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REVIEW ON 5G WIRELESS TECHNOLOGIES

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Abstract: Radio technologies have started its generation and evidenced a multidimensional and rapid growth with the launch of its analogue systems in the year of 1980s. Digitise the wireless communications was enhanced from 1G, 2G, 3G, 4G and finally as 5 G to satisfy the needs of human needs of everyday. With the ultraspeed speed technology the usability are far beyond the expectations and limitations in the revolution of upcoming mobile technology. Through the common wide area radio access technology a flexible network of WiMAX and LTE has enabled with the convergence of fixed and mobile networks. This mobile technology promises with high data speed with full mobility and high speed, similarly high capacity IPV shall used to maintain the completeness of the service.

***Keywords*: 5G, WiMAX, LTE, IPV, High speed, Mobile technology**

I. INTRODUCTION

To satisfy the human needs and increased in human population, with the need of higher transmission demand of data to hospitals, educational institution etc. 5G is one among the newest technology exclusively based on wireless standards and its is well known for the upcoming phase of mobile and telecommunication technology beyond the available 4G standards (IEEE 802.11 acstandard). The ultimate aim to have this technology in the hands of us is to have the increased capacity than 4G with high mobile broadband users per unit area and usage of unlimited mobile data by every user who use this technology. This would make it feasible for a large portion of the population to consume high-quality streaming media many hours per day in their mobile devices, also when out of reach of wifi hotspots. 5G research and development also aims at improved support of machine to machine communication, also known as the Internet of things, aiming at lower cost, lower battery consumption and lower latency than 4G equipment. Although the formal standard for 5G is yet to be set, hence to conclude some of the following basic requirements to fulfill 5G Wireless Technology:

- High & increased peak bit rate (Up to 10Gbps connections to end points in the field)
- Efficient use of energy in devices
- Larger data volume per unit area (i.e. high system spectral efficiency)
- High capacity to allow more devices connectivity concurrently and instantaneously (100percent coverage)
- More bandwidth, Lower battery consumption
- Better connectivity irrespective of the geographic region.
- Larger number of supporting devices (10 to 100x number of connected devices) and Lower cost of infrastructural development.
- Higher reliability of the communications (One millisecond end-to-end round trip delay)

With a huge array of innovative features, now the smart phone would be more parallel to the laptop. With the effective use of broadband internet connection and having other features such as gaming options, multimedia option, high quality sound and HD video can be transferred to the mobile handsets without compromising with the quality of audio and video.

1ST GENERATION

This was introduced in 1980 Analog cellular mobile Data speed 2.4kbps1G mobiles- AMPS, NMT, TACS Uses FDMA technique with 30KHz. The main challenges of this wireless technology were the issues in telephonic voice, low capacity of limited and local convergence. The increased demand by us this technology was not compatible, poor battery life, large phone size, no security and hence there is a need for the next generation and so 2G was initiated.

2ND GENERATION

This was introduced in 1990 with enhanced version as 2G. This was arrived to overcome the pitfalls of 1 G with enhanced voice telephony, text messaging, MMS and limited circuit data services. It hence provided the better quality and capacity. Digital cellular systems Digital modulation schemes- TDMA,CDMA Data speed in 2g is up to 64kbpsData speed in 2.5g is up to 144kbps GPRS, EDGE and CDMA 2000 were 2.5 technologies. Due to the lack of inability of handling complex data such as video messages made the researchers to search for the betterment in the system.

2.5TH GENERATION

This was the technology between 2G and 3G of the mobile telephony, sometimes shall describe as 2G technology combined with GPRS. With web browsing speed of 64 – 144 kbps, camera phones with the requirement of 6- 9 mins, required 3 minutes to download a MP3 songs. Hence to solve the issues, 3rd generation was evolved with added features.

