LTE RADIO NETWORK PLANNING

"The LTE Radio Network Planning training really suited our requirements and was very useful when dimensioning our LTE network".

– Jesper Simons, Senior RAN Expert, Tele2 Sweden

Course Description

LTE, long term evolution introduces new opportunities as well as challenges. Great spectrum flexibility and spectrum allocation alternatives contribute to the complexity. The new OFDMA radio standard requires new or updated design principles, compared to UMTS/WCDMA. Cell edge performance can no longer rely on soft handover, while Inter-cell interference levels still must be taken into account. Multi-antenna installation using MIMO will contribute to capacity increase in some occasions, while in others situations, beam-forming techniques will be used.

The course explores the new opportunities in the radio design area. Guidelines are explained and concrete examples are given. Could GSM 900 sites be re-used for e g LTE 900 MHz? What network performance would then be achieved?

Content

INTRODUCTION

- Evolution of 3G and network architecture
- E-UTRAN and EPC
- Comparing LTE to GSM/UMTS
- Hierarchical- vs flat architecture
- eNodeB, MME, S-GW, P-GW, HSS

LTE AIR INTERFACE AND CHANNEL STRUCTURE

- Link LTE protocols and channels
- OFDM and SC-FDMA
- Link adaptation
- LTE FDD radio frame, resource blocks
- Channels and signals
- Automatic Neighbor Relations
- Physical Cell Identity
- Tracking Area
- Exercise and examples

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WITH FOCUS ON FUTURE TECHNOLOGIES

RADIO PROPAGATION

- Review of key propagation mechanisms
- Propagation models and their applications
- eNB and UE transmitter and receiver requirements
- Exercises and examples

MULTIPLE ANTENNA TECHNIQUES

- Review of antenna principles
- Tx Diversity vs Spatial Multiplexing
- SU-MIMO, MU-MIMO
- Practical antenna configurations
- MIMO influence on throughput and network capacity
- Exercises and examples

LTE LINK BUDGET CALCULATIONS

- Gains and losses for downlink and uplink
- SNIR, throughput, sensitivity
- Deployment scenarios and coverage calculations
- RSRP, RSRQ, RSSI
- Exercises and examples

PLANNING OF FREQUENCY, INTERFERENCE AND NEIGHBOURS

- Fractional-, soft- and partial frequency reuse
- PCI planning
- Paging and TA planning

LTE PROCEDURES

- Synchronization and random access
- Cell reselection and handover
- Power control
- Measurements reporting
- Exercises and examples

Target audience

The primary target audience is radio network planners.

Pre-requisites

The participants should have good knowledge about UMTS Radio Network Planning.

Course length

3 days

Widermind communicates the knowledge you need to develop and implement new technologies for current and future network operations. Our clients are telecom operators, system integrators, system suppliers and consultancy firms.

Based in Stockholm, Sweden, we develop courses backed by a comprehensive network of associates. Our instructors employ technical and pedagogical skills that have made Widermind training well known and appreciated as one of the best services in the field.

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