ISSN: 2278 – 7798
International Journal of Science, Engineering and Technology Research (IJSETR)
Volume 2, Issue 2, February 2013

5G WIRELESS TECHNOLOGIES-Still 4G auction not over, but time to start talking 5G

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***Abstract*— The wireless industry is busy with the standardization of the 4th generation (4G) cellular networks. The 4G standards are expected to be concluded in the next year or two. 4g wireless system cannot exist in today's market without standardization. The 4G concept shave already moved to the standardization phase, we must begin to work on the building blocks of the 5G wireless networks. The major difference, from a user point of view, between current generations and expected 5G techniques must be something else than increased maximum throughput; other requirements include low battery consumption, more secure. We refer to this goal as enabling the 4A's paradigm i.e. Any rate, Anytime, Anywhere and Affordable. In particular, this paper focuses on the features such as broadband internet in mobile phones with a possibility to provide internet facility in the computer by just connecting the mobile and with a speed of 10Gbps and more. In 5G researches are being made on development of World Wide Wireless Web (WWWW), Dynamic Adhoc Wireless Networks (DAWN) and Real Wireless World.**

***Index Terms*— 1G, 2G, 3G, 4G, 5G, GSM.**

I. INTRODUCTION

The present cell phones have it all. Today phones have everything ranging from the smallest size, largest phone memory, speed dialing, video player, audio player, and camera and so on. Recently with the development of Pico nets and Bluetooth technology data sharing has become a child's play.

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Earlier with the infrared feature you can share data within a line of sight that means the two devices has to be aligned properly to transfer data, but in case of blue tooth you can transfer data even when you have the cell phone in your pocket up to a range of 50 meters. The creation and entry of 5G technology into the mobile marketplace will launch a new revolution in the way international cellular plans are offered. The global mobile phone is upon the cell phone market. Just around the corner, the newest 5G technologies will hit the mobile market with phones used in China being able to access and call locally phones in Germany. With the emergence of cell phones, which are similar to a PDA, you can now have your whole office within the phone. Cell phones will give tough competitions to laptop manufacturers and normal computer designers. Even today there are phones with gigabytes of memory storage and the latest operating systems. Thus one can say that with the current trends, the industry has a real bright future if it can handle the best technologies and can produce affordable handsets for its customers. 5G Network's router and switch technology delivers Last Yard Connectivity between the Internet access provider and building occupants. 5G's technology intelligently distributes Internet access to individual nodes within the building.

5G is not officially defined term or technology but people refer technologies that can deliver the speed beyond 4G as 5G.It's expected to be finalized somewhere in 2012 or 2013. New standard proposals or releases beyond 4G are submitted to standard bodies like 3GPP, WiMAX Forum or ITU-R. Ideal 5G model should accommodate the challenges and accommodate the short falls of the 4G Technology and 4G deployment experiences. To understand the necessities and uses of 5G could be raised once the 4G rollout is completed and experienced. Thus typical 5G concept would be raised in somewhere around 2013-2015.

II. EVOLUTION FROM 0G TO 5G

A. Classical 0G:

Wireless telephone started with what you might call 0G if you can remember back that far. The great ancestor is the

mobile telephone service that became available just after World War II. Technologies used in 0G systems included PTT (Push to Talk), MTS (Mobile Telephone System), IMTS (Improved Mobile Telephone Service), AMTS (Advanced Mobile Telephone System), OLT (Norwegian for Offentlig Landmobil Telefoni).

B. 1G: GSM

0G vision proved wrong when the GSM concretely came to life in 1990-91 in Finland.1G was old analog system and supported the 1st generation of analog cell phones speed up to 2.4kbps. Advance mobile phone system (AMPS) was first launched by the US and is a 1G mobile system. It allows users to make voice calls in one country.

Fig.1: 1G Mobile Phone

1G technology replaced 0G technology, which featured mobile radio telephones and such technologies as Mobile Telephone System (MTS), Advanced Mobile Telephone System (AMTS), Improved Mobile Telephone Service (IMTS), and Push to Talk (PTT).

