UMTS/HSPA+ Signaling & Protocols on Uu Interface

Course Number: UMTS3300-01EN | Duration: 4 Days

Target Audience

- System Design and IOT Engineers
- Network Planning/ Performance Engineering Staff
- Network Maintenance and Optimisation Personnel

Prerequisites

- UMTS & HSPA+ Air Interface (UMTS3200-01EN)

Learning Objectives

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

- Understand the various DCH and HSxPA related configuration & reconfiguration procedures.
- Analyse UMTS/HSxPA features and how they can be benchmarked.
- Identify faults in Iub & Iu traces, particular drops and the related root cause(s).
- Determine faulty procedures and erroneous protocol behaviours.
- Judge UE versus UTRAN mistakes and their impact on network performance.

Course Outline

1. Fundamentals of UMTS & HSPA+
   - 1.1 Network Architecture – RAN & CN
   - 1.2 Rel. 99 – Rel. 9 Feature Overview
   - 1.3 RRC States & supported Bearers
   - 1.4 Protocol Architecture Rel. 99 – Rel. 9
2. General Signaling Procedures
   - 2.1 UE & RAN/CN Identifiers
   - 2.2 SIM/USIM Functionality
   - 2.3 System Information Broadcasting
   - 2.4 Service Area Broadcasting - CBS
   - 2.5 CS/PS Paging – Paging Coordination
3. Registration (MM/GMM)
   - 3.1 PLMN & Cell Search
   - 3.2 Location Update & Attach Procedure
   - 3.3 Combined Attach for PS & CS
   - 3.4 Location & Routing Area Update
   - 3.5 CS/PS Detach Scenarios
4. RRC Establishment & Re-Establishment
   - 4.1 Random Access using RACH/FACH
   - 4.2 Random Access via E-DCH/HS-DSCH
   - 4.3 Synchronisation on DCH & F-DPCH
   - 4.5 Drop & Re-establishment
5. MAC Protocol Functionality R99 – Rel.9
   - 5.1 MAC-Header for LCH to TrCH Mapping
   - 5.2 (E-)TFC Selection & BSR/SI
   - 5.3 Reordering & Stalling Prevention
   - 5.3 Ciphering/De-Ciphering for RLC-TM
   - 5.4 Cell Update & Cell Update Confirm
   - 5.5 HARQ Signaling for HS-DSCH & E-DCH
   - 5.6 CQI Reporting per Category Table
6. RLC Protocol Functionality Rel. 99 – Rel. 9
   - 6.1 RLC Modes for CS & PS Bearers
   - 6.2 SDU Segmentation & Reassembly
   - 6.3 Flow Control & In-Sequence Delivery
   - 6.4 Error Correction & Status PDU's
   - 6.5 Ciphering / Deciphering
7. PDCP Protocol Functionality Rel. 99 – Rel. 9
   - 7.1 ROHC
   - 7.2 Lossless SRNS Relocation
   - 7.3 CS Voice over High Speed
8. RRC Protocol Procedures Rel. 99 – Rel. 9
   - 8.1 (Re-) Configuration of SRB's
   - 8.2 RRC Connection Management
   - 8.3 Radio Bearer Control
   - 8.4 Measurement & Control
   - 8.5 RRC Connection Mobility
9. Selected CS Scenarios
   - 9.1 Voice Call Setup
   - 9.2 TF Combination Control
   - 9.2 SMS & USSD Transfer
   - 9.3 64 kbps Video Call
10. Selected PS Scenarios
    - 10.1 PDP Context Activation & Modification
    - 10.2 Use Cases for XXX Reconfigurations
    - 10.3 HSxPA Serving Cell Change
    - 10.4 Fast Dormancy
11. Selected Multi-RAB Scenarios
    - 11.1 CS Voice & HSxPA PS Bearer
    - 11.2 Call Setup in CELL_FACH/XXX_PCH
    - 11.3 Compressed Mode & IRAT Mobility