

LTE RF Optimization: Part 1 – Coverage and Accessibility

This workshop provides insights into the symptoms and possible causes of field performance issues in LTE radio networks using UE logs. RF measurements related to coverage and interference are discussed to analyze coverage holes and overlapping regions. Students analyze LTE signaling messages through UE logs and map them to success and failure events. Students perform root cause analysis and gain an in-depth understanding of these signaling events to network performance. LTE RF optimization areas such as RRC connection setup, bearer drops, coverage issues. This knowledge transfer is obtained through hands-on experience using UE based diagnostic tools and scanner tools.

Intended Audience

This workshop is primarily intended for RF and systems performance engineers involved in LTE design, performance, and optimization.

Objectives

After completing this course, the student will be able to:

- Define the LTE RF KPIs and map them to RAN counters
- Identify various LTE signaling events that map to success and failure operational counters
- Identify the RF measurements that are key to coverage and interference
- Analyze the measurements through post processing tools
- Analyze UE logs for root cause analysis of successful and failure events
- Map above events to operational counters and corresponding KPIs
- Accessibility and RRC connection and bearer setup
- Radio link failures and bearer drops

Prerequisites

- Exploring LTE (series of self-paced eLearning)

Required Equipment

- PC laptop

Course Outline

1. Workshop Overview

2. LTE RAN KPIs

- 2.1 LTE RAN KPIs
- 2.2 LTE signaling to KPI mapping
- 2.3 Summary
- 2.4 Review exercises

3. Coverage Analysis

- 3.1 Defining the right coverage
- 3.2 RSRP, RSRQ, SINR plot analysis
- 3.3 Scanner data analysis
- 3.4 Coverage analysis using post processing tool
- 3.5 Summary
- 3.6 Review exercises

4. Accessibility KPI Analysis

- 4.1 PRACH parameter analysis
- 4.2 Default bearer setup analysis
- 4.3 Radio bearer setup and RRC reconfiguration
- 4.4 Call flow to generic counter mapping
- 4.5 Summary
- 4.6 Review exercises

5. Connection Drop Analysis

- 5.1 Radio link failure
- 5.2 UE context drops
- 5.3 E-RAB drops
- 5.4 Drop KPIs and troubleshooting
- 5.5 Summary
- 5.6 Review exercises