

Long Term Evolution (LTE) is based on OFDM and MIMO technologies. In Release 12, 3GPP initiated a special feature to enable users of LTE networks to discover nearby users within their home PLMN or any other local PLMNs using Proximity Services (ProSe). A number of applications and use cases are possible in healthcare, business, automotive and public safety and critical communication sectors availing ProSe feature. This course describes the architecture of LTE network and the enhancements and new network elements required to support Proximity Services. It explains the process using which Announcement and Monitoring of devices is achieved using RAN and EPC within home, local and visited PLMNs. Configuration of air interface and scheduling resources within and/or outside the network coverage area is also explained. It also steps through high level concepts of initial attach, registration, and traffic operations and provides an overview of call flow scenarios of ProSe.

Intended Audience

This is an introductory level technical course, primarily intended for those in system design, system integration and test, systems engineering, network engineering, operations, and support.

Learning Objectives

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

- Define what Proximity Services are
- Enumerate technical requirements defined for Proximity Services
- Describe the building blocks of Proximity services and enhancements required in LTE networks
- List key models of Announcements and Discovery
- Explain how UE registers for Proximity Services
- Define Direct Communication and its operation in LTE network for UEs that use Proximity Services
- List the requirements for UE to network relay function for enabling Proximity Services

Suggested Prerequisites

- [LTE_102] LTE Overview (eLearning)
- [LTE_117] eMBMS Overview (eLearning)

Course Outline

1. Proximity Services in LTE

- 1.1. Definition of ProSe
- 1.2. Use cases and typical applications
- 1.3. Architectural requirements
- 1.4. ProSe architecture
- 1.5. Network elements, interfaces and protocols

2. UE Registration for ProSe

- 2.1. Authentication procedures in LTE-EPC
- 2.2. Registration for ProSe applications

3. Discovery Mechanism for ProSe

- 3.1. Direct discovery using “open” and “restricted” mechanisms
- 3.2. EPC Level ProSe discovery
- 3.3. WLAN discovery with EPC support
- 3.4. UE Announcements Model A and Model B

4. Direct Communication

- 4.1. Public safety network requirements for Direct Communication
- 4.2. Configuration options for direct communication

5. UE to Network Relay Function

- 5.1. Definition of relay function
- 5.2. Requirements for relay functionality
- 5.3. Use cases in real life scenarios