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Research Article

Analysis of 5G Technology as current research in mobile wireless technology that concentrates on advance implementation of 4G Technology and 5G Technology as redefining wireless communication in upcoming years results in development of World Wide Wireless Web.

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5G and
Super Core.

Abstract

The word wide revolution in mobile is changing our lives in term of the way we work, learn and interact. In this paper, an attempt has been made to review various existing generations of mobile wireless technology in terms of their portals, performance, advantages and disadvantages. The paper throws light on the evolution and development of various generations of mobile wireless technology along with their significance and advantages of one over the other. In the past few decades, mobile wireless technologies have experience 4 or 5 generations of technology revolution and evolution, namely from 0G to 4G.Current research in mobile wireless technology concentrates on advance implementation of 4G technology and 5G technology. Currently 5G term is not officially used. In 5G researches are being made on development of World Wide Wireless Web (WWWW), Dynamic Adhoc Wireless Networks (DAWN) and Real Wireless World.

1.Introduction

G (5th generation mobile networks or 5th generation wireless systems) denotes the next major phase of mobile telecommunications standards beyond the current 4G/IMT-Advanced standards. 5G has speeds beyond what the current 4G can offer.

The Next Generation Mobile Networks Alliance defines the following requirements for 5G networks:

Data rates of several tens of megabits per second should be supported for tens of thousands of users
1 gigabit per second to be offered simultaneously to tens of workers on the same office floor
Several hundreds of thousands of simultaneous connections to be supported for massive sensor deployments
Spectral efficiency should be significantly enhanced compared to 4G
Coverage should be improved
Signalling efficiency should be enhanced
Latency should be reduced significantly compared to LTE

Mobile wireless industry has started its technology creation, revolution and evolution since early 1970s. In the past few decades, mobile wireless technologies have experience 4 or 5 generations of technology revolution and evolution, namely from 0G to 4G. The cellular concept was introduced in 5G Technology stands for 5th Generation Mobile technology. 5G technology has changed the means to use cell phones within very high bandwidth. User never experienced ever before such a high value technology. Nowadays mobile users have much awareness of the cell phone (mobile) technology. The 5G technologies include all type of advanced features which makes 5G technology most powerful and in huge demand in near future.

Were a 5G family of standards to be implemented, it would likely be around the year 2020, according to some sources. A new mobile generation has appeared every 10th year since the first 1G system (NMT) was introduced in 1981, including the 2G (GSM) system that started to roll out in 1992, 3G (W-CDMA/FOMA), which appeared in 2001, and "real" 4G standards fulfilling the IMT-Advanced requirements, that were ratified in 2011 and products expected in 2012-2013. Predecessor technologies have occurred on the market a few years before the new mobile generation.

New mobile generations are typically assigned new frequency bands and wider spectral bandwidth per frequency channel (1G up to 30 kHz, 2G up to 200 kHz, 3G up to 5 MHz, and 4G up to 40 MHz), but the main issue that there is little room for new frequency bands or larger channel bandwidths.

From end users point of view, previous mobile generations have implied substantial increase in peak bitrates (i.e. physical layer net bitrates for short-distance communication). However the major difference from a user point of view between 4G and 5G techniques must be something else than increased maximum throughput; for example lower battery consumption, lower outage probability (better coverage), high bit rates in larger portions of the coverage area, cheaper or no traffic fees due to low infrastructure deployment costs, or higher aggregate capacity for many simultaneous users.

2. The evolution of "g" from 1st to 5th generation

New mobile generation has appeared approximately every 10 years since the first 1G system, Nordic Mobile Telephone, was introduced in 1981. The first 2G system was commercially deployed in 1992, and the first 3G system appeared in 2001. 4G systems fully compliant with IMT Advanced were first standardized in 2012. The development of the 2G (GSM) and 3G (IMT-2000 and UMTS) standards took about 10 years from the official start of the R&D projects, and development of 4Gsystems began in 2001 or 2002.[3][4] Predecessor technologies have been present on the market a few years before the new mobile generation, for example the pre-3G system CdmaOne/IS95 in the US in 1995, and the pre-4G systems Mobile WiMAX in South-Korea 2006, and first release-LTE in Scandinavia 2009. In April 2008,NASA partnered with Machine-to-Machine Intelligence (M2Mi) Corp to develop 5G communication technology

The telecommunication service in World had a great leap within a last few year. 6 billion people own mobile phones so we are going to analyze the various generations of cellular systems as studied in the evolution of mobile communications from 1st generation to 5th generation.

We can analyze that this could be due to increase in the telecoms customers day by day. In the present time, there are four generations in the mobile industry. These are respectively 1G- the first generation, 2G- the second generation, 3G- the third generation, and then the 4G- the forth generation,5G-the fifth second generation.

