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Research Paper

# MILESTONE OF WIRELESS COMMUNICATION (1G TO 5G TECHNOLOGY)

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Our world need to go fast more as more we know that, all humans are cannot be satisfied. so we have to be invented new as per our needs. Hence we are in need of new technologies .People expecting a innovative and more useful thing for them. So that all are ready to be competitor themselves that expected our knowledge is 5G version , the main purpose of the fifth generation wireless networks (5G Wireless networks) is planned to design the best wireless world that is free from limitations and hindrance of the previous generations .Almost on the verge of entering 4G mobile network technology and this superfast technology is known here- the 5G Our future minds are the eagerly waiting for fifth generation technology which is based on user centric concept means user is the topmost priority of system. Each network in 5g mobile phones will capable to handle user mobility. As a whole, advancement in technology reaches our lives to a forward step ahead. 5G technologies will change the way most high bandwidth users access their Mobile Radio Communication (MRC). So, this paper represents, great evolution of 1G (First Generation) to 4G yield 5G, introduction to 5G technologies, why there is a need for 5G, advantages of 5G networks technology, exceptional applications, Quality of Service (QoS), 5G network architecture-The Master Core as well as hardware and software for the 5G Master Core technology.

Keywords: 5G, All IP Network, Cloud Computing , 5G architecture-The Master Core, Quality of Service (Quos), 5G-IU, Parallel Multimode (PMM)

## INTRODUCTION

In old days our dreams most of it cannot be possible in real but know our human brain make all our dreams as possible. On those days communication is very difficult more than 3 days receiver had to wait but now a day fraction of seconds only need for reach the receiver these operation performed by these version called 0G,

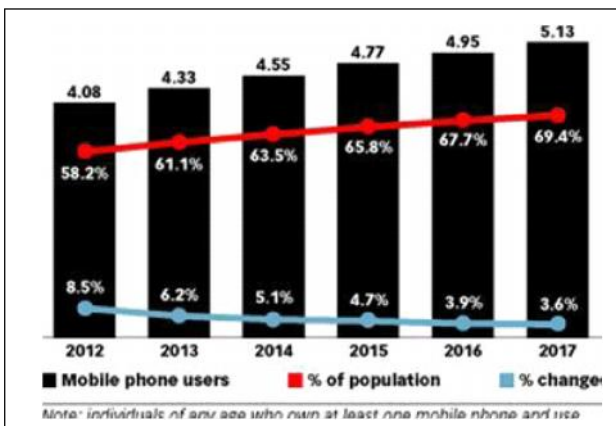
1G, 2G, 3G (present), 4G (upcoming), 5G (future) version every each version is developed step by step process 0G offer radio wireless transmission technology. This is the way the technology is developing and our culture also plays a crucial role for this tremendous growth in a friendly manner (UMTS World, 2009).This development so helpful to us in all ways for safety

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precaution, downloading files, playing games, chatting with friends, taking picture, while hanging with someone near to your heart .Now a day's youngsters get mobiles earlier are so they are highly advanced in technology. Growth of mobile phone users worldwide from 2012 to 2017 below figure shows it[11].

### DEVELOPMENT OF USERS FROM 2012 TO 2017

Starting from the 1G mobile phone technology to the future 5G connectivity is being explored in this paper review. 5G is our challenging technology. Till now researchers are using 4G technology. Our future generation eagerly waiting for 5G technology also.



### 1G TECHNOLOGY

It is the first generation technology that exists in



1980's and it works on analog signals. It supports and data band width in kbps. Analog mobile phone system(AMPS) was first established in USA in mobile networks. The first generation of analog mobile phones has speed up to 2.4 Kbps. It allows end users to make voice calls only within 1 country. It is based on basic mobility.

### DRAWBACKS

- It is a poor voice quality.
- Hand off reliability.
- Large sizes of phones.
- No security mechanism.
- Poor carrier aggregation.
- Band width per frequency channel of 1G is up to 30Khz.

### 2G TECHNOLOGY

It is introducing in 1990.the technologies based on GSM and it is use digital signals. It is mainly used for mobile communication and also using for the SMS and e-mail. It is using two modulation techniques. The modulation technique are time division multiple access(TDMA) and code division multiple access (CDMA). In the technology holds efficient security for the sender and receiver. Frequency bandwidth of channel up to 200Khz. The core network is PSTN.





