5G wireless technology

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ABSTRACT

5G technology will be changing the way of most high-speed bandwidth many users can be accessed mobiles. 5G networks will provide a "fiber-like" experience to the mobile user. 5G Technology is offered in the services of the product engineering, documentation, supporting electronics transaction (e-payment and e-transaction) etc. In this technology is heterogeneous mobile environment changes all in, either old or new wireless technologies and it is not possible of them. So, each and every solution towards the next generation smart mobiles and wireless devices should implement the service stratum, while the radio stratum accessing technology belong to transport stratum of the regarding the next generation of networks which are coming futures. A 5G cellular network is expected to meet high-speed requirements.

Keywords: *1G, 2G, 3G, 4G, DAWN, WLAN, WMAN, GSM, 5G.*

1. INTRODUCTION

The technologies are upgrading every year and advanced feature of the including network. The upcoming technologies are a 5G network of the technology. Capabilities are technologies of the future 5G system are not firmly set yet. This work.5G network will handle delivering high-quality video stream from a network media server to end user. The 5G network aims at providing new high-quality wireless services and specific needs of various sector beyond traditional mobile broadband.

What is 5G?

5G is the name of next generation upcoming technology of the mobile data connectivity, succeeding 4G. 5G is faster than 4G networks. It will provide the high-speed broadband and more important of it will not have the capacity of wherever you will perform every function if you want it to the with speed drop of the connection. It doesn't matter many peoples are connected. The 5G is running on the new "high-spectrum bandwidth" which is a better signal than 4G networks.

Why do we need it?

Once the 5G is coming to the main benefit of technology it over the 4G will not speed on the delivery signal of the networks, it can between the 10gbps to 100gbps but the latency of the technology. At present 4G technology is capable of the 40ms and 60ms, which is the low latency of but enough to provide to the real-time response.5G is provide ultra-low latency could be range between the 1 Ms to 10 Ms.
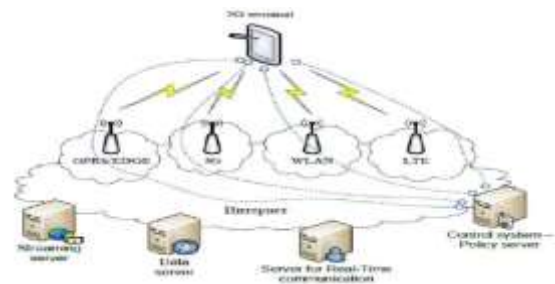
5G Architecture:

Fig. 1: Architecture of 5G

As the above figure shown the architecture consist of a user terminal and a number of independent radio access technologies (RAT). In Fifth generation Network Architecture all IP based mobile applications and services have some components such as Mobile portals, Mobile commerce, Mobile healthcare, Mobile banking and others, are based on Cloud Computing Resources (CCR). Cloud computing is a model for network access by the specific user or group which is configurable computing resources like servers and applications that enables the IP based system to controls data for appropriate routing of IP packets.

GPRS (General Packet Radio Service)

- The transmission speed of data at 60kbps.
- It also consumes less battery during communication or to browse the internet.

EDGE (Exchange Data Rate Evolution)

- It is an advanced version of GPRS which uses data rates.
- The speed of data transmission is 473kbps.

3G

- 3G makes it possible that users can do video call on the mobile network.
- It also provides an efficient way to browse the data or information over the internet on the mobile network.

Table 1: Evaluation of 5G

Generation of the Feature	1G	2G	3G	4G	5G
Deployment	1970-1980	1990-2001	2001-2010	2011	2015-20 onward
Data Rates	2 kbps	14.4-64kbps	2 Mbps	2Mbps – 1Gbps	1 Gbps and higher
Technology	Analog cellular technology	Digital cellular technology	Digital Broadband EVDO UMTS EDGE	Digital broadband WiMAX and LTE and WIFI	Wwww unified IP seamless combination of broadband LAN, WLAN, PAN, MAN
Services	Analog voice services, No data services	Digital voice, SMS, MMS, data services	Enhancing audio and video conference, Support web browser at high speed of the packet IPTV support.	Enhance audio, video, streaming, IP telephony HD mobile TV.	Dynamic information access and wearable devices with AI capabilities.
Multiplexing and switching	FDMA	TDMA CDMA	CDMA	CDMA	CDMA
Core Network	PSTN	PSTN	Packet n/w	Internet	Internet
Web Standard	MTS AMTS IMTS	GSM GPRS EDGE	IMT HSDPA HSUPA	LTE, WiMAX	Single unified standard
Handoff	Horizontal only	Horizontal only	Horizontal and vertical	Horizontal and vertical	Horizontal and vertical

WLAN (Wireless LAN)
- Wireless LAN is a wireless distribution method which provides short-range, the high-speed wireless data connection between mobile data devices.
- Wireless LAN allows users to move the WLAN enabled devices around the coverage area like home or small office while maintaining a network connection.

