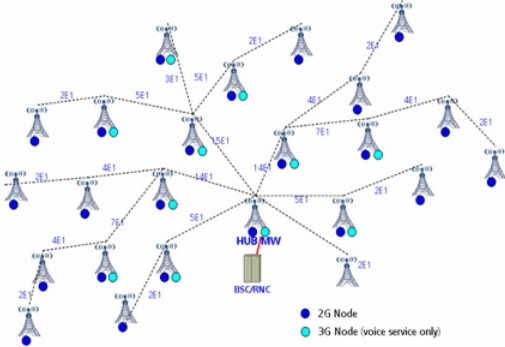


Telecom



Corporate Trainer's Profile

Corporate Trainers are having the experience of 4 to 12 years in development , working with TOP CMM level 5 companies (Project Leader /Project Manager) qualified from NIT/IIT/IIM and work exp in USA and UK.



CMM (Capability Maturity Model) level Project Standard:-

The Capability Maturity Model (CMM) is a method for evaluating the maturity of organizations on a scale of 1 to 5. Get the Oppertunites to work on Client Projects Of US/UK, which follow the all standard of CMM level 5 Company.



WiMAX Fundamentals Training Program

Course Details

1.Course Objective

WiMAX (*Worldwide Interoperability for Microwave Access- IEEE 802.16*) is a standards-based wireless technology (an implementation of 802.16) that provides high-throughput broadband connections. WiMAX can be used for a number of applications, including "last mile" broadband connections, hotspot and cellular backhaul, and high-speed enterprise connectivity for businesses.

This course provides an understanding of WiMax technologies, applications and standards. Other important topics such as protocol layers, quality of service, throughput, coverage, interoperability, interference and security are discussed.

After a general introduction to wireless networks, this course moves quickly into the details of the WiMax (802.16 physical, MAC (Media Access Control), 802.16 framing, TDD , FDD, security and QoS. The course also captures the details of the upcoming business market for the WiMAX technology.

The objective of the course is to get exposure to 802.16 based WiMAX Technology

- Understand the basic concepts of 802.16
- Understand 802.16 air interface specification
- Understand 802.16 RF concepts and issues
- Be able to understand the technical implementation of different types of 802.16
- Gain a general understanding of WiMax systems coverage and capacity
- Be able to select the most effective WiMax type from a wide assortment of recent and emerging implementations
- Be able to perform a more efficient design and operational support of WiMax

2.Prerequisite

- Basic understanding of wireless, radio communications and IP is recommended.
- Basic understanding of shell programming and Linux commands is preferable.

3.Contents and Duration

S.NoTopicDuration (in hrs)

TheoryLab

1Introduction2

- 1.1Wireless Communication
- 1.2Wireless Networks
- 1.3Wireless Technologies
- 1.4Third-generation Mobile Systems
- 1.5What Next? 4G

2WiMAX in Depth4

- 2.1802.16 Benefits

- 2.2 WiMAX Revolution
- 2.3 WiMAX: Working
- 2.4 WiMAX: Building Blocks
- 2.5 WiMAX Technology
- 2.6 WiMAX Standards
- 2.7 WiMAX Forum
- 2.8 WiMAX: Regulation
- 2.9 Implementation Scenarios and Market Opportunities

3802.16 High-level Architecture4

- 3.1 Network and Functional Architecture
- 3.2 Protocol Architecture
- 3.3 Time Slots and Time Division Multiple Access
- 3.4 Uplink and Downlink Channel Descriptors and Maps
- 3.5 Physical Slots, Mini-Slots and Symbols
- 3.6 Time Division Duplex and Frequency Division Duplex Options
- 3.7 Which Implementation Options are most common?

