

Nanotechnology in 5G Wireless Communication Network: An Approach

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Abstract - 5G is acronym of the Fifth Generation. 5G is the wireless communication network in Mobile Technology. The generations are travelled from 1G to 5G. Every generation have various features and function. In fifth generation WWW (World Wide Wireless Web, Dynamic Ad-hoc Wireless Network (DAWN) are developing. Generation by generation increasing the demand for high data rates and for this wireless application are required. This technology may be launched in 2020. Fifth generation network technology is depend on nanotechnology and all IP network. 5G can be cross the speed and connectivity. The 5G network technology should be offer various services like documentation, electronic transactions etc. Nowadays the people are more aware about the technologies. And also they are showing their interest for the use of this technology. So the main goal of 5G network technology is to design a real wireless world which should be free from various obstacles. The 5G network technology is more innovative and attractive technology which will be helpful for the user of various field or professionals. The paper covers the approach towards the Nanotechnology and the architecture, advantages and applications of the 5G wireless network communication technology.

Key Words: 5G, WWW, DAWN

1. INTRODUCTION

The abbreviation of 5G wireless communication network is 5th Generation Mobile Technology. It is the upgraded version of 4G technology which is existed and established before days. Now a day, Smart Phones are using the customer more than mobile phones. Because of with the smart phones, the various technologies are built up. Fifth generation technology is provide very high bandwidth which is never experienced before and also it provide advanced features which makes it more powerful than the 4G technology. All wireless and mobile networks implement all IP principle, that means all data and signaling will be transferred via IP (Internet Protocol) on network layer [5]. The user can connect their cell phone to laptop and access the internet by using 5G technology. 5G terminals might have software defined radios it has different modulation schemes and error control schemes [7] without streaming it provide the number of channels.

5G networks make use of this flat IP concept to make it easier for different RAN to upgrade in to a single NanoCore network. The 5th Generation networks have an approach to use Nanotechnology as defensive tool for security concern that arises due to IP Address. Certainly Flat IP network is the key concept to make 5G acceptable for all kind of technologies. Real time data applications are delivered over mobile broadband networks. Therefore wireless operators are turning to IP architectures. IP architectures provide a platform to identify those using symbolic names. This is of more interest to mobile broadband network operators. With the shift to flat IP architectures, mobile operators can:

- i) Mitigate the network elements in low cost and expenditure.
- ii) As per emerging applications delivering service should be partially decouple.
- iii) Minimize system latency and enable applications with a lower tolerance for delay;
- iv) Should be greater flexibility in network planning and deployment.
- v) Develop a flexible core network that can serve as the basis for service innovation across both mobile and generic IP access networks
- vi) Create a platform that will enable mobile broadband operators to be competitive, from a price /performance perspective, with wired networks.

2. RELATED WORK

The Author [1] tried to help to promote much stronger links between people who will be working and dealing with the very latest future concepts of communication networks, clouding, Internet services and moreover all the functionalities of Nanotechnologies. In paper [2] discusses all of the topics about 5G, then identifying key challenges for future research and preliminary 5G standardization activities, while providing a comprehensive overview of the current literature, and in particular of the papers appearing in this special issue. In this paper [4] the author has surveyed 5G wireless technology. 5G technology is modeled as an open platform that offers the best Operating System and lowest cost for a specific service using one or more than one wireless technology at the same time. There are lots of

improvements from 1G to 5G wireless technology. 5G include latest technologies such as SDR, cognitive radio, cloud computing, nanotechnology based on All IP Platforms along with high security, high data rate. This article [5] outlined the challenges that will be faced to realize these Things and, more importantly, to enable their communication and networking, with paradigm-shifting techniques for the fields of communication and network engineering. The author believes that the IoBNT research field, while still in its infancy, will result in a game-changer technology for the society of tomorrow.

3. OBJECTIVES & FEATUERS OF 5G

i) Elevated Service Quality and User Experience-

Consumer expectations for mobile broadband service quality are growing in parallel with traffic complexity and increase usage. Complex and constantly evolving multivendor networks and services are placing considerable demands on service management. The focus shifting towards managing the delivery of high-quality services i.e., support service centric and user-centric management.

ii) Consistent Connectivity Experience-

The next wave of the Digital Society will be characterized by an ICT network's capability for immediate service availability and on-demand adaptability. An instant immediacy in mobile services will lay the foundation for a whole new set of mobile apps to proliferate and push the capabilities of communications beyond what is currently possible. Widespread adoption of M2M services will be encouraged when there would be provision of higher network capacity required for handling enormous connections.

iii) Ability to Handle Disruptive Growth in Network Capacity-

Server workloads are growing by 10% a year. Network bandwidth demand is growing by 35%. Storage capacity is growing by 50%. Power costs growth is 20%. Throwing more capacity at demand is not the solution; there is a need to optimize capacity in new ways. Over 1.5 billion Web pages are accessible, 450,000 iPhone apps are being accessed, over 200,000 Android apps are being used, and 10,500 radio stations are existing. All drives demand for IT.

iv) Features of 5G Network-

i) The 5G network technology offer high resolution for all the mobile users.

