IP QoS in HSPA & LTE

Who Should Attend?

This course is intended for HSPA and LTE technical staff.

Course Scope

1. Introduction.
   - EPS/LTE network architecture.
   - UMTS/HSPA network architecture.
   - EPS/UMTS Integration (different scenarios).
   - Bearers (Primary and Secondary PDP Context / Default and dedicated EPS bearer, IP address allocation, TFTs).
   - QoS handling and bearer management model for Internet, IMS/VoLTE/RCS-based and M2M/Telemetry services.
   - EPS/UMTS bearer on different interfaces and protocol levels.
   - Exercises.
2. QoS profiles.
   - GSM/UMTS QoS profile R98-.
   - GSM/UMTS QoS profile R99+.
   - EPS QoS profile R8+.
   - R98, R99 and R8 QoS profile mapping.
   - QoS in HLR/HSS subscription data.
   - UE's application request for QoS (AT commands).
   - IMS service request for QoS profile.
   - QoS related counters and KPIs.
   - Exercises.
3. QoS on IP interfaces.
   - Differentiated Services (Diffserv).
     - DSCP, PHB, EF/AF/BE PHBs, Class Selector (CS) Codepoint.
     - Queuing and Scheduling - classifiers, policers, markers, shapers, droppers.
   - 802.1Q.
     - Priority Code Point (PCP).
     - PCP-Diffserv mapping.
   - MPLS.
     - Label Switched Paths (LSP).
     - Label distribution and Label Distribution Protocol (LDP).
     - Traffic Class.
     - EXP-inferred LSPs vs. Label-inferred LSPs.
   - Admission Control.
     - Trunk model.
     - Hose model.
   - Traffic Engineering.
     - Routing Protocol based TE.
     - MPLS based TE, RSVP-TE.

- ○ QoS and dimensioning in IP backhaul.
  - QoS in CN.
  - Roaming and Interconnect (GSMA guidelines).
4. Policy and Charging Control (PCC).
  - ○ PCC architecture, nodes and interfaces.
  - ○ PCC rules.
    - Predefined and dynamic PCC rules.
    - QoS rules.
  - ○ Policy Control.
    - QoS control.
    - Gating control.
    - IP-CAN bearer establishment.

Course Objectives

This course describes how LTE/EPS and HSPA networks support QoS for various IP-based services from terminal (UE) to Gateway (GGSN/PGW). The course defines and describes QoS concepts and parameters, and examines how QoS is achieved end-to-end and in various parts of the network, such as Radio QoS, Backhaul QoS and Core Network QoS. It also outlines general IP QoS mechanisms and solutions, such as Diffserv and MPLS.

The course accounts for 3GPP-style PCC (Policy and Charging Control) and how high-level QoS parameters derived from service-level signalling are implemented in network nodes such as GGSN/PGW, SGSN/SGW and RNC/NB/eNB. The mapping of service- or subscriber-related QoS parameters to Bearer-level QoS for PDP Contexts or EPS Bearers is examined.

Prerequisites

General telecom and IP knowledge is strongly recommended.

Training Structure

Three-day training divided into logical sessions.

Methodology

Instructor-led training. Lectures and multimedia presentations.