



Packet Core Network 2018

Training Programs

Catalog of Course Descriptions



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Introduction

Ericsson has developed a comprehensive Training Programs service to satisfy the competence needs of our customers, from exploring new business opportunities to expertise required for operating a network. The Training Programs service is delineated into packages that have been developed to offer clearly defined, yet flexible training to target system and technology areas. Each package is divided into flows, to target specific functional areas within your organization for optimal benefits.

Service delivery is supported using various delivery methods including:

Delivery Method

Instructor Led Training (ILT)

Web-based Learning (WBL)



5G Core Concepts

LZU1082641 R1A

Description:

Transforming today's networks to 5G is key to keeping pace with the demands of an evolving Networked Society, where opportunities span new high-bandwidth applications, low latency powered Internet of Things (IoT) services and beyond.

Are you interested in expanding your knowledge in the area of 5G core? Would you like to gain insight into the basic concepts of the 5G core network? This course can address your needs. The course explains the architecture and technical concepts for the 5G core network. It describes the concepts of Network Slicing and Life-Cycle Management and also explains the additional features for 5G EPC, communication services support and migration scenarios.

Learning objectives:

On completion of this course the participants will be able to:

- 1 Explore the background and reasons for developing the 5G Core
 - 1.1 Identify the operator challenges to enable new types of business
 - 1.2 Explain the new technical requirements arising from new customer segments
- 2 Review the 5G Core standardization
 - 2.1 Analyze the 3GPP 5G Core standardization time plan
 - 2.2 List the 5G Core deployment options studied by 3GPP
 - 2.3 Discuss the main purpose of the Next Generation Mobile Networks Alliance
- 3 Outline the main additional features of the 5G EPC network
 - 3.1 Differentiate between the network slice selection mechanisms, DECOR and eDECOR
 - 3.2 Explore the control plane and user plane split (CUPS)
 - 3.3 Review dynamic mobility switching and distributed cloud concepts
- 4 Explain the basic conceptual network architecture and technology for the 5G Core
 - 4.1 Examine the 3GPP key principals for the overall 5G core architecture
 - 4.2 Review the 5G Core system architecture according to 3GPP TS 23.501
 - 4.3 Identify the main 5G Core terms and definitions according to TS 23.501
 - 4.4 Review the node functions and interfaces for the 3GPP 5G Core reference architecture
 - 4.5 List the basics for network slicing in 5G Core
- 5 Discuss the suggested use cases and basic network slice types supported in 5G
- 6 Explain the basic concepts for 5G core orchestration and management
 - 6.1 Determine the Network as a Service (NaaS) concept
 - 6.2 Outline the network slice blueprint concept



- 6.3 Evaluate the basic principle of lifecycle management for network slice instances
- 7 Explain interoperable communication services support in the 5G Core
- 7.1 Define how communication services (IMS) will be used for different 5G Core deployment options
- 8 Discuss different 4G to 5G migration scenarios
- 8.1 Explore possible migration paths for the different 3GPP 5G architecture options
- 8.2 Describe 4G to 5G migration per network slice type

Target audience:

This course is suitable for anyone who is required to be familiar with 5G Core Concepts.

Prerequisites:

Successful completion of the following courses:

Understanding of the 4G EPC network.

Duration and class size:

The length of the course is 2 days and the maximum number of participants per session is 16.

Learning situation:

This course is based on theoretical instructor-led lessons given in a classroom environment.



5G Core Concepts Introduction

LZU1082642 R1A

Description:

This course is a web based learning, explaining the basic architecture and technical concepts for the 5G core network. It explains the main concepts of Network Slicing and Life-Cycle Management. Additional features for 5G EPC, communication services support and migration scenarios are also described. The course is divided into six e-learning modules.

Learning objectives:

On completion of this course the participants will be able to:

