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Comparative study on performance analysis of Wireless Technologies

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Abstract: **The Internet is a Global system of interconnected computer networks that use the standard internet protocol suite. Our ultimate goal is to communicate with any type of information with anyone, at anytime, from anywhere, this is possible with wireless technologies. 3G: Third generation wireless technology is the advanced wireless technology, it enhances the features that are available in 2nd generation. 4G: It supports interactive multimedia, voice, streaming videos etc. 5G: The major phase of mobile telecommunications standards beyond the current 4G/IMT-Advanced standards. 6G: It's a combination of radio and fibre technologies to give your home very best broadband.**

I. INTRODUCTION

3G: Japan was the first country to commercially launch 3g in 2001.the transition to 3g was completed during 2005/2006 in Japan. In 2005, there were 23 networks Worldwide, operating 3g technology some are only for test use and some operations are providing services to consumers. The main reason for the evolution of 3g was due to the limited capacity of 2g networks.2g networks were built for voice calls and slow data transmission, but these services were unable to satisfy the requirements of present wireless revolution. International telecommunication Union (ITU) has defined the demand for 3g in international mobile telecommunication (IMT)-2000 standards to facilitate growth increase bandwidth, support diverse applications. The development like 2.5g or GPRS (General packet radio service) and 2.75g or edge(enhanced data rates for GSM evolution) technologies act like bridge between 2g and 3g.

4G: The 4G Networks was originally envisioned by the defense advanced research projects agency (DARPA). The DARPA selected the distributed architecture and end-end internet protocol (IP) and believed at an early stage in peer to peer networking in which every device would be both at transceiver and router for other devices in the network. The transition to 4g was completed during 2011/2012 to be followed by "real" 4g, which refers to all IP networks giving mobile ultra broadband. **5G:** the next major phase of mobile telecommunications standards beyond the current 4g/IMT-advanced standards. Next generation mobile networks alliance feel that 5g should be rolled out by 2016 to meet business and consumer demands. In addition to simplify providing faster speeds, they predict that 5g networks will also need to meet the needs of new use-cases such as internet of things. **6G:** 6g mobile technology is upcoming naming field of mobile communication technologies, it is based on the set of standards which unable devices to connect internet with broadband wireless access. Complete information about this also follows the path of previous series. This technology can come as 6g mobile technology, 6g mobile, 6g network or 6g Wi-Fi, as these are rising and important technologies. 6g internet is a combination of radio and fiber technologies to give the very best broadband. It delivers speed of from 10mbits to 300mbits to residential users with radio technology by 6g line.

II. 3G TECHNOLOGIES :

The ITU (international telecommunication union) has proposed 3G telecommunications standards to provide cost efficient high quality, wireless multimedia application and enhanced wireless communications.3g can be divided into two categories-one is data rates and the other is security. The main feature of 3G technology is it supports greater voice and data capacity and high data transmission at low-cost .3G mobiles can operate on 2G and 3G Technologies. The second major feature is the security: 3G offer greater security features than 2G like Network Access security, Network Domain Security, User Domain Security, application Security. This technology provides localized services for accessing traffic and weather updates. Video calls and video conference is another major feature in 3g mobile technology. These Features reduces the communication barriers between people, that were not sacked even with mobile phones. All the functions performed in a normal 2G mobile device can be performed in 3G at a higher speed. 3G provides faster connectivity, faster internet access and music with improved quality. The

3G mobile can be used as a modem for a computer which can access internet and can download games and songs at high speed. 3G technology provides high quality voice calls and video calls.

III. 4G TECHNOLOGY

It supports interactive multimedia. Its user Friendliness. High speed, high capacity and low cost per bit. Higher Bandwidths. Terminal Heterogeneity. Network heterogeneity. SPEED: 20Mbps to 100 Mbps. BANDWIDTH: 100MHZ (or more). Localized personalized Information. Organizational Services. Communications Services Entertainment services. Mobile Commerce(m-commerce). Support for interactive multimedia, voice, streaming videos, internet, and other broadband services. IP based mobile system. High speed, high capacity, and low cost per bit. Global access, service portability, and Scalable Mobile Services. Seamless switching and a variety of Service driven Services. Better scheduling and call admission control techniques. Better spectral Efficiency . New Frequencies means Components in cell towers. Higher data prices for consumers. Consumer is forced to buy a new device to support the 4G.It is impossible to make your current equipment compatible with the 4G network.4G is currently available in certain cities within the united states.

IV. 5G TECHNOLOGY

Increased speed up to 1.3GHZ. Higher speeds over longer distances. Less interfaces with other wireless devices. Increased number of clients supported by an access point. Extended battery life . Increased speed is accomplished by wider frequency channels- 80 MHZ, later even 160 MHZ. More MIMO (Multiple Input Multiple Output) spatial streams-even up to 8 per access point. Higher density of modulation – 256-QAM. Beam forming. The most amazing feature of the 5th generation of Wi-Fi is beam-forming. Instead of radiating unidirectional signal, wireless router has concentrated transmission so that more data reaches the targeted devices. Higher speed so that we can easily manage them. Extended Wi-Fi coverage and reduction of dead spots. More stable Wi-Fi connection. Its more fast than 4G Network. Its data bandwidth is up to 1 GBPS and higher. Incompatibility with older Wi-Fi versions-older wireless devices-wireless routers and client adapters can't be upgraded. The upgrade can be done only with hardware replacement. The new devices are much more expensive, because they use more advanced technology. Speed is not so high as it is theoretically. Old devices can't support a new one – hardware replacement is required. Higher cost . All client devices still don't support. Speed and performance of device can vary for different devices. Possible problems with interference .

