5G (SA) RAN Signaling and Operations Part 2: Network Acquisition

5G_212d | On-Demand | 5G Access | Expanded
Course Duration: 4 hours

This is the second course in a six-course set of self-paced courses encompassing 5G SA RAN Signaling and Operations. In this course, you will learn about network acquisition for a device in a 5G standalone RAN. You will explore how a device finds and downlink synchronizes with a 5G New Radio cell, reads system information needed for cell selection and uplink synchronization, and establishes dedicated communications with the cell. Each course in this six-course set can stand on its own or can be combined with other courses as necessary to meet your learning objectives.

Intended Audience

5G RAN and device engineering, operations, and performance related job functions

Objectives

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

- Describe the steps of preparing to monitor 5G SA cell and 5G network acquisition
- Summarize the Random Access (RACH) operation
- Explain the details of RRC connection setup with the gNB

Course Prerequisites

5G NR Air Interface

Outline

1. Downlink Sync and System Information
1.1 Cell acquisition and RACH operation
1.2 Power on sequence for a device in 5G SA
1.3 SSB and beam sweeping
1.4 Beam association on network acquisition
1.5 Cell search operation using SS/PBCH
1.6 SSB measurements
1.7 System Information: MIB and SIB1
1.8 Cell selection criteria
Exercise: Network acquisition

2. Uplink Synchronization and RRC Setup
2.1 Uplink synchronization using RACH
Exercise: RACH configuration
Exercise: Preamble power control parameters
Exercise: Preamble power calculations
2.2 RRC connection setup

Assessment

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