

Course ID
HSPAOPT
Course Duration
3 days

Course Title
Optimizing HSPA (HSDPA and HSUPA) Networks

Related Courses

- Traffic Engineering Models for 3G Network Design (TRAFFIC3G, 3 days)
- HSDPA: An Advanced Tutorial (HSDPA-ADV, 2 days)
- 3G LTE/4G: The Next Generation Mobile Networks (3GLTE-4G, 2 days)

Aimed At

Those with UMTS-FDD and HSDPA/HSUPA background who wish to learn how to optimize HSDPA/HSUPA networks.

Group Size

5-25

Prerequisites

- UMTS-FDD: Network Architecture, Operation, and Design (UMTS-FDD, 3 days)
- HSUPA: Network Architecture, Operation, and Design (HSUPA, 2 days)
- HSDPA: Network Architecture, Operation, and Design (HSDPA, 2 days)

Course in a Nutshell

The course teaches the protocols and procedures for network optimization based on log file analysis and common optimization scenarios. Increasing prevalence of mobile broadband coupled with the promise of inexpensive data-based applications such as Mobile VoIP have made a course such as this mandatory for every UMTS professional.

In this course, you will undertake an in-depth study of the workings of HSDPA/HSUPA in a UMTS network and learn to optimize HSPA networks by studying real-life deployment scenarios. Covered are the optimization of web-browsing, data/voice systems, streaming, and mobile VoIP. The optimization methodology employed in class will use log files, hardware, and software tools – some of which are based on open source software.

Customize It!

We can tailor this course to your own needs at little-to-no additional cost. It can be adapted to the information needs and “tech level” of audiences such as network design and optimization engineers, equipment or application developers, and others.

Learn How To

- Identify the KPI’s that best characterize the quality of your own network
- Set the KPIs to suit your organization’s needs
- Troubleshoot and optimize the network to the target KPI’s
- Optimize a network with minimum error and maximum productivity

Course Outline

- Overview
 - Introduction to WCDMA and HSPA
 - Main parameters
 - Spreading, OVSF codes, and code tree
 - Power control
 - Soft handover
 - Retransmissions
- HSDPA
 - Principles
 - Targets and characteristics
 - Changes compared to Rel '99
 - New channels
 - Multi code operation
 - Basic operation
 - Setup
 - RRC states
 - Disadvantages
 - Applications
 - *Examples and guided self-assessment exercises*
- HSDPA Enhancement and Extensions
 - Propagation control plane
 - User plane
 - Node B
 - Packet scheduling
- HSDPA Physical Layer
 - HS-SCCH frame structure
 - HS-PDSCH frame structure
 - HS-DPCCH frame structure
 - Timing relationships
 - CQI
 - AMC
 - HARQ
 - *Examples and guided self-assessment exercises*
- HSDPA Mobility
 - Serving HS-DSCH cell
 - Event 1d
 - Intra/Inter-node B
- HSDPA Data Rates and Performances
 - Terminal capability
 - Retransmission
 - Throughput (cell/user)

- TCP/IP Protocol Suite and Tools
- Test Scenarios
 - Latency
 - File upload and Download
 - Web browsing
- HSDPA Logfile Analysis
 - Terminal capability analysis of logfiles from test lab and commercial networks
 - Description of test set-up
 - Analysis of key RRC messages including new information elements
 - CQI, Ack/Nack reporting and retransmission rate in a live network
 - FTP upload and download
 - Ping delay
 - Performance under different radio conditions
 - Impact of changing serving HS-DSCH cell on throughput
 - HSUPA
 - Introduction
 - Targets and characteristics
 - Changes compared to Rel '99
 - New channels
 - Basic operation
 - Applications
 - Mobility (soft handover)
 - Terminal capability
 - Handset availability
- Wrap-up: Course Recap, Discussion, and Evaluations

How You Will Learn

- An instructor who is highly experienced with the WCDMA technology family will present this course in interactive lecture format.
- Along with the lecture, we will use exercises and group activities to make the course more practical and interesting.
- We will build on what you already know about the UMTS technology. If you are less technical, we will use examples to simplify the complex subject matter.
- You will receive a printed Participant Handbook which will help you remember and retain what you learned in class and apply it on your job.

Revised

March 2nd, 2008