



## 3G Network Parameters & Optimisation Mentoring Workshops

### Overview

This set of mentoring workshops is designed to provide an explanation of the key parameters involved in deploying & managing a UMTS network. It will develop skills which can be used for optimizing the performance of the network and its interoperation with GSM/GPRS. The workshops will highlight mechanisms for improving both coverage and capacity, optimizing the handover & reselection process and providing better support for data service on the network. We bring the extensive field experience of the trainers with cellular networks to bear in these workshops, using real-world data.

**We customize and tailor the content, exercises and examples to your network configuration using the particular vendor system parameters that affect each area.**

### Pre-requisite Knowledge

It is expected that participants have a good understanding of a UMTS network operation and structure, and are familiar with the function of the key network elements in the UMTS network.

*It is recommended that participants should have attended the UMTS Signalling with HSPA and Certified IP Associate (CIPA) programs conducted by Orbitage.*

### Practical Learning Approach

We use a hands-on approach where the emphasis of the course is on practical exercises to build skills in analysis and troubleshooting based on data including the following:

- ✓ Guidance in effective parameter configuration using vendor parameter settings from your network
- ✓ Course is based around hands-on exercises & assignments using:
  - Case studies of problems from drive test data with recommended solutions
  - Examples using vendor parameters & impact of parameter tuning
- ✓ Uses relevant network KPIs
- ✓ Customised to addresses relevant issues experienced on your live network
- ✓ Uses drive test tools for data analysis
- ✓ Uses our A3 sheet exercises to provide understanding of issues and summaries of learning outcomes



## Detailed Workshop Content

### Mentoring Workshop Module 1: Coverage & Capacity

This module addresses issues with coverage and capacity through practical case studies from the network. Learning outcomes include:

- ✓ Able to analyse coverage & capacity tradeoffs in your network implementation
- ✓ Analyse data related to coverage, capacity & interference from your drive test log files
- ✓ Identify and solve common coverage issues such as pilot pollution, missing neighbours & poor Ec/Io
- ✓ Tune vendor system parameters related to coverage and capacity

#### Key Topics

- Capacity vs. coverage in UMTS
- Radio link performance indicators
- Impact of coverage and interference on performance
- Link budget analysis
- Quality measurement criteria (Eb/No, RSSI, RSCP, CPICH Ec/Io etc.)
- KPIs for circuit switched services
- Impact of CPICH tuning
- Pilot pollution

- Common channel planning
- Closed and open loop power control
- Power control on common channels
- Power control and terminal speed
- Adaptive Multirate Codec (AMR) & capacity/coverage
- Additional carriers & scrambling codes
- UMTS at 900MHz band
- Pico & femto cells
- Indoor coverage & optimization

### Mentoring Workshop Module 2: Handover & Reselection

This module addresses issues with handover & reselection through practical case studies from the network. Learning outcomes include:

- ✓ Able to analyse handover & cell reselection success & failure cases from your drive test data, diagnose failure causes and recommend solutions
- ✓ Tune vendor system parameters related to cell reselection
- ✓ Tune vendor system parameters related to soft and hard handovers
- ✓ Configure compressed mode parameters
- ✓ Define policies for service based handovers

#### Key Topics

- Idle mode, PLMN & cell selection and reselection
- Cell Reselection Processes in Connected Mode
- Multicarrier & Hierarchical Cell Structures (HCS)
- RACH access and parameters
- Broadcast parameters & reception
- Paging and SCCPCH configuration

- Discontinuous Reception (DRX)
- Soft handover algorithms & events
- Packet handover & HSDPA handovers
- Measurements & control for handover
- Neighbour lists
- Compressed mode
- Inter RNC border optimization
- Service based handover & reselection
- UMTS/GSM intersystem handover procedures



## Mentoring Workshop Module 3: Managing Data

This module addresses issues with both R99 and HSPA data through practical case studies from the network. Learning outcomes include:

- ✓ Able to analyse regular and HSPA data flows on the network from your drive test data, diagnose failure causes and recommend solutions
- ✓ Configure parameters related to radio resource management for packet traffic
- ✓ Able to analyse CQI data relating to throughput and configure related vendor-specific parameters
- ✓ Able to analyse & configure parameters related to QoS for data services
- ✓ Tune vendor system parameters related to RRC states (Cell DCH, Cell FACH, etc.)

### Key Topics

- Application of RRC connected states & key parameters
- Radio Resource Management (RRM) algorithms & parameters
- Optimization for HSDPA 7.2/10.8/14.4
- KPIs for packet switched services
- Load control & packet scheduling
- Impact of retransmission on packet services
- AC strategies on DCH and FACH/RACH

- Impact of HSPA and HSPA+
- Radio Bearer Control procedures
- Resource management and code planning
- Examples of Radio Bearer Reconfiguration
- Dynamic Resource Allocation
- Radio coverage & CQI analysis for HSPA
- QoS parameters & UMTS QoS Classes
- QoS Management Functions in the Network
- QoS Attributes & attribute mapping

Workshop 1: Coverage & Capacity 2 days

Workshop 2: Handover & Reselection 3 days

Workshop 3: Managing Data 2 days

MAXIMUM CLASS SIZE 12 pax