

# UMTS Packet Core Protocols & Procedures

“Key services, protocols & message flows to support the cellular packet core”



## Overview

Although transferring IP packets over a cellular network has been possible since the mid 1990s, it was not until the advent of the GPRS packet core that this transfer could be done in an efficient manner. With the introduction of HSPA in the network and flat rate billing the amount of data that users generate is growing exponentially. Practical skills in implementing and troubleshooting the packet core are essential.

This course will provide you with the knowledge and skills to effectively understand and administer the packet core network architecture and its interaction with other cellular network elements with extensive analysis of message flows and use of signalling traces. Our hands-on approach of ‘learning through doing’ will improve your practical skills in areas of high demand in the workplace.

## You Will Learn

- Packet core operation & architecture
- Rationale for using IP
- Key network components
- Signalling processes
- Charging & billing issues
- Typical scenarios for traffic
- Key applications & services

## Who Can Benefit

Technical managers, consultants, communications professionals, BSS, RAN and NSS system engineers, network planners for 3G

## Introduction

- Review of UMTS architecture & evolution
- Changes from GPRS to UMTS
- System components: SGSN & GGSN
- The Access Point Name (APN)
- Packet core interfaces
- PS Domain External Interfaces
- User identities: IMSI, IMEI, P-TMSI, TEID etc.

## IP in the Packet Core

- Review of IP
- Rationale for IP in cellular
- IP addressing
- IP QoS framework & DiffServ
- Transmission options
- Mapping of QoS to lower layers
- GPRS tunnelling protocol (GTP)
- Single tunnel architecture
- Traffic Flow Templates
- Policy and charging control element
- Lawful interception

## Packet Core Signalling Procedures

- GPRS Attach & Detach
- Mobility management procedures
- PDP Context Activation

- Secondary PDP Context Activation
- Network requested PDP Context Activation
- Non-Access Stratum Signaling
- Iu RAB assignment & release
- Role of MAP
- Interaction with HLR/EIR/MSC-VLR

## Support Services

- Dynamic Host Configuration Protocol (DHCP)
- Domain Name System (DNS)
- Virtual LANs (VLANs)
- Virtual Private Networks (VPN)
- Charging & billing
- Information Storage

## User Connection Procedures

- Key Performance Indicators (KPIs)
- Registration
- Security process
- Connecting to the Internet
- Connecting to an Intranet via packet core
- MMS procedures
- The UMTS USIM card
- Handover/cell reselection procedures
- Routing Area Updates
- Serving RNS Relocation
- Interaction with EGPRS
- Support for Roaming
- Suspend and Resume procedure (A/Gb mode)

## Applications & Services

- SMS & MMS
- Role of WAP Gateway
- Push email & Blackberry
- Location based services
- Overview of the IMS

DURATION 3 days

CLASS SIZE Max. 12 pax