Exploring LTE: Architecture and Interfaces

LTE_127d | On-Demand | LTE and VoLTE | Express
Course Duration: 1 hour

Long Term Evolution (LTE) is explicitly designed to deliver high-speed, high quality services to mobile subscribers. In order to achieve this, the LTE network architecture introduces a number of new network nodes and interfaces to implement the necessary functionality and manage the exchange of packets between mobile devices and external packet data networks. This self-paced eLearning class discusses the overarching goals of LTE networks and then defines the unique network functions needed to achieve those goals. The course then describes the key interfaces between these functions, with particular emphasis on the LTE air interface, as well as the underlying protocols carried over these interfaces. Frequent interactions are used to ensure student comprehension of the essential technologies used in all LTE networks.

Intended Audience

This course is intended for a technical audience looking for a detailed understanding of the important nodes, functions, and interfaces found in a typical LTE network.

Objectives

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

• Discuss the rationale behind the 4G LTE network architecture
• Describe the critical network functions required in every LTE network
• Describe other nodes and functions typically found in large commercial wireless networks
• Identify the key interfaces between LTE nodes and the protocols carried over each interface
• Define EPS bearers and describe their role in supporting user services
• Explain the structure and functions of the LTE air interface

Course Prerequisites

No Prerequisites

Outline

1. What is LTE?
1.1. 4G LTE
1.2. Packet data networks

2. LTE Network Nodes and Functions
2.1. E-UTRAN and EPC
2.2. eNodeB
2.3. MME
2.4. HSS
2.5. S-GW
2.6. P-GW

3. Other Network Functions
3.1. PCC
3.2. DNS
3.3. DRA
3.4. NAT/PAT
3.5. Firewalls
3.6. MSP
3.7. OSS

4. LTE Network Interfaces and Protocols
4.1. Internet Protocol (IP)
4.2. S1-MME and S1-U
4.3. S6a
4.4. S11
4.5. S5
4.6. X2

5. EPC Bearers
5.1. Default bearers
5.2. Dedicated bearers

6. LTE Air Interface
6.1. LTE-Uu protocol stack
6.2. OFDMA and SC-FDMA
6.3. OFDM and Cyclic Prefix
6.4. Air interface physical layer
6.5. Air interface physical channels
6.6. Reference signals
6.7. MIMO and diversity
6.8. Basic traffic operations

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