V. 6G TECHNOLOGIES

6G internet is a combination of radio and fiber technologies to give your home the very best broadband. 6G internet is communications Technology Company that offers wireless internet access with 6G air fiber. The company garnered media attention when they introduced 6G broadband services by rolling out its air fibre network that transmits and receives internet through the air. 6G internet claims to deliver speed of up to 10Mbits to 300Mbits to residential users with radio technology by 6G line. 6G uses air fiber, delivered through the air that allows to receive broadband connections similar to radio technology. It is a combination of radio frequencies and standards to deliver to end users in through their radio distribution and access network. The radio technology is supported by fibre network that transmits high speed internet regardless of your distance from the exchange.6G offers wireless internet services with 10mbits to 300mbits speed. It also offers call packages without physical line. As part of service they provide the provision to you of email facilities, web hosting and other services that involve 6G providing online storage space. 6G's provision of the service is dependent upon the operation of telecom providers. To use this we must have an

operating system: windows me, windows 2000, windows XP, windows vista, windows 7.

System requirements: 200. This network capacity is built to support multiple GBPS internet connections as standards whereas other providers using traditional Infrastructure are trying to support 20Mbps and 40Mbps fibre connections by evolving a network that was originally built to support tiny 2Mbps connection.

VI. ANALYSIS:

3G: In 3g internet the deployment is from 2001-2010. The bandwidth is 2Mbps. Its standards is WCDMA CDMA-2000.Its technology is broadband CDMA,IP technologies, its service is integrated high quality audio, video and data. Its multiple access is CDMA. Its core network is package network. it is horizontal handoff. Its shortfalls are need a accommodate higher network capacity.

4G: In 4g internet the deployment is from 2011.The bandwidth is 2Mbps to 1Gbps.its standards is single unified standard. Its technology is unified IP and seamless combination of broadband. LAN/WAN/PAN and WLAN. Its service is Dynamic information access, wearable devices. Its multiple access is CDMA. Its core network is internet . It is horizontal and vertical standard. The shortfalls are being deployed.

5G: In 5g internet the deployment is from 2015-20 onwards. Its bandwidth is 1Gbps and higher. Its standard is single unified standard. Its technology is unified and seamless combination of broadband. LAN/WAN/PAN/WLAN/& WWWW. Its service is dynamic information access, wearable devices with AI capabilities. Its multiple access is CDMA & BDMA. Its core network is internet. It is an horizontal and vertical handoff. The shortfalls are yet to be implemented.

Comparision table of 3g, 4g , 5g, 6g:

Generation→ Features↓	1G	2G	3G	4G	5G
Deployment	1970 – 1980	1990 - 2001	2001-2010	2011	2015-20 onwards
Data Rates	2kbps	14.4-64kbps	2Mbps	200 Mbps to 1 Gbps	1Gbps and higher
Technology	Analog Cellular Technology	Digital Cellular Technology: Digital narrow band circuit data Packet data	Digital Broadband Packet data: CDMA 2000 EVDO UMTS EDGE	Digital Broadband Packet data: WiMax LTE Wi-Fi	wwww Unified IP seamless combination of broadband LAN PAN MAN WLAN
Service	Analog voice service No data service	Digital voice with higher clarity SMS, MMS Higher capacity packetized data	Enhanced audio video streaming video conferencing support Web browsing at higher speeds IPTV support	Enhanced audio, video streaming IP telephony HD mobile TV	Dynamic Information access, Wearable devices with AI Capabilities
Multiplexing Switching	FDMA	TDMA, CDMA	CDMA	CDMA	CDMA
Core Network	PSTN	PSTN	Packet N/W	Internet	Internet
Standards	MTS AMTS IMTS	2G:GSM 2.5:GPRS 2.75:EDGE	IMT-2000 3.5G-HSDPA 3.75G:HSUPA	Single unified standard LTE, WiMAX	Single unified standard
WEB Standard		www	www(IPv4)	www (IPv4)	wwww (IPv6)
Handoff	Horizontal only	Horizontal only	Horizontal & Vertical	Horizontal & Vertical	Horizontal & Vertical
Shortfalls	Low capacity, Unreliable handoff, Poor voice links, Less secure	Digital signals were reliant on location & proximity, required strong digital signals to help mobile phones	Need to accommodate higher network capacity	Being deployed	Yet to be implemented

the graph of the technologies of 3g,4g &5g in mobile market :

CONCLUSION: In this paper, We have reviewed the 3rd ,4th,5th and 6th generation communication technology and predict the future. The 3rd generation wireless generation was to provide wireless data service with 144kbps to 384kbps in wide coverage areas .It was introduced around the year 2000. In order to provide wireless mobile internet to users as the same quality as the fixed internet network . 4G shall integrate current existing cellular networks and wireless LAN with fixed internet networks. Thus, the feature of 4G is one-word integration. It can be introduced around the year 2010. data path is designed to solve this problem and major the 5G in real wireless world. It can be introduced around the year 2020, data path is designed to solve this problem and the minor the 6G in real wireless world. It can be introduced around the year 2024.

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