

Generation's in Wireless Network

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Abstract- Sixth generation (6G) mobile networks face a new rival: so-called 7G. The point to point wireless communication networks that transmit super- fast broadband signals through the air will be assisted by high speed data transfer with much secured information from transmitters to destinations. Alvin Toffler, an eminent futurologist, once said, "THE FUTURE ALWAYS COMES TOO FAST, BUT IN THE WRONG ORDER". The state of wireless telecoms is a classic example. It is considered to be a cheap and Fast Internet Technology to provide unbelievably high data rates or very fast Internet speed access on air through wireless and mobile devices possibly up to 11 Gbps, while travelling or in a remote location. The satellite communication network may consist of telecommunication satellite networks, earth imaging satellite networks and navigation satellite networks. The goal of 6G is to integrate these kinds of satellite networks to provide network position identifier, multimedia and internet connectivity, and weather information services to the mobile users. Even as 6G mobile networks are being switched on around the world, a couple of years later than planned, attention is shifting to what comes next: a group of newer technologies that are, inevitably, being called seventh Generation Mobile Networks (7G). 7G is all about an integrated, global network that's based on an open systems approach.

The goal of 7G is to replace the current proliferation of core cellular networks with a single worldwide cellular core network standard based on IP for control, video, packet data, and VoIP. This integrated 7Gmobile system provides wireless users an affordable broadband mobile access solution for the applications of secured wireless mobile Internet services with value-added QoS. The 7G of mobile wireless networks which aims to acquire space roaming. The world is trying to become completely wireless, demanding uninterrupted access to information anytime and anywhere with better quality, high speed, increased bandwidth and reduction in cost

Keywords: PDA, Bandwidth, 5G, 6G, 7G, Mobile system, Space Roaming, Satellite.

I. INTRODUCTION

Today the whole world is aware of the revolutionary changes in cell phone communication field. Wireless communication has brought in the new innovation in this field. In the context of present scenario the 3G experienced better internet experience. Later on 3g has been improvised. It has been felt the urgency to have a better communication networks then 5g has come which can be a complete wireless communication without any hindrance and limitations. It is completely advanced in terms of wireless communication. In 5G system each and every cell phone will have a permanent home "IP address and care of address". Now awaiting future will experience 6G. In present time cell phones have everything and are compact, with high memory and high speed with low power consumption. Today Bluetooth technology and other technology are just like a child's play. 6G wireless cell phone communication network shall meet world class

standard covering the whole world under its communication just like Global covering system has been devised by some

companies. The 6th generation (6G) wireless mobile communication networks shall integrate satellites to get global coverage. The global coverage systems have been developed by four courtiers. The global position system (GPS) is developed by USA. The COMPASS system is developed by China. The Galileo system is developed by EU, and the GLONASS system is developed by Russia [3]. These independent systems are difficulty for space roaming. The task of 7th generation (7G) wireless mobile communication networks are going to Unite.

The present cell phones have it all. Today phones have everything ranging from the smallest size, largest phone memory, speed dialing, video player, audio player, and camera and so on. Recently with the development of Pico nets and Bluetooth technology data sharing has become a child's play. The 6th generation (6G) wireless mobile communication networks shall integrate satellites to get

global coverage. The global coverage systems have been developed by four countries. The global position system (GPS) is developed by USA. The COMPASS system is developed by China. The Galileo system is developed by EU, and the GLONASS system is developed by Russia [3]. These independent systems are difficult for space roaming. The task of 7th generation (7G) wireless mobile communication networks are going to unite

While 3G hasn't quite arrived, designers are already thinking about 4G technology. With it comes challenging RF and baseband design headaches. Cellular service providers are slowly beginning to deploy third-generation (3G) cellular services. As access technology increases, voice, video, multimedia, and broadband data services are becoming integrated into the same network. The hope once envisioned for 3G as a true broadband service has all but dwindled away. It is apparent that 3G systems, while maintaining the possible 2-Mbps data rate in the standard, will realistically achieve 384-kbps rates. To achieve the goals of true broadband cellular service, the systems have to make the leap to a fourth-generation (4G) network.

This is not merely a numbers game. 4G is intended to provide high speed, high capacity, low cost per bit, IP based services. The goal is to have data rates up to 20 Mbps, even when used in such scenarios as a vehicle traveling 200 kilometers per hour. The move to 4G is complicated by attempts to standardize on a single 3G protocol. Without a single standard on which to build, designers face significant additional challenges.

