



## VIVA-TECH INTERNATIONAL JOURNAL FOR RESEARCH AND INNOVATION

ANNUAL RESEARCH JOURNAL

ISSN(ONLINE): 2581-7280

---

### 5G Technology

Miteshree Rath<sup>1</sup>, Chandani Patel<sup>2</sup>

<sup>1</sup>(Department of Master Computer Applications, VIVA Institute of Technology, Virar, Maharashtra, India.)

<sup>2</sup>(Department of Master Computer Applications, VIVA Institute of Technology, Virar, Maharashtra, India.)

---

**Abstract:** The objective of this paper is comprehensive review connected with 5G innovation of versatile correspondence. Existing exploration work in versatile correspondence is connected with 5G innovation. In 5G, explores are connected with the improvement of World Wide Wireless Web (WWWW), Dynamic Adhoc Wireless Networks (DAWN) and Real Wireless Communication. The main innovations for 5G advancements are 802.11 Wireless Local Area Networks (WLAN) and 802.16 Wireless Metropolitan Area Networks (WMAN), Ad-hoc Wireless Personal Area Network (WPAN) and Wireless organizations for computerized correspondence. The significant commitment of this paper is the vital arrangements of 5G (Fifth Generation) innovation of portable correspondence, which is viewed as customer situated. In 5G innovation, the versatile user has given most extreme need contrasted with others. 5G Technology represents fifth Generation Mobile Technology.

**Keywords:** DAWN, IEEE, Technology, WLAN, WMAN, WPAN, WWW, 5G.

---

#### I. INTRODUCTION

Mobile and wireless networks have made remarkable progress in recent years. Today, many mobile phones are also equipped with a WLAN adapter. Many phones will soon come with a wax adapter in addition to adapters such as 3G, 2G, WiFi and Bluetooth. Use IP for both generations. One used 2.5G or 3G public land mobile networks (PLMN) and, and the other used WiFi to investigate their integration. 4G focuses on the perfect integration of cellular networks such as GSM and 3G. Multimode consumer devices are considered essential to 4G, but support for specific operating systems with specific security mechanisms and specific wireless technologies remains tested. Nevertheless, integration between different wireless networks (such as PLMN and WLAN) is still implemented. It is imperative to use different wireless networks on a single end device, but different wireless access technologies cannot be mixed in the same session (such as FTP downloads). The Open Wireless Architecture (OWA), planned for, aims to provide open interface parameters.

#### II. Challenges in Migration

##### 1. Data Encryption

When the GPS receiver communicates with the main transmitter, it is not difficult to break the communication link between these two, and consumer needs to use encrypted data.

##### 2. Security

Need to design a reconfigurable, adaptable and lightweight protection mechanism

##### 3. Multi Mode user terminals

With 4G, you need to design a single-user device that works with a variety of wireless networks and can overcome design issues such as device size, cost, and performance limitations. This problem can be solved by using a software defined radio approach.

#### **4. Choice among various wireless systems.**

Every wireless system has its own properties and tasks. Choose the technology that works best for your particular service at a particular location and time. This is applied by choosing to meet consumer(QoS) requirements as closely as possible.

#### **5. Jamming and Spoofing**

Spoofing sends a fake GPS signal. In this case, the GPS receiver assumes that the signal is from a satellite and calculates the wrong coordinates. Criminals can use such techniques. Interference occurs when a transmitter broadcasting a signal on one frequency shifts a GPS signal.

### **III. 5G Framework**

5G technology is the name used in various studies and projects and represents the next major level of cellular standards beyond the 4G standard. 5G is not currently an officially used term in any particular specification. 3GPP standard version via 4G and LTE. Standard implementation under 5G is planned around 2020.

Main terms of 5G technology:

1. 5G is a complete wireless communication with no restrictions. For some reason, it is known as Real Wireless World
2. Add multimedia newspaper-like features to watch TV shows with the clarity of an HDTV
3. Share the data more rapidly than the previous generation
4. 5G brings almost perfect wireless internet to the real world. This is called "WWW: World Wide Wireless Web". A true wireless world without further limiting access or zone issues.
5. Wearable device with AI function.
6. Internet Protocol version 6 (IPv6). Mobile IP addresses are assigned to visitors based on their location and the network they are connected to.
7. A single global standard.

### **IV. Concept**

#### **1. Physical/Mac Layers**

Physical and intermediate access control layer define wireless technology. At these two layers, the 5G cellular network may be based on the Open Wireless Architecture.

