3G heir 4G, 4G heir 5G, 5G heir ?

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Abstract: **3G means third generation. It is called as such in behalf of it is 3rd genesis of the standards technology tools. 4G means fourth generation. It is an heir of the 3rd genesis standards. A fourth generation (4G) system supplies mobile-ultra broadband internet access. The wireless companies are at work with the standardization of the 4G cellular network. The fourth generation wireless setup can exist in the modern days. Now, Airtel provides 4G network in today's market. They introduce Airtel 4G hotspot also. By using this hotspot device any android mobile can connect with 4G easily either it is not 4G supported mobile. This paper was totally deals with the differences between the 3G and 4G networks and also the comparisons between of these 2 networks and carry out their flash in the latest world. Let's see in feature how many G's are generated.**

Keywords: **3G, 4G, Wireless Networks, CDMA, network.**

1.   INTRODUCTION

'3' called as three and 'G' called as generation totally it is called as third generation. It is called as such in behalf of it is 3rd genesis of the standards technology tools. It is also the common telecommunication for mobile networking, passing the current 2.5G. The mechanism is organized in the International Telecommunication Union group of standards which are part to the IMT-2000.

'4' called as four and 'G' called as generation totally it is called as fourth generation. It is an heir of the 3rd genesis standards.

These dissimilarities are accomplished on the following order conditions: Backdrop dissimilarities, descriptions, technology advancement, fast/amount of transmission, switching mechanisms are used, bandwidth of network, architecture specification, QOS, billing and service, characteristics and ability to perform (capability).

2.   BACKDROP DIS-SIMILARITIES

In third generation mechanism which is organized on the International Telecommunication Union group of a standard which be linked to the IMT-2000 use W-CDMA mechanism. It admits service providers to provide users a longer range of the most recent services and it gets larger network volume by way of heightened spectral efficiency. The included overhaul services are video calls, expansive or wide area wireless vocal telephone and broadband wireless data all contained within the mobile surroundings.

When in fact 4G technology which was beginning with in cable TV company in 2009 which build users to investigate new downloading speed and ability to perform. The exercise of LTE mobile broadband mechanism is the lucky chance for the corporation to spread its vision into fourth generation region, upstaging present third generation 3G efficiency. The use for fourth generation network is linked with the more exercise of data sites they are: Facebook and YouTube, which need fastest bandwidth in order to be use successfully and efficiently.

3.   THIRD GENERATION (3G) AS LONG AS FOURTH GENERATION (4G)

Third generation present's the world's most excellent method when it is move to cell phones, and particularly mobile internet.3G is the evolutionary way of cell phones companies. Fourth generation is the set of principles that is being grown as a future successor of Third generation is the very close illustration.

Structural dissimilarities: the below two figures presents the key elements of these two structures:
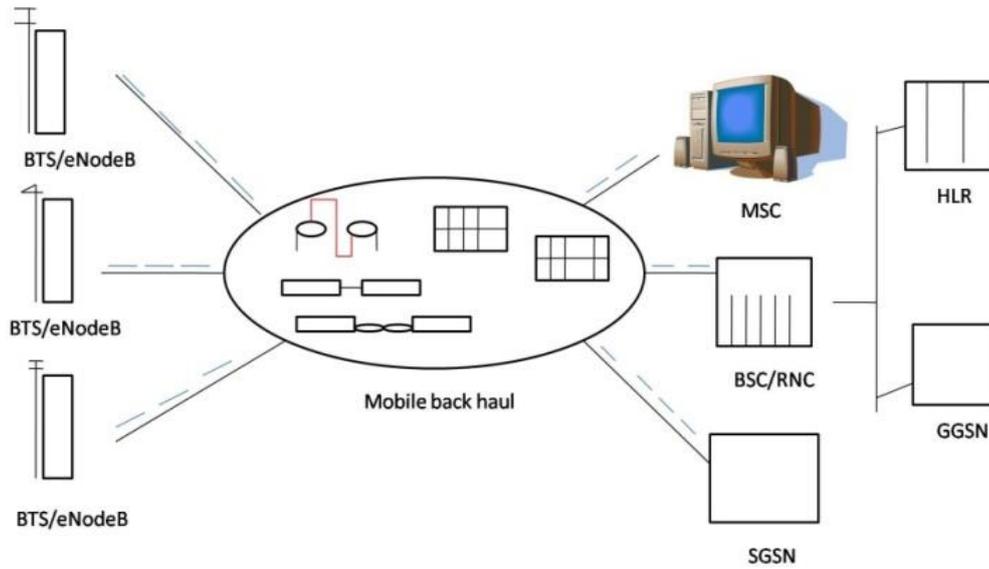