C. 2G:

2G cellular telecom networks were commercially launched on the GSM standard in Finland by Radio linja in 1991. 2G technologies enabled the various mobile phone networks to provide the services such as text messages, picture messages and MMS (multimedia messages). 2G technology is more efficient.. It was planned for voice transmission with digital signal and the speeds up to 64kbps.2G technology holds sufficient security for both the sender and the receiver. All text messages are digitally encrypted. This digital encryption allows for the transfer of data in such a way that only the intended receiver can receive and read it. Second generation technologies are either time division multiple access (TDMA) or code division multiple access (CDMA). TDMA allows for the division of signal into time slots. CDMA allocates each user a special code to communicate over a multiplex physical channel. Different TDMA technologies are GSM, PDC, iDEN, I.S-136. CDMA technology is IS-95.

GSM has its origin from the Group special Mobile, in Europe. GSM is also stands for Global system for mobile communication. Now GSM is used in more than 212 countries in the world. GSM technology was the first one to help establish international roaming. In comparison to 1G's analog signals, 2G's digital signals are very reliant on location and proximity.

Fig.2: 2G Mobile Phone

D.2.5 G:

For that last reason(9.6Kbytes/sec doesn't allow you to browse the Net or up/download an image),Telco operators came up with the GPRS which could enable much faster communications(115Kbytes.sec), but the market decided it was still not enough compared to what they had at home.

2.75G EDGE:

Which is a pretty recent standard allows for downloading faster. Since mobile devices have become both a TV and a Walkman or music player, people needed to be able to watch streaming video and download mp3 files faster that´s precisely what EDGE allows for and that's for the good news. The bad news is that if EDGE rock sat downloading, it´s protocol is a symmetrical hence making EDGE suck at uploading i.e. broadcasting videos of yours for instance. Still an interesting achievement thanks to which data packets can effectively reach 180 kbytes/sec EDGE is now widely being used.

E.3G: UMTS

International Mobile Telecommunications-2000 (IMT--2000), better known as 3G, is a generation of standards for mobile phones and mobile telecommunications services fulfilling specifications by the International Telecommunication Union. The use of 3G technology is

also able to transmit packet switch data efficiently at better and increased bandwidth.

Transmission speeds from 125kbps to 2Mbps. In 2005, 3G is ready to live up to its performance in computer networking (WCDMA, WLAN and Bluetooth) and mobile devices area (cell phone and GPS).Voice calls are interpreted using circuit switching. Access to Global Roaming and Clarity in voice calls. Fast Communication, Internet, Mobile T.V, Video Conferencing, Video Calls, Multi Media Messaging Service (MMS), 3D gaming, Multi-Gaming etc. are also available with 3G phones

Fig.3: 3G Mobile Phone

F. 3.5G or 3G:HSDPA

It is theoretically 6 times faster than UMTS (upto3.6Mbytes/sec)! Practically speaking, this would mean downloading an mp3 file would take about 30sec. instead of something like 2 minutes.

G.4G:

The basic feature of 3G Technology is fast data transfer rates. However this feature is not currently working properly because, ITU 200 is still making decision to fix the data rates. Network authentication has won the trust of users, because the user can rely on its network as a reliable source of transferring data. . 4G is a conceptual framework and a discussion point to address future needs of a high speed wireless network. It is expected to emerge around 2010 – 2015. 4G should be able to provided very smooth global roaming ubiquitously with lower cost.

Fig.4: 4G Mobile Phone

Some of the applications are:

1. Mobile TV – a provider redirects a TV channel directly to the subscriber's phone where it can be watched.
2. Video on demand – a provider sends a movie to the subscriber's phone.
3. Video conferencing – subscribers can see as well as talk to each other.
4. Location-based services – a provider sends localized weather or traffic conditions to the phone, or the phone allows the subscriber to find nearby businesses or friends
5. Mobile ultra-broadband (gigabit speed) access and multi-carrier transmission.
6. Mobile WiMAX (Worldwide Interoperability for Microwave Access)

H. 5G:

5G technology has changed the means to use cell phones within very high bandwidth. User never experienced ever before such a high value technology. The 5G technologies include all type of advanced features which makes 5G technology most powerful and in huge demand in near future. 5G technologies which are on hand held phone offering more power and features than at least 1000 lunar modules. A user can also hook their 5G technology cell phone with their Laptop to get broadband internet access.

