3GPP Long Term Evolution (LTE)

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Abstract – **in these theses in common considered objectives of development of the LTE standard and also the advantages of application of this technology, meeting requirements of subscribers and operators of services. The article describe OFDM technology and possibilities of 3GPP standard.**

Keywords - **LTE, OFDM, mobile broadband, flexible carrier bandwidth, cost-effectively.**

INTRODUCTION

LTE offers several important benefits for consumers and operators:

• ***Performance and capacity*** – One of the requirements on LTE is to provide downlink peak rates of at least 100 Mbit/s. The technology allows for speeds over 200 Mbit/s and Ericsson has already demonstrated LTE peak rates of about 150 Mbit/s. Furthermore, RAN (Radio Access Network) round-trip times shall be less than 10 ms. In effect, this means that LTE – more than any other technology – already meets key 4G requirements.

• ***Simplicity*** – First, LTE supports flexible carrier bandwidths, from below 5 MHz up to 20 MHz. LTE also supports both FDD (Frequency Division Duplex) and TDD (Time Division Duplex). Ten paired and four unpaired spectrum bands have so far been identified by 3GPP for LTE. And there are more band to come. This means that an operator may introduce LTE in 'new' bands where it is easiest to deploy 10MHz or 20MHz carriers, and eventually deploy LTE in all bands.Second, LTE radio network products will have a number of features that simplify the building and management of next-generation networks. For example, features like plug-and-play, self-configuration and self-optimization will simplify and reduce the cost of network roll-out and management. Third, LTE will be deployed in parallel with simplified, IP-based core and transport networks that are easier to build, maintain and introduce services on.

• ***Wide range of terminals*** – in addition to mobile phones, many computer and consumer electronic devices, such as notebooks, ultra-portables, gaming devices and cameras, will incorporate LTE embedded modules. Since LTE supports hand-over and roaming to existing mobile networks, all these devices can have ubiquitous mobile broadband coverage from day one.

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THE CREATION PURPOSE

- data transmission depreciation;
- bit rate magnifying;
- possibility of higher spectrum of services in lower price;
- boosting of flexibility of use of already existing systems.

SOLUTIONS

OFDM radio technology

LTE uses OFDM for the downlink – that is, from the base station to the terminal. OFDM meets the LTE requirement for spectrum flexibility and enables cost-efficient solutions for very wide carriers with high peak rates. It is a well-established technology, for example in standards such as IEEE 802.11a/b/g. In the uplink, LTE uses a pre-coded version of OFDM called Single Carrier Frequency Division Multiple Access (SC-FDMA). This is to compensate for a drawback with normal OFDM, which has a very high Peak to Average Power Ratio (PAPR). High PAPR requires expensive and inefficient power amplifiers with high requirements on linearity, which increases the cost of the terminal and drains the battery faster.

Advanced antennas

Advanced antenna solutions that are introduced in evolved High Speed Packet Access (eHSPA) are also used by LTE. Solutions incorporating multiple antennas meet next-generation mobile broadband network requirements for high peak data rates, extended coverage and high capacity.

CONCLUTION

LTE infrastructure is designed to be as simple as possible to deploy and operate, through flexible technology that can be deployed in a wide variety of frequency bands. LTE offers scalable bandwidths, from less than 5 MHz up to 20 MHz, together with support for both FDD paired and TDD unpaired spectrum. The LTE–SAE architecture reduces the number of nodes, supports flexible network configurations and provides a high level of service availability.

REFERENCES

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