- 1 Explain the background and reasons for developing the 5G Core
 - 1.1 Explain the operator challenges to enable new types of business
 - 1.2 Explain the new technical requirements arising from new customer segments
- 2 Describe the 5G Core standardization
 - 2.1 Describe the 3GPP 5G Core standardization time plan
 - 2.2 List the 5G Core deployment options studied by 3GPP
 - 2.3 Describe the main purpose of the Next Generation Mobile Networks Alliance
- 3 Explain the main additional features of the 5G EPC network
 - 3.1 Explain the network slice selection mechanisms, DECOR and eDECOR
 - 3.2 Explain the Control Plane and User Plane split (CUPS)
- 4 Explain the basic conceptual network architecture and technology for the 5G Core
 - 4.1 Explain the 3GPP key principals for the overall 5G core architecture
 - 4.2 Explain the 5G Core system architecture according to 3GPP TS 23.501
 - 4.3 Explain the Main 5G Core terms and definitions according to TS 23.501
 - 4.4 List the node functions and interfaces for the 3GPP 5G Core reference architecture
 - 4.5 Explain the basics for network slicing in 5G Core
- 5 Explain the suggested use cases and basic network slice types supported in 5G
- 6 Explain the basic concepts for 5G core orchestration and management
 - 6.1 Explain the Network as a service (NaaS) concept
 - 6.2 Explain the network slice blueprint concept
 - 6.3 Explain the basic principle of lifecycle management for network slice instances
- 7 Explain interoperable communication services support in the 5G Core
 - 7.1 Elaborate how communication services (IMS) will be used for different 5G Core deployment options
- 8 Describe different 4G to 5G migration scenarios
 - 8.1 Explore possible migration paths for the different 3GPP 5G architecture options



8.2 Describe 4G to 5G migration per network slice type

Target audience:

This course is suitable for anyone who is required to be familiar with 5G Core concepts.

Prerequisites:

Successful completion of the following courses:

Understanding of the 4G EPC network.

Duration and class size:

The length of the course is 3 hours.

Learning situation:

This is a web-based interactive training course with multimedia content.



5G Core Protocols and Procedures

LZU1082643 R1A

Description:

Transforming today's networks to 5G is key to keeping pace with the demands of an evolving Networked Society, where opportunities span new high-bandwidth applications, low latency powered Internet of Things (IoT) services and beyond.

This course explains the protocols and the signaling used for the 5G Core (5GC) infrastructure. It describes the interfaces in 5GC and the interworking with 3GPP 5G RAN. The course describes various 5GC use case scenarios such as Connection, Registration, Mobility, and Session management based on the 3GPP Release 15.

Learning objectives:

On completion of this course the participants will be able to:

- 1 Explain the basic conceptual network architecture and technology for the 5G Core
- 2 List and explain the identifiers relevant for the 5GC
- 3 List the interfaces and explain the signaling, protocols and service exchange between the network functions.
- 4 Analyze the basic procedures for 5GC
 - 4.1 Explain the Registration Procedures
 - 4.2 Explore the Service Request Procedures
 - 4.3 Examine the Session Management Procedures
 - 4.4 Interpret the Handover Procedures

Target audience:

This course is suitable for anyone who is required to be familiar with the protocols and procedures used in 5G Core network.

Prerequisites:

Successful completion of the following courses:

5G Core Concepts, LZU1082641



Duration and class size:

The length of the course is 2 days and the maximum number of participants per session is 16.

Learning situation:

This course is based on theoretical instructor-led lessons given in a classroom environment.



5G EPC Introduction

LZU1082644 R1A

Description:

Transforming today's networks to 5G is key to keeping pace with the demands of an evolving Networked Society, where opportunities span new high-bandwidth applications, low latency powered Internet of Things (IoT) services and beyond.

Ericsson is driving 5G in the industry with unmatched experience from four generations of mobile networks, the strongest global 5G ecosystem, engagement in standards around the world, and technology leadership in all 5G domains.

How will 5G Evolved Packet Core (EPC) architecture evolve as Ericsson moves from 4G towards 5G?

The course will explore the features and enhancements for 5G EPC such as the Control Plane/User Plane split etc. and go through the different LTE/5G slicing options.

The course is given as a Web Based Learning (WBL).

Learning objectives:

On completion of this course the participants will be able to:

- 1 List the main benefits of 5G EPC.
 - 1.1 Explain the 5G EPC architecture and the 5GC architecture.
 - 1.2 Mention the migration alternatives to 5G.
 - 1.3 Describe the main 5G Use Cases.
- 2 Explore the main 5G EPC features.
 - 2.1 Describe the feature 20/10 Gbps subscribed QoS for 5G/New Radio (NR).
 - 2.2 Outline the feature 5G/NR admission control.
 - 2.3 Assess the feature dual connectivity LTE/NR.
 - 2.4 Evaluate the NR usage reporting.
 - 2.5 Discuss the operator control of UE 5G NR admission and resource use.
 - 2.6 Review the CP/UP separation.
 - 2.7 Describe the Core Network selection based on UE 5G/NR Capability.
 - 2.8 Explain the slicing LTE/5G option.

Target audience:

This course is suitable for anyone who is required to be familiar with 5G EPC.