II.HISTORY

The history and evolution of mobile service from the 1G (first generation) to fourth generation are discussed in this section. Table 1 presents a short history of mobile telephone technologies. This process began with the designs in the 1970s that have become known as 1G. The earliest systems were implemented based on analog technology and the basic cellular structure of mobile communication. Many fundamental problems were solved by these early systems. Numerous incompatible analog systems were placed in service around the world during the 1980s.

The 2G (second generation) systems designed in the 1980s were still used mainly for voice applications but were based on digital technology, including digital signal processing techniques. These 2G systems provided circuit-switched data communication services at a low speed. The competitive rush to design and implement digital systems led again to a variety of different and incompatible standards such as GSM (global system mobile), mainly in Europe; TDMA (time division multiple access) (IS-54/IS-136) in the U.S.; PDC (personal digital cellular) in Japan; and CDMA (code division multiple access) (IS-95), another U.S. system.

These systems operate nationwide or internationally and are today's mainstream systems, although the data rate for users in these systems is very limited. During the 1990s, two organizations worked to define the next, or 3G, mobile system, which would eliminate previous incompatibilities and become a truly global system. The 3G system would have higher quality voice channels, as well as broadband data capabilities, up to 2 Mbps. Unfortunately, the two groups could not reconcile their differences, and this decade will see the introduction of two mobile standards for 3G.

In addition, China is on the verge of implementing a third 3G system. An interim step is being taken between 2G and 3G, the 2.5G. It is basically an enhancement of the two major 2G technologies to provide increased capacity on the 2G RF (radio frequency) channels and to introduce higher throughput for data service, up to 384 kbps. A very important aspect of 2.5G is that the data channels are optimized for packet data, which introduces access to the Internet from mobile devices, whether telephone, PDA (personal digital assistant), or laptop. However, the demand for higher access speed multimedia communication in today's society, which greatly depends on computer communication in digital format, seems unlimited. According to the historical indication of a generation revolution occurring once a decade, the present appears to be the right time to begin the research on a 4G mobile communication system.

What is 5G?

5G technology though not standardized and implemented internationally is expected to provide more than 1 GBPS speed over air with very special attributes like lower battery consumption, higher network speed in larger geographical area, lower tariffs, multiple users etc. Looking back at history of development of this technology it is expected to hit the market round about the end of this decade. Underlying Principle that explains the extremely high speed of 5G networks is that a user is simultaneously connected to several existing wireless access technologies (3G, 2G, WiFi, WiLan, GPRS etc.). It augments his download / upload bandwidth by using multiple data transfer paths from these channels concurrently. It will enable uninterrupted high online video streaming. In layman's language one can watch High Definition internet videos on his mobile uninterrupted.

5G-Fifth Generation Mobile Communication System

These fifth era of frameworks are driven by OFDM, MC-CDMA, LAS-CDMA, UWB, Network LMDS and IPV6.

Taking after table analyzes 4G versus 5G innovations and notice contrast somewhere around 4G and 5G remote advancements. It notices fundamental examination somewhere around 4G and 5G.

Key technology terms for 5G:

- **Group cooperative relay:** makes high bit rates available in a larger portion of the network
- **Multihoming:** User connected to multiple ISP using different networks (3G, 2G etc.)

Advantages

- High resolution and bi-directional large bandwidth shaping.
- Technology to gather all networks on one platform.
- More effective and efficient.
- Technology to facilitate subscriber supervision tools for the quick action.
- Most likely, will provide a huge broadcasting data (in Gigabit), which will support more than 60,000 connections.
- Easily manageable with the previous generations. Technological sound to support heterogeneous services (including private network).
- Possible to provide uniform, uninterrupted, and consistent connectivity across the world.

Disadvantages

- High cost
- Research
- Infra structure
- Security issues
- Technology is still under process and research on its viability is going on.
- The speed, this technology is claiming seems difficult to achieve (in future, it might be) because of the incompetent 5G.

