

5G Mobile Wireless Technology

Palak Sharma; Megha Verma; Neha Sundriyal & Jyoti Chauhan

III Semester, Department of Computer Science & Engineering

Dronacharya College of Engineering, Gurgaon-123506, India

Email Id: palaksharma1009@gmail.com

Email Id: megha16093@ggnindia.dronacharya.info

Email Id: neha.16101@ggnindia.dronacharya.info

Email Id: jyoti.16078@ggnindia.dronacharya.info

ABSTRACT :

In this research paper, an attempt to review the existing generations of mobile technology in terms of their features, performance, advantages and disadvantages has been made. We will also discuss the evolution and development of different generations of mobile technology along with their importance and advantages of each generation. In this paper, comparison of 5G will also be done with all other generations from 1G to 4G including their important characteristics, advantages and disadvantages. Then later in this paper, requirement of 5G technology, 5G networks and 5G Mobile Network Architecture will be discussed. In the end all the features of 5G technology, its advantages over other generations and applications will be included and some future scope (beyond 5g) will be proposed.

Keywords:

1G, 2G, 3G, 4G, LTE, 5G.

I. INTRODUCTION

5G stands for 5th generation of mobile technology. 5g will provide us with very high bandwidth. This technology causes speed to be greater than 100 mbps and 1 gbps when at full mobility and low mobility respectively, this increase in speed is caused by the use of CDMA, BDMA and millimeter wireless. 5G will be the most powerful and advanced technology in the future. 5G technology features high data rates than the previous versions, huge bandwidth and the best quality of service. The only thing which is required is to make it affordable so that common man can also use the features and offers of the 5G technology. 5G will be much better than the 4G technology.

According to some research papers on 5G technology, the features 5G would have are as follows :

- High data rates and coverage at cell edge.
- Less consumption of battery.
- 1Gbps data rate.
- Better security.
- WWW – World Wide Wireless Web

- IPv6 (Internet Protocol Version6)
- Wireless world with no zone issues and limited access.

Review of previous generation systems –

i. 1G (1970-1980)

It provided data bandwidth upto 2kbps. Technology used was analog cellular technology. Mobile telephony was the only service provided in 1G. It replaced 0G technology. The first cellular system in the world was made by Nippon Telephone and Telegraph (NTT). US launched the first Advance mobile phone system (AMPS), Push to talk(PTT) and improved mobile telephone systems (IMTS).

ii. 2G (1990-2004)

It provided data bandwidth upto 64 kbps. This generation used Digital Cellular Technology. 2G provided services like - Short Message Services (SMS), Digital voice, Higher capacity packetized data, E-mail.

TDMA (Time Division Multiple Access) and CDMA (Code Division Multiple Access) are the two types of modulation

used in 2G. frequency band of 2G ranges from 850MHz-1900 MHz 2G includes 2G, 2.5G, 2.75G.

iii. 3G (2004-2010)

It provides us with data bandwidth upto 2Mbps. Technology used by this generation is EDGE, CDMA 2000. In this technology clarity is increased due to the use of Wide Brand Wireless Network. Packet Switching technology is used for sending the data. Services provided are voice calls, data services, Global roaming, High-speed internet services, video calling, multimedia services.

iv. 4G (2010-2015)

It provides data bandwidth of upto 1Gbps. Technology used by 4G is WiMax LTE Wi-Fi. 4G provides us many facilities like downloading speed upto 100 mbps, Multi-Media Newspapers, sending data faster than the previous generations. It is also being developed to provide HD streaming, Global Roaming, wear-able devices, Multimedia Messaging Service (MMS), Video calling, Digital Video Broadcasting (DVB).



FIFTH GENERATION (5G)

It provides data bandwidth higher than 1Gbps. Technology used by this generation is WWW (World Wide Wireless Web), seamless combination of broadband and unified IP. The user never experienced such high valued technology before the 5G. 5G technology will be having the most advanced features. Frequency band for this technology ranges from 3GHz-300GHz.