**Prerequisites:**

Successful completion of the following courses:

Virtual EPC Overview, LZU1082264

5G Core Concepts, LZU1082641

Duration and class size:

The length of the course is 1 hour.

Learning situation:

This is a web-based interactive training course with multimedia content.



AAT Introduction

LZU1082608 R1A

Description:

Automated Acceptance Test is a stand-alone tool for performing acceptance tests of the Packet Core, of the virtual Packet Core, of VoLTE and UDC. AAT automates deployment functional tests and executes them on, for example, the main release before it is released into production, after upgrades, updates, patching, re-configuration. The main objective of AAT is to simplify as much of the testing effort as possible with a minimum set of tests but achieve good test coverage.

The Ericsson Automated Acceptance Tests (AAT) enables the acceptance procedures at customer premises.

If you want to discover the new features available in AAT, including both the classical solution and the solution in Cloud and VoLTE, then this course is for you.

Learning objectives:

On completion of this course the participants will be able to:

- 1 Describe the AAT, an end to end verification tool.
 - 1.1 Outline the main characteristics of AAT architecture.
 - 1.2 Describe the EPC Function Test
 - 1.3 List the main elements of the AAT GUI and show how to add, modify and run test cases.
 - 1.4 Explain the steps called Build, Execute, Results and Configure in the AAT GUI.
 - 1.5 List the LTE procedures handled by AAT.
 - 1.6 List the IMS procedures handled by AAT.
 - 1.7 Describe the EPC Load Test
 - 1.8 Explain the Configuration Guideline for EPC Test.
- 2 Describe a Use Case in AAT
 - 2.1 Outline the main steps when working with AAT Load Testing for Attach and Detach procedures.
 - 2.2 Explain the main steps when working with AAT for IMS.

Target audience:

This course is suitable for anyone who is required to be familiar with AAT.

**Prerequisites:**

Successful completion of the following courses:

EPC System Survey - LZU1087977

BSP 8100 Operation & Maintenance, LZU1089779

Ericsson Cloud Execution Environment (CEE) - LZU1082364

Ericsson Cloud System Overview - LZU1089909

Basic knowledge on Unix, Cisco SCE, Cisco BRAS and Juniper CRAS configurations or equivalents.

Duration and class size:

The length of the course is 1 day and the maximum number of participants per session is 16.

Learning situation:

This course is based on theoretical instructor-led lessons given in a classroom environment.



EPC Signaling

LZU1087580 R1A

Description:

Evolved Packet Core (EPC) is part of the Evolved Packet System (EPS) that provides packet data services to mobile communication.

This course describes the protocols and signaling in the EPC infrastructure. It covers the interfaces in the EPC and also interworking with 3GPP and non-3GPP architectures with reference to the Ericsson EPC solutions. Traffic cases for the EPC describing the various scenarios such as Mobility, Session and Bearer management are explained.

Actual signaling traces are used where possible to show the practical aspects of signaling in an EPC network.

Learning objectives:

On completion of this course the participants will be able to:

- 1 Describe the EPC nodes and Interfaces
 - 1.1 List and describe the function of the nodes in the EPC with reference to Ericsson EPC solutions
 - 1.2 Describe the LTE Access Interfaces such as S1 and X2
 - 1.3 Describe the EPC Core Interfaces such as S10, S11, S6a, S5, S8, S2a and S2b interfaces
 - 1.4 Describe Interfaces to external networks such as SGs, Gx and SGi
 - 1.5 List of interfaces to 2G/3G network and interworking interfaces to non-3GPP network
- 2 Explain the Signaling and Protocols between the nodes
 - 2.1 List and explain some EPS Identifiers, e.g. Geographical Identifier TA, MME Pool Area, SGW Serving area. E-UTRAN identifiers, PLMN identifiers, UE temporary Identifiers.
 - 2.2 List and describe the protocols used in the EPC network, SCTP, Diameter, S1-AP, NAS, SGs-AP, GTP, and RADIUS
- 3 Understand, describe and explain how different traffic cases are handled by the EPC nodes
 - 3.1 List nodes involved in traffic cases
 - 3.2 Describe the Identity, Authentication and Location Management procedures
 - 3.3 Explain the traffic cases of EPS Session Management
 - 3.4 Describe selected traffic cases for Mobility and Handover procedures
 - 3.5 Analyze detailed EPS signaling flows and Message content for EPS procedure, e.g. Attach, Detach, TAU etc from actual traces.
- 4 Explain the supporting services for EPC
 - 4.1 Describe signaling from the Home Subscriber Server (HSS) and AAA
 - 4.2 Describe the DNS procedures for EPC



4.3 Explain E2E Voice Signaling over LTE/EPC using IMS, CSFB, SRVCC

Target audience:

This course is suitable for anyone who is required to be familiar with signaling in EPC.

