
FIFTH GENERATION (5G) TECHNOLOGY FOR MOBILE COMMUNICATION: A COMPREHENSIVE SURVEY

Chaluvaraju PP

Faculty of Engineering and Technology

Jain (Deemed-to-be University), Ramnagar District, Karnataka - 562112

Email Id- pp.chaluvaraju@jainuniversity.ac.in

Abstract

The goal of this paper is a detailed analysis related to 5G mobile communication technology. Current research work is linked to 5G technology in mobile communication. Study on the growth of the World Wide Wireless Web (WWW), Complex Adhoc Wireless Networks and Actual Wireless Networking in 5G. 802.11 Wireless Local Area Networks (WLAN) and 802.16 Wireless Metropolitan Area Networks (WMAN), Ad-hoc Wireless Personal Area Network (WPAN) and Wireless Networks for Digital Networking are the most relevant technologies for 5G technologies. Similar to 3G, but with IEEE 802.xx wireless mobile networks incorporated from the beginning, 4G technology would include many standards under a single umbrella. The main provisions of 5G (Fifth Generation) mobile communication technology, which is seen as consumer-oriented, are a significant contribution to this article. The mobile user has been given utmost importance compared to others in 5G technology. 5G Technology stands for the 5th Generation Mobile Technology. This paper provides a detailed review on the fifth generation (5G) technology for the mobile communication.

Keywords: WLAN; Fifth Generation (5G); Global System for Mobile (GSM); WMAN; DAWN.

I. INTRODUCTION

The performance requirements for the 3G and 4G wireless technologies currently deployed, have been motivated by rising Internet data traffic [1]. Today, on many fronts, extensive research on 5th generation wireless communication networks is advancing. It is estimated that the 5G system will be in operation around 2020 [2].

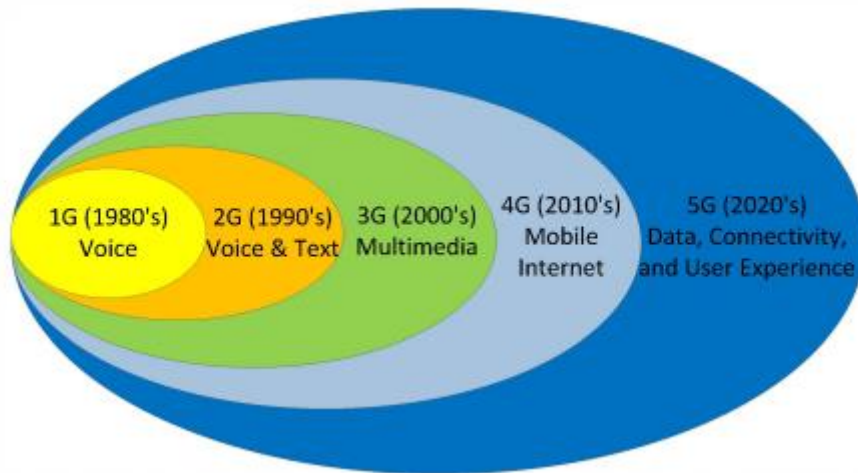


Fig. 1 Depicts Development of service types over wireless mobile generations

The 5G network is very stable and fast. With the introduction of 5G, the notion of hand held devices is going to be revolutionised. All services and software, such as telephony, gaming and many other multimedia applications, can now be accessible via a single IP. Since it's not a new phenomenon on the market, there are millions of people around the world who have used wireless technology for wireless services [3].

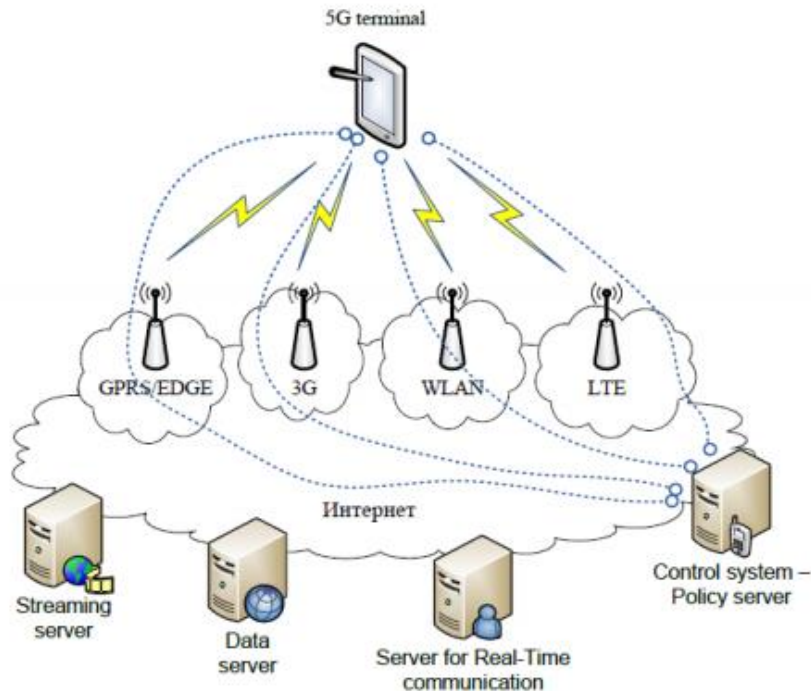


Fig. 2 Illustrates 5G Mobile Network Architecture

Shrinking from the use of this new 5G network technology is not easy for them. There is only need to make it available so that the lucrative packs sold by the firms can easily be afforded by a common man so that the 5G network will retain the authentic position. Figure 1 depicts development of service types over wireless mobile generations.

