5G (SA) RAN Signaling and Operations Part 1: 5G RAN Essentials

5G_211d | On-Demand | 5G Access | ⚙⚙
Course Duration: 4 hours

This is the first course in a six-course set of self-paced courses encompassing 5G SA RAN Signaling and Operations. In this course, you will learn about the 5G SA RAN architecture and interfaces as well as the life of a 5G device in a 5G SA deployment from a RAN signaling and operations perspective. This course includes a review of key 5G New Radio (NR) air interface capabilities needed to put RAN architecture and operations into context. 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 interfaces and protocols related to 5G NR RAN signaling
- Step through the life of a 5G UE in SA (Option 2) deployment
- Review key functionalities of 5G NR such as flexible numerology, beamforming

Course Prerequisites

5G NR Air Interface

Outline

1. 5G Standalone (SA) RAN Overview: RAN Essentials
1.1 5G SA RAN split architecture - gNB-CU, gNB-DU
1.2 Use of interfaces: NR, N1, N2, N3
1.3 Role of protocols like PHY, MAC, RRC, PDCP, NAS
1.4 gNB related interfaces - F1, Xn
1.5 5G RAN performance targets and solutions
1.6 NR Numerology and Frame Structure
1.7 Role of beamforming and MIMO
1.8 Bandwidth adaptation (BWP)
Exercise: 5G SA RAN architecture and interfaces

2. 5G SA RAN Overview: UE Operations in 5G SA Overview
2.1 5G NR air interface overview
2.2 Life of a UE in 5G SA network
Exercise: 5G SA operations

3. 5G NR Air Interface Overview
3.1 Key features of 5G NR air interface
3.2 NR Numerology and Frame Structure
3.3 Synchronization Signals and Broadcast Channel (SS/PBCH)

Assessment