

WiMAX - TECHNOLOGY

WiMAX is a technology based on the IEEE 802.16 specifications to enable the delivery of last-mile wireless broadband access as an alternative to cable and DSL. The design of WiMAX network is based on the following major principles:

- **Spectrum** . able to be deployed in both licensed and unlicensed spectra.
- **Topology** . supports different Radio Access Network *RAN* topologies.
- **Interworking** . independent RAN architecture to enable seamless integration and interworking with WiFi, 3GPP and 3GPP2 networks and existing IP operator core network.
- **IP connectivity** . supports a mix of IPv4 and IPv6 network interconnects in clients and application servers.
- **Mobility management** . possibility to extend the fixed access to mobility and broadband multimedia services delivery.

WiMAX has defined two MAC system profiles the basic ATM and the basic IP. They have also defined two primary PHY system profiles, the 25 MHz-wide channel for use in *USdeployments* the 10.66 GHz range, and the 28 MHz wide channel for use in *Europeandeployments* the 10.66 GHz range.

WiMAX Physical and MAC Layers are explained in separate chapters of this tutorial.

The WiMAX technical working group is defining MAC and PHY system profiles for IEEE 802.16a and HiperMan standards. The MAC profile includes an IP-based version for both wireless MAN *licensed* and wireless HUMAN *licence – exempt*.

IEEE Standard 802.16 was designed to evolve as a set of air interfaces standards for WMAN based on a common MAC protocol but with physical layer specifications dependent on the spectrum of use and the associated regulations.

The WiMAX framework is based on several core principles:

- Support for different RAN topologies.
- Well-defined interfaces to enable 802.16 RAN architecture independence while enabling seamless integration and interworking with WiFi, 3GPP3 and 3GPP2 networks.
- Leverage and open, IETF-defined IP technologies to build scalable all-IP 802.16 access networks using common off the shelf *COTS* equipment.
- Support for IPv4 and IPv6 clients and application servers, recommending use of IPv6 in the infrastructure.
- Functional extensibility to support future migration to full mobility and delivery of rich broadband multimedia