

GSM, UMTS, HSPA AND LTE

“What a wonderful experience on GSM, UMTS, HSPA and LTE. It was structured towards our needs and well delivered in a practical manner. There is no doubt that the trainer is highly skilled in this field”.

– Adeola Gbadebo, Manager Technical Development,
Survenet Integrated Limited, Nigeria

Course Description

Mobile networks of today are true multimedia networks, providing telephony, data and video services to mobile end-users. Historically, mobile networks have been optimized for mobile telephony services. The data related traffic has surpassed the telephony generated traffic. In addition, the end-user expectations on the mobile data services, in terms of high quality, lead to tougher requirements on network performance, such as bandwidth availability, packet loss and delay.

Some mobile operators are facing the challenges of managing several different generations of mobile technologies simultaneously; 2G, 3G and 4G. The course “GSM, UMTS, HSPA and LTE” covers all these network technologies but with the emphasis on LTE.

Content

MOBILE EVOLUTION

- Circuit switched and Packet switched
- Mobile generations
- Analogue and Digital information
- Services
- Bit rates
- Statistics



NETWORK ARCHITECTURE

- Radio Network
- Core Network
- Network nodes (base stations, switches, data bases etc).

MOBILE TECHNOLOGIES

- FDMA
- TDMA
- CDMA

TDMA IN GSM

- Frequencies
- Time Slots
- Frequency re-use

WCDMA IN UMTS

- Signal over Interference Ratio, E_c/N_o
- Codes
- Chip rate
- Spreading Factor
- Power control

TRAFFIC CASES AND PROCEDURES

- Location Updating
- Call set-up
- Hard- and soft handover

HSPA

- HSPA protocol architecture
- Impact on existing UTRAN systems
- Second carrier
- Capacity upgrade
- Transmission requirements on UTRAN due to HSPA introduction

RADIO RESOURCE MANAGEMENT

- Power and Code allocation
- HSPA vs R99 priority handling
- Admission Control
- Load and Congestion Control
- RRC states
- Resource allocation in NodeB/UE

HSPA MOBILITY

- Handover
- Cell Reselection
- E-DCH cell change (soft and hard handover)

LTE –TRENDS AND DRIVERS IN THE 4G DEVELOPMENT

- Service portfolio and positioning
- Abandoning Telephony for the Internet
- Promises and expectations

IMPORTANT SPECTRUM RELATED ISSUES

- Spectrum Flexibility
- Spectrum migration and re-farming of 2G and 3G spectrum
- Bandwidth, capacity and coverage planning

THE LTE SYSTEM ARCHITECTURE

- The major differences compared to UMTS
- Migration vs. replacement of 3G systems
- OFDMA radio interface
- SON, Self Optimized Network

ROAMING, MOBILITY AND SESSION MANAGEMENT ACROSS LTE AND GSM/UMTS

- Handover scenarios between HSPA and LTE networks
- VCC, Voice call continuity and CS fallback/interworking with UMTS
- Multi-operator shared Radio Access Networks
- Commonalities between LTE and HSPA evolution releases

TRAFFIC CASES IN LTE/EPS

- Network registration – Initial procedure
- Paging and Location update Procedures
- Throughput calculations for LTE

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Target audience

The target audience is engineers, project leaders, marketing staff or others, who need an efficient and thorough introduction to the mobile telecom technologies.

Pre-requisites

It is advantageous however not necessary for the participants to have some working experience from the telecom sector.

Course length

2 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:

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