Prerequisites:

Successful completion of the following courses:

EPC System Survey LZU1087977

Knowledge of basic GPRS concepts and signaling in GPRS is helpful but not required.

Duration and class size:

The length of the course is 2 days and the maximum number of participants per session is 16.

Learning situation:

This course is based on theoretical instructor-led lessons given in a classroom environment.



EPC Signaling in 5G

LZU1082647 R1A

Description:

Transforming today's networks to 5G is key to keeping pace with the demands of an evolving Networked Society, where opportunities span new high-bandwidth applications, low latency powered Internet of Things (IoT) services and beyond.

Ericsson is driving 5G in the industry with unmatched experience from four generations of mobile networks, the strongest global 5G ecosystem, engagement in standards around the world, and technology leadership in all 5G domains.

This course explains the protocols and the signaling used for the 5G Evolved Packet Core (5G EPC) infrastructure. It describes the interfaces in 5G EPC and the interworking with 3GPP 5G NR access.

The course will explore various 5G EPC use case scenarios such as Mobility, Session and Bearer management based on the 3GPP Release 15, also signaling traces will be analyzed.

Learning objectives:

On completion of this course the participants will be able to:

- 1 Examine the 5G EPC nodes and Interfaces
 - 1.1 List and describe the function of the nodes in the Ericsson 5G EPC
 - 1.2 Explore the LTE and NR access interfaces related to 5G EPC
 - 1.3 Describe the 5G EPC core interfaces
- 2 Analyze the signaling and protocols between the nodes
 - 2.1 List and explain some EPS identifiers, e.g. Geographical Identifier TA, MME Pool Area, SGW Serving area. E-UTRAN identifiers, PLMN identifiers, UE temporary identifiers.
 - 2.2 Outline and describe the protocols used in the EPC network, SCTP, Diameter, S1-AP, NAS, SGs-AP, GTP, and PFCP
- 3 Describe how different traffic cases are handled by the 5G EPC nodes
 - 3.1 Outline the Identity, Authentication, and Location Management procedures
 - 3.2 Describe selected traffic cases for mobility and handover procedures
 - 3.3 Analyze detailed EPS signaling flows and message content for EPS procedure, e.g. Attach, Detach, TAU etc. from actual traces.
 - 3.4 Identify the main elements in the signaling between the PGW and S-MME.
 - 3.5 Explain the Internet of Thing related signaling flows related to Power Saving Mode (PSM), Data over NAS (DoNAS), and SMS over SGs.
 - 3.6 Describe Dedicated Core network selection (DeCOR).



- 3.7 Describe the traffic flow in the Sx interface (CP/UP split in EPG).
- 4 Explain the supporting services for 5G EPC
 - 4.1 Describe signaling from the Home Subscriber Server (HSS) and AAA
 - 4.2 Describe the DNS procedures for EPC
 - 4.3 Explain e2e voice signaling using CSFB, VoLTE and SRVCC

Target audience:

This course is suitable for anyone who is required to be familiar with EPC signaling in 5G.

Prerequisites:

Successful completion of the following courses:

EPC System Survey, LZU1087977

5G Core Concepts, LZU1082641

Knowledge of basic GPRS concepts and signaling in GPRS is helpful but not required.

Duration and class size:

The length of the course is 2 days and the maximum number of participants per session is 16.

Learning situation:

This course is based on theoretical instructor-led lessons given in a classroom environment.



EPC System Survey

LZU1087977 R1A

Description:

With the emergence of Long Term Evolution (LTE) as the future proof technology, this course is designed to examine how Evolved Packet Core (EPC) can become an integral part of the Evolved Packet System (EPS). EPC is the next generation technology that provides users with access to packet data services. This technology is an evolution from GSM, GPRS, EDGE, WCDMA and WiFi technology that enables interconnectivity from different access domains so that users could stay connected to their mobile network.

This is an introductory course aimed at providing an overview of EPC infrastructure and its associated nodes, EPC protocols and interfaces, EPC mobility architecture, EPC transport domain and operation and maintenance of EPC. This is an ideal course for those who wish to gain fundamental technical understanding for topics such as Access Point Names (APNs), IP connectivity, bearers and QoS, user plane, signaling plane from an end-to-end perspective. Also different EPC nodes and their functionalities.