- ii) We can say, 5G network technology is bidirectional system.
- iii) The 5G network technology can be provide the effective and attractive features.
- iv) That provides high quality services which are used to avoid the errors.
- v) It takes very fast actions like searching, downloading, uploading and so on.
- vi) 5G connectivity speed up to 25 Mbps.
- vii) The 5G Support virtual private networks.
- viii) The speed of downloading and uploading touching the high peak.
- ix) By using 5G technology the user can get better and fast solution.

4. NANOTECHNOLOGY

Nanotechnology is the application of nanoscience which is used to control the process on nanometer scale between 0.1 and 100nm. Nanotechnology is considered as the next industrial revolution, and the telecommunications industry will be radically transformed by it in a few years. As the future applications will require more memory and computing power to offer higher data rates, current technologies cannot resolve these challenges. For power efficient computing, sensing, memory enlargement, and human machine interaction it is providing effective solutions. After some days nanotechnology should be the next industrial revolution. There are some impacts of nanotechnology on both mobile device as well as core network as follows:

- In modern world, the mobile device has become more than a communication device. Now in an intelligent way, both the computation and communication can be serve the user. Mobile devices together with the intelligence, embedded in human environments, will create a new platform that enables ubiquitous sensing, computing, and communication [5]. By using nanotechnology, mobile phones should act as intelligent sensors which have various applications in many industries like transportation, communications, medicine and safety.
- There is a need of high speed and a reliable capacity to core network for manipulating and interoperating the increasing number of various access technologies. Now days, the Digital Signal Processing (DSP) Fabrication using nanotechnologies and it increase the overall system speed and capacity.

a) Nano Equipment (NE)

Now days, mobile phones are using more purpose rather than communication. These mobile are referred as nano equipment which is used with Nano-technology in 5G Nano core. By using this system the computation and communication are always available and ready for serving the user in intelligent way. For this there is require mobile as a device and this device will be embedded in human environment like home, office, public places. Graphene's Transistor, Micro-Micro Phones, Liquid lens, Intelligent Batteries, Nano Sensor: Physical, Chemical, Biosensor [6].

b) Morph:

Morph is come from greek word Morphe which is means shape. Morph tells that how the future mobile device will work that how much is flexible. It demonstrate the ultimate functionality that nanotechnology might be capable of delivering: flexible materials, transparent electronics and self-cleaning surfaces.

c) GPS:

In future nanotechnology will add to the cell phones by using carbon nano tube, vaccum tube, microscopic microphones, liquid lenses, compasses which will linked with global poisoning system satellites and electronic noses.

d) Nanotechnology over Core Network:

Nano core requires high speed and reliable capacity for manipulating a large task as a single entity and for maintaining a balance in security aspects. The recent core like Wimax, LTE can't fulfill these requirements. But by using nanocore with nanotechnology will fulfill the requirements. Now a day, creating platforms for supporting NanoCore elements requires performance, flexibility and extensibility in the hardware/software infrastructure. For media conversion and transcoding required DSP farms. The need to combine these functions like controlling and signaling within highly available and "network ready" chassis makes Advanced TCA the ideal architecture. Advanced TCA enables the appropriate connectivity as well as the infrastructure to support high Density DSP cards [6].

e) Storage capability, speed and improved security:

Nanocore has the ability to store more amount of data. And for storing need more memory. The user can access the data, applications and gives the security.

f) Nano dots:

Nano dots have the number of discrete balls which are made of hundred nickel atoms. It allows holding a single bit of data 1 or 0. Nanodot is implemented on both Nano Equipment as well as Nano Core.

5. NANOCORE SHARING

Infrastructural level of sharing is normal thing in the telecom and there are two types of infra sharing as given below [5].

- Active Infra Sharing
- Passive Infra Sharin

To achieve a single shared nanocore for network enhancements, a passive infra sharing which leads to the commercial deployment has to done in short span of time. It effects on net and it reduces the CAPEX (Capital Expenditure) requirements by creating a very affordable and less cost to end user. Because of flexible functionality of nanocore should be handled by global vendor or small vendors can be manageable to their own extends. In the long run all the functionalities can be successfully added once the existing operators become Mobile Virtual Network Operator (MVNO).

6. CONCLUSION

5G technology is the Mobile Wireless Communication Technology which has the bright future. Because it has the best technologies and it will easily available in the market. It has the attractive features. It has the high bit rate, no traffic at the time of accessing the data. The 5G technology is implemented with nanotechnology so it will helpful for the various professions and also helpful for our society. The 5G technology will help to promote the link between the people which are working in various fields on the basis of mobile communication, nanotechnology and all IP networks. It is the intelligent technology and can be work nanocore by using the Artificial Intelligence. By using 5G technology, more opportunities will be available.

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