

COURSE DESCRIPTION

6884

Next Generation Network Planning & WiMAX Engineering

16 August 2010 - 20 August 2010, Mauritius

5 Day(s)

Offering Partner: Telecommunications Regulatory Board - PDT OP (Cameroon)

OVERVIEW

The evolution of next generation networks (NGN) as one remedy of the difficulties facing incumbent operators and the migration of the networks of the latter to the former require that managers and other senior level staff be sufficiently aware of some of the pressing technical and business issues to be resolved. Besides the fundamental technological developments related to NGNs and WiMAX about which management should have some acquaintance, questions about the technical and business approach to migration to NGN, deployment of WiMAX for the last mile and the overarching regulatory framework must be understood. This course is designed to address these issues by presenting basic concepts of NGNs, WiMAX and more detailed discussion of migration and of the regulatory and policy framework for these emerging technologies.

OBJECTIVES

To present fundamental concepts of NGNs that will enable senior managers and other senior staff to make informed decisions about migration to NGNs and the enabling regulatory and policy framework.

To introduce the fundamentals of WiMAX to give attendees a broad grasp of the key engineering principles.

TARGET AUDIENCE

This course is primarily designed for those wanting a good understanding of NGN and WiMAX. Engineers involved with the convergence of traditional telecommunications networks and designing and deploying WiMAX networks will find this course very useful. This training programme is developed for those who already understand the basics of telecommunications, as well as technicians and engineers who need to improve their skills. This course will benefit those working in areas related to various telecommunication operations, project and product management, hardware and software development, system engineering, testing and verification, network planning and operations engineering.

EXPECTED OUTCOME

On completion of this course the delegates will:

- Understood the history and drivers for NGN
- Gained knowledge of migration to NGN
- Fundamentals of WiMAX engineering
- WiMAX network design considerations
- Understood the importance of regulation
- Appreciated commercial implications

COURSE OUTLINE

Day 1: NGN (2 days)

Session-1: Introduction and legacy networks

- History
- Legacy networks
- Definition of NGN
- Characteristics
- Architecture
- Enabling technologies

Session-2: Core network

- Core network Architecture

Session-3: Access network

- Fixed technologies: copper lines and fibre optics
- Wireless technologies: 3GPP based technologies and IEEE based technologies

Session-4: Drivers and motivation behind NGN

- End user requirements
- Operator requirements
- Competition
- Application

Session-5: Convergence

- Drivers for convergence
- Fixed mobile convergence
- Voice and data convergence

Session 6: Network design and cost modelling project

Delegates understand what is involved in the creation of a WiMAX/NGN network business plan. This project explains how to define customers and services offered, and how local regulations, spectrum, and capital availability affect the final engineering design considerations.

Day 2: NGN

Session-7: Regulation

- Introduction to regulation
- ITU and process
- Requirements for regulation
- Issues of interconnection, numbering, emergency, licensing, spectrum management, consumer protection, digital divide, etc.

Session-8: NGN migration and future directions

- Fixed mobile convergence
- Soft-switching
- Quality of service
- Interconnecting to legacy systems and soft-switches

Session-9: Commercial Implication

- Critical success factors
- Different charging methods
- Wholesale arrangements
- Cost modelling

Session 10: Network design and cost modelling project

Day 3: WiMAX Engineering (3 days)

Session 11: Broadband wireless access (BWA)

- What is WiMAX
- How it fits to provide BWA

- Topologies
- BWA standards
- WiMAX applications
- Global BB initiatives

Session 12: WiMAX network architecture

- Network architecture
- WiMAX network reference model
- Services and applications

Session 13: WiMAX air interface

- Single carrier and Multi carrier
- OFDM basics
- Orthogonal radio carriers and OFDMA
- Channel coding and modulation

Session 14: WiMAX networks

- Physical layer
- Frame structure
- System profiles
- Features
- Backhaul

Session 15: Network design and cost modelling project

Day 4: WiMAX network design

Session 16: Mobile WiMAX and migration strategies

- Introduction to mobile WiMAX
- Main features of mobile WiMAX
- Upgrade considerations and strategies

Session 17: Performing a WiMAX Link Budget

- Sources of noise and determine the system noise
- System performance
- Maximum Allowable Path Loss
- Determine the amount of margin required
- Basics of the RF channel, propagation and interference
- Use spreadsheets to design WiMAX network