#### **2. Network Layer**

Currently, there is no resistance in this layer, so the network layer can be IP (Internet Protocol). IPv4 (Model 4) is internationally widespread and has many problems, including its limited scope and the lack of real potential for flow-based QoS support. These issues are resolved in IPv6, but are exchanged for fairly large packet headers. Still, mobility is still a problem. Along with many micro mobility solutions (cellular IP, HAWAII, etc.), mobile IP is widely used on one side. All cellular networks use 5G mobile IP, each cellular device is a FA (Foreign Agent), maintaining a CoA (Care of Address) mapping between permanent IPv6 contracts and state-of-the-art WiFi CoA contracts. You can community. However, cells can connect to many cellular or WLAN networks at the same time. In this case, each air interface has a unique IP address, but each of these IP addresses can be the CoA address of the FA in the mobile. Certain IPv6 can be run within the smartphone with the help of 5G smartphone manufacturers. 5G mobile phones are aimed at maintaining a digital multi-Wi-Fi community environment. For this reason, on 5G mobile devices, the community layer should be split into sublayers. That is, the lower community layer (per interface).

#### **3. Open Transport Protocol Layer**

In terms of the transport layer, mobile and wireless networks differ from wired networks. Although all TCP variations presume that the misplaced phase is because of community congestion, wi-fi networks can enjoy losses because of the wi-fi interface's excessive bit mistakes rate. As a result, TCP modifications and variations are

encouraged for cell and wi-fi networks that completely use wi-fi hyperlinks to retransmit lacking or damaged TCP segments. The delivery layer is like minded for 5G cell gadgets and may be downloaded and installed. Downloadable mobile phones are required (TCP, RTP, etc.). Or a new transport protocol version for a certain radio technology deployed at a base station). The open transport protocol, or OTP, is what we're talking about here.

#### 4. Application Layer

The ultimate requirement for 5G mobile devices in terms of applications is intelligent QoS management across a range of networks. Mobile customers today choose the wireless interface for a certain Internet service manually, rather than using the QoS history to choose the optimum wireless connection for that service. 5G phones are said to have a lot of potential in terms of service. Information on quality inspection and measurement is stored in a mobile device's information database. The database of 5G mobile phones stores QoS factors such as delay, jitter, loss, bandwidth, and dependability, which are then used by intelligent algorithms running on mobile devices to create the optimum wireless system. As a procedure, it's been used. Personal cost constraints and needed QoS. There will be a plethora of new services and models available.



Fig 01 : 5G Use Cases

### V. Comparative Analysis

Table 01 : Comparative Analysis between 5G and previous generation Networks.

<b>Technologies / Features</b>	<b>1G</b>	<b>2G/2.5G</b>	<b>3G</b>	<b>4G</b>	<b>5G</b>
Evolution	1970	1980	1990	2000	2010
Deployment	1984	1999	2002	2010	2015
Data Rate	2 kbps	14.4-64 kbps	2 Mbps	200 Mbps to 1 Gbps for low mobility	10 Gbps to 100 Gbps
Famous Standards	AMPS	2G: GSM, CDMA 2.5G: GPRS, EDGE, 1xRTT	WCDMA, CDMA-2000	LTE, WiMAX	Not yet defined
Technology behind	Analog cellular technology	Digital cellular technology	Broad bandwidth CDMA, IP technology	Undefined IP and seamless combination of broadband. LAN/WAN/PAN/WLAN	Undefined IP and seamless combination of broadband. LAN/WAN/PAN/WLAN
Service	Voice	2G: Digital Voice, SMS 2.5G: Voice+Data	Integrated high quality audio, video and data	Dynamic information access, wearable devices	Dynamic information access, wearable devices with AI capabilities
Multiplexing Type of Switching	FDMA Circuit	TDMA, CDMA 2G: Circuit 2.5G: Circuit and packet	CDMA Packet	CDMA Packet	CDMA Packet
Handoff	Horizontal	Horizontal	Horizontal	Horizontal and Vertical	Horizontal and Vertical
Core Network	PSTN	PSTN	Packet network	Internet	Internet

