Open RAN Advance

Learning Objective:

Upon completing the course, the participant will be able to:

- Identify the key components of the OpenRAN architecture, including the RAN Intelligent Controller (RIC), Distributed Unit (DU), and Central Unit (CU).
- Explore the benefits and challenges of OpenRAN implementations.
- Analyse different RAN split options and their implications for network performance and deployment flexibility.
- Differentiate between eCPRI and CPRI technologies and their application in OpenRAN.
- Understand the implementation details of the Distributed Unit (DU) and Central Unit (CU) within OpenRAN.
- Describe the control loops within the OpenRAN architecture and their importance for network optimization.
- Understand the role of Service Management and Orchestration (SMO) in O-RAN.
- Differentiate between the Near-RT RIC and Non-RT RIC.
- Understand various Interfaces in OpenRAN and their protocol stacks.
- Understand the functionalities and use cases of rApps and xApps in the O-RAN ecosystem.
- Explore the QoS-based Resource Allocator (QRA) xApp and its role in dynamic resource allocation.
- Convergence of RAN and RIC in OpenRAN Ecosystem: Explore the convergence of RAN and RIC and its impact on network performance.
- Examine different deployment scenarios for OpenRAN.

Who Should Attend?

- The "Open RAN Advance" e-learning course is designed for a diverse audience interested in understanding and implementing Open RAN technology.

Target Audience:

- Telecommunications Engineers / Network Architects / Network Engineers / RF Engineers
- Network Planners/System Integrators/System Designers/System Administrators/Technical Support Teams

Instructional Method:

- Lectures in Classroom, Virtual Classroom training, Discussion, Questions & Answers. All participants will also receive comprehensive course materials.

Course Outline:

1. OpenRAN from the perspective of 3GPP and O-RAN Alliance

- Understanding OpenRAN Fundamentals and Network Architecture Component
- Exploring RAN Split Options in OpenRAN Architecture
- Bits processing and use of eCPRI
- eCPRI and CPRI Technologies & DU and CU Implementation
- OpenRAN Control Loops

2. Entities of OpenRAN

- Service Management and Orchestration (SMO) in O-RAN Architecture
- SMO Support for O-RAN Network Functions
- RAN Elements in O-RAN Architecture
- O-Cloud Architecture and Deployment
- RAN Intelligent Controller (RIC) Overview
- Understanding Near-RT RIC in O-RAN Architecture

3. Interfaces in OpenRAN

- Interface in OpenRAN - A1
- O1 Interface
- 02 Interface
- E2 Interface and Procedure Overview
- Exploring E2AP Procedures and Elements
- Understanding E2SM: Overview and Services
- Signalling Transport Services Between E2 and Near-RT RIC
- E2SM RAN Control- Characteristics and Procedure
- Exploring the Open Fronthaul Interface and Protocol Stack
- E1 interface
- Understanding Open Interfaces and F1-c/F1-u Interface in 3GPP
- NG-c and NG-u Interfaces: Protocols and Structure
- X2-c and X2-u Interfaces: Protocols and Structure
- Xn Interface: Protocols and Structure
- Uu Interface: Exploring Protocol Structure

4. OpenRAN Entities and Applications

- Exploring rApps, xApps and QoS-based Resource Allocator xApp
- Parameters Monitored Through E2 Interface
- Dynamic Resource Allocation Strategies in QRA xApp
- Advanced Network Optimization Techniques in OpenRAN
- Convergence of RAN and RIC in OpenRAN Ecosystem

5. Implementation, Deployment, Optimization of OpenRAN

- Next-Generation RAN Architecture: Evolution and Implementation Options
- OpenRAN Deployment Scenarios
- Optimizing OpenRAN Deployment and Use Cases

Number of Hours: 3 Hr. 10 Min.