## DRAW BACKS

- No quality of services.
- The maximum speed is up to 64Kbps.
- Cannot take multiple parties simultaneously.

## 3G TECHNOLOGIES

The 3G technology was introduced in 2000. The 3G services combine high speed mobile access with Internet Protocol (IP) based services. It is also called as tri band 3G. The maximum data transfer speed is up to 3.1mbps. It is offer high data rate up to 2Mbps. It is provides faster communication, large broadband capabilities, video conferencing, 3D gaming, high speed web, more security. It provides digital navigation. The bandwidth per frequency channel is up to 20 Mhz. the core network is packet network. The multiple access method is code division multiple access method (CDMA).



## DRAWBACKS

- It is a very expensive.
- The mobile size is large.
- The bandwidth requirement is high.

## 4G TECHNOLOGY

The 4G technology was performed Tokyo. Japan

on June 23rd in 2005. The 4G provides dynamic information access and wearable devices. The data bandwidth rate is 1Gbps. The 3G recently standardizing LTE Advanced as future standard. 4G provide high definition streaming and additional features such as multimedia newspaper and ultra broad band internet access this process not present in 3G. the multiple access method is code division multiple access method(CDMA). The bandwidth per frequency channel is up to 100Mhz. the core network is internet. The 4G technology is WI-FI. The speed of 4G is further increased to keep up with data access demand used by various services.



## 5G TECHNOLOGIES

The 5<sup>th</sup> generation of wireless network will be a highly remarkable communication system with no limitations. The 5G generation technology will be completely available in the market by 2020. The 5G is a revolution to 4G. 5G provides perfect real wireless or worldwide wireless web. The 5G includes all advance features and it is unimaginable technology. It will be more demanding in future (Patil *et al.*, 2012). It will be supports the data bandwidth up to 1GB. The 5G is mainly based on IPv6. It is a very fast of mobile communication. The core network is internet. The maximum speed

is 1Gbps. The multiple access methods are code division multiple access method(CDMA).



### NEED FOR 5G TECHNOLOGY

This paper mainly focus on how a 5G network can provides more facilities approach to a common man to utilizes his available in an enormous way to make him to feel the real progress (Anwar and Mousa, 2012). An end users can also connect their 5G mobile phones with their desktops have a internet connection. It has totally supports World Wide Wireless Web (WWW). The benefits of 5G technology are like mobile phones like dialing speed, MP3 recording, cloud storage, HD downloading in instant of seconds and much more that you had never imagined (Mishra, 2004).

### CONCEPTS OF 5G NETWORKS

The 5G will be a completely user centric. It is also includes prevention schemes that can be installed through internet anytime and have modulation methods and software defined ratio (Mishra, 2004). The collaboration network and individual network can be handling by using user mobility. The OSI model layer of 5G technology.

|                    |                            |
|--------------------|----------------------------|
| Application Layer  | Application (Services)     |
| Presentation Layer |                            |
| Session Layer      | Open Transport Protocol    |
| Transport Layer    |                            |
| Network Layer      | Upper Network Layer        |
|                    | Lower Network Layer        |
| Data Link Layer    | Open Wireless Architecture |
| Physical Layer     |                            |

### OSI Layer in 5G Technology [4]

### FEATURES OF 5G TECHNOLOGY

The features of 5G technology are given bellows,

- It has a very high data rates
- The 5G provides very high speed as well as efficient use of available band width to the consumers.
- The 5G has a high quality of services and it's based on policy to avoid error [3].
- Lower battery consumption
- Lower outage probability
- Better coverage and high data rates available at cell edge.
- Multiple concurrent data transfer paths (2014).
- The 5G are more secure compare to other generation.
- High quality of picture.
- The 5G has a more attractive and more effective.
- It is a peak uploading and downloading speed.
- This is a remote diagnostics (Patil et al., 2012).
- It is providing the ultrahigh HD video calling.
- It can be take the unlimited number of parties simultaneously.
- Higher system level spectral efficiency.

- Not harmful to human health.
- It is a cheaper traffic fees due to low infrastructure deployment costs.
- The smart beam antenna systems are used.
- It has a bi-directional large bandwidth.

This is a feature of 5G technology.

