

6G-Next Gen Mobile Wireless Communication Approach

Dr.Dhananjay Kalbande ,Prof. HOD of Computer Engineering and Dean(Industry Relations),
Sardar Patel Institute of Technology, Andheri (West),Mumbai, drkalbande@spit.ac.in

Zubaida khan,Asst. professor,computer Engineering ,KC College of Engineering Thane(E)
Maharashtra, zubaidakhan93@gmail.com

Sana Haji,Asst. professor,computer Engineering ,KC College of Engineering Thane(E) Maharashtra,
haji.sana18@gmail.com

Rukhsar Haji,Asst. professor,computer Engineering ,Rizvi College of Engineering Bandra
Maharashtra,

Abstract: In this modern era, Wireless Communication emerges as the most flexible and convenient way of communication among the users present across the globe. In this scenario, 6G communication networks will satisfy the user requirements of high data speed without any network interrupts. It provides the data speed in the range of 10-300 Mbps and an extension of up to 10-11 Gbps. 6G is considered as the fastest and efficient wireless communication networks in this modern Mobile Technology, as it uses full duplex radio-wave transmission methodology in its communication process[1]. 6G network uses radio technology and fiber network as the underlying architecture to enhance the capability of high data speed regardless of their distance and mode of connectivity. 6G network has the tendency to provide superfast-streaming, without any interruption and buffering, which does not exist in previous network generations. The main purpose of this research work is to implement 6G networks in India, which can support various emerging communication technologies to achieve a high data speed at low cost.

Keywords: 6G, GSM, Hex-Optics.

I. Introduction

In this digital world, due to the extensive influence of mobile technologies with the additional features of piconet and wireless connectivity, data sharing and recourse sharing among people has been made easier. 6G is a communication technology that offers wireless Internet access with 6G-radio fiber technology into existence. 6G-radio fiber technology uses the radio waves with 5.8 GHz Bandwidth and C light-licensed frequencies to broadcast the access layer and also the combination of 802.11n and 802.11ac for standards supported by ISO to enhance wireless connectivity. The 6th generation (6G) wireless mobile communication networks provides global coverage facility with an enhanced global area networks. The global coverage systems are universally supported by different countries with components such as the global position system (GPS) developed by USA,

the COMPASS system developed by China, The Galileo system developed by EU, and the GLONASS system developed by Russia [1,2]. 6G Internet has extended the existing data speed to the range of 10Mbps to 300 Mbps for the residential users and for Commercial users, the data speed in the range of 10 to 12 Gbps, with the combination of radio fiber network and physical optical fiber as the underlying network architecture. 6G uses radio fiber, so-called “Hex-optics network”, which consists of signals delivered through the air that allows receiving the broadband connections similar to radio technology.

II. Literature Survey

The following section described the literature survey as:

1) Communication Technologies:

Now-a-days, Wireless technologies remains useful as they assist users to transfer information from one Base station to another in a wireless manner. These technologies are helping us to communicate with users as short distances and long distances. With the help of wireless communication, users can communicate instantly. Many wireless technologies are already available such as 1G-5G, but these technologies have provided high Availability, good network performance and coverage. 6G mobile technologies enable devices to connect internet with wireless devices as a broad band like wifi, wimax, Bluetooth, etc.

2) Evolution:

Today, 4G and 5G mobile network technologies are available on almost every mobile devices. But the network data speed and coverage still remains as the challenge. 6G has the ability to deliver users more than their expectations with an increased data speed of about 1000 Megabits per second. Currently 4G technologies are offering 100 Mbps Internet speed. Additionally 6G support to obtain a better security for data transmission and wireless connectivity.

3) Economical Impact

3.1) Cost Efficiency: In 6G networks, the data rates and cost are comparatively reduced due to the inclusion of Radio waves as the data transmission mode. This allows the network users to utilize the efficient connectivity offered from Wi-Fi-router system or the mobile data. This helps to greatly avoid the payment of huge sum rental to the Internet Service Providers (ISP).

3.2) Abolishing Movie Privacy: As majority of people suffer from the low buffering speed, they are ought to go for an easier way for downloading it from different websites or torrents that are facilitated by the earliest generation. This emerges as a huge threat nowadays to both the film industry as well as to the theatres [1]. As the 6G networks facilitate a very high data speed, the mobile users can easily watch the online movies even while travelling also at any time and any anyplace without the buffering challenges. This technology profits the film industry by providing the new technique of streaming the movies online. This reduces the cost

spent on watching the movies as much as low of 100-150 rupees per month. This cost-effective method increases the number of customers in streaming service more than in theatres, which will automatically increase the profits of movie producers. High Speed 6G Internet will also significantly reduce piracy of movies since with these high speeds of data people would rather watch the movie online than downloading it. Hence, 6G emerges as a pervasive solution for avoiding the ever-augmenting threat on movie piracy.

4) Past-to-present: In the past decades, mobile phones are used only to make and receive telephone calls over a radio link while moving around a wide geographic area. As the Mobile phone uses Wireless Communication for its information exchange process [5]. We started with the 0G technologies, which has offered only the basic voice communication, and then we were provided with the additional service called 1G, which has allowed to make voice calls within the country with a signal analog Speed up to 2.4 Kbps, then we were provided with a chance to exchange the text message through pager. The Multimedia Messaging Service (MMS) was later launched in the introduction of 2G technology, which had enabled the mobile phone users to send multimedia picture messages. 2.5G technology is evolved with the successful integration of Cellular Technology with GPRS and GSM. When compared with 2.5G, 3G has provided faster and flexible communication. 4G technologies are Capable of providing up to 300

Mbps speed irrespective of their place and time, 5G Technology (5G as Nano Core) provides the enhanced wireless communication with no limitations. Recently, 6G satisfies the mobile users' requirements on achieving high data speed without any form of network interruption.