Tab 1: Comparing Key Parameters of 4G with 5G

Specifications	4G	5G
Full Form	Fourth Generation	Fifth Generation
Data Bandwidth	2Mbps to 1Gbps	1Gbps and higher as per need
Frequency Band	2 to 8 GHz	3 to 300 GHz
Standards	AI access convergence including OFDMA, MC-CDMA, network-LMPS	CDMA and BDMA
Technologies	unified IP, seamless integration of broadband LAN/WAN/PAN and WLAN	Unified IP, seamless integration of broadband LAN/WAN/PAN/WLAN and advanced technologies based on OFDM modulation used in 5G
Service	Dynamic	Dynamic information access,

	information access, wearable devices, HD streaming, global roaming	wearable devices, HD streaming, any demand of users
Multiple Access	CDMA	CDMA, BDMA
Core Network	All IP network	Flatter IP network, 5G network interfacing(5G-NI)
Handoff	Horizontal and vertical	Horizontal and vertical
Initiation From	year-2010	year-2015

Challenges

1. Technical Challenges
 - a. Inter- Cell Interference
 - b. Efficient Medium Access Control
 - c. Traffic Management
2. Common Challenges
 - a. Multiple services
 - b. Infrastructure
 - c. Communication
 - d. Security
 - e. Legislation

What is 6G?

6G Mobile Technology Network is futuristic technology aiming to provide unimaginably high-speed internet access on-air through mobile probably up to 10 GBPS. Although no official research papers have been published in the scientific world on this technology but it is thought to be based on 5G technology by researchers. It is fancied to provide user on the fly high internet access speed without any fluctuations even if a user is travelling or a user is in a remote location.

6G Mobile Communication System

6G frameworks will have reconciliation of 5G alongside satellite system. Taking after are the satellite frameworks created in various nations:

- GPS (by USA)
- COMPASS (by China)
- Galileo (by EU)
- GLONASS (by Russia)

It bolsters neighborhood voice scope and different components.

6G TECHNOLOGIES

Cutting edge technology

6G internets use a combination of the latest in radio and fiber optics technology. We deliver through line of sight. Which means we don't have to rely on the copper cable or

base our speed on how to far your business is away from the exchange.

How does 6G compare with traditional broadband?

6G has the benefit of the bleeding a brand a new network in compassing the latest state of the art technology .so we do not suffer the any of the legacy essay the other provide do 6G air fiber id deferent future reroof wireless solution id using technology pioneer by the military to communicate with unmanned Arial vehicle for critical matter during sever condition. Now refuse and available for bushiness 6g offer faster moor secure and cost effective and brood band.

WISDOM – Wireless innovative System for Dynamic Operating Mega communications concept, 6th generation (with very high data rates Quality of Service (Quos) and service applications) and 7th generation (with space roaming). This paper is focused on the specifications of future generations and latest technologies to be used in future wireless mobile communication networks. However keeping in view the general poor masses of India, some of the future generation technologies will be embedded with 2and 2.5G so that general masses may get the advantage of internet, multimedia services and the operators may get proper revenues with little extra expenditure in the existing mobile communication networks.

6G Mobile communication system

The 6G mobile system for the global coverage will integrate 5G wireless mobile system and satellite network. These satellite networks consist of telecommunication satellite network, Earth imaging satellite network and navigation satellite network.

The telecommunication satellite is used for voice, data, internet, and video broadcasting; the earth imaging satellite networks is for weather and environmental information collection; and the navigational satellite network is for global positional system (GPS). The four different countries which developed these satellite systems are; the GPS by USA, the COMPASS system developed by China. The Galileo system by EU, and the GLONASS system developed by Russia.

In 6G handoff and roaming will be the big issue because these satellite systems are different networks and 6G has four different standards. So, the handoff and roaming must take place between these 4 networks but how it will occur is still a question.

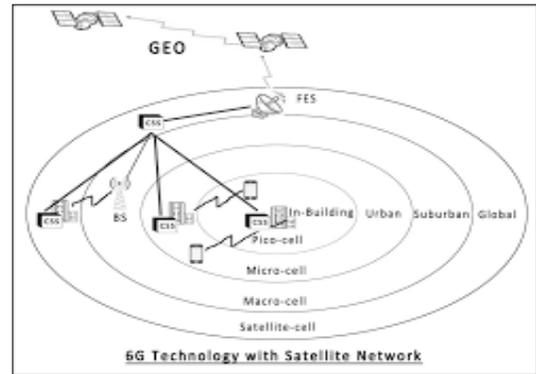


Fig 1: 6G Technology with Satellite Network

Handover (handoff) - When a mobile user travels from one area of coverage or cell to another cell within a call’s duration the call should be transferred to the new cell’s base station. Handoffs are expensive to execute, so unnecessary handoffs should be avoided. Unreliable and inefficient handoff procedures will reduce the quality and reliability of the system.

