

HSPA, HSPA EVOLVED AND LTE

“Widermind has a great ability to understand our needs and the tailored HSPA and LTE training program has been of great value to our organization. Both content of the training program and the presentation skills has completely fulfilled our expectations”

– Rickard Höglund, Radio Engineering, Telenor Sweden

Course Description

The mobile operators need to address the customers’ continuous demand for higher data capacity and higher peak rates. The course “HSPA, HSPA Evolved and LTE” details the HSPA technology currently implemented in most networks as well as the path towards higher capacity and peak rates. Among many other topics, the course brings up e.g. how the different radio access networks will work with the future Evolved Packet Core Network (EPC).

Content

WCDMA EVOLUTION HSPA AND MBMS

- Overall architecture
- Physical layer
- Resource handling and packet-data session

HSDPA

- Overview
- Shared-channel transmission
- Channel-dependent scheduling
- Rate control and higher-order modulation
- Hybrid ARQ with soft combining.
- Architecture
- HS-DSCH, inclusion of features in WCDMA Release 5.



- MAC-hs and physical-layer processing
- Scheduling
- Rate control
- Hybrid ARQ with soft combining.
- Data flow
- Resource control for HS-DSCH
- Mobility
- UE categories
- Hybrid ARQ revisited: physical-layer processing
- CQI and other means to assess the downlink quality
- Downlink control signaling, HS-SCCH
- Downlink control signaling, F-DPCH
- Uplink control signaling, HS-DPCCH

HSUPA

- Overview
- Scheduling
- Hybrid ARQ with soft combining
- Architecture
- Details of Enhanced Uplink
- MAC-e and physical layer processing
- Scheduling
- E-TFC selection
- Hybrid ARQ with soft combining
- Physical channel allocation
- Power control
- Resource control for E-DCH
- Mobility
- UE categories

MBMS, MULTIMEDIA BROADCAST MULTICAST

- Overview
- Macro-diversity
- Application-level coding
- Details of MBMS

HSPA EVOLUTION

- MIMO
- HSDPA-MIMO data transmission
- Rate control for HSDPA-MIMO
- Hybrid ARQ with soft combining for HSDPA-MIMO
- Control signaling for HSDPA-MIMO
- UE capabilities

- Higher-order modulation
- Continuous packet connectivity
- DTX – reducing uplink overhead
- DRX – reducing UE power consumption.
- HS-SCCH-less operation: downlink overhead reduction
- Control signaling
- Enhanced CELL_FACH operation
- Layer 2 protocol enhancements
- Advanced receivers
- Receiver diversity (type 1)
- Chip-level equalizers and similar receivers (type 2)
- Combination with antenna diversity (type 3)
- Interference cancellation
- Introduction
- Single priority queue dimensioning
- Multiple priority queues
- Dual stack Iub dimensioning

LTE AND SYSTEM ARCHITECTURE EVOLUTION, SAE

- LTE design targets
- Capabilities
- System performance
- Deployment-related aspects
- Architecture and migration
- Radio resource management
- Complexity
- General aspects
- SAE design targets
- LTE radio access, an overview 289
- Transmission schemes: downlink OFDM and uplink

SC-FDMA

- Channel-dependent scheduling and rate adaptation
- Downlink scheduling
- Uplink scheduling
- Inter-cell interference coordination
- Hybrid ARQ with soft combining
- Multiple antenna support
- Multicast and broadcast support
- Spectrum flexibility
- Flexibility in duplex arrangement
- Flexibility in frequency band of operation
- Bandwidth flexibility
- LTE radio interface architecture 299
- RLC: radio link control
- MAC: medium access control

- Logical channels and transport channels
- Downlink scheduling
- Uplink scheduling
- Hybrid ARQ
- PHY, physical layer
- LTE states
- Data flow
- LTE physical layer 317
- Overall time-domain structure
- Downlink transmission scheme

SYSTEM ARCHITECTURE EVOLUTION

- Functional split between RAN and core network
- Functional split between WCDMA/HSPA RAN and core network
- Functional split between LTE RAN and core network
- HSPA/WCDMA and LTE radio access network
- WCDMA/HSPA radio access network
- LTE radio access network
- Core network architecture
- GSM core network used for WCDMA/HSPA
- The Evolved Packet Core
- WCDMA/HSPA connected to Evolved Packet Core

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Target audience

The course targets cell planners and others in the wireless industry working with planning or operating UMTS/HSPA networks and need to understand more about HSPA and how to plan for the future of the network with HSPA Evolved and LTE/EPS.

Pre-requisites

The participants should have a good understanding and working experience from UMTS/HSPA Systems.

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.

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