LTE (Long Term Evolution)
- LTE is a standard for mobile communication for high-speed data transmission for the mobile network.
- LTE is often used to refer to wireless broadband or mobile network technologies.
- it provides Speed up to 100mbps
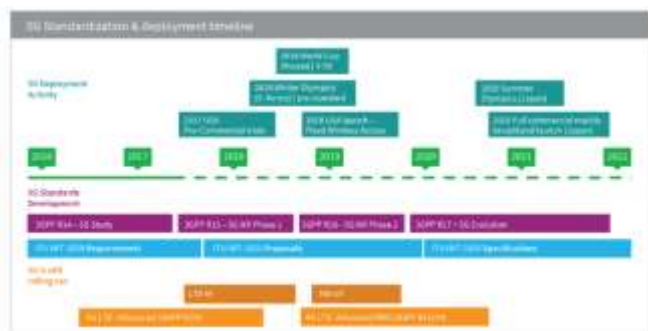
5G Standardization and Deployments:

Fig. 2: 5G standard and deployment timeline
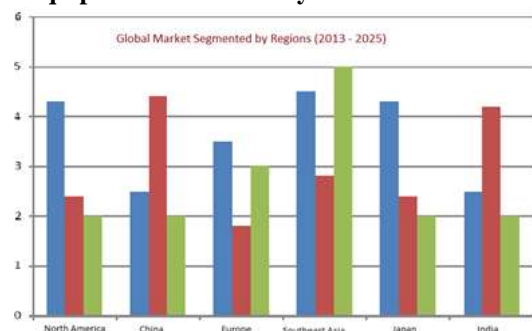
5G Equipment market analysis:

Fig. 3: Global market in 5G

Trends of 5G Technologies in 2018:
1. **5G Connectivity:**
- The 5G connectivity for mobile devices has been the works for sometimes move are being made towards firm planning.
- Last year focus on the IoT concept of 5G so it will be interesting the see how are planning and implementation. In a simple way of the 5G networks faster than current 4G networks.

2. **Shaping the 5G network tomorrow:**
- As the 5G network is the 5th generation of wireless technology is known as 5G them creates networks of the networks which will be delivered in higher bandwidth and lower latency of the Mobile network operation(MNO)
- Densification-----→Virtualization------→ optimization.

3. **AI permeation:**
- Artificial intelligence (AI), made possible through machine learning algorithms, will be incorporated in a larger variety of applications. AI is set to feature in almost every new platform, app, or device, and that trend is only going to accelerate further than what we've seen since 2017.

4. **Centralized Data:**
- As the years have gone by, we've seen many different types of devices and have become dependent on these smart devices in our daily lives.

Features of 5G:
1. 25 Mbps connectivity speed.
2. Uploading and downloading speed of 5G touching the peak (up to 1 Gbps).
3. Provides high resolution for heavy mobile phone users and bi-directional large bandwidth.
4. 5G will possible to provide the super speed i.e. 1 to 10 Gbps.
5. Latency will be 1 millisecond (end-to-end round trip).
6. Can connect 10 to 100 number of devices.
7. Offers worldwide coverage.
8. Battery life will be much longer.
9. The whole world will be in Wi-Fi zone.

2. CONCLUSION

5G technology is the upcoming technology and the bandwidth for this is very high and was having higher data transfer rate. However, now we are using the 3G technology efficiently and in some countries, the people are using the 4G but in future, we can use the 5G technology. Many big countries are investing a huge amount of money on this project as it was having high demand in the future. There are a lot of improvements from 1G to 5G in the world of mobile communications. Now we can watch HD TV channel in our mobile phones without any inconvenience. Future work will investigate the porting of 5G network.

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