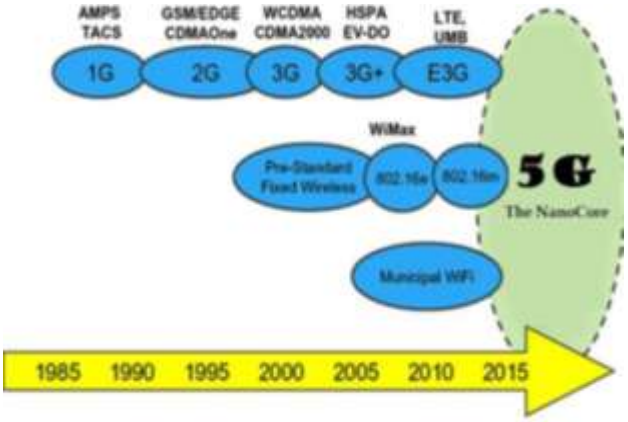

Fig.5: Evolutional changes in mobile technologies.

5G technology including camera, MP3 recording, video player, large phone memory, dialing speed, audio player and much more you never imagine. For children rocking fun Bluetooth technology and Pico nets has become in market.

III. SYMBOLS

WWWW: A World Wide Wireless Web is capable of supporting a comprehensive wireless-based Web application that includes full graphics and multimedia capability at beyond 4G speeds.

WCDMA: Wideband CDMA is a technology for wideband digital radio communications of multimedia and other capacity demanding applications. It is adopted by ITU under the name IMT-2000 direct spread.

PSTN: Public Switched Telephone Network is a regular voice telephone network. Spread Spectrum: It is a form of wireless communication in which the frequency of the transmitted signal is deliberately varied over a wide range. This results in a higher bandwidth of the signal than the one without varied frequency.

TDMA: Time Division Multiple Access is a technology for sharing a medium by several users by dividing into different time slots transmitting at the same frequency.

UMTS: Universal Mobile Telecommunications System is the third generation mobile telephone standard in Europe that was proposed by ETSI.

WAP: Wireless Application Protocol defines the use of TCP/IP and Web browsing for mobile systems.

CDMA-2000: Sometimes also known as IS-136 and IMT-CDMA multicarrier (1X/3X) is an evolution of narrowband radio transmission technology known as CDMA-ONE or CDMA or IS-95.1X refers to the use of 1.25 Mhz. channels while 3X refers to 5 Mhz. channels.

IV. WHAT IS 5G NETWORKS?

5G network is very fast and reliable. The concept of hand held devices is going to be revolutionized with the advent of 5G. Now all the services and applications are going to be accessed by single IP as telephony, gaming and many other multimedia applications. As it is not a new thing in market and there are millions of users all over the world who have experienced the wireless services wireless technology. It is not easy for them to shrink from using this new 5G network technology. There is only need to make it accessible so that a common man can easily afford the profitable packs offered by the companies so that 5G network could hold the authentic place. There is need to win the customer trust to build fair long term relation to make a reliable position in the telecommunication field. To complete with the preceding wireless technologies in the market 5G network has to tender something reliable something more pioneering.

All the features like telephony, camera, mp3 player, are coming in new mobile phone models. 4G is providing all these utility in mobile phone. By seeingthefeaturesof4G one can gets a rough idea about what 5G Networks could offer. There is messenger, photo gallery, and multimedia applications that are also going to be the part of 5G. There would be no difference between a PC and a mobile phone rather both would act vice versa.

V. WHAT 5G TECHNOLOGY OFFERS?

5G Technology going to be a new mobile revolution in mobile market. Through 5G technology now you can use worldwide cellular phones and this technology also strike the china mobile market and a user being proficient to get access to Germany phone as a local phone. With the coming out of cell phone alike to PDA now your whole office in your finger tips or in your phone. 5G technology has extra ordinary data capabilities and has ability to tie together unrestricted call volumes and infinite data broadcast within latest mobile operating system.