Learning objectives:

On completion of this course the participants will be able to:

- 1 Get an overview of the EPC
 - 1.1 Show the evolution of GPRS for GSM & WCDMA nodes and functionality to EPS
 - 1.2 Describe EPC according to 3GPP R10 and R11
 - 1.3 Describe the Ericsson Evolved Packet System (EPS) inclusive of LTE and EPC
 - 1.4 Explain the benefits of Ericsson EPS to the operator and end user
- 2 Explain the infrastructure of EPC
 - 2.1 Describe the function of Mobile Management Entity (MME), Home Subscriber Server (HSS), Policy and Charging Rules Function (PCRF), Serving Gateway (SGW), Packet Data Network Gateway (PGW), Domain Name System (DNS) and Ericsson DPI node (SASN)
 - 2.2 Describe the SGSN-MME node and features
 - 2.3 Describe the HSS node and features
 - 2.4 Describe the Service Aware Policy Controller (SAPC) node which provides PCRF functionality
 - 2.5 Describe Evolved Packet Gateway (EPG) node which provides SGW and PGW functionality
 - 2.6 Describe IPWorks node which provides DNS functionality
 - 2.7 Describe Ericsson Deep Packet Inspection (DPI) node SASN and its features and functionality
 - 2.8 Introduce the virtual EPC (vEPC) network and way forward



- 3 EPC protocols and interfaces
 - 3.1 Explain the different protocols and interfaces of EPC
 - 3.2 Describe the different interfaces and their functions
 - 3.3 Describe the GTPv2 protocol and usage scenario
 - 3.4 Explain the Geographical Network Structure, Tracking Area, PLMN area and their identity
 - 3.5 Describe charging Interfaces in EPC network
- 4 Overview of SGSN-MME 15A
 - 4.1 Describe the functions and hardware of the Wireless Packet Platform (WPP) based SGSN-MME 15A
 - 4.2 List the main hardware components in the SGSN-MME 15A
 - 4.3 Illustrate the SGSN-MME 15A features and functions used to connect the user to the EPS network
- 5 Overview of EPG 14B
 - 5.1 Describe the features of the EPG 14B that provide EPC functionality
 - 5.2 Describe the hardware components of the EPG 14B
 - 5.3 Illustrate the EPG functionality that provides LTE/WCDMA/GSM session continuity.
- 6 Explain the concept of QoS and Bearer in EPS, EPS services and mobility architecture of EPC
 - 6.1 Describe the EPS Bearer, default and dedicated bearer
 - 6.2 Understand the main QoS parameters: QCI, ARP, AMBR, GBR etc
 - 6.3 A brief overview of the Services (data, voice and messages) that EPC enables
 - 6.4 Explain the alternative options for providing Voice and Messaging service over LTE/EPC
 - 6.5 Understand how to provide Voice service using IMS
 - 6.6 Explain the network features provided by EPS for coexistence with 3GPP CS Telephony
 - 6.7 List traffic scenarios for mobility, handover, session continuity
- 7 Describe the transport domain of EPC
 - 7.1 Mobile Packet Backbone Network
 - 7.2 Packet RAN
- 8 Explain the Operations & Maintenance System of EPC
 - 8.1 OSS-RC overview
 - 8.2 Explain OSS-RC functions
 - 8.3 Understand basic software and hardware management
 - 8.4 Describe the OSS-RC usage to operate and maintain the SGSN-MME 15A

Target audience:

This course is suitable for anyone who is required to be familiar with Evolved Packet Core.

**Prerequisites:**

Successful completion of the following courses:

Some basic IP knowledge and basic GPRS concepts is desirable, but not necessary.

Duration and class size:

The length of the course is 2 days and the maximum number of participants per session is 16.

Learning situation:

This course is based on theoretical instructor-led lessons given in a classroom environment.



EPG 1 Online Delta

LZU1082534 R1A

Description:

This EPG 1 delta course is intended for those who wish to update their knowledge on the new features and enhancements introduced from EPG 1.0 to EPG 1.10.

This course includes training modules covering the new features and feature enhancements corresponding to each deployment package beginning from EPG 1.0 to 1.10.

Learning objectives:

On completion of this course the participants will be able to:

- 1 Outline the new features and feature enhancements from EPG 1.0 to 1.10

Target audience:

This course is suitable for anyone who is required to be familiar with new features in EPG 1.

Prerequisites:

Successful completion of the following courses:

EPG 1 Operation, Configuration and Troubleshooting - LZU1082499

Duration and class size:

The length of the course is 2.5 hours.

