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THE FIFTH GENERATION TECHNOLOGY FOR MOBILE COMMUNICATION

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ABSTRACT

The aim of this essay is a thorough examination of Fifth Generation mobile communication technology. Current technological effort is connected with Fifth Generation technology in mobile communication. Fifth Generation research involves developing the World Wide Web, the Dynamic Ad-hoc Wireless Networks, and Real Wireless Communications. Research has been done throughout the years. 802.11 wireless local area networks and 802.16 Wireless metropolitan area networks, ad-hoc wireless network people area networks, and Wireless digital communications networks are the most important technologies for Fifth Generation technologies. Fourth Generation technology will cover a variety of standards in a shared Third Generation similar environment with IEEE 802.xx integrated mobile wireless network from the outset. The primary input of this article are the key provisions of mobile communication technology of Fifth Generation. Mobile consumers have put greatest focus in Fifth Generation technology compared to others. Fifth Generation Technology represents mobile technology for the fifth generation. Fifth Generation technology is intended to make extremely high bandwidth utilization of mobile phones. The consumer never has the greatest technology of value as Fifth Generation. Fifth Generation technologies include all sorts of state-of-the-art features, making Fifth Generation technology the leader in the near future.

KEYWORDS: *Fifth Generation Mobile, Fifth Generation Technology, Architecture, Mobile Terminal, Wireless Networks.*

INTRODUCTION

Over the past several years, mobile and wireless networks have evolved significantly. Many mobile phones now include a Wi-Fi adapter as well. It may be expected that, in addition to their Third Generation, Second Generation, WLAN, and Bluetooth and so on, many mobile phones also include wax adapters. For both generations, we have expanded the study of integration with IP 2.5 Generation and the Third Generation Public Land Mobile Networks on the one hand and WLAN on the other. With respect to Fourth Generation, its goal is to integrate mobile phone network like GSM and Third Generation perfectly. Multi-mode consumer terminals are regarded to be Fourth Generation, although extra security measures and compatibility for specific wireless technologies continue to be a problem. However, integration across different wireless networks is still being done today in reality. Although multiple wireless networks from a single terminal are used, distinct wireless access techniques are not used for the same session. The anticipated OWA is intended to provide open baseband processing modules with open interface settings. The OWA is connected to future (Fourth Generation) mobile MAC/PHY layers. The Fifth Generation terminals have radio software and modulation techniques developed, and the Internet may download new error control systems. The improvement is seen as a focus on Fifth Generation mobile networks in consumer terminals. The Fifth Generation mobile terminals will concurrently have access to multiple wireless technologies. Special flows from various technologies should be integrated with the Fifth Generation mobile terminal. The network is trustworthy for user mobility management. The Fifth Generation terminal is the final option for a particular service by different mobile network access providers. The article offers the idea of a smart Internet telephone that mobile phones can prefer (see Fig. 1)[1].

Fig.1: What Is 5G Technology And How Must Businesses Prepare For It?

Challenges in Migration from Fourth Generation:

- With Fourth Generation, a single user terminal will have to be built to operate over multiple wireless networks and solve design challenges such as device size limitations, cost and power consumption. The radio technique can solve this issue.
- The unique characteristics and functions of each wireless system. The finest technology to select for a specific service at a certain place at a given time. This will be done by choosing the customer quality of service requirements according to the best possible fit.
- Reconfigurable, adaptable and lightweight protective methods should be developed.
- Integrating the existing non-IP and IP-based systems and delivering QoS guarantee for end-to-end services that involve various systems is a problem.
- It is challenging to collect, manage and aggregate the Consumers' account information from numerous service providers. In the same manner Consumers' billing is also a tough job.
- Software programs which will provide a new function to the customer but will start new problems.
- Spoofing involves false GPS signals being sent out, in which case the GPS receiver thinks that the signals comes from a satellite and computes the incorrect coordinates. Criminals may make advantage of such methods. Jamming happens when a transmitter putting out signals at the same frequency shifts a GPS signal.
- If a GPS receiver will connect with the main transmitter then the communication link between these two is not difficult to break and customer must utilize encrypted data.

Theoretical Framework:

- Fifth Generation Technology is a phrase for the next most important step in mobile communications standards beyond Fourth Generation standards used in various research papers and projects. Fifth Generation is presently not an official term used for any specific criteria. 3GPP version beyond Fourth Generation and LTE[2].

