

Mobile IoT in Half a Day

CONTENTS

This course is a short, but intensive overview of the various aspects of the mobile communication for the Internet of Things (IoT) and its impact on the 3GPP networks (GSM with GPRS/EDGE, UMTS with HSPA, LTE), focusing mostly on the new radio technologies, like NB-IoT, LTE-M, and also EC-GSM-IoT.

After a brief introduction to various IoT technologies, the course focuses on solutions for machine-type communication introduced in the 3GPP system from Release 10 up to Release 15 (changes in the existing radio access network technologies, description of the new ones, and new core network features, nodes, and interfaces).

PREREQUISITES

General technical knowledge of the GSM/GPRS/UMTS/HSPA/LTE networks is recommended. For required background knowledge, we strongly recommend Apis' "3GPP Mobile Systems Overview" course and suggest various Apis' radio and core network signalling courses.

Note: FoldOuts are not used in this training.

- IoT landscape: existing and new capillary and wide-area network technologies for licensed and unlicensed spectrum
- Specific requirements and issues for IoT communication
- Introduction to 3GPP mobile IoT radio solutions
- Random Access and RRC Connection enhancements
- LTE, LTE-M, NB-IoT device categories and frequency bands
- Power Saving Mode
- Control Plane and User Plane CIoT EPS optimisations
- Extended idle-mode Discontinuous Reception (eDRX)
- MCL comparison for various 3GPP RAN types
- Introduction to NB-IoT, operation modes, supported and unsupported features, cost-saving features
- Classic LTE physical layer organization with modifications for LTE-M and NB-IoT
- Physical layer organization of NB-IoT uplink, multi- and single-tone transmissions.
- E-UTRAN channel architecture for WB-E-UTRAN and NB-IoT
- Full and half duplex modes
- Overview of EC-GSM-IoT and Power Efficient Operation
- Coverage enhancements: repetitions of data transmissions, CE modes A and B
- Architecture enhancements for MTC: new nodes (MTC-IWF and SCEF)
- New subscription options: MSISDN-less with external id, PS-only with SMS, new data in subscriber's profile
- Data transport options: CP or UP, IP or non-IP, SCEF or SGi delivery
- SMS delivery options
- Data transport in SMS over T4 interface
- Non-IP Data Delivery (NIDD): connection authorization, setup, mobility, release and MO/MT data transfer
- Monitoring event configuration and reporting
- New overload indications from MME to E-UTRAN
- CN assistance info for RAN parameter tuning
- Overview of Remote Provisioning Architecture for Embedded UICC (a.k.a. eUICC, eSIM or soft-SIM)