**Over view of 5G**

The given below of the diagram like a expected format of 5<sup>th</sup> generation mobile technology. Now a days each desktop has assigned an individual IP address to track the flow of data traffic but in future 5G mobile phones will have permanent care of address and home IP address associated which tells actual location without any error [3]. Now a days each desktop has assigned an individual IP address to track the flow of data traffic but in future 5G mobile phones will have permanent care of address and home IP address associated which tells actual location without any error [3].

**Expected 5G mobile phone (UMTS World, 2009)**

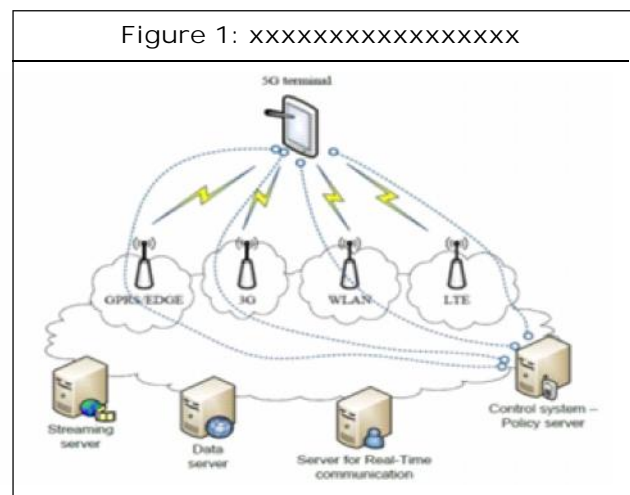
The internet connect to the once your system, then it can easily connect with mobile phone as computer sends a data packet to IP address of a mobile set and as result, sever present on IP address send acknowledgement packet to real location through message forwarding mechanism (Mishra, 2004).



The most special and main attractive features is advanced billing interfaces.

**ARCHITECTURE OF 5G**

Up to 4G, the wireless evaluation is following path of Moore’s law. The newer generations were identified by increased bit rate. (2G (9.6 Kpbs) to 4G (1Gbps)). There is belief that, 5G will be generation will defy the Moore law and it will be phase of integration of network technologies, rather expansion or evaluation of new wireless standard. The architectural diagram is shown in Figure 1.



**Services**

The following services are available in the architecture of 5G.

- GPRS
- EDGE
- 3G
- WLAN
- LTE

**GPRS:** General Packet Radio Service is used to transmit data at 60kb/sec and it also consumes less battery during sending and receiving mail or to browse internet.

**EDGE:** Exchanged Data Rate for GSM Evolution is an advanced version of GPRS. It provides data speed of 473kb/sec.

**3G:** 3G makes it possible to do video call on mobile network and it also provides efficient way to browse internet on mobile network.

**WLAN:** WLAN is Wireless Local Area Network which provides short range, high speed wireless data connection between mobile data device using radio signal.

**LTE:** Long Term Evolution is a standard for mobile communication to obtain high speed data transmission for mobile network. It has speed up to 100mbps.

### Technologies of 5G

The technologies behind 5G architecture are [8,9]

- a. Nano Equipment
- b. Cloud computing
- c. IP platform

#### NanoEquipment

5G mobile equipment is generally referred as Nano equipment. This mobile is designed by Nano core technology which has ubiquitous specification as given below,

- Self cleaning
- Self charged
- Flexible
- Environmental sensor

#### Cloud Computing

Cloud computing is a technology that uses the internet and central remote server to maintain data and applications. The development of cloud computing provides operators with tremendous

opportunities. Since cloud computing relies on the networks, it shows the significance of networks and promotes network development.

#### IP Platform

IP architecture acts as an essential part of 5G network architectures. The IP Network is an evolution of the 4G system to meet the increasing demands of the mobile telecommunications market. IP provides a continued evolution and optimization of the system concept in order to provide a competitive edge in terms of both performance and cost.

The key benefits of flat IP are:

- Lower costs
- Universal Seamless Access
- Improved User Experience
- Reduced System Latency
- Decoupled Radio Access
- Core Network Evolution

### CONCLUSION

Our dreams are come to be true now. Thus you can touch the sky .Do just want to touch it? No way we ready to go out beyond the world also to do those things our technologies also developed as much 5G is one of the milestones for our technology development .To use our extraordinary invention we must know about that technology our previous invention drawbacks are overcome by this future upcoming technique. And also extra applications also added. By technology basis this is not a end. Our knowledge and idea are day by day increasing. Definitely we will achieve peak of our imagination

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