5) Storage Capability, Speed and Improved Security: 6G with high internet speed has the extensive ability to store huge amount of data, and this process occupies more memory space. 6G allows the users to access the data and applications in a secured manner.

III. 6G Technologies

1) Cutting edge: As the 6G technology is considered as the synergy of the state-of-the-art techniques like radio and fiber optics, it make the communication network users to come out of the traditional copper cable or base to increase the business data exchange speed at an unprecedented rate.

2) WISDOM [Wireless Innovative System for Dynamic Operating Mega communications]: Using of WISDOM in 6th generation provides with very high data rates, Quality of Service (QoS) and service applications.

3) Fly sensors and Nano Antennas:

Fly sensors will provide information to their remote observation, which helps to connect across the globe.

4) Radio Fiber Concept

Radio fiber technology is nothing but the traditional

old radio technology, which incorporates this old technology into a new paradigm. In the conventional radio we use a particular frequency to broadcast a channel, where the user can send data and receive data simultaneously in full duplex communication mode by multiplexing many data packets and then transmitting it by using a transmitter in the same radio frequency.

5) Encryption:

As the 6G technology uses radio waves, it is critically prone to the information loss challenge, so this can be avoided by using strong encryption technologies to protect the data while passing it through the communication channel, this concept is then performed and completed through a common firewall architecture.

Iv. Proposed System

6G Mobile Communication System

The 6G mobile system architecture is basically used for achieving the global network coverage that integrates 5G wireless mobile system and satellite network. Satellite network and telecommunication network remains very useful for the mobile networks users for the process of voice calling and video broadcasting. Cellular system are considered as the state-of-the-art mobile systems to initiate a two-way wireless communication between the fixed part of the system(transmitter or Base station)and the mobile part of the system(mobile station) that move in the area covered by each base station. In a cellular system, the entire network coverage area is divided into cells. And each cell is served by a

single base station as shown in fig1 .and each cell has a size depending on the number of users. More the number of users and smaller the size of the cell. The areas which are not covered by the cellular telecommunication such as GSM, AMPPS can be covered by using satellite system to provide a global mobile communication technologies. Recently, satellite system are developed by different countries with the applications of GPS, COMPASS, Galileo system and GLONASS [2].

Depending on its type LEO, GEO orbit and each satellite can cover a certain area on the earth with its beam. The Base station can communicate with satellite by using a Gateway Link (GWL).Within the footprint, mobile users can communicate with satellite via Mobile User Link (MUL). Satellite can communicate with each other via ISL [Inter Satellite Link], this link provides direct communication between users present within the different beams without utilizing base station or any other networks on the earth. 6G satellite communication systems have special antennas installed on them to create smaller cells by using spot beams, the usage of ISL reduces the latency for data packet and voice data because the extra links from satellite to gateway is not required.

The major challenge here is the smooth handover between cellular system (GSM) and satellite system, this handover is called vertical handover. Users should not notice a handover from cellular network (GSM) to a satellite network during the conversation. The main aim of 6G is to facilitate the

mobile users for different services like network identifier at different positions, multimedia applications (audio, video, image, graphics etc) and availability of internet connection for mobile users with high speed of data without any type of network interruption.

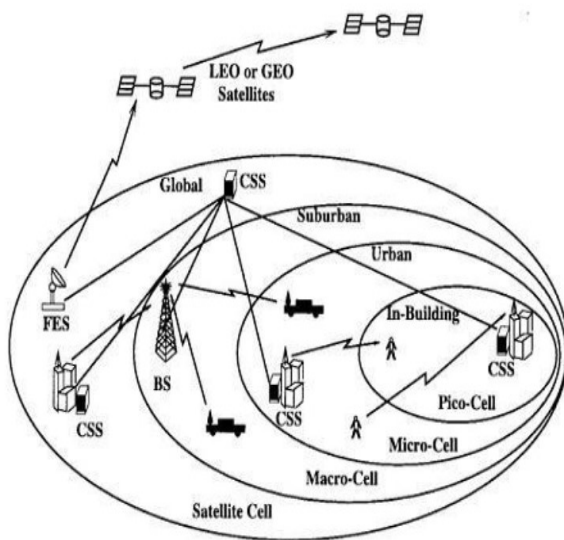


Fig1: 6G with Satellite Network

Features

- 1) It will provide an ultra-fast access of Internet services with an amazing data rate of up to 10-11 Gbps.
- 2) It provides a complete wireless Network with no limitations.
- 3) Zero distance connectivity between the network users to offer Incredible Transmission Speed in Terabit range.
- 4) Data maximization and IOPS (Input Output Operation Per Second).

VI. Conclusion

In this paper, a future wireless mobile communication generation 6G is discussed, which satisfies the user requirements on achieving high data speed without any interruption. The propose architecture integrates 5G with satellite network for developing the global coverage of 6G to provide a fast Internet access when compared with the existing generation. Hence, the proposed framework contributes to speed up the communication process with minimum duration.

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