Learning situation:

This is a web-based interactive training course with multimedia content.



EPG 1 Operation, Configuration and Troubleshooting

LZU1082501 R1A

Description:

The Evolved Packet Gateway (EPG) 1 includes new functions for Serving Gateway (SGW), Packet Data Network Gateway (PGW) and GPRS Gateway Support Node (GGSN). EPG 1 can be deployed both as a native node and as a Virtual Network Function (VNF) included in Ericsson's vEPC solution.

This course is recommended for those who want to build competence in configuring, operating and troubleshooting both native and virtual EPG 1. EPG 1 Configuration and Troubleshooting course helps participants in understanding day to day operations, configuring the EPG SSR system and EPG VNF, its interfaces, routing and security management.

Furthermore, participants learn about methods and tools available in EPG to troubleshoot and rectify issues quickly and effectively.

Learning objectives:

On completion of this course the participants will be able to:

- 1 Review the basic concepts of EPG 16A and its architecture
 - 1.1 Explain the functions and services provided by the EPG, with concepts such as bearer activation and session Management procedures
 - 1.2 Explain the native EPG System architecture in terms of platform and application software
 - 1.3 Discuss the hardware EPG architecture and list the different cards supported in SSR 8020 and SSR 8010
 - 1.4 Explore the new line card supporting 200 GB capacity and the second generation switch cards introduced in EPG 1
 - 1.5 Explain the latest enhancement/features available in EPG 1
- 2 Discuss Ericsson's Virtual EPG 1 architecture in cloud solution
 - 2.1 Discuss high level vEPC architecture and key features of vEPC Solution like IoT, distributed MBB Broadband
 - 2.2 Detail the role of Ericsson Cloud Execution Environment (CEE) and Ericsson Cloud Manager (ECM)
 - 2.3 Explain the vEPG architecture and its deployment in cloud architecture
 - 2.4 Elaborate the resilience mechanism available in virtual EPG
 - 2.5 Describe high level network configurability for virtual EPG
 - 2.6 Outline the failure handling in vEPG1
- 3 Explain and perform basic Operations for native and virtual EPG 1
 - 3.1 Explain the basic IPOS software components
 - 3.2 Navigate through EPG CLI and configure basic system properties



- 3.3 Discuss the EPG configuration flows and command mode hierarchy
- 3.4 Configuring cards, management port and administrator access in EPG
- 3.5 Show how to monitor basic system operations
- 3.6 Discuss logging mechanisms available for identifying faults in EPG
- 3.7 Explain Event Base Monitoring (EBM) for performance monitoring and troubleshooting in EPG
- 3.8 Run through various toolbox commands available to monitor and troubleshoot EPG
- 3.9 Illustrate how UE Trace and ITC trace is useful in troubleshooting
- 4 Perform platform related configurations such as context creation, routing and security in native and virtual EPG 1
 - 4.1 Explain the concept of contexts, bindings and interfaces in EPG
 - 4.2 Configure physical interfaces such as port, VLAN tagging in EPG
 - 4.3 Perform configurations related to routing such as protocols, metrics and links
 - 4.4 Show different security configurations available on EPG such as packet filtering and Access Control Lists (ACLs)
- 5 Configure EPG services like SGW & PGW Interfaces, APN, Radius, QoS and charging related Configuration.
 - 5.1 Explain the functionalities of the serving gateway and steps to configure the SGW Interfaces like S11, S5, S8, S4 and S1-U
 - 5.2 Administer the configurations involved to configure the PDN gateway and the interfaces involved such as Gn, S5/S8, and SGi
 - 5.3 Illustrate how to perform Access Point Names (APNs), Radius, QoS and charging related confirmation for the EPG
- 6 Identify Operation & Maintenance procedures on native and virtual EPG 1
 - 6.1 Run commands to view new alarms related to the EPG running in the serving & PDN gateway role
 - 6.2 Execute commands for displaying status information on the EPG running EPC services
 - 6.3 Describe the EPG toolbox (Support Package, EPG versions, EPG Health check KPIs, UE Trace tools) and enhanced ITC trace functionality
 - 6.4 Explain the software management and backup procedure in EPG
- 7 Introduction to EPG/vEPG tools available for troubleshooting
 - 7.1 Discuss logging mechanisms available for identifying faults in EPG
 - 7.2 Explain Event Base Monitoring (EBM) for performance monitoring and troubleshooting in EPG
 - 7.3 Run through various toolbox commands available to monitor and troubleshoot EPG
 - 7.4 Illustrate how UE Trace and ITC are used in troubleshooting

Target audience:

This course is suitable for anyone who is required be able to configure/operate/maintain EPG1.

