

# O-RAN Architecture and Operations

This training is a technical overview of Open RAN as defined by the O-RAN Alliance. It sketches the O-RAN architecture, defines the RAN logical functions, their interfaces, and steps through the deployment operations.

## Intended Audience

This course is intended for planning, engineering, operations, and systems performance teams.

## Objectives

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

- Identify the key technology enablers for Open RAN initiatives
- Sketch O-RAN architecture, describe role of each logical function and their open interfaces
- Describe SMO architecture and functions
- Describe the role of Non-RT RIC, Near RT-RIC towards network operations
- Describe A1/E2 operations that helps to improve Network Performance for different usage scenarios
- Identify the different location strategies of O-RAN components and its challenges

## What You Can Expect

- Prerequisite: Welcome to 5G (On-Demand)
- Expert-Led Live Duration: 7 HOUR

## Outline

### 1. Open RAN Drivers

- 1.1 Need for Open RAN
- 1.2 Industry Initiative and role of O-RAN Alliance
- 1.3 Separation of user and control planes
- 1.4 Virtualization in 5G RAN
- 1.5 Role of artificial intelligence and automation

**Exercise:** Open RAN drivers

### 2. O-RAN Network Architecture

- 2.1 O-RAN reference architecture
- 2.2 Role of Service Management and Orchestration (SMO)
- 2.3 SMO using ONAP and OSM
- 2.4 RAN Intelligent Controllers (Non-RT RIC, Near RT RIC)
- 2.5 Functionalities of O-CU-CP, O-CU-UP, O-DU, O-RU
- 2.6 O-Cloud services
- 2.7 O-RAN interfaces

2.8 O-RAN Split Option 7-2x Interface

2.9 APIs in O-RAN

**Exercise:** O-RAN architecture

### 3. O-RAN Operations

- 3.1 Network service instantiation and management
- 3.2 O-Cloud management and orchestration
- 3.3 Non-RT RIC Services Framework
- 3.4 A1/E2 interface protocol stack and procedures
- 3.5 Interaction between xAPPs and E2 nodes
- 3.6 RAN usage scenarios
- 3.7 Fronthaul transport and synchronization

**Exercise:** Operations in O-RAN

### 4. O-RAN Deployment Scenarios

- 4.1 Near RT-RIC, O-DU, O-CU, O-RU location strategies
- 4.2 Challenges and key considerations
- 4.3 O-RAN slicing