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Developments of 5G Technology

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ABSTRACT: This technology is the future of current LTE technology which would be a boost to the future of wireless and computer networks, as the speeds would be way higher than the current LTE networks, which will push the technology to a new level. This technology will make the radio channels to support data access speeds up to 10 Gb/s which will turn the bandwidth radio channels as WiFi. Comparing it with other LTE technology's it has high speed and capacity, support interactive multimedia, voice, internet and its data rate is 1 Gbps which makes it faster than other LTE's . This paper provides detail explanation of 5G technology, its architecture, challenges, advantages and disadvantages, issues and ends with future of 5G technology.

*Keywords:-* CDMA, GPRS, GSM, UTMS

INTRODUCTION: The world has seen a lot of changes in the realm of communication. Today we no more use landlines. Everyone possesses a mobile phone that functions nine to seven. Our handsets not only keep us connected with the world at large but also serve the purpose of entertainment gadget. From 1G to 2.5G and from 3G to 5G this world of telecommunications has seen several improvements along with improved performance with every passing day. 5G technology is on its way to change the way by which most of the users access their handsets. Users will go through a level of call volume and data transmission with 5G pushed over a VOIP enables gadget. In such a small electronic piece, huge features are getting embedded. There are very few mobiles left without mp3 player or/and camera. People are focusing on getting everything without spending a penny more. 5G technology will change the way cellular plans are offered worldwide. A new revolution is about to begin. The global cell phone is around the corner. The global mobile phone will hit the localities who can call and access from China to Germany's local phone with this new technology.

Generations:-

1) 1G
2) 2G
3) 3G
4) 4G

EVOLUTION *OF* FIFTH GENERATION

It's time to move from services to multiservice approach. The transformation will be moving from LTE to LTE Advanced and the features would be added as pervasive networks where users can be concurrently being connected to several wireless accessed technologies and seamlessly move between them. The 5G (Fifth Generation Mobile and Wireless Networks) can be a complete wireless communication without limitation, which bring us perfect real world wireless – World Wide Wireless Web (WWWW). 5G denotes the next major phase of mobile telecommunications standards beyond the 4G/IMT-Advanced standards. The 5G technologies include all type of advanced features which make 5G mobile technology most powerful and in huge demand in near future. For children rocking fun Bluetooth technology and Pico nets has become available in market.
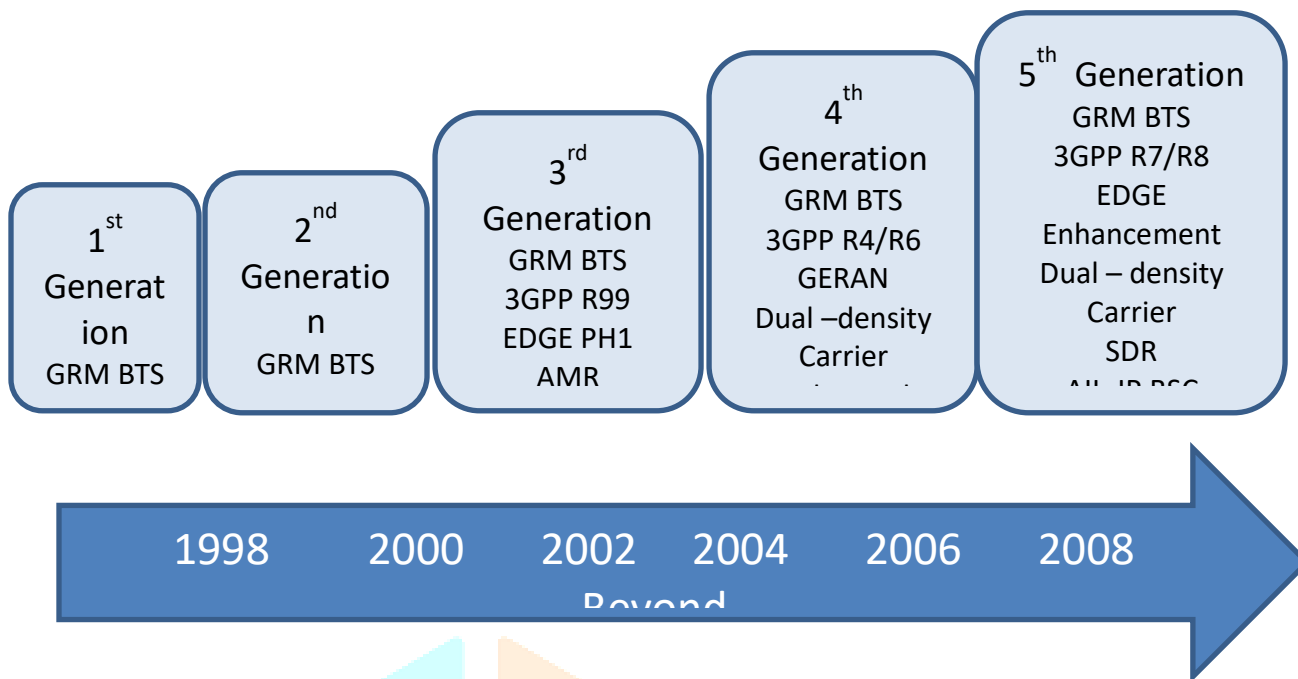
Architecture of 5G Technology