**Prerequisites:**

Successful completion of the following courses:

EPC System Survey - LZU1087977

EPG 1 Overview - LZU1089270

For Virtual EPG:

Virtual EPC (vEPC) Overview - LZU1082264

Ericsson Cloud System Overview - LZU1089909

Foundation Series - Ericsson Cloud Execution Environment (CEE) - LZU1082364

Duration and class size:

The length of the course is 4 days and the maximum number of participants is 8.

Learning situation:

This course is based on theoretical and practical instructor-led lessons given in a technical environment using equipment and tools.



EPG 2 Online Delta

LZU1082717 R1A

Description:

This course is intended for those who wish to update their knowledge on the new features and enhancements introduced in EPG 2 software release.

Learning objectives:

On completion of this course the participants will be able to:

- 1 Outline the new features and feature enhancements introduced in EPG 2

Target audience:

This course is suitable for anyone who is required to be familiar with new features introduced in EPG 2.

Prerequisites:

Successful completion of the following courses:

EPG 1 Operation, Configuration and Troubleshooting - LZU1082499

EPG 1 Online Delta - LZU1082534

Duration and class size:

The length of the course is 30 minutes.

Learning situation:

This is a web-based interactive training course with multimedia content.



EPG 2 Operation, Configuration and Troubleshooting

LZU1082788 R1A

Description:

This course is recommended for those who want to build competence in configuring, operating and troubleshooting both native and virtual Evolved Packet Gateway (EPG) 2.

The course helps participants to understand day to day operations, configuring the EPG SSR system and EPG VNF, its interfaces, routing and security management. The evolution of the Operation and Maintenance activities by supporting the Ericsson Open Interface (OPI) is described in This course is recommended for those who want to build competence in configuring, operating and troubleshooting both native and virtual Evolved Packet Gateway (EPG) 2.

The course helps participants to understand day to day operations, configuring the EPG SSR system and EPG VNF, its interfaces, routing and security management. The evolution of the Operation and Maintenance activities by supporting the Ericsson Open Interface (OPI) is described in the course. Furthermore, participants learn about methods and tools available in EPG to troubleshoot and rectify issues quickly and effectively.

EPG 2 includes new functions for Serving Gateway (SGW), Packet Data Network Gateway (PGW) and GPRS Gateway Support Node (GGSN).

The course consists of two parts – a digital and an instructor-led ones.

Learning objectives:

On completion of this course the participants will be able to:

- 1 Review the basic concepts of EPG2.
 - 1.1 Explain procedures as attach, bearer activation and bearer management.
 - 1.2 Outline the improvements in 4G+ and the advantages of the 5G EPC.
 - 1.3 Describe the role of Ericsson Cloud Execution Environment (CEE) and Ericsson Cloud Manager (ECM).
 - 1.4 Discuss Virtual Network Services as IoT and distributed MBB Broadband.
- 2 Describe the Ericsson's EPG 2 architecture in the cloud solution and in the native solution.
 - 2.1 Explain the native EPG System architecture in terms of platform and application.
 - 2.2 Discuss the hardware EPG architecture and list the different cards supported in SSR 8020 and SSR 8010.
- 3 Explain the main EPG 2 features.
 - 3.1 Elaborate the resilience mechanisms available in native EPG and in virtual EPG.
 - 3.2 Outline the failure handling in EPG2.
 - 3.3 Explain the Ericsson Core CLI.
 - 3.4 Discuss the EPG configuration flows and command mode hierarchy.



