

Next Generation Transport Networks

An exploration of how our transmission network is evolving to support high speed data

Overview

With the rapid uptake in mobile broadband subscribers and the increase in use of smart phones and high speed modems on our mobile networks, customer are now generating vast amounts of data traffic which is putting the existing transport infrastructure under great strain. It is clear that traditional E1 links cannot support this demand efficiently so new packet-based transmission systems are being implemented to meet traffic requirements more cost effectively. However, the market presents a huge range of backhaul options and selecting the best fit for your network is a complex job. This course identifies the leading packet based transmission options that are available and compares their suitability in a number of deployment scenarios. Hybrid solutions that deal with the transmission of circuit and packet switched services are also discussed. At the end of this program, participants will understand the issues related to the various solutions in terms of complexity, cost, resilience, QoS and synchronisation.

You will be able to:

- Identify issues related to traditional backhaul technologies
- Outline different options available for high speed backhaul over Copper, Microwave & Fibre
- Describe the basic operation of MPLS, Metro Ethernet & Next Generation SDH
- Define how to meet quality requirements via IP backhaul
- Perform simple planning & dimensioning of a transport network

Who Can Benefit

Technical staff who need to be able to compare key next generation backhaul solutions for different deployment scenarios

Prerequisite Knowledge:

The participant should have a good understanding of cellular 3G/UMTS networks & CIPA level IP or equivalent.

Outline

Introduction

- Transmission Requirements
 - Review of packet switching & statistical multiplexing
 - Trends in data
 - Data QoS and QoE requirements
- Existing transmission network architectures
 - PDH/SDH-based systems
 - ATM over PDH/SDH & IMA
- Next generation transmission network architectures
- 3GSM Radio Access Network Architectures (GSM (E)GPRS, UMTS & HSPA)
- Transmission Planning Principles
 - Transmission network dimensioning
 - Planning for a multiservice & multiprotocol environment
- Transport Requirements for Radio Network Evolution
 - Impact of HSDPA/HSUPA/HSPA+ on transmission requirements

- Requirements for transporting LTE/LTE-Advanced traffic
- Femtocell deployments
- Data offload

Packet based Transmission Networks

- Cell site transmission options
- Design issues for packet based transmission networks
- Handling of mixed traffic types (PDH and IP)
- Resilience and redundancy provision
- Providing synchronization using Synchronous Ethernet and IEEE 1588-2008
- QoS provision and traffic prioritization
- Traffic aggregation
- Packet overheads and retransmissions
- Efficiency of packet based transmission networks
- Operations & Maintenance

Transport Protocols

- Metro Ethernet & Carrier Ethernet
- MPLS & MPLS-TP
- Next generation SDH (VCAT & LCAS)
- Pseudo Wire & TDM over IP

Transport Links

- Bonded E1 (PPP & MLPPP)
- xDSL for mobile transmission
- FTTx for mobile transmission
- Microwave transmission (traditional, hybrid and packet)
- Dense Wavelength Division Multiplexing (DWDM)

Implementation Case Studies

- Network evolution example
- Greenfield example
- Equipment specifications
- Budget analysis

DURATION	3 days
MAX CLASS SIZE	12