LITERATURE SURVEY

T. Janevski stated in the paper that with the 2.5 generation of mobile cellular networks, integration of mobile networks with the Internet has started. Today, internet traffic is globally dominant. For the development of future wireless networks, the need for higher data rates for data traffic and new IP-based services is essential. Even Third Generation with up to 2 Mbit/s could not provide data speeds used by Internet users utilizing fixed broadband or wired local area networks. In this situation, data rates were not provided. Wireless LAN was the solution to provide faster speeds in the wireless network, but was originally developed to extend the wired wireless LAN to the wireless domain. We propose a method for interoperability between the mobile cellular network and the WLAN in this post. This is a solution. Authentication, authorization, and accounts, i.e. AAA, for the integration of the two networks, cellular and WLAN, are carried out. For this goal, we have developed a Wi-Fi access controller and a Wi-Fi AAA gateway to provide gateway access control, charging and accounting capabilities for the Wi-Fi service. We have evaluated the current state of development of all network entities and

protocols required for the expansion of these components. The solution is an inexpensive and simple to use PLMN-WLAN Internetworking scenario[3].

J. McNair et al. stated in the paper that revolutionary Fourth Generation drivers include push-through seamless personal and end-station mobility towards ubiquitous wireless access and all-round computing. The creation of a vertical handoff protocol for users traveling between various kinds of networks is one of the major challenges for seamless mobility. Habits, policy metrics and radio link transfer processes historically used handoff detection policies cannot adapt or respond to changing user inputs and network accessibilities to dynamic handoff criteria. They cannot offer context-conscious services or provide interoperability for network operations. New methods are thus required to manage user mobility among different kinds of networks. This article provides a tutorial on design and vertical handoff performance issues in an envisioned fourth-generation multi-network system. Various Third Generation and beyond network topologies, such as wireless LANs, cellular, satellite and Mobile IPs are explored. In a diverse network context, the issue of vertical handoff is then explained. Finally, research efforts are being explored to solve remaining difficulties, including new methods for dynamic decision-making and algorithm identification and contextual transmission of radio connections[4].

W. Lu presented in the article that this article presents a mobile terminal open-label wireless architecture, which concentrates on an open baseband processing platform, which supports various existing and future wireless communication standards by multi-dimensional open baseband processing modules and baseband management systems. The article provides a multi-layered open architecture platform for system flexibility to optimize and minimize terminal power consumption so that wireless and mobile terminal communication systems are integrated and convergent next-generation. For full openness and simplicity, the OWA platform is fully compatible with computer architecture and interface rather than system architecture based on transmission[5].

M. R. Bhalla et al. stated in the article wireless communication is the distant transfer of information without requiring upgraded electric conductors or cables. The distance may be a few of meters as on TV or millions of kilometers for radio communications) (thousands or millions of kilometers for radio communications. The term is usually shortened to 'wireless' when the context is clear. It comprises various types of two-way, fixed, mobile and mobile radio, cellular telephones, PDAs, and wireless networking. In this essay, we will highlight the history and development of mobile technology in consecutive generations and their significance and benefits across the globe. Mobile wireless technologies have experienced the technical revolution and development of 4 to 5 generations over the last several decades. Mobile wireless research is currently focused on improving Fourth Generation technology and Fifth Generation technology deployment. Fifth Generation term is not presently used officially. Fifth Generation research is being conducted on the development of the WWW, the Adhoc Wireless Networks Dynamics and the WWW[6].

