

High-Touch Delivery Learning Services

Implementing Cisco Service Provider Mobility LTE Networks



The Implementing Cisco® LTE Packet Core Networks (SPLTE) Version 1.0 is an instructor-led course that is presented by Cisco training partners to customers who use products that are part of the General Packet Radio Service (GPRS) and Universal Mobile Telecommunications System (UMTS), packet core families, or the Long Term Evolution (LTE) packet core family. The course is designed as a follow on to the LTE certification that follows either Implementing Cisco UMTS Packet Core Networks (SPUMTS) or Implementing Cisco CDMA Packet Core Networks (SPCDMA) certifications or training.

The SPLTE Version 1.0 course is designed to teach professionals the skills required to understand and implement technologies and components found in common LTE networks. The course provides information about the evolved packet core components and their roles in the LTE Evolved Packet System (EPS) to include the Evolved Packet Core/LTE network as well as the Radio Access Network (RAN). The major part of the course includes detailed information on standardized technologies that are implemented on the Cisco SGW Serving Gateway for the Cisco MME Mobile Management Entity and the Cisco PGW Packet Data Network Gateway, and their interaction with authentication, charging, and billing components in the network of the mobile operator. This course also includes configuration details of how these components are implemented on the Cisco ASR 5000 Series system.

Duration

Five days.

Target Audience

The primary audience for this course is as follows:

- Network administrators
- Network engineers
- Network managers

The secondary audience for this course is as follows:

- All individuals preparing for the Cisco Service Provider Mobility CDMA to LTE or the UMTS to LTE Specialist Certification

Course Objectives

After completing this course, you should be able to meet these overall objectives:

- 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 SGW 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

Course Prerequisites

The knowledge and skills that a learner must have before attending this course are as follows:

- In depth knowledge of UMTS or CDMA 3G mobile cellular technologies
- Good knowledge of routing and switching
- Basic knowledge of tunneling and packet-switched virtual private networks (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 Internet Engineering Task Force (IETF) and 3rd Generation Partnership Project (3GPP)

Participant Material Requirements

Participants are required to bring the following materials to this training course:

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

Participants are responsible for all travel and expenses.

Course Outline

The course outline is as follows:

- **Module 1: Introduction to LTE, EPC, and System Architecture Evolution (SAE)**
 - Lesson 1: Introduction to LTE, EPC, and SAE
 - Lesson 2: Introducing GPRS Tunneling Protocol (GTP) Services
 - Lesson 3: Evolved Packet System (EPS) Key Concepts
 - Lesson 4: Basic LTE Mobility Principles
 - Lab 1-1: Flow Trace: The details of the end-to-end flow of a call are described
- **Module 2: Protocols in the Evolved Packet Core (EPC)**
 - Lesson 1: Understanding IPv6
 - Lesson 2: Understanding GTP
 - Lesson 3: Understanding Radius and AAA Services
 - Lesson 4: Diameter Protocol
 - Lesson 5: Understanding Mobile IP and Dual Stack Mobile IPv6 (DSMIPv6) Protocols
- **Module 3: EPC Network Entities, Interfaces, and Configuration**
 - Lesson 1: Long-Term Evolution and EPC Network Entities
 - Lesson 2: Introduction to LTE Radio Components
 - Lab 2-1: Configuring Cisco MME Connectivity: You configure all interfaces associated with the MME
 - Lesson 3: Cisco MME Functionality, Interfaces, and Configuration
 - Lab 2-2: Configuring Cisco MME Services and Support: You build and test all services required by the MME
 - Lesson 4: Cisco SGW Features, Functionality, and Configuration
 - Lab 3-1: Configuring Cisco SGW Connectivity: You build and test all required interfaces of the SGW
 - Lab 3-2: Configuring Cisco SGW Services and Support: You build all services associated with the SGW and validate the services with a call flow
 - Lesson 5: PGW Features, Functionality and Call Flows
 - Lab 4-1: Configuring Cisco PGW Connectivity: You build and test all the required interfaces of the PGW
 - Lab 4-2: Configuring Cisco PGW Services and Support: You build all services associated with the PGW and validate the services with a call flow

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- **Module 4: LTE Call Flows**
 - Lesson 1: Mobility Management States and Attach-Detach Call Flows
 - Lesson 2: Packet Data Network Connectivity and Service Request Flows
 - Lesson 3: Intra and Inter Tracking Area Updates and ISR Call Flows
 - **Module 5: EPC Network Entity Selection Function**
 - Lesson 1: EPC Network Entity Selection Function
 - **Module 6: QoS Architecture**
 - Lesson 1: QoS Architecture
 - Lesson 2: MME and the QoS Architecture
 - Lesson 3: SGW QoS Architecture
 - Lesson 4: PGW and QoS Architecture
 - **Module 7: Charging and Policy Control**
 - Lesson 1: Policy Charging and Control (PCC) Functions
 - Lab 5-1: Configuring ECS: You configure an inline ECS as it applies to policy and enforcement
 - **Module 8: Implementing VoLTE**
 - Lesson 1: Introduction to VoLTE
 - Lesson 2: Circuit Switch Fallback
 - Lesson 3: VoLTE Applications Messages and Protocols
 - Lesson 4: VoLTE Applications Messages and Protocols
 - Lesson 5: VoLTE End-To-End Call Flow
 - Lesson 6: VoLTE and QoS
 - Lesson 7: VoLTE Supplementary Services
 - Lesson 8: Interworking in VoLTE
 - **Module 9: Interworking**
 - Lesson 1: Interworking with UMTS
 - Lesson 2: High-Rate Packet Data (HRPD) Based Interfaces
 - Lesson 3: Implementing Non-3GPP Access
 - **Module 10: Security**
 - Lesson 1: Introduction to Security Services
 - Lesson 2: Lawful Intercept
 - **Module 11: Management Protocols**
 - Lesson 1: Terminal Access Control Services
 - Lesson 2: Fault Management
 - Lesson 3: Access Security Management
 - Lesson 4: Network Time Protocol Management
 - Lesson 5: Performance Management and Key Performance Indicators

Registration Email

For more information about schedules and registration for this course, contact aeskt_registration@cisco.com.

Website Addresses for More Information

For more information about Cisco High-Touch Delivery Learning Services for Cisco classic products and technologies, see <http://www.cisco.com/go/ase>.

For information about Cisco TelePresence™ training, see <http://www.cisco.com/go/telepresencetraining/>.

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