

# Packet Core Network Performance & Optimisation



## Who Should Attend?

This training is aimed at engineers who deal with CN performance, especially packet-switched based services.

## Course Content

1. Overview of Telecommunication Services and their Probabilistic Modelling.
  - Circuit-switched Services (real-time).
  - Packet-switched Services (not real-time).
  - Packet-switched Services (real-time).
  - Legacy Telephony Solutions.
  - IP Networks and Internet.
  - Modern Telephony: VoIP & Softswitch.
  - 2G/3G Circuit-switched Service.
  - 2G/3G Packet-switched Service.
  - User Profiles and Requirements.
  - Nodes and Characteristics of Core Networks.
  - Principles of Traffic Engineering.
2. Network architecture.
  - Overview of 3GPP Rel5 and onward Architecture.
  - Network Features Impacting CN Architecture.
  - PS Network Architecture.
  - PS Network Address Design.
  - SGSN Pooling.
  - PS Network Dimensioning.
3. Mobile Networks — Specific Aspects of Traffic and Signalling.
  - Packet Switching in Mobile Networks.
  - Requirements for Mobile PS.
  - Signalling in Mobile Networks.
  - Requirements for Mobile Network Signalling.
  - SS7 Signalling in Modern Telecoms.
  - IP Signalling in Mobile Networks.
  - GSM Packet-switched Services.
  - PS Service Interfaces.
  - 3G Architecture from R5.
  - IMS Architecture.
  - All-IP networks.
  - PDP Context.
  - GPRS Tunnelling Protocol.
  - Gx Interface Dynamic QoS Handling.
4. Traffic Planning.
  - Objectives and Inputs.
  - Initial Tasks.



- Traffic Modelling.
  - Outputs.
  - Traffic Cases.
  - PS Traffic.
  - Reference Network Model.
  - Traffic Dispersion.
  - CN Node Dimensioning.
  - Examples of CN Node Licensing.
5. QoS Solutions in Transport Network Planning.
- Internet Protocol.
  - IPv4 and IPv6 Transition.
  - Transport Alternatives: ATM and Ethernet.
  - Transport Alternatives: MPLS.
  - MPLS Network Architecture.
  - MPLS Signalling.
  - MPLS Protection Mechanism.
  - IP over MPLS.
  - Impact of ATM, Ethernet, and MPLS.
  - QoS in IPv4 Integrated Services.
  - Differentiated Services.
  - QoS Handling in MPLS.
  - 3G Traffic Classes vs. DiffServ.
  - DiffServ and MPLS QoS Mapping.
6. Other Aspects of 3G Network Planning.
- Expansion and Migration Planning.
  - Interconnection Planning.
  - Interconnection of Mobile Backbones.
7. Performance Analysis.
- Accessibility KPIs for Packet CN.
  - Retainability KPIs for Packet CN.
  - Service delivery KPIs for Packet CN.

## Course Objectives

Participants attending this course will be given the framework for 3G CN planning, dimensioning, and performance optimisation. During the course, we will discuss network design and planning, traffic analysis, and generic KPIs and counters. Example calculations will be done in reference to different CN nodes (in terms of different solutions) and QoS requirements, capacity and licensing dimensioning.

## Prerequisites

Participants must have basic knowledge of Core Network. Practical experience is recommended.

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## **Training Structure**

Three-day training divided into logical sessions.

## **Methodology**

Instructor-led training.