

An Overview of LTE Technology and its Applications in Telecommunication Domain

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Various wireless access technologies i.e. both the non-3GPP and 3GPP are beyond the Long Term Evolution (LTE) and connected to the Evolved Packet Core System (EPC), for example Wi-Fi (Wireless Fidelity). The wireless access technologies predicted that mobile data traffic may increase the high capacity demands. The improved device capabilities and new services indicates that the consumer data-rate and mobile broadband traffic demands are growing at an unprecedented rate. The mobile broadband traffic are increased at high rate and the Ericsson reports specify that world total mobile data traffic in 4G, 3G and 2G networks will have possibilities to grow 10-fold between 2011 and 2016.

Keywords: Wireless Networks, Long Term Evolution (LTE), Evolved Packet Core System (EPC), Wireless Fidelity (Wi-Fi).

1. INTRODUCTION

The word LTE stands for Long Term Evolution and it is the preferred path for the development of HSPA/GSM/W-CDMA networks deployed presently and a choice for CDMA networks evolution [1]. This potential evolution will develop networks to provide greater throughput of data to mobile terminals required to provide advanced and new services of mobile broadband. The major aim of LTE is to offer these services with quality at least similar to what an end-user can enjoy now-a-days using their fixed access of broadband at home, and to lower down expenses of operation by means of implementing flat Internet Protocol architecture [2]. Across the world thousands of millions of subscribers are already popular with mobile broadband whether browsing internet or passing mails using High Speed Packet Access enabled notebooks; sending and gaining music or videos using 3G phones or by exchanging fixed Digital Subscriber Line modems with USB dongles or High Speed Packet Access modems. LTE will develop the experience of user for such tasks and more data requirement and demanding tasks such as interactive television, advanced professional and gaming services and mobile video blogging. While LTE will rise over time the 100 Mbps speed of downlink can be gained already through present appliances [3]. LTE infrastructure is configured to be as simple as available to unfold and perform through flexible technology that can be used in a vast number of frequency bands. Long Term Evolution is possible in more than 160 appliances mainly mifis, built in modems, dongles and tablets [4].

Some of the main driving forces that cause overwhelming increase in the mobile data traffic are: high bandwidth cellular data networks deployment e.g. LTE (Long Term Evolution); improved connected device capabilities and incredible growth of new mobile

services; increasing data applications will cause more and more traffic on cellular networks; flat-rate mobile data pricing and internet services are mainly online advertising and it provides more bandwidth demanding services, e.g. VoIP, mobile TV, YouTube, Video on demand, online game play, large file download, etc.

The overwhelming growth of mobile data traffic has some effect on both the end-user experience and the provider's network operator. This makes the data traffic makes high pressure on the network resources. The network congestion will prevent the cellular voice users from the network accessing. Network congestion makes the worst effect on the growth of operators. The network congestion is one of the major problems for the operators that must need an immediate attention.

2. MEANING AND DEFINITION OF LTE

Sacristan, Monserrat, Penuelas et al. have defined the LTE as a wireless broadband technology configured to help roaming access of Internet through handheld appliances and mobile phones [5]. Because LTE provides essential developments over older communication standards of cellular some had known it as 4G (fourth generation) technology along with Wi-Max.

Conversely Parkvall and Astely [6] defined that LTE is assumed by several to be evident successor to present generation of Universal Mobile Telecommunication System 3G technologies which is based upon HSPA, WCDMA, HSUPA and HSDPA [6,7]. LTE is not replacement for Universal Mobile Telecommunication System in the way that Universal Mobile Telecommunication System was a replacement for Global System for Mobile but rather an update to Universal Mobile Telecommunication System technology which will enhance it to offer essentially quicker rates of data for both downloading and uploading [8]. The Figure 1 shows the 3GPP technology evolution as:

