

GSM, UMTS AND LTE ADVANCED OVERVIEW

– RADIO ACCESS NETWORK AND CORE NETWORK

Course Description

Introduction of LTE/4G technology will increase the demand for high capacity transport networks. This course meets the requirements from experienced professionals, dealing with operational and planning aspects of the mobile radio, core or transport level. The course gives a detailed description of post-R99 system architectures, their configuration options and additional features.

Multi-RAB options, Flexible Iu and S1 configurations for MOCN and pooled SGSN/MSC-S/MME and S-GW are explained. The new features for operator centric services, like PCRF and CSCF and IP enabled QoS across the UMTS and LTE core and radio infrastructures are also described.

The evolution of UMTS towards HSPA advanced and LTE is described in terms of system architectures, protocols and operational features like self configuration and self optimization (SON).

Content

POST-R99 UMTS SYSTEM ARCHITECTURE

- Softswitch based core network domain for 2G and 3G
- 3G Direct Tunnel for the PS domain
- Pooled SGSN and MSC resources
- HSDPA and HSUPA impact on UTRAN and CN



PS CN DOMAIN

- Principles for end to end IP connectivity in UMTS and GPRS
- The use of APN, secondary PDP context and service aware control in PS CN domain
- International roaming and operator interconnect
- Dependencies between UTRAN and PS CN

CS CN DOMAIN

- Mobile softswitch implementation with MSC servers (MSC-S) and Media Gateways (MGW)
- End-to-end call setup examples in CS domain
- CS transcoding, International roaming and operator interconnect
- Dependencies between UTRAN (RNC) and CS CN

PROTOCOLS AND FUNCTIONS FOR IP BASED INTERFACES IN UMTS

- Iub/Iur interfaces for control and user planes
- Iu and intra-CN interfaces for CS and PS core domains
- SIGTRAN implementation in UMTS
- Requirements on Iu interfaces for Multi Operator CN implementations

UMTS QoS AND TRAFFIC SEPARATION FOR IP TRANSPORT

- Matching the UMTS QoS classes with IP traffic classes
- DSCP mapping and UMTS node classification requirements
- Priority, packet loss and delay requirements in traffic separation

RADIO ACCESS BEARER TYPES AND THEIR QoS RELATION

- Conversational, Streaming, Interactive and Background RAB capabilities
- Multi-RAB concept and implementation options in UTRAN and UE
- Service level examples using Multi-RABs

IMPLEMENTATION OF MOCN, MULTI OPERATOR CORE NETWORKS

- MOCN configuration options with flexible Iu on ATM and IP transport
- Iu CS/PS configurations in RNC and MSC/SGSN
- Dependencies between flexible Iu, 3G DT and pooled CN resources
- National and International roaming scenarios using flexible Iu (2G-3G and 3G-3G)

EVOLUTION OF UMTS

- HSPA advanced and above: MIMO, Dual Carrier WCDMA and VoIP
- What is new and what remains upgrade paths and new radio standards
- Abandoning CS Domain technology while maintaining existing service portfolios

LTE, Long Term Evolution

- LTE radio access network architecture and protocols
- Transmission bandwidth and frequency bands for LTE
- EPC (LTE core network) architecture and functions
- Service interworking between 2G/3G and LTE
- Mobility management in LTE networks

LTE RADIO- AND CORE NETWORK FEATURES

- LTE cell throughput calculations in 2,6 GHz spectrum
- SON features for configuration and optimization of LTE radio
- Traffic cases for mobile broadband data services
- Sharing the radio capacity between different operators

Widermind

Drottninggatan 89
113 60 Stockholm
Sweden

Telephone: +46 8 410 757 11

E-mail: info@widermind.com

www.widermind.com

- Multi-Band LTE implementations (800MHz/2,6MHz)
- Implementation of Advanced MIMO and Carrier aggregation

BEARER QoS AND END-TO-END SERVICE CONSIDERATIONS

- Managing the Bearer and services Quality in 2G/3G and 4G: QoS and QCI
- KPI definitions for CS and PS services in mobile networks
- Important Bearer level KPI definitions
- Matching RAB and E-RAB attributes with QoS and QCI
- IP based Transport network QoS implementations
- Matching the quality attributes on the Transport network: DSCP and .1p/1Q mapping
- Monitoring KPI in the network

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 113 60 Stockholm
 Sweden
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Target audience

Target audience is e.g staff with engineering background within IP technology, staff with with working experience from a mobile operator's Network Management Centers / Network Operator Centers, project managers etc.

Pre-requisites

The participants should have working experience from mobile networks.

Course length

3 days

Widermind communicates the knowledge you need to develop and implement new technologies for current and future network operations. Our clients are telecom operators, system integrators, system suppliers and consultancy firms.

Based in Stockholm, Sweden, we develop courses backed by a comprehensive network of associates. Our instructors employ technical and pedagogical skills that have made Widermind training well known and appreciated as one of the best services in the field.

You are warm welcome to contact our representatives at:

Email: info@widermind.com or telephone: +46 8 410 757 11