Fig: 1 Third Generation Structure or Archietecture

Miscellaneous key variations in a LTE network allow greater flexibleness in its structure than in a third generation 3G. A working illustration of 3G network structure is shown in figure 1. In this indicated network, the BTS – Base Terminal Station BTS/Node BS total the radio access network – RAN traffic and move it over a mobile backhaul network and also RNC- Radio Network Controller RNC'S/Base station Controller- BSC's . Usually, this carrier is over T1/E1 auburn facilities. If fiber is accessible at close the mobile site, then the mobile influx is transfer over SDH/SONET circles or more presently, a carrier Ethernet network when eNodBs are supplied with IP/Ethernet   mingle or interfaces. The conveyor traffic from a number BSCs/RNCs is intricate at the MTSO – Mobile Telephone Switching office carried by way of straight excavate to the Gateway GPRS Serving bulge or Node (GSSNs) in the center hub information. The transfer is usually over a SDH/SONET center or a bearer Ethernet network. This exhausted collection and transfer anatomy lends itself specific location point to point network topology and decrease twain amount of collection equipment necessary and the move backhaul amount.

In third generation again release eight networks, RNCs/SGSNs are outlined to support twain the signalling carrier plane processing and bandwidth requisite. Thus the present third generation 3G packet core structure is usually a centralized 1 network sketch with GGSNs spread out in major data centers, and whole the data services and backhauled from the SGSNs which are crucially deployed in regional serving offices. As a result of the aggregate bandwidth of these services did not growth significantly just before the previous few years, the backhaul transport amount were controllable and could be supported with rent object TDM.
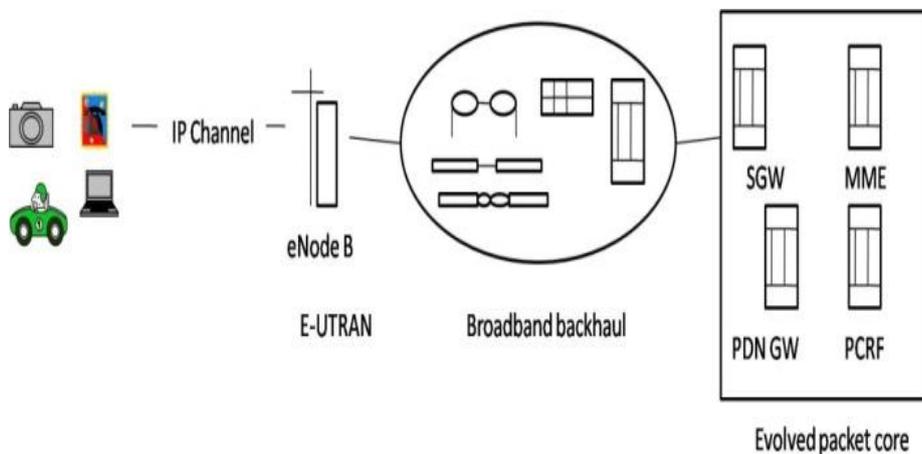

Fig2: Fourth Generation Structure

The above diagram shows 4G architecture supports a distinctive representation of a 4G/LTE networks. 4G network is composed of three important sub networks: 1. (eUTRAN) Evolved Universal Terrestrial Radio Access Networks. 2. (UE) User equipment. 3. (EPC) evolved packet core.

4.   NETWORK

Third generation mechanisms are in widespread of as long as fourth generation complaint mechanisms are still in the limit:

The largest differences in the middle of the twain are in the existence of complaint mechanisms. There are a collection of mechanisms that fall under third generation, containing WCDMA, EV-DO, and HSPA are between others. Even though a lot of cell phone industries are fast to dub their mechanisms as fourth generation, such as LTE, UMB, and WiMax, nobody of these are actually complaint to the requirements set 4rth by the 4G principles.

