LTE-M and NB-IoT Network and Operations

5G_201x | Expert-Led Live | 5G Access | Expert
Course Duration: 2 days

LTE-M and NB-IoT in the Low Power Wide Area (LPWA) cellular deployment have requirements such as low cost, enhanced coverage, high capacity, and long battery life. This course describes network architecture enhancements in LTE networks for IoT such as Non-IP Data Delivery (NIDD) and Service Capability Exposure Function (SCEF). The fundamental operations such as network acquisition, random access, RRC connection setup, data transfer, and mobility are covered.

Intended Audience

Technical personnel working for wireless operators, equipment and device manufacturers, who need a detailed look at LTE-M and NB-IoT.

Objectives

After completing this course, the learner will be able to:

- Sketch the end-to-end network architecture of LTE for LTE-M and NB-IoT
- List roles of new network elements of IoT network in LTE
- List and describe categories of IoT devices supported in LTE networks
- Categorize LTE features to enhance coverage for IoT devices
- Categorize LTE features to enhance capacity and network performance
- Categorize LTE features to extend battery life of IoT devices
- Step through life of a Cat-M and NB-IoT devices and explore various network operations

Course Prerequisites

LTE Overview

Outline

1. LTE-M and NB-IoT Network Architecture
1.1 IoT essentials
1.2 IoT support in 3GPP specifications
1.3 Need for network enhancements for IoT
1.4 LTE-M and NB-IoT network architecture
1.5 End-to-end operation of IoT devices
1.6 LTE IoT devices
Exercise: IP-based IoT architecture
Exercise: Non-IP-based IoT architecture

2. LTE Enhancements for IoT
2.1 Wireless optimizations for IoT
2.2 Coverage enhancements for IoT
2.3 IoT load management
2.4 Power saving enhancements
2.5 IoT network features

3. LTE-M Operations
3.1 Device and network enhancements for LTE-M
3.2 Network Attach and UE-AS link setup
3.3 Network acquisition in LTE-M
3.4 Air interface for LTE-M
3.5 RRC Connection Setup for LTE-M
3.6 DL and UL traffic operations
Exercise: Life of a Cat-M device in LTE Networks

4. NB-IoT Operations
4.1 Characteristics of NB-IoT
4.2 NB-IoT channels and signals
4.3 System acquisition and SIBs
4.4 Random Access in NB-IoT
4.5 Initial Attach Non-IP Data Delivery (NIDD)
4.6 Air interface for NB-IoT
Exercise: Life of a NB-IoT device in LTE networks