



4G TECHNOLOGY

Introduction to 4G Technology



1. INTRODUCTION TO 4G

4G usually refers to the successor of the 3G and 2G standards. In USA, 4G is associated with *International Mobile Telecommunications-Advanced* (IMT Advanced), though 4G is a broader term and could include standards outside IMT-Advanced. In fact, the 3GPP is currently standardizing LTE Advanced as future 4G standard.

A first set of 3GPP requirements on LTE Advanced has been approved in June 2008. The working groups are currently evaluating various proposals for standardization. LTE Advanced will be standardized as part of the Release 10 of the 3GPP specification.

A 4G system may upgrade existing communication networks and is expected to provide a comprehensive and secure IP based solution where facilities such as voice, data and streamed multimedia will be provided to users on an "Anytime, Anywhere" basis and at much higher data rates compared to previous generations.

One common characteristic of the new services to be provided by 4G, is their demanding requirements in terms of QoS. Applications such as wireless broadband access, Multimedia Messaging Service (MMS), video chat, mobile TV, HDTV content and Digital Video Broadcasting (DVB) are being developed to use a 4G network.

The 4G working group has defined the following as objectives of the 4G wireless communication standard:

- A spectrally efficient system (in bits/s/Hz and bits/s/Hz/site).
- High network capacity: more simultaneous users per cell.
- A nominal data rate of 100 Mbit/s while the client physically moves at high speeds relative to the station, and 1 Gbit/s while client and station are in relatively fixed positions as defined by the ITU-R.
- A data rate of at least 100 Mbit/s between any two points in the world.
- Smooth handoff across heterogeneous networks.
- Seamless connectivity and global roaming across multiple networks.
- High quality of service for next generation multimedia support (real time audio, high speed data, HDTV video content, mobile TV, etc).
- Interoperability with existing wireless standards.
- An all IP, packet switched network.