4802.16 Physical Layer Options8

- 4.1 Why are there so many PHY options?
- 4.2 Physical layer dependence on licensed and unlicensed bands.
- 4.3 Multipath: Why multi-carrier approaches?
- 4.4 WirelessMAN-Scs physical layer characteristics
- 4.5 WirelessHUMAN physical layer modifications
- 4.6 Orthogonal Frequency Division Multiplexing (OFDM) Operations
- 4.7 Orthogonal Frequency Division Multiplexing Access (OFDMA) Operations
- 4.8 Advance techniques like Advance Antenna System (AAS), MIMO, Beam Forming

5 Medium Access Control108

- 5.1 MAC Layer Operations
- 5.2 MAC Frame Structure
- 5.3 Access Methods
- 5.4 Security
- 5.5 Synchronization
- 5.6 Power management
- 5.7 MAC enhancements for advanced antennal systems
- 5.8 Variable Length Protocol Data Unit (PDU)
- 5.9 Self-correcting Bandwidth Request/Grant Scheme
- 5.10 Link adaptation and Automatic Repeat Request (ARQ) functions
- 5.11 UL and DL schedulers
- 5.12 QoS on IEEE 802.16
- 5.13 Delivering Ipv4 Compatible QoS: UGS, rtPS, nrtPS, and Best Effort
- 5.14 Lab Session: Case Study of HARQ Design and QoS Classification

6 Security2

- 6.1 Key Parameters/attributes for secure communication
- 6.2 Key security nodes in WiMAX
- 6.3 EAP-SIM based security for Mobile Network

6.4Certificate based security for Fixed Network

7WiMAX Mobility86

7.1Why a mobile version of 802.16?

7.2802.16e adoption forecast

7.3802.16e MAC and PHY enhancements

7.4Type of Handover supported by WiMAX

7.5Difference between Fast BS Switching and Macro Diversity Handovers

7.6Cell Selection and Paging

7.7Lab Session: Case study of Hard Handover and Cell selection procedure

8WiMAX Network Design4

8.1Feasibility Analysis of 802.16

8.2Base stations locations

8.3Access point frequency assignments

8.4IP Network installation and configuration

8.5Capacity and Bandwidth planning

Total4214

4.Course Workshop

The course presents WiMAX technical concepts using the simulation interface provided by Network Simulator 2 tool in Linux. Using this simulator, the trainer shall explain the concepts of MAC and Physical layer procedures in the classroom.

The students shall participate in the design and development of some of the key WiMAX (IEEE 802.16) MAC algorithms and procedures

Signaling Connection Control Part (SCCP)

- Enhancements to MTP Routing
- Flow Control
- Connection-Oriented and Connectionless Services
- Global Title Translation
- SCCP Management
- SCCP Management Structure
- Message Types
- Task of SCCP Messages
- Parameters of SCCP Messages
- The Principle of a SCCP Connection

Transaction Capabilities Application Part (TCAP)

- Component and Transaction Portions
- ASP Services
- TCAP Message Structure
- Connectionless TCAP
- TCAP Parameters

SS7 for Wireless and VoIP:

Wireless Market Summary

- Elements in a Mobile Network
- Mobile Switching Center (MSC)
- Base Station Controller (BSC)
- Base Transceiver Station (BTS)
- Home Location Register (HLR)
- Visitor Location Register (VLR)
- Short Message Service Center (SMSC) ANSI-41 and Mobile Application Part (MAP)
- GSM, CDMA and SS7

VoIP

- VoIP Call Control Protocol Overview
- SS7 Interworking with H.323, SIP, and Media Gateway Control (MEGACO)
- SS7 and IP Transport
- Stream Control Transmission Protocol (SCTP)
- SS7-IP Interworking

SS7 PRODUCTS:

SS7 Enabling Products

- SS7 Enabling Products
- SS7 STACKS
- Source Code
- Binary Stacks
- SS7 BOARDS
- SS7 PLATFORMS
- VoIP Gateways

·VoIP Policy Servers

SS7 Equipments

- Service Switching Points (SSP) And MSC
 - SS7 Connectivity Software
 - Signaling Transfer Points (STP)
 - Service Control Points (SCP)/Adjunct Processors (AP)
 - Intelligent Peripherals (IP)/Service Nodes (SN)
 - Home Location Registers (HLR)/Visitor Location Registers (VLR)
 - Short Message Service Centers (SMSC)
- VoIP Gateways