

Introduction to Mobile Technology 6G – A Revolution

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Abstract: Wireless correspondences is the exchanging of data between at least two points which are not physically associated. Separations can be short, which is utilized for TV remote control and even far separation which is utilized for deep-space radio communications. The paper manages the advancements of technologies and its favourable circumstances and near investigation on 3G, 4G, 5G and 6G and outline of 6G innovation.

Keywords: Mobile Technology, 6G.

1. Introduction

Mobile technology is a technology used for cellular communication. It has evolved rapidly over that last few years. Since the start of this millennium, a standard mobile device has gone from being no more than a simple two-way pager to being a mobile phone, GPS navigation device, an embedded web-browser and an instant messaging client, and a handheld gaming console. It is an innovation which is convenient. An assortment of assignments can be performed at whenever and anyplace. The integration of information technology and communication technology is bringing great changes to our social life. Through the use of high-coverage mobile communication networks, high-speed wireless networks, and various types of mobile information terminals, the use of mobile technologies has opened up a vast space for mobile interaction. And has become a popular and popular way of living and working. There are various transmissions medium like radio wave, microwave, infra-red, GPS and Bluetooth is used to trade of data by methods for voice, content, video, 2-dimensional scanner tags and anything is possible from that point.

COMPARISON BETWEEN 1G, 2G, 3G, 4G AND 5G					
Technology / Features	1G	2/2.5G	3G	4G	5G
Start/ Deployment	1970/ 1984	1980/ 1999	1990/ 2002	2000/ 2010	2010/ 2015
Data Bandwidth	2 kbps	14.4-64 kbps	2 Mbps	200 Mbps to 1 Gbps for low mobility	1 Gbps and higher
Standards	AMPS	2G: TDMA, CDMA, GSM 2.5G: GPRS, EDGE, iRTT	WCDMA, CDMA-2000	Single unified standard	Single unified standard
Technology	Analog cellular technology	Digital cellular technology	Broad bandwidth CDMA, IP technology	Unified IP and seamless combination of broadband, LAN/WAN/	Unified IP and seamless combination of broadband,

Fig 1. Comparison of different generation of mobile technology

A. Advantages

- Access speed
- Higher efficiency
- Reduced cost of operations
- Endless possibilities
- Increase availability of social networks



Fig. 2. Mobile technology

2. Existing system and its drawbacks

A. Existing System

5G technology alludes to fifth era technology, which was begun in 2010 and the wide deployment began in 2019. The frequency spectrum in 5G is divided into millimeter wave, mid-band and low-band. Low-band uses the same frequency as the predecessor, 4G. 5G millimeter wave is the fastest, with actual speeds often being 1-2Gb/s down. It gives up-to 25Mbps network speed. Frequencies are above 24 GHz reaching up to 72 GHz which is above the extremely high frequency band's lower boundary. The reach is short, so more cells are required. Millimeter waves have difficulty traversing many walls and windows, so indoor coverage is limited. It underpins the virtual private system. 5G mid-band is the most widely deployed, in over 20 networks. Speeds in a 100 MHz wide band are usually 100–400 Mbit/s down. In the lab and occasionally in the field, speeds can go over a gigabit per second. Frequencies deployed are from 2.4 GHz to 4.2 GHz. Sprint and China Mobile are using 2.5 GHz, while others are mostly between 3.3 and 4.2 GHz, a range which offers increased reach. Many areas can be covered simply by upgrading existing towers, which lowers the

cost. 5G low-band offers similar capacity to advanced 4G. In the United States, T-Mobile and AT&T launched low-band services on the first week of December 2019. T-Mobile CTO Neville Ray warns that speeds on his 600 MHz 5G may be as low as 25 Mbit/s down. AT&T, using 850 MHz, will also usually deliver less than 100 Mbit/s in 2019. The performance will improve, but cannot be significantly greater than robust 4G in the same spectrum. The speed of transferring and downloading the document is high. It devours low battery and solid data transmission up-to 40 MHz. It is modest in rates and can be utilized by multi-client. 5G is finished remote correspondence without any constraints. Verizon, AT&T, and almost all 5G providers in 2019 have latencies between 25–35 milliseconds. The "air latency" (between a phone and a tower) in 2019 equipment is 8–12 ms. The latency to the server, farther back in the network, raise the average to ~30 ms, 25–40% lower than typical 4G deployed. Adding "Edge Servers" close to the towers can bring latency down to 10–20 ms. Lower latency, such as the often touted 1 ms, is years away and does not include the time to the server.



