Advanced HSPA/HSPA+ Training

HSPA/HSPA+ trainig course covers the fundamentals of HSPA/HSPA+ network including Adaptive Modulation and Coding (AMC), Multiple-Input Multiple-Output (MIMO), Hybrid Automatic Request (HARQ), fast cell search, and advanced receiver design

Who Should Attend

Engineers

Objectives

Advanced HSDPA training course provides you with a comprehensive technical foundation in HSDPA analysis, design, implementation and testing (RF and MAC layers applied to mobile device, Node B (BS) and RNC)

Outline

HSDPA Principals

- HSDPA radio optimization principals
- HSDPA's distributed architecture
- Low delay link adaptation
- Fast physical layer (L1) retransmission
- Combining and link adaptation techniques
- Scheduling for the downlink packet data operation at the base station
- Higher-order modulation
- Impact of HSDPA on W-CDMA
- HSDPA power management
- HSDPA performance
- Significant performance improvements
- Achieving higher theoretical peak rates
- QPSK modulation and 16-QAM
- HSDPA mobile devices, Node B, RNC and modems

Key HSDPA Technologies

- Adaptive modulation and coding (AMC)
- Fast Scheduling
- Hybrid automatic repeat request (HARQ)

- Fast PHY Re-Transmissions
- Channel Quality Feedback
- High-Speed Downlink Shared Channel (HS-DSCH)
- MIMOs

High-speed downlink shared channel (HS-DSCH)

- Basic structure of HS-DSCH
- Protocol structure
- Basic physical structure
- HS-DSCH Characteristics
- DL HS-DSCH Physical layer model
- FDD Downlink Physical layer Model
- TDD Downlink Physical layer model
- UL Physical layer model
- HS-DSCH physical-layer structure in the code domain

MAC architecture

- HS-DSCH MAC architecture - UE side
- Overall architecture
- Details of MAC-d
- Details of MAC-c/sh
- Details of MAC-hs
- HS-DSCH MAC architecture - UTRAN side
- HARQ protocols
- Signalling
- Uplink and Downlink
- Error handling
- Signaling parameters
- Downlink signaling parameters
- UE identification
- Transport Block Sizes
- Channelization codes
- HS-PDSCH configuration
- HARQ information
- Measurement feedback rate
- HS-PDSCH power offset
- HS-SCCH Cyclic Sequence Number (HCSN)
- Uplink signaling parameters Measurement report

High Speed Downlink Packet Access: Iub/Iur protocol

- Impacts on Iub Interface - General Aspects
- Impacts on Iub/Iur Control Plane Protocols
- HSDPA Signaling Requirements (Comparison between DSCH and HS-DSCH)
- Impacts on NBAP Procedures
- Example of HS-DSCH Configuration and Capacity Allocation
- Examples of HS-DSCH Mobility Procedures
- Impacts on Iub Interface User Plane Protocols
- Transport Bearer Options
- QoS Aspects
- Security Aspects
- TDD versus FDD Aspects
- Backwards Compatibility

HSDPA Radio Aspects

- Basic physical structure
- HS-DSCH Characteristics
- DL HS-DSCH Physical layer model
- FDD Downlink Physical layer Model
- TDD Downlink Physical layer model
- UL Physical layer model
- HS-DSCH physical-layer structure in the code domain
- Signaling parameters
- Downlink signaling parameters
- UE identification
- Transport Block Sizes
- Channelization codes (FDD only)
- HS-PDSCH configuration (TDD only)
- HS-PDSCH power offset
- HS-SCCH Cyclic Sequence Number (HCSN) (TDD only)
- Uplink signalling parameters
- Measurement report

HSDPA Physical and MAC Layer Design Issues

- Turbo coding
- Acquisition, rake receiver, TDD mode receiver, symbol rate processing, MIMO antennas, and interference cancellation and equalization
- Physical Channels and Channel Structures

- Spreading and modulation
- Adaptive Modulation and Coding (AMC)
- HSDPA ASIC verification
- Devices, Node Bs and RNCs