Table 1 Illustrates the 5G cognitive radios spectrum possibilities

Spectrum opportunity	Purpose	CR Function
54-698 Megahertz	TV Bands	Utilized beneath the carrier accumulation conception, i.e., using them as components carrier
2.7-2.9 Gigahertz	Bandwidth scaling from 2.7 to 3.4 gigahertz for improved pliable spectrum usage	Not identify clearly & definitely yet
3.4-3.6 Gigahertz Band 43	A smooth misuse of the Band 43 from WiMAX to LTE	Co-deployment on uppermost of the large layer of cell
3.6-3.8 Gigahertz	Neighboring carrier accumulation provision with the maximal 100 megahertz bandwidth	Carrier aggregation application
3.8-4.2 Gigahertz	Macro cell & mini cell layers' deployment, i.e., heterogeneous networks (HetNet)	Carrier aggregation within HetNet
60 Gigahertz unlicensed band	Small cell backhaul deployment	Not identify clearly & definitely yet

II. LITERATURE REVIEW

Kumar et al. have carried out an analysis on the circularly polarised microstrip patch antenna. For mobile communication and GPS applications, a triple-frequency single-feed S-shaped circularly polarised microstrip antenna with a minimal frequency ratio has been proposed [4][5]. In the centre of a square patch of 84.5 to 84.5 mm² for multi-band service, an S-shaped slot is eliminated. The suggested antenna geometry consists of a single microstrip line with an aperture-coupled feeding structure. The results of the simulation show that the proposed antenna can be used with an efficient return loss of -34.34 dB, -18.23 dB and -24.75 dB at 1.193 GHz, 1.454 GHz and 1.615 GHz respectively for multiband service [6].

Osseiran et al. performed a survey on 5g mobile and wireless networking scenarios: the metis project view. METIS is an EU 5G flagship project that seeks to lay the groundwork for 5G networks and to create consensus prior to standardisation. The overall 5G strategy of METIS builds on the advancement of emerging technology complemented by innovative radio models designed to fulfil new and demanding use-case criteria that radio access networks do not accommodate today [7].

III. DISCUSSION AND CONCLUSION

We have discussed 5G technology for mobile communication in this article. The 5G technology is built as an open network, from the physical layer to the application, on various layers. Current work is currently being conducted on modules providing the best operating system and the lowest cost for a given service using one or more of the 5G mobile wireless technologies at the same time. A new 5 G technology revolution is about to begin because 5 G technology would give ordinary computers and laptops whose market value will be affected to a tough

completion. In the field of mobile networking, there are plenty of upgrades from 1G, 2G, 3G, and 4G to 5G. The new forthcoming 5G technology is available on the market at low costs, high peak demands and a high degree of reliability compared to previous technologies. Figure 2 illustrates 5g mobile network architecture. Table 1 illustrates the 5G cognitive radios spectrum possibilities.

A novel era of mobile connectivity will be launched by 5G network technology. At the same time, 5G mobile devices would have access to different wireless technology, and the terminal should be able to merge the various flows of different technologies. High resolution for enthusiastic cell phone users is supported by 5G technology. Without any interference, we can watch an HD TV channel on our cell phones. 5G cell phones are going to be tablet PCs.

IV. REFERENCES

- [1] F. Boccardi, R. Heath, A. Lozano, T. L. Marzetta, and P. Popovski, "Five disruptive technology directions for 5G," *IEEE Commun. Mag.*, 2014, doi: 10.1109/MCOM.2014.6736746.
- [2] J. G. Andrews *et al.*, "What will 5G be?," *IEEE J. Sel. Areas Commun.*, 2014, doi: 10.1109/JSAC.2014.2328098.
- [3] Ericsson, "5G Radio Access What is 5G?," *White Pap.*, 2015.
- [4] H. Haas, "LiFi is a paradigm-shifting 5G technology," *Reviews in Physics*. 2018, doi: 10.1016/j.revip.2017.10.001.
- [5] A. K. Jain, R. Acharya, S. Jakhar, and T. Mishra, "Fifth Generation (5G) Wireless Technology 'Revolution in Telecommunication,'" *Proc. Int. Conf. Inven. Commun. Comput. Technol. ICICCT 2018*, no. September, pp. 1867–1872, 2018, doi: 10.1109/ICICCT.2018.8473011.
- [6] Sanjeev Kumar, "Triple Frequency S-Shaped Circularly Polarized Microstrip Antenna with Small Frequency-Ratio," *Int. J. Innov. Res. Comput. Commun. Eng.*, vol. 4, no. 8, 2016.
 [Online]. Available: http://www.ijircce.com/upload/2016/august/24_Triple_new.pdf.
- [7] A. Osseiran *et al.*, "Scenarios for 5G mobile and wireless communications: The vision of the METIS project," *IEEE Commun. Mag.*, 2014, doi: 10.1109/MCOM.2014.6815890.