

Long Term Evolution: Technologically Advantages over WiMax

¹Nikhil Ranjan, ²Vibhor Sharma, ³Vandana Bharti, ⁴Ankur Chaudhary

¹Dept. of MCA, Tula's Institute (An Engineering and Management College), Dehradun, UK, India

^{2,3}Dept. of CSE, Tula's Institute (An Engineering and Management College), Dehradun, UK, India

⁴Dept. of IT, Tula's Institute (An Engineering and Management College), Dehradun, UK, India

Abstract

The recent increase of mobile data usage and emergence of new applications such as MMOG (Multimedia Online Gaming), mobile TV, Web 2.0, streaming contents have motivated the 3rd Generation Partnership Project (3GPP). In this paper we mainly focus on LTE with 4G technology, its future scope and how it is differ from WiMax.

Keywords

MMOG, 3GPP, WiMax, 4G Technology

I. Introduction

Long Term Evolution abbreviated as LTE is a project of 3rd Generation Partnership Project working in association with the European Telecommunications Standards Institute. LTE was introduced after the outcome of GSM/EDGE and UMTS/HSPA network technologies and is considered as the latest standard in the mobile network technology sector. It is not backwards compatible with 3G system but LTE advanced is compatible with LTE and hence uses the same frequency bands.

Now days, GSM and CDMA are the only two networks that people use across the globe. More than 80% of the global population makes use of the GSM networks and CDMA is widely used in the United States. However, LTE which is currently in development phase can really take over the global mobile network because it has the capability to transition users using 3G technology to 4G technologies keeping the price factor at the minimum level. Most mobile developers across the world know that their consumers are always looking for the faster speeds so that they can access their data and information at lightning speed and they are currently not available on 3G technology but with the help of LTE they can be available on the 4G technology.



Fig. 1: Official Logo of LTE

The appetite for advanced and speeding services of mobile or internet never ends and for the purpose of satisfying the users with a vast range of facilities and benefits far more out of the existing ones the broadband providers have to bring out LTE technology over their networks. Because of this the providers have to shift or say upgrade their network infrastructure completely in order to classify this technology as 4G and is being considered by many mobile broadband providers. That's why the advancement of this technology is to feed the never ending appetite of the mobile technology users.

II. LTE Technology

All network users will find a whole host of great new advantages over their current 3G connections when LTE technology is finally deployed by mobile broadband operators. This will include much faster connection speeds that will allow users to stream high quality audio and video over the internet and also the ability the download much larger data files than they are currently able to over their 3G service. For mobile network providers LTE technology will allow them to support far more users over their network providers LTE technology will allow them to handle much data moving around their network, even during the busiest times of the day. Far better coverage will also be available using LTE technology and providers will need to install less equipment in order achieve this extra coverage, which will greatly reduce the cost of upgrading their network and this will allow them to provide much cheaper services. Users living in rural and remote parts of the country that are currently very limited in the level of fixed line and mobile broadband services they are able to receive will stand to benefit the most from the introduction of this technology as it will provide them with internet access over an affordable high speed broadband connection.

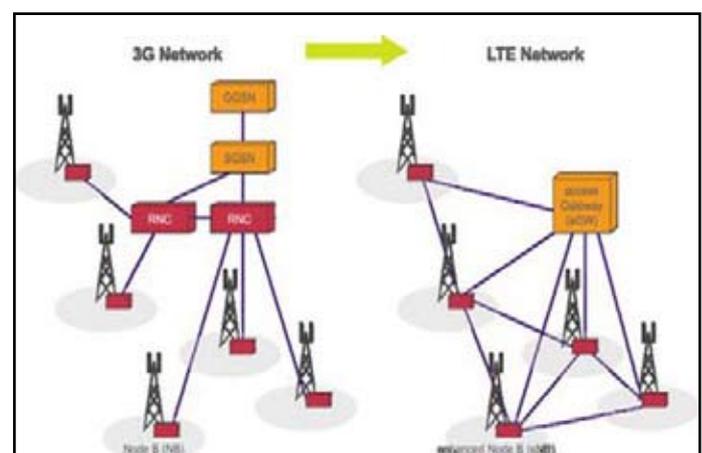


Fig. 2: Conversions of 3G to LTE

The improvement that will be made when LTE technology is finally rolled out in terms of speed, network capacity and coverage will make mobile broadband a far more viable option for many users, whether they are using the service for personal or business

use. Faster connection speeds and greater levels of coverage will allow users to access the internet at a speed of similar to a fixed line broadband connection and this will appeal to existing users who wish to upgrade to a better service and new users who now feel that LTE technology will allow them to do everything they want to do.