3RD GENERATION

This technology was available from the year 2000, with increased data transmission speed because of these so called smart phones with increased bandwith of data transfer and web based applications like audio and video files. Advantages universal global roaming multimedia (voice, data & video) 384 kbps while moving with 2mbps when stationary at specific l locations video calling. With provided faster communications, larger text messages, high speed, more security, streaming with the required time limit of 11 seconds to 1.5 minutes to download a MP3 songs.

4TH GENERATION

The so called technology had come up in late 2000s having the capability of providing 100 mbps to 1 Gbps speed. It shall otherwise known as mobile magic with data anywhere, everyone with customized personal services. It has high-speed data access high quality streaming video combination of wi-fi and wi-max and uses SDR, OFDM, OFDMA and MIMO.

5TH GENERATION

This technology was known at the late of 2000s with upgraded and to solve the issues of 4G. Complete wireless communications with nearly no limitations, it shall highly supportable to WWWW known as wireless worldwide web. With high speed and high capacity, faster transmissions, larger phone memory made 5G is more effective and attractive. 5G will increase download speeds up to 10 gigabits per second. That means a full HD movie can be downloaded in a matter of seconds. It will also reduce latency significantly (giving people faster load times). In short, it will give wireless broadband the capacity it needs to power thousands of connected devices that will reach our homes and workplaces.

II.OBJETIVES OF 5G

5G being developed to accommodate QoS rate requirements set by further development of existing 4G applications. Flexible channel bandwidth between 5 and 20MHz, optionally up to 40MHz. Data rate of at list 1Gb/s between any two points in the world. Increase system spectral efficiency of up to 3bit/s/Hz/cell in the downlink and 2.25bit/s/Hz/cell for indoor usage.

III. STANDARD WIRELESS 5G

WiMAX formed to provide conformance and interoperability of the IEEE 802.16 standard. It aims to provide wireless data over long distance from point-to-point link to cellular mobile type access. WIBRO a part of IEEE 802.16e in process to provide collaborative and generic mobile WiMAX.3GPP LTE a project aims to improve the mobile phone standard to cope with future requirements. 5GPP 2 UMB a project to improve the CDMA2000 mobile phone standard for next generation applications.

IV. IPv6 SUPPORT

IPv6 increases the IP addresses size from 32 bit to 128 bits, to support more levels of addressing hierarchy and much greater number of addressable node. IPv6 support large number of wireless enabled devices.
IPv6 Extend the IP address space enough to offer a unique IP address to any device.IPv6 Improve support for IP Mobility.

V. CONCLUSION

The concept of every generation is better than the earlier had proven since form the 1G to 5G. The issues raised in one generation will drive the researchers to search for the problem or issue free next generation. As per TRAI there is an increase of 6.08% growth of wireless subscribers, year on year basis. Urban subscribers are higher than the rural subscribers; it was also observed that there is a drastic reduction among the number of CDMA customers. Thus, suggestive of the wireless technology was made available to nearly all. The wireline tele density data declines from 2.16 to 2.12 by the end of March 2015. The percentage of internet subscribers was registered with a quarterly growth rate as 13.08%, more than double of the subscribers in the same period (2). Based on the review analysed during the course of study it was suggesting 5G is one among the best suited technology than the 6G that may be available in the year of 2020. 5G will aid its assistance in self driven cars, drones and robots in near future. UK government had already invested 15 million pounds in quantum technology studies. It also states that there is a need of another five years to put it into the hands of wireless technology hence, in 2025 (1). The current scenario states that 5G is still on the process and not available to all. This 5G pushes the smart phone speed as 10 Gbps and so the other versions should have more speed than this. In near future or otherwise stated as Internet of Things should made available by the construction of resistant water and temperature proof sensor on the daily wearable so, as to sense the environment, heart rate, blood sugar, volume of breathing, level of available oxygen available, detection of cancerous cells in the body (3) etc shall coupled with 5G and the physician of the patient shall expect a seamless integration of monitoring and handling the bulky data stored on the server. Similarly the payment system in India is on its path to cashless way, it needs to much faster, simpler and secure than the existing one to the common man.

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