LTE Radio Network Design Workshop

Who Should Attend?

The course is addressed to Service Planning, Service Design, and Network Design Engineers.

Course Scope

1. LTE design introduction.
   - LTE RND tasks.
   - LTE characteristics.
   - LTE traffic 2.
2. LTE RND inputs.
   - Accuracy [particle/cell].
   - Site-to-site distance [km].
   - Graph size [pixel].
   - Propagation model.
   - Area type.
   - Frequency [MHz].
   - Antenna height [m].
   - Additional loss [dB].
   - Antenna gain [dBi].
   - Horizontal beamwidth [deg].
   - Vertical beamwidth [deg].
   - Downtilt [deg].
   - eNB power [W].
   - Bandwidth [MHz].
   - Transmission mode.
   - UE power [W].
   - p0 PUSCH [dBm].
   - Alpha PUSCH [1].
   - UL SINR break point [dB].
   - Load PDSCH [%].
   - DL average user load [Mbps].
   - Load PUSCH [%].
   - UL average user load [Mbps].
3. LTE downlink coverage and capacity dimensioning.
   - Signal attenuation.
   - DL RX power per RE.
   - DL N+I per RE.
   - DL SINR.
   - DL UE throughput.
   - DL cell load 2.
4. LTE uplink coverage and capacity dimensioning.
   - UL number of RBs.

- UL TX power per RB.
- UL RX power per RB.
- UL interference margin.
- UL SINR.
- UL UE throughput.
- UL cell load 3.

5. Case study: Design LTE radio network.
   - Define LTE RND requirements.
   - DL coverage and capacity dimensioning.
   - UL coverage and capacity dimensioning.
   - Project summary 4.
6. LTE physical channels and design parameters dimensioning.
   - PCI planning.
   - RACH root sequence planning.
   - PDCCH dimensioning.
   - Paging capacity dimensioning.
   - TA dimensioning.
   - PUCCH dimensioning.

Course Objectives

The LTE Radio Network Design Workshop training presents the complete workflow of the LTE radio network dimensioning to meet operator's coverage and capacity requirements. Coverage and capacity calculations and their results are carried out and visualised with use the LTE Radio Network Design software tool developed by our trainers.

The training explains the LTE design requirements and system characteristics particularly important from radio network design perspective, including channel bandwidth, physical layer bit rate, signalling overhead, maximum user throughput, MIMO, link adaptation, scheduling, UE categories and eNB hardware. Next, the design inputs, e.g. frequency, antenna radiation pattern, downtilt, cell load and UE power control parameters are explained together with their impact on the network coverage and capacity.

Step-by-step, each calculation is explained in details with an example exercise. The results of each exercise are illustrated by a dimensioning graph of the LTE RND tool. Each participant uses the LTE RND tool to design an LTE network with characteristic, coverage and capacity requirements of her/his interest. The course also explains the techniques of physical channel dimensioning and important design parameter dimensioning including PCI and tracking area dimensioning.

Prerequisites

Successful completion of LTE Air Interface course is required.

Training Structure

Three-day training course, equivalent to an 18-hour lecture.

Methodology

Instructor-led training, presentation, and exercises with our radio network design tool.