Fig. 3. 3GPP's 5G Logo

B. Disadvantages of existing system

- High expense
- Research
- Infra structure
- Security issues
- Technology is still under process and research on its practicality is going on.
- The speed, this innovation is asserting to be hard to accomplish (in future, it may be) as a result of the inept 5G

3. Proposed system

A. 6G Revolution

6g technology alludes to the 6th era innovation. It is proposed to incorporate 5G technology for a worldwide inclusion. 6G is being developed in response to the increasingly distributed radio access network (RAN) and the desire to take advantage of the terahertz (THz) spectrum to increase capacity and lower latency. While some early discussions have taken place to define 6G, research and development (R&D) activities will start in earnest in 2020. Many of the problems associated with deploying millimeter wave (MM wave) radio for 5G new radio are expected to be solved in time for network designers to address the challenges of 6G. For asset monitoring and climate

data, mixed media video and fast Internet availability and the Earth imaging satellite systems are utilized. To coordinate these three sorts of satellite like telecommunication, navigation, multimedia systems which give worldwide positions, web availability with fast and for portable client's climate data administrations are real three destinations for 6g innovation. The sixth generation of cellular wireless communications will integrate a set of previously disparate technologies, including deep learning and big data analytics.



Fig. 4. 6G Technology

B. Advantages of 6G

- Ultra quick to get to Internet.
- Data rates up to 10-11 Gbps.
- Home automation and other related applications.
- Smart Homes, Cities and Villages.
- Used in the generation of Energy from galactic world.
- Space innovation and Defence applications will be altered with 6G systems
- Home based ATM frameworks.
- Satellite to satellite communication for the improvement of humanity.
- Natural Calamities will be controlled with 6G systems.

4. Literature survey

A. Trends in 5G Wireless Technology

Authors: Madan Pal Singh, Ashish Kumar Gupta

Year: April 2018

Abstract: 5G Wireless technology networks or 5th Generation wireless systems which is used for videos and audios communication announcement the next major time period of mobile telecommunications. Criteria time the current next Generation mobile networks confederated. In this paper we are studying different Technologies in 5G. The handover of 5G the Models of 5G its architecture, its different components and METIS Task Force Networks. 2-Day video recording is available. Its components access/backhaul integration, direct device-to-device communication, flexible duplex, flexible spectrum usage multi-antenna transmission, ultra-lean design, user/control separation architecture of 5G is highly advanced, its network elements and various terminals are characteristically upgraded to afford a new situation. Likewise, service providers can implement the advance technology to

adopt the value-added services easily.

B. A Survey on Green 6G Network: Architecture and Technologies

Author: Tongyi Huang, Wu Yang, Jun Wu, Jin Ma
Year: December 2019

Abstract: While 5G is being commercialized worldwide, research institutions around the world have started to look beyond 5G and 6G is expected to evolve into green networks, which deliver high Quality of Service and energy efficiency. To meet the demands of future applications, significant improvements need to be made in mobile network architecture. We envision 6G undergoing unprecedented breakthrough and integrating traditional terrestrial mobile networks with emerging space, aerial and underwater networks to provide anytime anywhere network access. This paper presents a detailed survey on wireless evolution towards 6G networks. In this survey, the prime focus is on the new architectural changes associated with 6G networks, characterized by ubiquitous 3D coverage, introduction of pervasive AI and enhanced network protocol stack. Along with this, we discuss related potential technologies that are helpful in forming sustainable and socially seamless networks, encompassing terahertz and visible light communication, new communication paradigm, block chain and symbiotic radio. Our work aims to provide enlightening guidance for subsequent research of green 6G.

C. The Roadmap to 6G: AI Empowered Wireless Networks

Author: Khaleb B Letaif, Wei Chen, Yuanming Shi, Jun Zhang

Year: August 2019

Abstract: The recent upsurge of diversified mobile applications, especially those supported by AI, is spurring heated discussions on the future evolution of wireless communications. While 5G is being deployed around the world, efforts from industry and academia have started to look beyond 5G and conceptualize 6G. We envision 6G to undergo an unprecedented transformation that will make it substantially different from the previous generations of wireless cellular systems. In particular, 6G will go beyond mobile Internet and will be required to support ubiquitous AI services from the core to the end devices of the network. Meanwhile, AI will play a

critical role in designing and optimizing 6G architectures, protocols, and operations. In this article, we discuss potential technologies for 6G to enable mobile AI applications, as well as AI-enabled methodologies for 6G network design and optimization. Key trends in the evolution to 6G will also be discussed.

5. Conclusion

Today cell phones comprise of everything going from the smallest size, biggest telephone memory, speed dialing, video player, sound player, and camera etc. As of late with the advancement of online worlds and Bluetooth innovation information sharing has turned into a piece of cake. The sixth era (6G) remote versatile correspondence systems incorporate satellites for worldwide coverage. It very well may be a blend of Nano-core and artificial intelligence, where all the system administrators will be associated with one single core. As in development and blast, many will wind up wiped out yet some will change the world. In 6G the expense of portable call will be moderately high yet in 7G this issue will be enhanced and the expense of call will be decreased and lower level client will be prohibited.

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