IoT in Wireless Networks [Advances in LTE-RAN Series]

Instructor Led Live Virtual Class | Duration: 0.5 Day | Course Number: TPR1001

Technology Primers

Internet of Things (IoT) is expected to dominate telecom market where machines exchange data for intelligent applications. Devices and networks supporting IoT pose unique challenges such as low power, low cost, low mobility, and long battery life. This course addresses several low power wide area (LPWA) network technologies defined by 3GPP to meet these requirements. IoT-specific 3GPP-defined technology options such as machine type communication (MTC), enhanced MTC (eMTC), Narrowband IoT (NB-IoT), Extended Coverage-GSM (EC-GSM), and critical MTC are being embraced by the wireless industry. This course provides a foundation for MTC, eMTC, NB-LTE, and EC-GSM. Fundamental concepts of IoT-centric optimizations for a wireless network are explained. IoT-specific characteristics of the wireless network and relevant UE categories (e.g., Category M1 and Category NB1) are described.

Intended Audience

Technical and product marketing personnel working for wireless operators, equipment and device manufacturers, as well as IoT architects and designers.

Learning Objectives

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

- Give examples of IoT use cases
- Explain wireless optimizations for IoT such as Power Save Mode and eDRX
- List key technology options to support IoT
- Distinguish among MTC, eMTC, NB-IoT, and critical MTC
- Specify IoT-specific characteristics of the network and UE categories

Suggested Prerequisites

- [LTE_102] LTE Overview (eLearning)

Course Outline

1. **Introduction to IoT**
   - 1.1. IoT: what and why
   - 1.2. Overview of MTC, eMTC, and NB-IoT
   - 1.3. Critical MTC
   - 1.4. Non-3GPP IoT solutions (SIGFOX, LoRa, Silver Spring Networks, and Ingenu)
2. **Wireless Optimizations for IoT**
   - 2.1. IoT requirements on wireless networks
   - 2.2. Extended Access Barring (EAB)
   - 2.3. Overload and congestion control
   - 2.4. Optimized NAS signaling
   - 2.5. Coverage enhancement (CE) techniques
   - 2.6. CE Mode A and CE Mode B
   - 2.7. Power Save Mode (PSM)
   - 2.8. eDRX for idle and connected modes
3. **Network and UE Characteristics**
   - 3.1. Overview of UE categories
   - 3.2. UE Category 1 and MTC
   - 3.3. eMTC and UE category M1: A Closer Look
   - 3.4. Characteristics of NB-IoT
   - 3.5. UE category NB1 for NB-IoT
   - 3.6. A brief overview of EC-GSM
   - 3.7. Network architecture enhancements (e.g., NIDD via SCEF)