III. LTE Vs WiMax

At the moment the biggest rival to LTE technology is WiMax and although they offer almost identical benefits in terms of speed and coverage they are completely different technologies. The cost of the two technologies will also differ, and this may have a major impact on which of the technologies network providers opt for. Even after a number of successful trials of LTE technology there is no guarantee that this will be the technology they use for their next generation networks.

LTE produces high amount of output, has low expectancy, plug and play, FDD and TDD are found to be on the same platform, compared to others much better end user experience and last but not the least it has simple structural design. LTE also supports smooth passing to cell towers with previous network technology like GSM, UMTS and CDMA. When the cost setting up new network infrastructure, upgrading them and installation of new equipment comes, disadvantages arise. For this purpose LTE engages MIMO technology which for data transmission raises the need to use additional antennas. To experience new network infrastructure, the network users must buy new cell phones.

LTE and WiMax both are 4G technologies designed to move data rather than voice. Both are IP networks based on OFDM technology, so rather than rivals such as GSM and CDMA, they are more like siblings. Long Term Evolution or LTE is the next major step in mobile radio communications. The advantages of LTE are higher throughput, low latency, plug and play capabilities, a superior end-user experience and a simplified network architecture resulting in a ten times improvement in cost per-megabyte to carry data traffic.

LTE provides mobile carriers with a single network infrastructure for all services, including voice, Short Message Services (SMS), and broadband data for mobile and fixed end users. Finally, mobile operators can migrate voice and SMS from their congested and costly circuit switched core networks to a more efficient IP based core. The de facto standard for delivering voice over LTE using IP Multimedia System (IMS) is specified in one voice; Voice over IMS profile.

IV. Future Scope

All network users whether for their personal or business use will experience the enhancement in this technology regarding its speed, capacity, coverage and reliability that will make mobile broadband way too feasible. Users being anywhere will be able to access faster connection speeds and greater levels of coverage of internet. Existing users will certainly wish to upgrade to better service and the new users will also benefit from it. The only thing is that WiMax is considered as the rival of LTE technology for now, though they provide some benefits regarding speed and coverage but they are entirely different technologies. LTE technology even being successful in its various trials cannot guarantee to be the technology practiced by the users for their next generation.

Currently, mobile telecom operators are facing the challenge to handle an exponentially increasing and unprecedented capacity demand while trying to be cost-effective. LTE small cells will be a key element of a sustainable mobile broadband business

in the future. The telecom industry has now come to a common understanding that future mobile broadband business must offer a much higher capacity and also need to cope with the continuing traffic increase yet at a low total cost of ownership or TCO. This will not be possible unless we realize LTE small cells in a multi-vendor Het-Net (Heterogeneous Network) environment though a more intelligent, automated, resilient and efficient Self Organizing Network (SON).

V. Conclusion

LTE is the future of the wireless broadband network. This technology will allow users more of what they want, in terms of mobility. Inter-technology mobility offers operators the promise of extracting more value from their access networks and provides them with a powerful set of tools for matching network resources to application requirements. LTE will support more of the products and services in use today, because of its backward compatibility to 3GPP networks. LTE is the technology that delivers the next generation of mobile services and applications to its users.

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Nikhil Ranjan is working as an Assistant Professor in the Tula's Institute, Dehradun (An Engineering & Management College), UK, India.



Vibhor Sharma is working as a Lecturer in the Tula's Institute, Dehradun (An Engineering & Management College), UK, India.



Vandana Bharti is working as a Lecturer in the Tula's Institute, Dehradun (An Engineering & Management College), UK, India.



Ankur Chaudhary is working as a Lecturer in the Tula's Institute, Dehradun (An Engineering & Management College), UK, India.