DISCUSSION

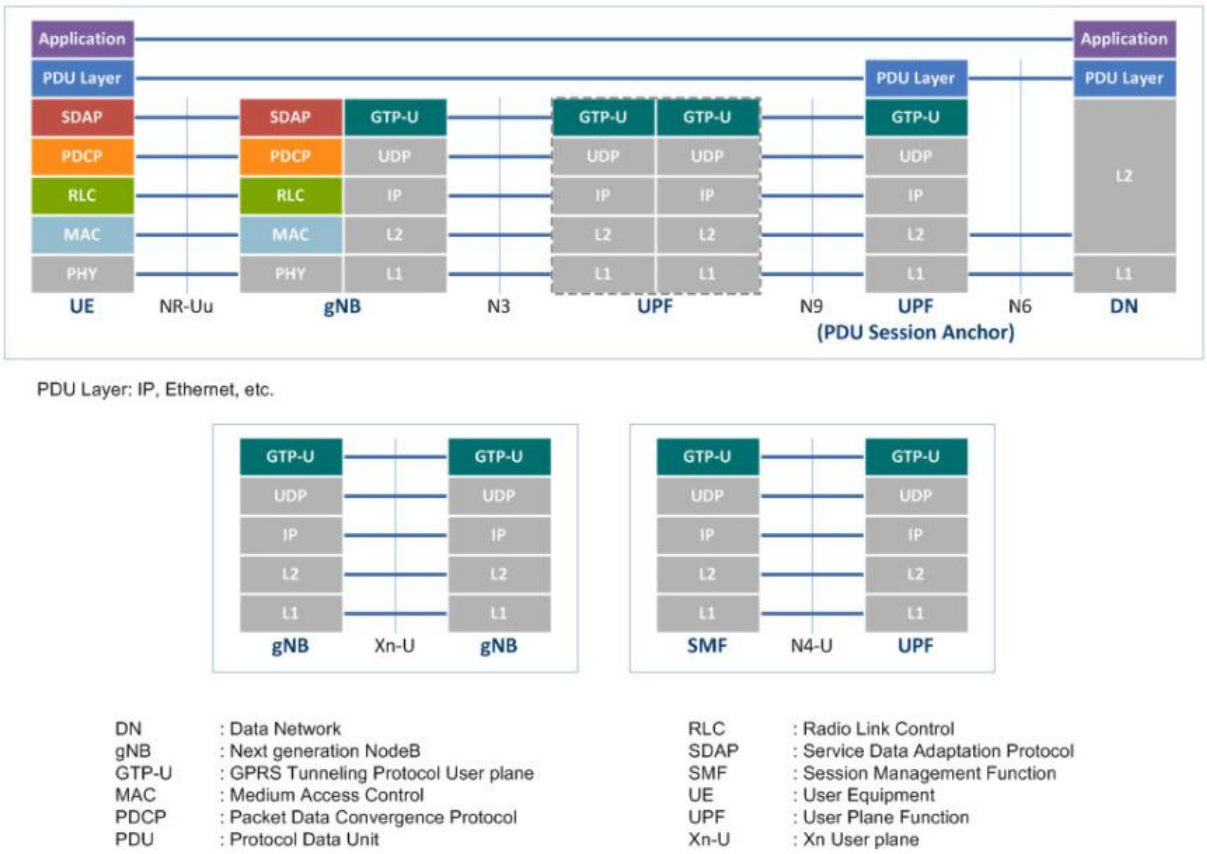

Fig. 2: Concept of Fifth Generation Technology explaining protocol stack for Fifth Generation.

Fig. 2 establishes the wireless technology and the layers for physical and media access control, i.e. OSI Layers 1 and OSI Layers 2. The Fifth Generation mobile networks are presumably based on open wireless architecture for these two tiers.

The network layer will be IP, since there is no competition at that level currently. The worldwide IPv4 has many problems including limited address space, and no significant QoS support per flow. These issues are addressed with IPv6, but are exchanged with a considerably bigger packet header. Mobility is still a problem. The Mobile IP standard is available on one side as are different choices for small mobility. The mobile IP is used for all mobile networks at Fifth Generation, each mobile terminal being FA (foreign agent) and keeping the Care Of Address mapping (CoA) for the current wireless network between its fixed IPv6 and CoA Address. However, multiple mobile or wireless networks may concurrently be linked to a cellphone. In this case, separate IP addresses will be kept on each radio interface while the IP addresses of the FA installed on the mobile phone will be each CoA. Fifth Generation phone makers will incorporate the fixed IPv6 on the mobile phone. The Fifth Generation mobile telephone features a multi-wireless virtual network environment. The network layer should be split into two sublayers of Fifth Generation mobile devices for this purpose i.e. the lower network layer (for

each interface) and the higher network layer (for the mobile terminal) (for the mobile terminal). This is because the Internet was originally created and the entire routing is reliant on the IP addresses which in every IP network worldwide should be distinct. The Upper-Level-Network (Fig. 2) intermediary program must maintain the Upper Network Address Translation (IPv6) into different Lower Network IP Addresses (IPv4 or IPv6), and vice.

Mobile and wireless networks vary in terms of transport layer from wired networks. In all TCP versions it is believed that lost segments are the consequence of network connectivity, but in the event of network wireless losses due of higher radio interface bit error. TCP modifications and adaptations for mobile and wireless networks are thus suggested, which broadcast the missing or impacted TCP segments exclusively through the wireless channel. Mobile terminals for Fifth Generation are suitable for downloading and installing transport layers. The versions of those mobiles (e.g. the TCP, RTP and so on or the New Transportation Protocol) that are targeted at a particular wireless technology installed at base stations should be accessible for the download. This is called the Open Protocol to Transport[7].