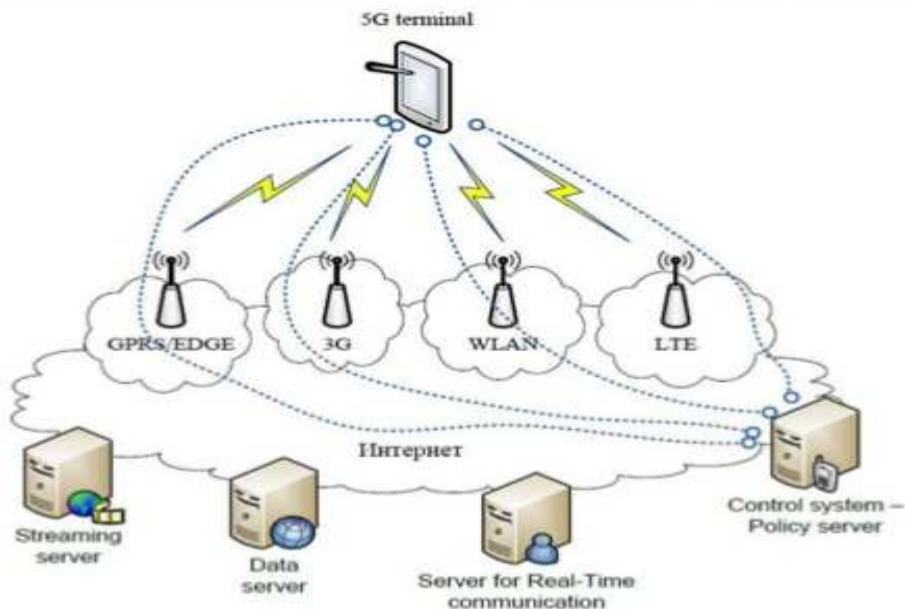
II. 5G NETWORK

5G Network will be the most Advanced Technology. Though we have few years to

experience this amazing technology. There will be a new revolution for all the devices with the invention of 5G. A single IP will be accessed by all the applications, multimedia and services. Nowadays wireless services are not new to anyone. There are millions of users in the world using wireless services and wireless technology. The only thing we need is to make 5G affordable so that

everyone could enjoy this technology. All the phones are coming with camera, mp3 player, telephony etc features. 5G will be having features as that of 4G but there will be much more. A user using 4G can get a rough idea about 5G technology. When 5G will be introduced to the world, there will not be much difference between a computer and a phone.

NETWORK ARCHITECTURE FOR 5G MOBILE



III. FEATURES OF 5G TECHNOLOGY

- High speed.
- Low cost per bit.
- It offers access globally and service portability.
- High capacity.
- It will provide broadcasting capacity up to gigabit.
- Supports virtual private network.

IV. ADVANTAGES OF 5G TECHNOLOGY

- Globally accessible

- Dynamic information access
- Lower battery consumption
- High system level spectral efficiency
- With 6th sense technology
- Faster data transmission than the previous generations

V. FUTURE SCOPE (BEYOND 5G)

5G mobile wireless technology will be a new revolution in the world of mobile communication technology. Different wireless technologies will be accessed by

the 5G mobile phones. 5Gcell phones will provide high resolution to the user. 5G technology will offer best utilization of cellular communication in future. With the help of 5G technology we would be able to control any place of the world from any part of the world, watch HD quality movies without buffering. Many more technologies will evolve which will be embedded in 5G mobile phones. Future of Nano-core will be extraordinary as it will combine with artificial intelligent (AI). User will be able to operate his robot by using his mobile. Message will be automatically typed whatever your brain thinks.

VI. CONCLUSION

In this paper we discussed the existing mobile wireless technologies and the future mobile technologies. Mainly focused on features, Data rates, bandwidth and technology used. 5G will be introduced by the end of this decade. We expect that this paper will help other people from different fields working on the future mobile technologies. 5G will provide high reliability, high and bright peak future. 5G will be a whole new level of mobile technologies. Technologies will be invented to incorporate with 5G technology to meet the future needs.

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