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Half day Tutorial T2: Broadband Networking with WiMAX

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The IEEE 802.16 family of standards has been considerably extended during the recent past. Primarily designed to provide broadband wireless access (BWA) to fixed subscriber terminals, the 802.16d, in its present form, can cater for portable terminals and has been complemented with the 802.16e for fully mobile subscribers too.

The OFDM based physical (PHY) layer, advanced link layer adaptation and highly evolved medium access control (MAC) layer mechanisms are useful for the design of radio links offering data rates comparable to the ones in wired broadband access. Using the suggested set of standards, Radio Access Networks (RAN) can be implemented in TDD or FDD modes in several identified, licensed and unlicensed frequency bands located in < 1GHz to 11 GHz range.

End to end solutions are based on inter working between a multipurpose RAN (for data, speech and video applications) and an IP Core Network. Integration with other RANs like Wi-Fi, 3GPP and 3GPP2 networks is possible. Seamless roaming of subscriber terminals has been designed by leveraging the use of Mobile IP mechanisms provided by IETF.

After a detailed presentation on the above aspects, the tutorial will conclude with some information on the WiMAX (Worldwide interoperability for microwave access) Forum, which is working to generate type-approval specifications - a requirement for ensuring multi-vendor equipment inter-operability.

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Dr. Vinod Kumar holds a Bachelor of Engineering degree from Punjab Engg College Chandigarh in India and a Masters & PhD degree from ENST - Paris in France. He has about thirty years of professional experience in design and advanced development of wire line MODEMS, algorithm design for PHY and MAC Layer processing for cellular voice and data network equipment (eg for GSM, GPRS, EDGE and W-CDMA). He holds 23 patents and has published 50+ conference and journal papers in the fields mentioned above. Presently, he is working on WiMAX systems in the Research and Innovation wing of Alcatel-CIT in France. Dr Kumar is a Visiting Professor in several telecom institutes in France and he has participated in several collaborative IST Projects. Also, he is Secretary of the Wireless World Research Forum (WWRF) - an international organisation with more than 150 institutional members.