layer which can be downloaded and installed.

C. Network Layer

All mobiles network make use of mobile IP. The fixed IPV6 will be implemented in the mobile phones. A mobile can be connected to many mobiles or wireless connection at a time. So the network layer is divided into two parts Upper network layer and lower network layer. Lower network layer is for each network and upper network layer is for mobile terminal.

D. Open wireless Architecture

Data link layer along with physical layer forms the open wireless architecture. 5G mobile network is based on open wireless architecture which in turn depends on OSI layer 1 and 2.

South Korea are leading in its implementation. South Korea has already invested \$1.5 billion in 5G research.

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V. ADVANTAGES

5G wireless technology on implementation it provides longer battery life, rate of data transfer is high, and it has high speed and capacity. It provides more clarity for multimedia usage. Dialling speed is high; it provides very good clarity for usages of audio and video. It is more efficient and attractive. It is available at low cost.

VI. DISADVANTAGES

The main disadvantage is that it is still under process and not yet implemented. It requires high cost for development. Issues related to security and privacy is yet to be solved.

VII. APPLICATIONS OF 5G

5G is media independent, radio resource management, global networking device. It is a wearable device with artificial intelligence capacity; it is also enabled with voice over IP with 6th sense technology.

VIII. CONCLUSION

5G is a wireless technology which will take four more years for launching from now. It requires more time for developing its functionality and more researches has to be taken place on its users and security. It is very hard to fulfil its goals. On completion of its development it will be the most intelligent system that interconnects the world without limits. It provides the features such as extra ordinary data capability, uninterrupted access to the information, communication and entertainment, unhindered call volumes, vast data broadcasting. It is expected to create healthier environment by providing good governance to government and regulators, which leads to continuing in the investment on 5G. So we can expect its launching on 2020. At present United States and