

# A Review Paper on 5G Wireless Technology

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**Abstract**— The in-depth exploration in the era of fifth generation (5G) wireless network technology is a sign of technical revolution to joint up with the demands and requirements for very fast speed communication and applications which are based on Internet of Thing (IoT) as well. IoT devices and the mobile phone technology supports the 5G technology to invent with distinct facilities like the smart city, smart building and many more that will need an antenna with 5th Generation technology, with reduced latency, minimum path loss and steady pattern of radiation. This paper provides a deep study of various characteristics of all the wireless generations with their salient characteristics along with 5G technology.

**Keywords**—5G technology, Internet of Thing (IoT), latency, low path loss, radiation pattern Introduction.

## 1. INTRODUCTION

The entire world has witnessed a number of developments in the field of Communication. In the last few years, drastic development of wireless services and technologies has contributed a lot in forming our economic system and society. The world has turned towards digitized format, from services that are using voice only applications to wireless broadband connectivity, from second Generation to fourth Generation and even after this also [1]. New development in technology not only supports but also extends the limits of easy to use policies giving authorization to a number of users and uses. It is correct in view of fifth Generation technologies which permits larger bands of spectrum for quality purposes than many previous wireless generations.

The next offered main phase of mobile phone telecommunication standards in the Fifth Generation wireless network technology are beyond the present Fourth Generation/IMT Advanced standards. Along with a number of improvements 5G planning carries The speed of Internet connectivity is very fast as compared to current 4G.

The Fifth Generation smartphone mixed media networks of internet can be entirely communicated wirelessly without any major constraints that creates a complete real world wirelessly known as World Wide Wireless Web (WWW). It is based on 4G technologies.

## 2. THE EVOLUTION OF GENERATIONS FROM 0 TO 5<sup>TH</sup> GENERATION

**0G WIRELESS SYSTEM:** In the late of year 1940, the first ever radio telephone service came into picture. It was created for communicating between the callers in four wheelers to the land-line connected telephone network.

During the year 1960's, the new technology called Improved Mobile Telephone Service (IMTS) which was a system started by Bell Systems brought some of the changes like Direct Dialing and a large bandwidth. In the late 1960's and early 1970's, IMTS was the main technology on which the very first analog systems were based upon.[2]

**1G WIRELESS SYSTEM:** These system uses networks analogy signals. A very high frequency which is near to approximately 150 MHz was used for voice modulation.

Analog cell phones of 1st generation which are having a speed limited up to 2.4 kbps, allow the callers to initiate voice calls in one country. The salient features of 1G standard are:

- \* Advanced Mobile Phone System referred as AMPS

- \*Nordic Mobile Telephone referred as NMT [2].

**2G WIRELESS SYSTEM:** These wireless systems are commercially launched on the standards of GSM (1991). 30 to 200 KHz is the bandwidth used by 2G Wireless system. 2G networks allows for a lot more penetration intensity. E.g. GPRS, CDMA[2].

It also provides the facility of SMS (Short Message Service).

**3G WIRELESS SYSTEM:** These type of wireless system makes use of technology of Code Division Multiple Access and Time Division Multiple Access. In computer networking and mobile devices area 3G came into the use (WCDMA, WLAN and Bluetooth) (cell phone and GPS) in 2005. In terms of spectral efficiency, 3G technology is far better than 2G technology. Transmission speed is from 125 kbps to 2 Mbps. Packet switching is the main technology through which Data is sent. The main feature of 3G Wireless systems is very high clarity in Voice calls and Access to Global Roaming[2].



#### 4.2 5G Demerits

Though, 5G wireless network technology is explored and its concepts are there to resolve the existing radio frequency based transmission issues and major hardships of cell phone world, still due to some of the security reasons and need of technological enhancement in majority of the geographical regions, it has underlying demerits

- The research on viability of 5G Technology is currently ongoing.
- The internet accessing speed of 5G wireless network technology is still difficult to attain in nearby future, due to the inefficient technological network support worldwide.
- A large number of the earlier used devices will be inefficient to 5G technology, hence, each one of them will be required to be exchanged with newer versions.
- Huge amount of cost is required to develop infrastructure needs.
- 5G wireless network technology needs to address the issues related to security and data privacy.

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