The last requirement from the Fifth Generation mobile terminal is that intelligent QoS management be given over a variety of networks with respect to the apps. Today, customers choose the wireless interface for their specific Internet service manually on mobile phones without utilizing QoS history in order to buy the finest wireless connection for a given service. Fifth Generation telephone provides the ability to evaluate service quality and store measurement information in mobile terminal information bases. The QoS parameters, such as delay, jitter, losses, bandwidth, dependability, are maintained in a Fifth Generation mobile phone data base to make the best wireless connection with the required QoS and personal cost constraints accessible through sophisticated algorithms that work in a mobile terminal. 4G will be able to offer a range of new services and models. For their interaction with Fourth Generation systems design, these services and models need to be further explored. By the time Fourth Generation is deployed, the process of IPv4 Address Extension should be completed. IPv6 support for Fourth Generation is thus needed to handle a large number of wireless devices. By increasing the IP number, IPv6 removes the need of Network Address translation. A wide variety of novel coding methods may be developed for Fourth Generation units and applications, which may assist with the deployment of the Fourth Generation network and services with available space and addressing bits in IPv6. The fourth generation seeks to fulfill PCC's goal - a vision that provides high data speeds in all wireless networks affordably. There must be minimal implementation complexity and an efficient negotiation mechanism between end-users and the wireless infrastructure in future wireless networks. For mobile wireless users, the Internet promotes the increase of data rates and speed access. This drives a development of the basic mobile IP network[8].

The Fifth Generation mobile phone design is being developed to respond to the QoS and price needs of upcoming applications such as wireless broadband access and MMS, video chat, mobile television, HDTV content, Digital Video Broadcasting (DVB), minimum voice and data services and other bandwidth services. Fifth Generation has the concept of delivering a sufficient RF, more bits/Hz and linking all heterogeneous wireless networks to provide the user with a smooth, consistent telecoms experience[9].Packet Core Evolved is an IP based core network for LTE and other access technologies developed by the 3GPP (Telecom Standard). The aim of the EPC is to allow simpler access to various services, such as those offered by the IMS, across all IP core

network topologies (IP Multimedia Subsystem). EPC is essentially a Mobility Management Entity (MME) and user datagram's agnostic access portal fir routing. EPC will be a completely new wireless operator architecture which will mimic the IP data communication world rather than the voice-centered wireless world. The IP network theory is based on flat IP. IP architecture is flat.

To this point, mobile networking for the circuit-changed voice has been developed. In order to aggregate, authenticate, control and steer conversations, wireless networks were hierarchically constructed. A BSC aggregates calls from multiple basic stations, allocates radio broadcasts, transfers from base stations to a more centralized mobile switching center. When the packet data networks were established the existing voice-centric architecture was overlaid, using the BSC to handle comparable mobility, the SGSN and GGSN were added for GSM/UMTS, and for CDMA, PDSN to route and manage the data and to connect to the Internet or correctly to the session. Due to the rapid growth in data traffic, this voice-centric architecture with too many network providers has grown noisy and difficult to manage. The flat network design eliminates the network's voice-centered structure. The independent and streamlined data architecture that removes many elements of the network chain may be used rather than overlaying a packet data core on a voice network. Both the BSC operations and the media gateway router are isolated. The base station interacts directly with a media gateway through WAN via the Third Generation Direct Tunnel Carrier Ethernet, MW, and DWDM etc. Certain duties of BSC/RNC, such as radio resource management, radio carrier control and resource dynamic distribution are performed on base stations, while features like paging messages distribution, security are handled in gateway routers by mobility managers. There are clear benefits to this approach. This will reduce Capex and Opex considerably, since there are little hopes and fewer network entities for the service provider. Data flows between endpoints faster by reducing the number of network hops, which substantially reduces network Latency to allow real-time applications like voice over IP, gaming and video-conferencing. WiMAX introduced flat IP designs, which will be flat by definition in future LTE networks[10].

CONCLUSSION

We investigated Fifth Generation mobile communication technology in this research. The Fifth Generation technology is an open platform for various layers from the physical layer to the application. Presently, the present work is carried out in modules which provide one or more wireless technologies from one mobile Fifth Generation simultaneously the best operating system, with the lowest prices for a specified service. A new revolution in Fifth Generation technical development is scheduled to commence, because Fifth Generation technology will make it impossible to finish ordinary PCs and laptops that affect their market value. In the mobile communications industry, there are many advancements from First Generation, Second Generation, Third Generation, and Fourth Generation to Fifth Generation. The new Fifth Generation technology is put on the market at cheap costs, with high expectations, and excellent reliability. Fifth Generation mobile communications network technology will open up a new century. The Fifth Generation mobiles will have access to multiple wireless technologies at the same time, and various flows of different technologies may be combined between the terminals. For passionate mobile customers, Fifth Generation technology offers high-resolution options. Without any interruption, we may watch an HD TV channel on our mobile phones. A Tablet PC

will be accessible on Fifth Generation mobile phones. There will be a lot of mobile technologies integrated.

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