LTE; WIMAX: The Next Generation of Mobile Broadband Technology

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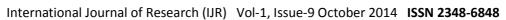nishatrisal@yahoo.in   cprincess20@gmail.com
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Abstract:-
 The paper presented over here is a complete exposure to the precisely used technologies World Wide Interoperability for Microwave Access commonly called as WIMAX and Long Term Evolution called as LTE. Both of these technologies are the most leading and will be used next generation broadband technologies. Driving to the evolution of the next generation mobile broadband service will make users expectation more towards the increase in speed , bandwidth and at all the global access. As customers want more and more information from the various sites available on the net for there business purposes , commercial work, further studies and other activities but they want all this to be possible to them with a higher speed for which such a makeover must be designed which provides such intentions to them. For the wireless network connectors to achieve a greater speed and higher pervasive connectedness there networks should behave like the landline-IP based networks. The line of thinking has changed a lot firstly it was limited to only mobile service but now it has extended to broadband connections same as for customers and service providers. Now, it we talk about the just entered 4G wireless network this network too is based on the TCP/IP, which is the core of internet protocols. These TCP/IP protocols enable the wireless network to operate at higher rates that means they increase the network speed, such as videos and multimedia while supporting the devices and application of future.

 The version wireless uses LTE over the WIMAX as it makes the foundation of the 4G network technology. The wireless company makes that the technology and business over the WIMAX that makes it a superior networking standard.

Introduction:- The below given information will enable us to interpret how these two technologies are related to each other and in the mean time differ from each other. There is technical explanation of

these two technologies that is by the usage of these two technologies the mobile broadband would reach to its higher level of priority.

(a) Long Term Evolution (LTE):- It is probably a suitable word generated for 4G LTE. It is basically a form of wireless communication used for high data speed for phones and data terminals.

It is based on the GSM/EDGE and UMTS/HSPA network technologies, increasing the capacity and speed using a different radio interface together with core network improvements. The standard is developed by the 3GPP (3rd Generation Partnership Project) and is specified in its Release 8 document series, with minor enhancements described.

The Benefits of LTE

- Provides a global ecosystem with inherent mobility
- Offers easier access and use with greater security and privacy
- Dramatically improves speed and latency
- Delivers enhanced real-time video and multimedia for a better overall experience
- Enables high-performance mobile computing.
- Supports real-time applications due to its low latency.
- Creates a platform upon which to build and deploy the products and services of today and those of tomorrow.
- Reduces cost per bit through improved spectral efficiency.

(b) **WIMAX: -** WiMAX (Worldwide Interoperability for Microwave Access) is a wireless communications standard designed to provide 30 to 40 megabit-per-second data rates, with the 2011 update providing up to 1 Gbit/s for fixed stations. The name "WiMAX" was created by the WiMAX Forum, which was formed in June 2001 to promote conformity and interoperability of the standard. The forum describes

WiMAX as "a standards-based technology enabling the delivery of last mile wireless broadband access as an alternative to cable and DSL.

The bandwidth and range of WiMAX make it suitable for the following potential applications:-

- Providing portable mobile broadband connectivity across cities and countries through a variety of devices.
- Providing a wireless alternative to cable and digital subscriber line (DSL) for "last mile" broadband access.
- Providing data, telecommunications (VoIP) and IPTV services (triple play).
- Providing a source of Internet connectivity as part of a business continuity plan.

Smart grids and metering.

Technical Aspect:-

Wireless Technology:-

Wireless technologies enable one or more devices to communicate without an actual wired connection. Radio frequency is used to transmit the data. Such technologies are rapidly evolving to meet a variety of communications needs, from simple to complex.

Wireless communications needs can all be classified in one of three ways, based on the distance they are meant to cover. These include: wireless personal area networks (WPAN), wireless local area networks (WLAN), and wireless wide area networks (WWAN).

Wireless networks form the transport mechanism between devices and traditional wired networks. WPANs are limited to distances under about 10 meters and include technologies such as infrared (IR), Bluetooth® technology, and ultra-wideband (UWB). WLANs cover a local area with distances of individual access points reaching to about 100 meters, and include technologies such as Wi-Fi (802.11a/b/g/n). WWANs cover even larger areas, using cellular data networks. This section discusses some of the most popular and widely used wireless technologies to provide readers with a point of reference for the use of 3G technology.

WPAN:-

WPANs typically provide *ad hoc* network connections designed to dynamically connect devices to other devices within close range of each other. These connections are termed *ad hoc* because they do not generally need to connect to any network infrastructure to operate. They can simply connect to each other and perform necessary communications without the need of any access network devices, such as access points or base stations.

Bluetooth:-

Bluetooth has emerged as the most widely used WPAN network standard. The Bluetooth standard is an industry specification that describes how mobile phones, headsets, computers, handhelds, peripherals, and other computing devices should interconnect with each other. Bluetooth network applications include wireless headsets, hands-free operation, wireless synchronization, wireless printing, advanced stereo audio, dial-up networking, file transfer, and image exchange, to name a few.
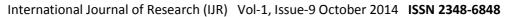
WLAN:-

WLANs provide connections designed to connect devices to wired networks. Unlike a wired LAN, a WLAN does not require cabling to connect the device to a switch or router. Devices connect wirelessly to nearby wireless access points that are attached to the local network using an Ethernet connection. A single access point communicates with nearby WLAN devices in a coverage area of about 100 meters. This coverage area allows users to move freely within range of an access point with their notebook computers, handhelds, or other network devices. Multiple access points can be coordinated together by a network WLAN switch to allow users to hand off between access points.

Wi-Fi:-

Wi-Fi (or IEEE 802.11) is the set of standards established to define wireless LANs. A number of different protocols are defined in the 802.11 family of standards, addressing various operating frequencies and maximum throughputs. The 802.11g standard is currently the predominant protocol deployed in WLAN implementations.

WWAN:-

WWANs provide broadband data networks with a far greater range, using cellular technologies such as GPRS, HSPA, UMTS, 1xRTT, 1xEV-DO, and LTE. Wireless data devices connect to a wireless broadband network through a commercial carrier's data network, allowing broadband performance without the need for a cabled connection to a network infrastructure (much like a WLAN), while providing end users with far greater mobility. These WWANs typically incorporate sophisticated user identification techniques to ensure that only authorized users are accessing the network. Multiple base stations are coordinated by base station controllers to allow users to hand off between base stations (cell sites).

1xEV-DO Rev. A:-

1xEV-DO is the broadband wireless network standard developed by the Third-Generation Partnership Project 2 (3GPP2) as part of the CDMA2000 family of standards. EV-DO networks were first launched based on release 0 of the standard. The standard is currently in revision A, which has been deployed nationally by Verizon Wireless, and provides average download speeds of 600 Kbps to 1.4 Mbps, and average upload speeds of 500 to 800 Kbps, with low latency, typically between 150 and 250 milliseconds.

Conclusion: - From the above discussion we came to know that how the wireless technology varies to us that is how these technology makes an impact on our living. Because this world is truly based on these technology everyone is at beck and call for these internet speed.LTE provides the base to this type of system because it has higher speed efficiency, bandwidth.

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