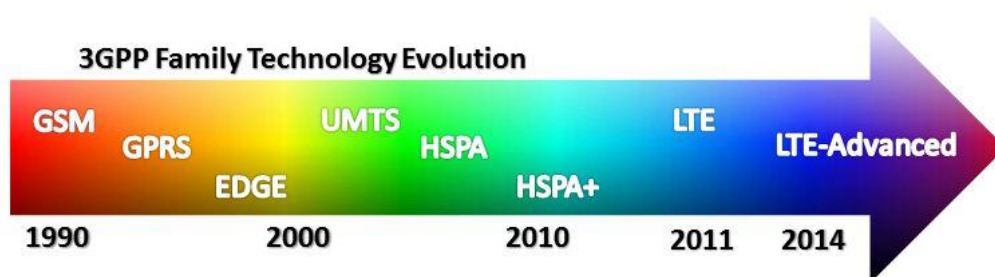


Fig. 1: 3GPP Family Technology Evolution

Conversely Dahlman, Parkvall, Skold and Beming [7] referred that the 3G Partnership Project developed a 4G wireless broadband technology known as Long Term Evolution [8]. 3GPP engineers termed the technology as Long Term Evolution because it denotes 4G in a progression from Global System for Mobile a second generation standard to Universal Mobile Telecommunication System, the Third Generation technologies based upon Global System for Mobile [9]. LTE offers essentially developed peak data rates, with the significance for 30 Mbps upstream and 100 Mbps downstream, lower down

latency, backwards compatibility with Universal Mobile Telecommunication System and Global System for Mobile technology and scalable bandwidth capacity.

3. APPLICATIONS OF LTE TECHNOLOGY

Sanchez *et al.* [10] explained that LTE applications are set to emerge in multi-platform surroundings. LTE applications will be possible across different wireless technologies and in appliances like printers, mobile phones, e-readers, laptops, digital camera and so on. LTE applications are very likely to be expanded and developed versions of occurring services of 3G but it is still unclear what the quantity of Long Term Evolution will manage for the mobile world [11]. The applications of LTE Technology are:

3.1. Mobile IPTV

Mobile IPTV is a technology which enhances users to exchange and gain multimedia traffic consisting of television video, audio, signal, graphics and text services through Internet Protocol based wireless and wired networks with support for quality of service, mobility, security and interactive functions. Users can enjoy IPTV services anywhere in the world in Mobile IPTV [12]. IPTV represents a traditional television services are being moved and converged into online space.

3.2. Social Networking Services

Boyd and Ellison [13] described that a social networking services can be referred as a mobile or internet based social space where people can interact, create, share and communicate content with others. Most of the services of social network are based on web and offers means for users to communicate over internet such as instant messaging and electronic mail.

3.3. Mobile Marketing and Advertising

According to Balasubramanian *et al.* [14] mobile marketing consists of interacting with customers through mobile or cellular appliance either to send easy message of marketing, to implement them to new clients participation-based campaign or to permit them to visit cellular website. Similarly Barwise, Patrick and C. Strong [15] explained that mobile advertising is ready to emerge. In past years mobile ad investment has developed as several advertisers have existed to identify their prospects are attainable increasingly through mobile appliances. Advertisers can no longer provide to avoid mobile and it is time to establish budget with a mobile strategy [15,15,16].

3.4. M2M Apps

Barwise, Patrick and C. Strong [15] explained that M2M is the acronym for machine-to-machine communications. Machine to Machine communications is the transformation of data between back end and remote machine information technology infrastructure. The exchange of data can be two way such as: 1) downlink to send software updates or instructions or to monitor equipment remotely; and 2) Uplink to gather product and usage information [15,17].

3.5. Telematics

The way of observing the place, status, health and movements of a vehicle or fleet of vehicles is known as Telematics. This is gained through an integration of a communication appliance and a Global Position System receiver installed in every vehicle [18], interacting with user coordinating, emergency and dispatching unit through a web based software or personal computer. By web based management component the data are turned into information.

4. CONCLUSION

As there is a quick increase in demand for mobile broadband, it has become essential for expanding the capacity of the network and understanding the requirement for traffic offloading and offering better technology that goes in line with LTE since it is the most widely used and advanced unifying macro WAN technology.

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