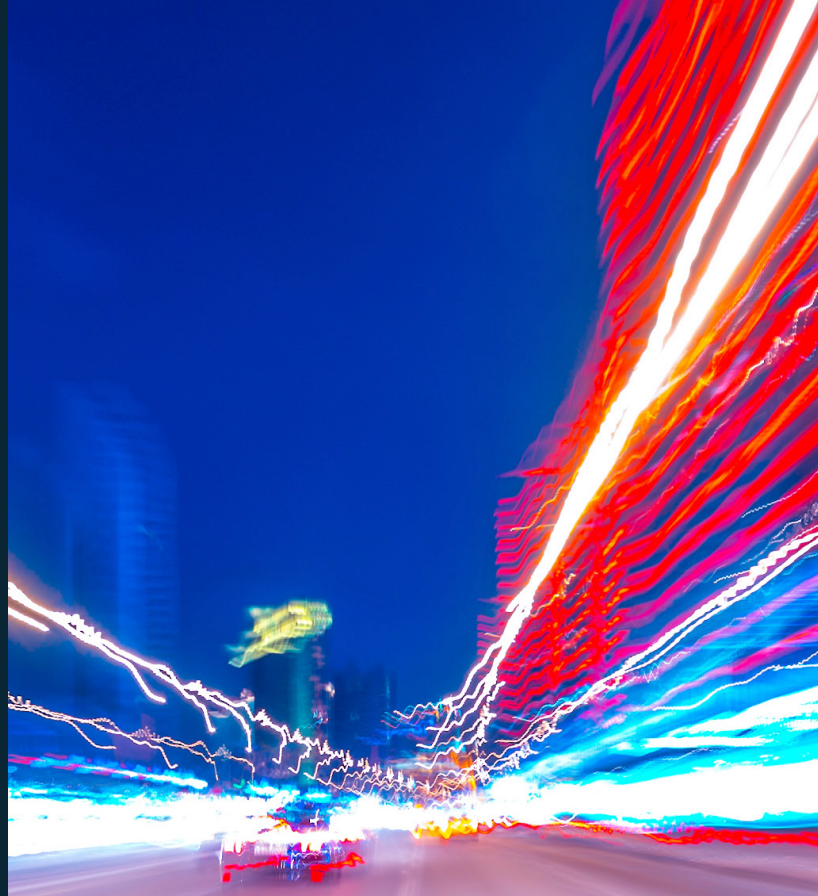




Good knowledgeable trainer delivered an interesting course. Thank you!



Watch our course intro video.



# Analyzing LTE Advanced

## Course Description

With Release 10 of the 3GPP specifications came the introduction of LTE Advanced, a suite of radio related improvements designed to push the data rates and capacity of LTE even higher. Techniques explored in this course include the use of Carrier Aggregation, SON, CoMP and Dual Connectivity, as well as the improvements required across the air interface signalling protocols to support these new features. The course also features E-UTRAN related improvements, including the required enhancements to X2 in support of mobility, as well as the use of relays.

This course has no prerequisites.

1

Day  
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CPD Learning  
Credits



Level: 3  
(Advanced)

**This course will contain the following sections:**

## **1. Introduction to LTE-Advanced**

### **Topic areas covered include:**

- LTE Releases:
  - Release 10 Onwards.
- LTE-Advanced:
  - LTE vs. LTE-Advanced.
- LTE-Advanced Frequency Bands and Channels.

## **2. LTE-Advanced Operation**

### **Topic areas covered include:**

- Recap LTE Protocols:
  - LTE Protocol Stack.
    - PDCP, RLC, MAC.
  - Enhancements to Protocols for LTE-Advanced.
- SON in 3GPP Releases:
  - MDT (Minimization of Drive Testing).
- LTE-Advanced Physical Channels:
  - The LTE Downlink Physical Channels.
  - The LTE Uplink Physical Channels.
  - LTE-Advanced Physical Channels.
  - EPDCCH and ICIC.
  - EPDCCH (Enhanced Physical Downlink Control Channel).
  - EPDCCH Assignment Procedure.
- Transmission Mode Enhancements:
  - 8-Antenna MIMO.
  - Transmission Mode 9.
  - Transmission Mode 10.
  - Uplink MIMO.

## **LTE-Advanced Operation (cont.)**

- Carrier Aggregation:
  - CA in 3GPP.
  - Carrier Aggregation Terminology.
  - CA Scheduling.
  - FDD-TDD Carrier Aggregation.
- HetNet Scheduling:
  - Multi Site CA.
- CoMP Operation:
  - CoMP Scenarios.
  - CoMP Categories.
  - CoMP Measurements.
  - Dynamic Point Selection.
  - CoMP Sets.
  - DCI Format 2D.
  - Uplink CoMP.
  - Virtual Cell Identity.
- Dual Connectivity:
  - Key Dual Connectivity Aspects.
  - Layer 2 for Dual Connectivity.
  - Dual Connectivity Operation.
- ProSe Direct Communication.

## **3. LTE-Advanced Mobility**

### **Topic areas covered include:**

- E-UTRA :
  - Measurement Configuration Options.
  - Basics of Measurement Objects.
  - Basics of Report Configuration.

**1**

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## LTE-Advanced Mobility (cont.)

- LTE Events:
  - Event A1, A2, A3, A4, A5 and A6.
  - Event B1 and B2.
  - Event C1 and C2.
  - Event W1, W2 and W3.
  - Event V1 and V2.
  - Event H1 and H2.
- RRC Measurement Configuration Example.
- RRC Connection Reconfiguration in LTE-Advanced.
- X2 Handover:
  - RRC Connection Reconfiguration.
  - Random Access.
  - SN Status Transfer and Status Report.
- Inter-RAT Mobility in LTE-Advanced:
  - E-UTRAN to UTRAN/GERAN Handover Procedure.
  - UTRAN to E-UTRAN Handover Procedure.
- Mobility with Carrier Aggregation:
  - Event A6.
- ICIC in HetNets.
- ES (Energy Saving).
- Self Healing.

## 4. Relays in LTE-Advanced

### Topic areas covered include:

- Evolution of Relay Nodes.
- RN Terminology.
- Uses of Relay Nodes:
  - Range Extension.
  - Capacity Boost.
  - Indoor Coverage.
  - Blind Spot Coverage.
- Relay Architecture.
- Relay Node Start Up Procedure:
  - Phase I – Attach for RN pre-configuration.
  - Phase II – Attach for RN Operation.
  - Relay Node Detach Procedure.
  - Example of RN Reconfiguration Message.
- Resource Multiplexing:
  - Use of MBSFN.
  - Frame Structure Type 1.
  - Example Backhaul.

The NetX logo is displayed in a large, stylized font. The background of the slide features a complex network diagram with various nodes and connections, representing a telecommunications network.

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