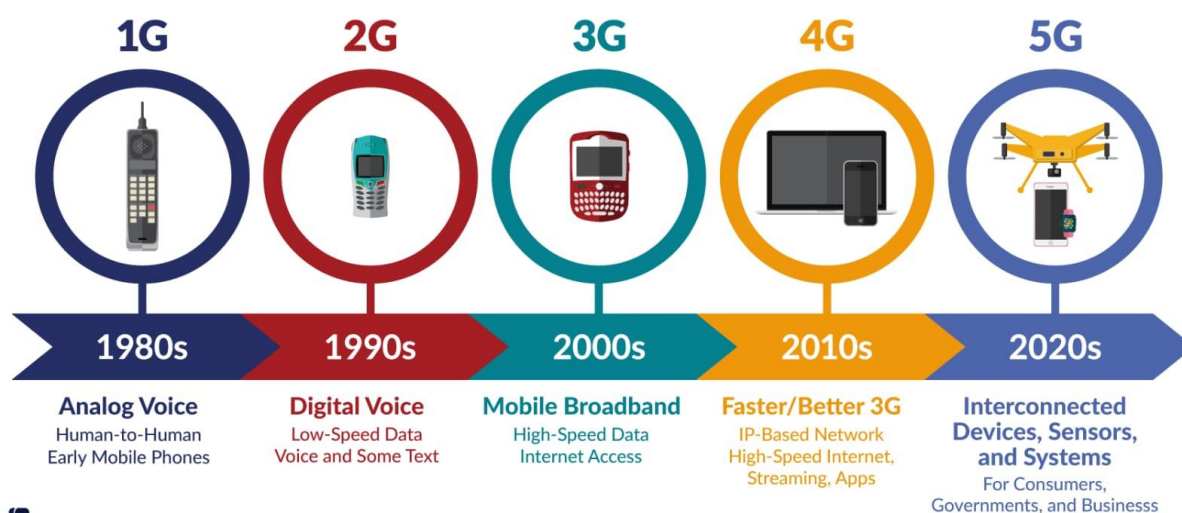


Fig 02 : 5G Evolution



Fig 03 : 5G Features

## VI. 5G Architecture

Evolved Packet Core is an IP-based core network defined by 3GPP (Telecom Standard) for use with LTE and other access technologies of the purpose of EPC is to provide a simplified architecture for all IP core networks that enable efficient access to various services such as those provided by IMS (IP Multimedia Subsystem). is. teeth. The EPC basically consists of a (MME) and an access-independent gateway for transferring user datagrams. EPC is a brand new architecture for mobile operators that emulates the IP world of data communications, rather than the world of voice-centric wireless communications. EPC is based on the theory of flat IP network . With the advent of packet data networks, BSC was used in the and adhered to the existing voice-centric architecture. Overlay the same mobility management capabilities, add SGSNs and GGSNs for GSM / UMTS, and PDSNs for CDMA to route and manage data sessions and connect to the Internet or the appropriate IP network. As traffic grows rapidly, this language centric architecture becomes cumbersome and difficult to manage with too many network entities.

## VII. Conclusion

We looked at 5G technologies for mobile communication in this paper. From the physical layer to the application layer, the 5G technology is designed as an open platform. Currently, work is being done on modules that will provide the best Operating System and lowest cost for a certain service employing one or more wireless technologies at the same time from a 5G mobile. A new revolution in 5G technology is set to commence, since 5G technology will put a strain on traditional computers and laptops, lowering their market value. In the field of

mobile communication, there have been numerous advancements from 1G to 2G to 3G to 4G to 5G. The new 5G technology is now available.

### Acknowledgements

Presentation inspiration and motivation have always played a key role in a one's success. I would like to express my sincere gratitude to our institute for presenting this research and giving us the opportunity to work on it. I pay my deep sense of gratitude to Mrs. Chandani Patel Master Computer Applications Department. VIVA Institute of technology encourages me to the highest peak. I have endless connections with my friends Uplifting inspiration, encouraging guidance, and kind monitoring Completion of my project. I feel to acknowledge my indebtedness and deep sense of gratitude to my guide Mrs. Neha Lodhe whose valuable guidance and kind supervision given to me throughout the course which shaped the present work as its show. Last, but not the least, my parents are an important inspiration for me. So with due regards, I express my gratitude's to them.

### REFERENCES

#### Journal Papers:

[1] Toni Janevski, "A System for PLMN-WLAN Internetworking", Journal of Communications and Networks (JCN), pp. 192-206, Vol 7, No. 2, June 2005

#### Books:

- [2] Suk Yu Hui, Kai Hau Yeung, "Challenges in the Migration to 4G Mobile Systems", IEEE Communications Magazine, December 2003.
- [3] Willie W. Lu, "An Open Baseband Processing Architecture for Future Mobile Terminals Design", IEEE Wireless Communications, April 2008.
- [4] M. Hata, "Fourth Generation Mobile Communication Systems Beyond IMT-2000 Communications," Proc 5th Asia Pacific Conf. Commun. 4th Optoelect. Commun. Conf., vol. 1, 1999, pp. 765-67.
- [5] Idea about 4g Available: <http://www.studymode.com/essays/Idea-About-4G-344635.html>
- [6] Niki Upaddyay "5G wireless technology" Available: <http://www.slideshare.net/upadhyayniki/5-g-wireless-system>
- [7] 4G as a next wireless network Available: <http://www.scribd.com/doc/45905504/4G-as-a-Next-Generation-Wireless-Network>.
- [8] 5G mobile terminal network Available: <http://www.scribd.com/doc/84304292/Concepts-for-5g-Mobile-Networks>.
- [9] 4G Features Available: <http://www.mindya.com/shownews.php?newsid=2248>
- [10] 5G Mobile Technology Available: <http://seminarprojects.com/Thread-5g-mobile-technology-documentation-download?pid=116396#pid116396>
- [11] Vadan Mehta "5G Wireless Architecture" Available: <http://www.4gwirelessjobs.com/pdf/5g-Wireless-architecture.pdf>
- [12] 5G mobile Technology Abstract Available: <http://www.seminaronly.com/Labels/5g-Mobile-Technology-Abstract.php> The Flat World Theory Available [http://connectedplanetonline.com/wireless/news/core\\_networks\\_090201/](http://connectedplanetonline.com/wireless/news/core_networks_090201/)