Open RAN Overview – 2 days

CONTENTS

The course provides a technical overview of Open RAN and specifically O-RAN from the O-RAN Alliance. The course outlines the O-RAN architecture and terminology, central functions and concepts like SMO, Non-RT RAN Intelligent Controller, Near-RT RAN Intelligent Controller, O-CU, O-DU, O-RU and O-Cloud.

Relevant interfaces are described, along with a few simple use case examples. The motives and objectives for Open RAN are outlined, as well as its relationship to technical specifications from e.g. 3GPP, ETSI and IETF.

PREREQUISITES

Basic knowledge of 5G NG-RAN architecture is recommended.

3GPP C-RAN RAN Architecture

- NG-RAN architecture and protocols
- C-RAN according to 3GPP
- gNB-CU and gNB-DU
- the F1 interface and F1AP
- the E1 interface and E1AP

Main O-RAN Architecture

- Open RAN objectives and overall vision
- Building blocks: SMO, Non-RT RIC, Near-RT RIC, E2 Nodes and O-Cloud
- gNB split into O-CU-CP, O-CU-UP, O-DU and O-RU
- Main Interfaces and protocols
- Relation to 3GPP specifications

Service Management and Orchestration (SMO) and Non-RT RIC

- Purpose and role
- Non-RT RIC
- rApps
- OAM Functions
- Relevant Interfaces: R1, A1, O1 and O2
- AI (Artificial Intelligence) and ML (Machine learning) fundamentals
- Simple Use Cases

The R1 Interface

- Non-RT RIC Applications (rApps) and Non-RT RIC Platform
- R1 Services
- The R1AP Protocol

Near-RT RIC

- Purpose and role
- xApps
- Near-RT RIC Platform functions
- Relevant Interfaces: A1 and E2

The A1 Interface

- The A1AP Protocol
- Policies, Enrichment Information and AI/ML models

The E2 Interface

- E2 Interface functions and E2 Nodes
- E2AP
- Open Fronthaul

OAM and the O1 and O2 Interfaces and O-Cloud

- OAM (Operation and Maintenance) functions in SMO
- The O1 interface and NETCONF
- The O2 interface
- O-Cloud; locations and contents