5G technology has a bright future because it can handle best technologies and offer priceless handset to their customers. May be in coming days 5G technology takes over the world market. 5G Technologies have an extraordinary capability to support Software and Consultancy. The Router and switch technology used in 5G network providing high connectivity. The 5G technology distributes internet access to nodes within the building and can be deployed with union of wired or wireless network connections. The current trend of 5G technology has a glowing future.

VI. WHY IS THERE A NEED FOR 5G?

Fig.6:5G Mobile Phone.

The major difference, from a user point of view, between current generations and expected 5G techniques must be something else than increased maximum throughput; other requirements include:

•Lower out age probability; better coverage and high data rates available at cell edge.

•Lower battery consumption.

•Multiple concurrent data transfer paths.

•Around 1Gbps data rate in mobility.

•More secure; better cognitive radio/SDR Security.

•Higher system level spectral efficiency.

•World Wide wireless web (WWWW).

•More applications combined with artificial intelligent (AI) as human life will be surrounded by artificial sensors which could be communicating with mobile phones. Not harmful to human health.

•Cheaper traffic fees due to low infra structure deployment costs.

VII. FEATURES OF 5G

According to some research papers on 5G technology, the main features the technology might have are as follows:

•High speed, high capacity, and low cost per bit. It Support interactive multimedia, voice, streaming video, Internet, and other broadband services, more effective and more attractive, Bidirectional, accurate traffic statistics.

• Introduction of a new radio system is possible in which different radio technologies will share the same spectrum. This can be done by finding unused spectrum and then adapting to the technology of the radio technology with which the spectrum is being shared.

•Every mobile in a 5G network will have an IP address (IPV6) according to the location and network being used.

•The technology is expected to support virtual private networks and advanced billing interfaces.

•With 5G Enabled phone, you might be able to connect your phone to your laptop to get access to broadband.

•5G technology is providing large broadcasting of data in Giga bit which supporting almost 65,000 connections.

•The traffic statistics by 5G technology makes it more accurate and it also support virtual private network.

VIII. KEY CONCEPTS

Key concepts suggested in scientific papers discussing 5G and beyond 4G wireless communications are:

•Dynamic Adhoc Wireless Network (DAWN), essentially identical to Mobile adhoc network (MANET), Wireless mesh network (WMN) or Wireless grids, combined with smart antennas and flexible modulation.

•Internet Protocol Version6 (IPv6), where a visiting Care of mobile IP address is assigned according to location and connected network.

•High altitude stratospheric platform station (HAPS) systems.

•Real wireless world with no more limitation with access and zone issues.

•User centric network concept instead of operator-centric (as in 3G) or service-centric (asin4G) World-wide wireless web (WWWW), i.e. comprehensive wireless based web applications that include full multimedia capability beyond 4G speeds. On July7, 2008, South Korea announced plans to spend 60 billion won, or US$5 8,000,000, on developing 4G and even 5G technologies, with the goal of having the highest mobile phone markets here by 2012, and the hope of an international standard.

IX. CONCLUSION

The idea of WWWW, world-wide wireless web, is started from 4g technologies. 5g evolution will be based on 4g. Thus, 5g should make an important difference and add more services and features to the world over 4g. 5g should be more intelligent technology that interconnects the entire world without limits. Therefore, in this paper, we propose a multi bandwidth data path scheme for 5g real wireless world, completed WWWW we refer to this goal as enabling the 4A's paradigm any rate, anytime, anywhere, affordable.

X. FUTURE SCOPE

BEYOND 5G:

The future enhancement of Nano-core will be incredible as it combines with artificial intelligent (AI).One can able to control his intelligent Robot using his mobile phone. Your Mobile can automatically type the message what your brain thinks. We might get a circumstance where we don't require any spectrum for communication.

The Google hot trends have rated the term 6 gas the 17 th most searched word in the search engines. The iPod 6G comes in seven different colors and has an aluminum body which makes the body strong to with stand constant daily usage. It has a clip on design like iPod shuffle and it attached to shirt firmly. 6g technology

haven't been fully revealed yet but search phrases like what is 6g mobile technology, 6g technology, 6g mobile, 6g network, 6g wiki, 6g technology ppt. are getting more familiar with new mobile technology getting evolved.

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