# O-RAN Architecture and Operations

**5G_208x | Expert-Led Live | 5G Access | Expert**
**Course Duration:** 1 day

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

## Course Prerequisites

Welcome to 5G

## 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

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