Advantages

- Ultra-fast to access Internet.
- Data rates up to 10-11 Gbps.
- Home automation and other related applications.
- Smart Homes, Cities and Villages.
- Used in the production of Energy from galactic world.
- Space technology and Defense applications will be modified with 6G networks.
- Home based ATM systems.
- Satellite to Satellite Communication for the development of mankind.
- Natural Calamities will be controlled with 6G networks.
- Sea to Space Communication

Tab 2: Comparing Key Parameters of 5G with 6G

FEATURES	5G	6G
Year	2015	After 5g onwards
Speed	1Gbps and Higher	10 to 11Gbps
Technology	4G+www	5G+Satellite
Standards	Wi-max LAS, WCDMA, OFDM, UWB, NetworkLMDS, IPv6	GPS, COMPASS, GLONASS, Galileo System
Core Network	Internet	Internet
Handwork	Horizontal & Vertical	Horizontal & Vertical

7G Mobile Communication System

The 7G system will be same as 6G. Moreover, 7G characterizes satellite functionalities in remote portable correspondence. This will give numerous elements and deal with every one of the downsides of past era of portable remote correspondence frameworks. The main consideration here will be expense of telephone call and different administrations. It gives consistent development of cell telephone from one nation to the next. This will be significant advantages for successive worldwide explorers.

III. CONCLUSION

In this paper we have discussed the existing and future wireless mobile communication generations. Edge will contribute to a bright future for 3G and onwards generations, a vision shared by major analyst and industry groups. Satellite network will be used from 6G mobile communication systems and onwards. In 6G the cost of mobile call will be relatively high but in 7G this problem will be improved and the cost of call will be reduced and lower level user will benefit from it. Automobile and the television changed our lives but EDGE will change our lives by providing 3G, 4G, 5G, 6G, 7G services for the masses. Sixth generation took advanced computing to a new level with voice recognition. Consumers can only imagine what the seventh generation of computer will bring. Consumers will look forward to these new advancements as they development. The world is trying to becomes completely wireless, demanding uninterrupted access to information anytime and anywhere with better quality, high speed, increased bandwidth and reduction in cost. After 4G the next generation 5G aims a real wireless world with no limitations while 6G integrates 5G with satellite networks. Due to variable technologies and standards, with 6G handoff/roaming will be an issue. This drives the 7G of mobile wireless networks which aims to acquire space roaming.

REFERENCE

- [1] International Journal of Electronics and Computer Science Engineering 1265 Available Online at www.ijecse.org ISSN-2277-1956 ISSN 2277-1956/V2N4-1265-1275 “5G Technology of Mobile Communication”.
- [2] “System Multimedia Wireless Sensor Networks: Perspectives” S j l K D and Future Directions Sajal K. Das National Science Foundation Center for Research in Wireless Mobility and Networking.
- [3] Purnendu S. M. Tripathi and Ramjee Prasad Spectrum “Trading in India and 5G “
- [4] Prasad, Ramjee “Global ICT Standardization Forum for India (GISFI) and 5G Standardization”.
- [5] Generations of Mobile Wireless Technology: A Survey Future broadband mobile communication technology.
- [6] Muhammad Farooq, Engr. Muhammad Ishtiaq Ahmed, Engr. Usman M Al. “5G WIRELESS TECHNOLOGIES-Still 4G auctions not over, but time to start talking 5G Future Generations of Mobile Communication Networks Engr.”

- [7] Kumar N Sivarajan Chief Technology Officer “What India wants from 5G”
- [8] The FP7 RAS cluster in the ignition phase of 5G research © 2014, IJCSMC All Rights Reserved 1080 Available Online at www.ijcsmc.com
- [9] Meenal G. Kachhavay, Ajay P.Thakare “5G Technology-Evolution and Revolution “
- [10] Aleksandra Tudzarov “5G Ultra-High Capacity Network Design With Rates 10x LTE-A Protocols and Algorithms for the Next Generation 5G Mobile Systems “