Session 18: WiMAX network deployment

- Frequency reuse plan for your WiMAX network
- Optimizing WiMAX networks
- Planning of neighbourhood and handover
- Traffic and KPI analysis.
- Performance and coverage considerations

Session 19: Network design and cost modelling project

Day 5: WiMAX

Session 20: WiMAX measurements

- Measurement equipment
- Introduction to measurements

Session 21: The WiMAX Network considerations

- Spectrum bands
- Bandwidth requirements
- User experience
- Determine cell density required for a desired level of service, performance and coverage

Session 22: Current status and Future directions

- Current status
- WiMAX products

- IMT-Advanced

Session 23: Guest lecture

Distinguished professional will provide a guest lecture related to NGN and WiMAX.

Session 24: Design project presentation and discussion

Delegates are expected to present the cost modelling project during this time. Feedback will be given and best design project will be selected based on the design concepts, practicality and commercial awareness.

Expert Profile 2:

Mr Kingsley Abeynayake BSc. MIET

Mr. Abeynayake, principal consultant with Hammatan LLC based in Washington, has been a key player in network expansion of MTN Nigeria network and also providing consultancy to Ministry of Telecommunications in Burkino Faso for establishment of fiber optic backbone network.. Mr. Abeynayake was previously Director of Engineering for Teligent International and was responsible for engineering and network rollout activities in France, Germany, Spain and Hong Kong. He also led the Teligent Professional Services Group and was responsible for deploying technical resources required by Teligent & international partners.

Prior to that, Mr. Abeynayake worked for Cable & Wireless, based in London, held the Global Design Authority role and was responsible for designing and implementing GIVN (Global Intelligent Virtual Private Network) platform across C&W business units in Hong Kong, Japan, USA, UK and Australia, later integrating with other service partners such as TMI and SingTel. During his time with C&W, he was instrumental in winning major corporate customers such as Digital Equipment Corporation (now Compaq), IBM, and Andersen Consulting (now Accenture) by providing innovative network solutions to meet their communication requirements. He also has experience in bid management, customer development, network design and vendor management.

Mr. Abeynayake has represented Cable & Wireless in the Global Virtual Network Service provider & forum. He also has previous experience with telecommunications equipment manufacturers such as Nortel, Alcatel, and Marconi where he has been responsible for the design and development of digital switching systems such as Nortel's DMS, Alcatel's system 12 and Marconi System X. He has experience in European and North American signalling systems used in a PSTN environment as well as in private networking. Mr. Abeynayake has expertise in Fixed Wireless, VSAT, voice, data and VoIP networking. He has a BSc and HND from the University of Middlesex, U.K

EXPERT PROFILE

Abhaya, Sumanasena

Dr. Abhaya Sumanasena (PhD MSc. Ceng MIEEE MIET) is currently working as a Technical Policy Manager at Ofcom, the government regulator in the UK. Prior to Ofcom, Abhaya has worked as a Principal Engineer in Ericsson, and in Hutchison 3UK, the first mobile operator dedicated to 3G services in the UK. During this period Abhaya has taken a leading role in designing, rolling out and optimising of 3G and the first HSDPA network in the UK. Before joining 3UK, Abhaya worked as a Researcher at Mitsubishi Electric research laboratory where he conducted research work for beyond 3G systems. After obtaining his MSc from King's College London, Abhaya completed his Ph.D. in "3G Mobile Satellite Systems" from University of Surrey, UK. He has published 12 papers in major international journals/conferences and obtained two patent rights. While pursuing his PhD, he won a special award for Research Excellence from Inmarsat. After his PhD, Abhaya has served as a Post Doctoral Research Fellow at University of Surrey where he involved in teaching and supervising research students.

Abhaya is experienced in delivering high quality interactive training courses in range of current and emerging technologies. Abhaya's proven communication skills and the ability to present complex technical ideas to non-specialists have been well recognised by the companies he worked for. As a result, he was specifically assigned to train internal colleagues, including the management, to enhance their knowledge on technologies. Abhaya is also closely following current and emerging technologies by attending standardisation meetings and regulatory meeting at ITU. His in-depth understanding of current issues and technologies together with commercial awareness in diverse environments is grounded in 8 years of industry experience working in R&D, vendor, operator, managed service and regulatory environments.