5.   4G IS SO FASTER THAN COMPARED TO 3G

4G is so faster than 3G. Present 3G speed is high at 14Mbps downlink and 5.8 Mbps uplink. And the 4G mechanism speed is 100 Mbps must be arrived at for a moving consumer and 1 Gbps for a stationary user. Compared to 3G, 4G is so faster and high speed.

6.   FREQUENCY RANGE

The coming difference between 3rd and 4^{rth} generation is frequency range. At 1st glance, the frequency range of both third generation and fourth generation are the similar numbered at between 5 and 20 MHz. Anyway the cost of information is what builds the dissimilarities between twain. As long as the data cost of the 3G only goes up to 2Mbps, the 4G goes entire the way up to tween 100Mbps to 1Gbps.

7.   ARCHIETECTURE SPECIFICATION

The third generation technology supports twain circuit architecture and packet design. Circuit architecture being the primeval, has larger capability to hold the link for a greater period. Another side the packet architecture is a wireless technology and is the center piece of internet data transmission. Anyhow, the fourth generation technology is conserved free from circuit design with a goal to contribute nanosecond wings to information transfer and so has wrapping design only.

8.   INFORMATION TRANSMISSION RATIO

Third generation setup is based on wideband Code-Division Multiple Access (CDMA) that performs in 5MHZ of frequency range and can produce information rate of usually 384 Kb/s below usual circumstances and up to 2 Mb/s in some case. The Wideband Code Division Multiple Access (WCDMA) phones have added HSPA – High speed packet access that use larger level Quadrate amplitude modulation to access speeds up to 21 or 42 Mb/s down connection (transmission path for data or information)(cell site to phone) and up to 7 or 14 Mb/s up connection (phone to cell site). When in fact 4G also popular as telecommunication LTE uses an entirely different radio technology. Alternately Code-Division Multiple Access, it uses orthogonal frequency division multiplexing and OFDM access. This inflection technique separates a channel for the most part 5, 10 or 20 MHz wide into lesser sub-channels each 15 kHz wide.

9.   GQOS- GOOD QUALITY OF SERVICE

In third generation network based Quality of service rely upon on following factor to determine in a satisfactorily manner service as: Packet Loss Rate, Throughput, reliability and delay, Packet Loss Rate. In 4G with esteem to network quality, profuse telecommunications providers are hopeful that there will be improved connectivity, and the quality of information that is communicated across the network will be of the largest possible quality.

10.   CHARACTERISTICS AND CAPABILITIES

Table 1: similarities between 3rd Generation and fort Generation

Requirements	*Third generation (3G)*	*Fourth generation (4G)*
Frequency band	1.8 – 2.5 GHz	2 – 8 GHz Bandwidth 5-20 MHz 5-20 MHz
Information cost	Up to 2Mbps	20 Mbps or more
Approach	Wideband Code-Division Multiple Access	Multi-carrier – Code-Division Multiple Access or frequency division multiplexing (TDMA)
Switching	Circuit/Packet	Packet

11.   EVOLUTION FROM 1G TO 5G

1G-*GSM:*

Fig3: 1st generation mobile phones

2nd Generation:

Fig4: 2nd generation mobile phones

3rd Generation:

Fig5: 3rd generation mobile phones

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4rth Generation:

Fig6: 4rth generation mobile phones

5th Generation:

Fig7: 5th generation mobile phones

12.   CONCLUSION

For excellent accomplishment we have to make third generation as internet packet, IP based which will admit larger information transmission rate. We use single packet switching that we can concludes higher internet speed remove circuit switching which makes computer network speed sluggish. To have excellent performance we have to use frequency division multiplexing mechanism. The third generation should be mixed with internet packet IP based mechanism so that it can have the amazing information transmission support VoIP as well. By comparing these two networks 4G is so faster than 3G. Here 2G is so faster than 1G, 3G is so faster than 2G, in the same way 4G is so faster than 3G. So that's why 1G heir 2G and 2G heir 3G in the same way 3G heir 4G. So finally the title of this research paper was satisfied.

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