

Implementing Cisco Service Provider Mobility LTE Networks (SPLTE) v1.0

What you'll learn in this course

The **Implementing Cisco LTE Packet Core Networks (SPLTE)** v1.0 course gives you an overview of the products that are part of the General Packet Radio Service (GPRS), Universal Mobile Telecommunications System (UMTS), and Long-Term Evolution (LTE) packet core families. The course covers Evolved Packet Core (EPC) components and their roles in the LTE Evolved Packet System (EPS), including the Evolved Packet Core/LTE network and the Radio Access Network (RAN). The course provides detailed information on standardized technologies in the Cisco® Serving Gateway (SGW) for the Cisco Mobile Management Entity (MME) and the Cisco Packet Data Network Gateway (PGW), as well as explaining their interaction with authentication, charging, and billing components in the mobile operator's network. The course also covers configuration details for implementing these components on Cisco Aggregation Services Router (ASR) 5000 Series routers.

Course duration

- Instructor-led training: 5 days in the classroom with hands-on lab practice

How you'll benefit

This course will help you:

- Deploy and implement technologies and components found in common LTE networks
- Understand EPC components and their roles in the LTE Evolved Packet System
- Gain knowledge of the standardized technologies implemented on the Cisco Serving Gateway for the Cisco Mobile Management Entity and the Cisco Packet Data Network Gateway

Who should enroll

- Network administrators
- Network engineers
- Network managers
- Anyone preparing for the Cisco Service Provider Mobility Code Division Multiple Access (CDMA) to LTE Specialist certification or the Cisco Service Provider Mobility UMTS to LTE Specialist certification

How to enroll

- For instructor-led training, visit the [Cisco Learning Locator](#).
- For private group training, visit [Cisco Private Group Training](#).

Technology areas

- Enterprise networking
- Service provider

Course details

Objectives

After taking this course, you should be able to:

- Describe and understand these LTE architecture fundamentals: radio access network, packet core components and operations, and interworking with UMTS and CDMA
- Implement Cisco MME solution and configure MME features
- Implement Cisco SGW solution and configure SGW features
- Implement Cisco PGW solution and configure PGW features
- Describe and implement Quality of Service (QoS)
- Describe and configure data network Access Point Names (APNs), security, and routing pools
- Discuss Voice over LTE (VoLTE)
- Discuss LTE interworking
- Describe and configure Cisco ASR 5000 Series inline Enhanced Charging Service (ECS)
- Discuss security and management

Prerequisites

We recommend that you have the following knowledge and skills before taking this course:

- In-depth knowledge of UMTS or CDMA 3G mobile cellular technologies
- Good knowledge of routing and switching
- Basic knowledge of tunneling and packet-switched VPNs
- Basic knowledge of Global System of Mobile Communications (GSM) and GPRS networks
- Basic knowledge of radio mobile network functions
- Basic knowledge of packet core supporting functions for Authentication, Authorization, and Accounting (AAA), charging, and billing
- Basic knowledge of tunneling protocols such as Generic Routing Encapsulation (GRE), Layer 2 Tunneling Protocol (L2TP), and Internet Protocol Security (IPsec)
- Familiarity with and basic knowledge of configuring the Cisco ASR 5000 Series system
- Knowledge of organizations that develop technologies used in the mobile packet core such as the Internet Engineering Task Force (IETF) and 3rd Generation Partnership Project (3GPP)

Bring a laptop or notebook computer with the following:

- Terminal emulation program (such as PuTTY available at <https://www.chiark.greenend.org.uk/~sgtatham/putty/>) capable of Telnet and Secure Shell (SSH)
- IEEE 802.11 (A, B, G, N) Wi-Fi interface

Outline

The course outline is as follows:

- **Introduction to LTE, EPC, and System Architecture Evolution (SAE)**
 - Introduction to LTE, EPC, and SAE
 - Introducing GPRS Tunneling Protocol (GTP) Services
 - Evolved Packet System Key Concepts
 - Basic LTE Mobility Principles
- **Protocols in the EPC**
 - Understanding IPv6
 - Understanding GTP
 - Understanding Radius and AAA Services
 - Diameter Protocol
 - Understanding Mobile IP and Dual Stack Mobile IPv6 (DSMIPv6) Protocols
- **EPC Network Entities, Interfaces, and Configuration**
 - Long-Term Evolution and EPC Network Entities
 - Introduction to LTE Radio Components
 - Cisco MME Functionality, Interfaces, and Configuration
 - Cisco SGW Features, Functionality, and Configuration
 - PGW Features, Functionality, and Call Flows
- **LTE Call Flows**
 - Mobility Management States and Attach-Detach Call Flows
 - Packet Data Network Connectivity and Service Request Flows
 - Intra- and Inter-Tracking Area Updates and Integrated Services Router (ISR) Call Flows
- **EPC Network Entity Selection Function**
 - EPC Network Entity Selection Function
- **QoS Architecture**
 - QoS Architecture
 - MME and QoS Architecture
 - SGW and QoS Architecture
 - PGW and QoS Architecture
- **Charging and Policy Control**
 - Policy Charging and Control (PCC) Functions

- **Implementing VoLTE**
 - Introduction to VoLTE
 - Circuit Switch Fallback
 - VoLTE Applications Messages and Protocols
 - VoLTE Applications Messages and Protocols
 - VoLTE End-To-End Call Flow
 - VoLTE and QoS
 - VoLTE Supplementary Services
 - Interworking in VoLTE
- **Interworking**
 - Interworking with UMTS
 - High-Rate Packet Data (HRPD)-Based Interfaces
 - Implementing Non-3GPP Access
- **Security**
 - Introduction to Security Services
 - Lawful Intercept
- **Management Protocols**
 - Terminal Access Control Services
 - Fault Management
 - Access Security Management
 - Network Time Protocol Management
 - Performance Management and Key Performance Indicators

Lab outline

- Flow Trace
- Configuring Cisco MME Connectivity
- Configuring Cisco SGW Connectivity
- Configuring Cisco SGW Services and Support
- Configuring Cisco PGW Connectivity
- Configuring Cisco PGW Services and Support
- Configuring ECS



Americas Headquarters
Cisco Systems, Inc.
San Jose, CA

Asia Pacific Headquarters
Cisco Systems (USA) Pte. Ltd.
Singapore

Europe Headquarters
Cisco Systems International BV Amsterdam,
The Netherlands

Cisco has more than 200 offices worldwide. Addresses, phone numbers, and fax numbers are listed on the Cisco Website at www.cisco.com/go/offices.

Cisco and the Cisco logo are trademarks or registered trademarks of Cisco and/or its affiliates in the U.S. and other countries. To view a list of Cisco trademarks, go to this URL: <https://www.cisco.com/go/trademarks>. Third-party trademarks mentioned are the property of their respective owners. The use of the word partner does not imply a partnership relationship between Cisco and any other company. (1110R)

Course content is dynamic and subject to change without notice.

© 2018 Cisco and/or its affiliates. All rights reserved.

SPLTE_1-0 C22-741472-00 10/18