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Long Term Evalution (LTE)

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***Abstract*: With the increase in usage of mobile phones by the naïve users all over the world, there was a huge demand for data services over these cellular networks. These wireless technologies have been segregated into various generation types based on their time of release and the technology used behind it. There is always an increased demand for increases data transfers over cellular networks with various technologies being released over the time with higher data transmission speeds and affordable prices. After seeing all 2G, 3G technologies, now is the time to upgrade to pay a visit to LTE technology and understand its advantages and have a glance at their underlying technology.**

***Keywords:* MIMO; OFDM; data transmission; frequency bands; mobile networks.**

I. LTE

Long term evolution (LTE) is also another term for 4G technology was developed and finalized by 3GPP, Third generation partnership project. This technology is basically intended to serve a better bandwidth and efficient network. Some of the other highlights of this technology include high speed data transfers, flexible frequency bands, reduced costs for data consumption and shortest latency time. As per data collected from various sources, download data speeds can reach a maximum speed of 326Mbps while the upload speed can reach speeds up to 80 Mbps with a bandwidth between 20-30 Mhz.

Technology adopted by 4G

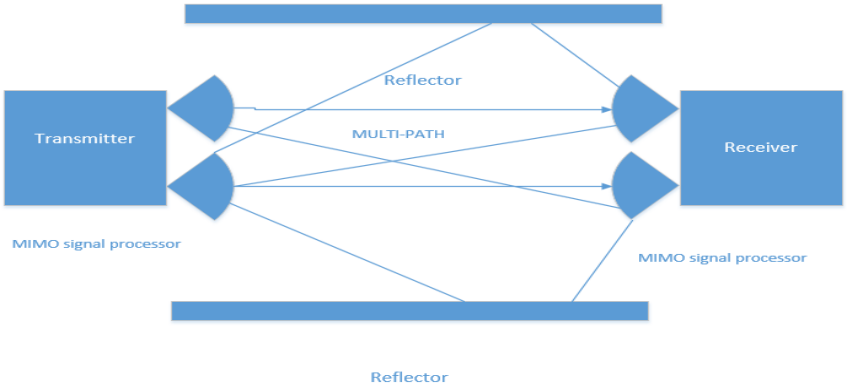
Essentially there are 2 technologies which are being adopted in 4G technology. They are:

a) MIMO(Multiple Input Multiple Output)

b) OFDM(OrthogonalFrequency Division Multiplexing)

II. MIMO (MULTIPLE INPUT MULTIPLE OUTPUT)

MIMO is based on the concept of using multiple antennas both at the mobile terminal and the base station. This is one of the famous antenna technologies which has transceiver and receiver which consists of multiple antennas. But in reality, the transmitter sends a numerous number of streams on many other transmit antennas and each stream will have to go through various unique paths to find the antenna. This technology also allows spatial multiplexing which finally helps in achieving good data transmission rates and signal coverage. MIMO is also classified into two types SU-MIMO and MU-MIMO which means single user multiple input multiple output and multi user single input and single output.



III. OFDM (ORTHOGONAL FREQUENCY DIVISON MULTIPLEXING)

Orthogonal frequency division multiplexing is a technology in which frequency channel is split into a number of smaller sub-channels and sub carriers. The data carriers in the sub carriers are used to carry the data and all these sub carriers are modulated using amplitude modulation or phase key shifting modulation and ultimately provides high data transmission rates.

Basically in OFDM, it allows the process of assigning the carriers to channels and their subsequent subcarriers to sub channels depending upon the conditions imposed on the channels.

Advantages:

- It has efficient data rates and capacities due to the concept of VoIP (Voice over Internet protocol)
- Wireless provides can upgrade to this technology with less costs and eliminates the problem of rebuilding their networking structure. In simple terms we can say that this technology is compatible with previous wireless technologies.
- This technology offers greater quality of service, higher throughput and low latency.

IV. CONCLUSION

Though there is a huge buzz about the LTE from many cellular service providers, it is still in the process of implementation in many parts of the world. This technology is only available in few countries and is still a dream for many others. This is one of the most important barriers which have to be considered on primary note. And more over, the cost for upgrading from 3G to 4G network in terms of hardware is quite inexpensive and this is compatible with the previous technologies. I think a little more research on this technology is appreciated since few things are need to be available to everyone and LTE signal coverage is still in the process of improvement for even the world's leading cellular network providers.

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