2.1. 1G Generation:

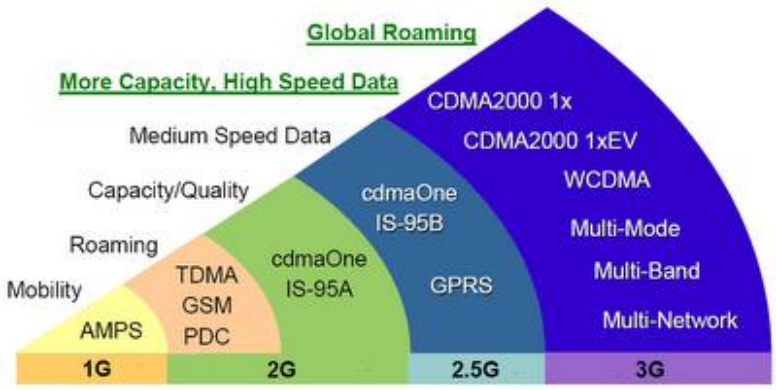
The first generation of mobile phones was analog systems that emerged in the early 1980s. More popularly known as cell phones. 1G- technology replaced 0G technology, which featured mobile radio telephones and such technologies as Mobile Telephone System (MTS), Advanced Mobile Telephone System (AMTS), Improved Mobile Telephone Service (IMTS), and Push to Talk (PTT). Its successor, 2G, which made use of digital signals, 1G wireless networks used analog radio signals. Through 1G, a voice call gets modulated to a higher frequency of about 150MHz and up as it is transmitted between radio towers. This is done using a technique called Frequency-Division Multiple Access (FDMA). But its fail in some field such as in terms of overall connection quality, 1G compares unfavourably to its successors. It has low capacity, unreliable handoff, poor voice links, and no security at all since voice calls were played back in radio towers, making these calls susceptible to unwanted eavesdropping by third parties.

2.2. 2G Generation:

The second generation, 2G system, fielded in the late 1980s and finished in the late 1990s, was planned mainly for voice transmission with digital signal and the speeds up to 64kbps. Second Generation (2G) wireless cellular mobile services was a step ahead of First Generation(1G) services by providing the facility of short message service(SMS) unlike 1G that had its prime focus on verbal communication. The bandwidth of 2G is 30-200 KHz. During the second generation, the mobile telecommunications industry experienced exponential growth in terms of both subscribers and value-added services.

3. Comparison between these technologies

Mobile generations typically refer to non–backward-compatible cellular standards following requirements stated by ITU-R, such as IMT-2000 for 3G and IMT-Advanced for 4G. In parallel with the development of the ITU-R mobile generations, IEEE and other standardization bodies also develop wireless communication technologies, often for higher data rates and higher frequencies but shorter transmission ranges. The first gigabit IEEE standard was IEEE 802.11ac, commercially available since 2013, soon to be followed by the multigigabit standard WiGig or IEEE 802.11ad.A look at the definition, throughput and technology used for various generations of telecom technology. The comparison between 1g, 2g, 3g, 4g, 5g helps analyze capabilities of each of the technologies and features that can be supported by each of them [1].



Generation (1G, 2G, 3G, 4 G, 5G)

4. 5G TECHNOLOGIES

Wireless network virtualization: Virtualization will be extended to 5G mobile wireless networks. With wireless network virtualization, network infrastructure can be decoupled from the services that it provides, where differentiated services can coexist on the same infrastructure, maximizing its utilization. Consequently, multiple wireless virtual networks operated by different service providers (SPs) can dynamically share the physical substrate wireless networks operated by mobile network operators (MNOs). Since wireless network virtualization enables the sharing of infrastructure and radio spectrum resources, the capital expenses (CapEx) and operation expenses (OpEx) of wireless (radio) access networks (RANs), as well as core networks (CNs), can be reduced significantly. Moreover, mobile virtual network operators (MVNOs) who may provide some specific telecom services (e.g., VoIP, video call, over-the-top services) can help MNOs attract more users, while MNOs can produce more revenue by leasing the isolated virtualized networks to them and evaluating some new services

5G Technology stands for 5th Generation Mobile technology. 5G mobile technology has changed the means to use cell phones within very high bandwidth. User never experienced ever before such a high value technology. Nowadays mobile users have much awareness of the cell phone (mobile) technology. The 5G technologies include all type of advanced features which makes 5G mobile technology most powerful and in huge demand in near future [2].

A user can also hook their 5G technology cell phone with their Laptop to get broadband internet access. 5G technology including camera, MP3 recording, video player, large phone memory, dialling speed, audio player and much more you never imagine. For children rocking fun Bluetooth technology and Pico nets has become in market.

5.Conclusion

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 a bright future because it can handle best technologies and offer priceless handset to their customers.

As data traffic has tremendous growth potential, less than 4G existing voice centric telecom hierarchies will be moving flat IP architecture where, base stations will be directly connected to media gateways. 5G will promote concept of Super Core, where all the network operators will be connected one single core and have one single infrastructure, regardless of their access technologies. 5G will bring evaluation of active infra sharing and managed services and eventually all existing network operators will be MVNOs (Mobile virtual network operators).

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