

# LTE Transport Network Design Mentoring

*How to design packet-based transmission networks 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. Packet-based transmission systems are being implemented to meet traffic requirements more cost effectively. This course discusses how to design & monitor the transmission network to serve a range of services and applications. It takes a “mentoring” approach where concepts are described through the use of case studies and specific examples.

## You will be able to:

- Identify issues related to traditional backhaul technologies
- Describe how IP is used for transmission networks in LTE
- Describe the use of MPLS, Metro Ethernet in LTE transmission
- Define how to meet quality requirements via IP backhaul
- Explain KPIs for transmission
- Describe different redundancy strategies for LTE
- Explain how to achieve synchronization using IEEE1588v2
- Perform planning & dimensioning of a transport network

## Who Can Benefit

Technical staff who need to be able to plan next generation backhaul solutions for different deployment scenarios including LTE

## Prerequisite Knowledge:

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

## Outline

### Overview of LTE

- What is 3GPP Long Term Evolution?
- 3GSM Family of Technologies
- Evolution from UMTS R99 to HSPA+ & LTE
- LTE system capabilities
- LTE System Architecture
  - The Evolved UTRAN (E-UTRAN)
  - The Evolved Packet Core (EPC)
- Transmission requirements
- S1 and X2 Network interfaces
- Connection life cycle

### IP Packet based Transmission Networks

- Review of IP, switching & routing
- IP as applied in LTE
  - Switching & VLANs in LTE transmission
  - Routing & MPLS/MetroE
- IP at the user and transmission layers
- Key IP issues for LTE transmission:
  - Handling of mixed traffic types
  - Efficiency
  - QoS
  - Redundancy
  - Synchronisation
  - Operations & Maintenance
- Review of Metro Ethernet & MPLS
- Implementing synchronization with IEEE1588v2
- Key redundancy methods for IP, MetroE & MPLS

### Planning & Dimensioning for LTE Transmission

- EPC/E-UTRAN dimensioning
- Example vendor equipment & equipment capacity
- Traffic engineering for transmission
- KPIs for LTE transmission
  - Impact of KPIs on different services
  - Latency & Jitter
  - QoS for transmission
  - Matching LTE QoS
- Aggregation & oversubscription
- What is an Erlang & where is Erlang valid?
- Provisioning for real-time traffic
- Provisioning for non real-time traffic
- Queuing theory
- Link utilization & system delay
- Design examples
- Practical equipment design case study

DURATION	2 days
MAX CLASS SIZE	12