This section first presents the key features of 5G architecture, later presents the basic architecture of 5G then presents the network architecture of 5G along with key requirements of the architecture and lastly ends with explaining about the mobile network architecture.

Lower Latency
Huge Number of Connected Devices
Decrease of Cost
Improvement of Energy Efficiency:
Basic Architecture of 5G
Architecture of 5G is highly advanced, its network elements and various terminals are characteristically upgraded to afford a new situation. Likewise, service providers can implement the advance technology to adopt the value-added services easily.

Network Architecture of 5G:-

Agyapong, Iwamura, Staehle, Kiess, and Benjebbour [4] proposed an architecture for 5G. Before presenting the architecture, we would discuss the key elements of the network architecture, they are:

• Two logical network layers, a radio network (RN) that provides only a minimum set of L1/L2 functionalities and a network cloud that provides all higher layer functionalities

• Dynamic deployment and scaling of functions in the network cloud through SDN and NFV

• A lean protocol stack achieved through elimination of redundant functionalities and integration of AS and NAS

• Separate provisioning of coverage and capacity in the RN by use of C/U-plane split architecture and different frequency bands for coverage and capacity

The 5G system comprises three layers:-

Infrastructure resource layer
Business enablement layer
Business application layer

SOFTWARE PLATFORMS OF 5G

The Open-Air Interface(OAI) platform includes a full software implementation of fourth generation mobile cellular systems which complies with 3GPP LTE standards which is coded in C language under real-time Linux which dedicated for x86. At the physical layer, it provides the following features:

• LTE release 8.6, with a subset of Release 10;

• FDD and TDD configurations in 5, 10 and 20 MHz bandwidth;

• Transmission mode: 1 (SISO), and 2, 4, 5, and 6 (MIMO 2x2);

FUTURE SCOPE

The many initiatives and discussions on 5G going on around the world by governments, vendors, operators and academia demonstrate the continuing ethos of collaboration and innovation across the industry. In these debates, we must ensure that we continue to co- ordinate with aligned goals to maintain momentum in completing the definition of 5G. The key 5G considerations at this stage are: When 5G arrives will be determined by what 5G turns out to be as discussed earlier, there are currently two differing views of what 5G is. The first view makes its implementation somewhat intangible – 5G will become a commercial reality when sufficient industry voices say so, but this will be difficult to measure by any recognizable metric. The second approach is more concrete in that it has a distinct set of technical objectives, meaning that when a service is launched that meets those objectives it will count as the advent of 5G.

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