- 4 Explain the Ericsson Open Interface (EOI)
 - 4.1 Describe the configuration files in EPG 2 and the new CLI state machine.
 - 4.2 Show the structure of the Ericsson Core CLI commands.
- 5 Perform the native and virtual EPG2 platform level configuration.
 - 5.1 Configure cards and management ports.
 - 5.2 Perform platform configurations such as context creation.
 - 5.3 Explain the concepts of contexts, bindings and interfaces in EPG.
 - 5.4 Perform static and dynamic routing configuration.
 - 5.5 Show different security configurations available on EPG such as packet filtering and Access Control Lists (ACLs).
- 6 Configure the EPG applications level.
 - 6.1 Explain the functionalities of the SGW and steps to configure the SGW Interfaces like S11, S5, S8, S4 and S1-U.
 - 6.2 Administer the PGW and configure the interfaces Gn, S5/S8, and SGi.
 - 6.3 Illustrate how to perform Access Point Names (APNs), Radius and QoS confirmation for the EPG.
- 7 Identify Operation and Maintenance activities on native and virtual EPG 2.
 - 7.1 Describe the system-defined user roles and NETCONF Access Control Model (NACM) groups.
 - 7.2 List the main logs in EPG 2 and explain their function, paying special attention to the Unified Audit log file.
 - 7.3 Describe the YANG model for Fault Management (FM).
 - 7.4 Run the fault management procedures in EPG2.
 - 7.5 Describe the YANG model for Performance Management (PM).
 - 7.6 Explain the EPG2 performance management Report Output Period (ROP) XML file.
 - 7.7 Describe the YANG models Backup and Restore Management (BRM) and the Software Management (SWM).
 - 7.8 Explain the software management and list the new SWM commands.
 - 7.9 Run the backup and restore procedures in EPG 2.
 - 7.10 Describe the YANG model for Software inventory management (SWiM).
 - 7.11 Describe the main EPG toolbox including the Support Package and EPG Health check.
 - 7.12 Outline the maintenance procedures in EPG2.
- 8 Perform basic EPG2 troubleshooting.
 - 8.1 Discuss logging mechanisms available for identifying faults in EPG.
 - 8.2 Explain Event Base Monitoring (EBM) for performance monitoring and troubleshooting in EPG.
 - 8.3 Run through various toolbox commands available to monitor and troubleshoot EPG.
 - 8.4 Illustrate how UE Trace and ITC trace is useful in troubleshooting.

**Target audience:**

This course is suitable for anyone who is required be able to configure/operate/maintain EPG2.

Prerequisites:

Successful completion of the following courses:

Successful completion of the following courses:

EPC System Survey – LZU1087977

For virtual EPG:

Virtual EPC Overview – L ZU1082264

Ericsson Cloud System Overview - LZU1089909

Foundation Series - Ericsson Cloud Execution Environment (CEE) - LZU1082364

Duration and class size:

The length of the WBL (Part 1) is 1.5 hours.

The length of the ILT (Part 2) is 3 days and the maximum number of participants is 8.

Learning situation:

This course is based on theoretical and practical instructor-led lessons given in a technical environment using equipment and tools.



HSS-FE 1 Operation and Configuration for EPC and IoT

LZU1082584 R1A

Description:

This course provides participants with the knowledge and skills necessary to perform Surveillance, Operation and Configuration activities on the virtual HSS-FE 1 node in the Evolved Packet Core environment. The course covers both virtual and native HSS-FE.

Learning objectives:

On completion of this course the participants will be able to:

- 1 Describe HSS-FE node functions and interworking
 - 1.1 Describe the network solutions that Ericsson HSS-FE is a part of
 - 1.2 Describe HSS-FE functions in a Packet Core environment
 - 1.3 Describe HSS-FE functions in Narrowband IoT
 - 1.4 Explain HSS-FE interworking, interfaces and protocols
- 2 Explain the HSS-FE node architecture
 - 2.1 Explain HSS-FE implementation as a VNF
 - 2.2 Explain External Connectivity and eVIP functionality
 - 2.3 Perform Scaling Management
- 3 Explain HSS-FE Operation and Maintenance Principles
 - 3.1 Describe O&M Interface
 - 3.2 Perform Compute Resources Check
 - 3.3 Explain Fault Management principles
 - 3.4 Perform HSS-FE Health Check
 - 3.5 Explain Performance Management principles
 - 3.6 Perform Backup and Restore
- 4 Configure EPC HSS-FE components and interfaces
 - 4.1 Configure ESM parameters (ESM Configuration Container)
 - 4.2 Configure Narrowband IoT parameters
 - 4.3 Configure the interface between HSS-FE and CUDB
 - 4.4 Configure the S6a interface between HSS-FE and MME
 - 4.5 Configure MAP interface between HSS-FE and HLR
 - 4.6 Configure SWx interface between HSS-FE and AAA
- 5 Configure AVG Module in HSS-FE
 - 5.1 Configure AVG in HSS-FE

**Target audience:**

This course is suitable for anyone who is required be able to configure/operate/maintain HSS-FE 1 for EPC and IoT.

Prerequisites:

Successful completion of the following courses:

Virtual EPC Overview LZU1082264

EPC Signaling LZU1087580

The following course is a prerequisite for native HSS-FE 1:

BSP 8100 Operation and Maintenance LZU1089779

The following course is a prerequisite for virtual HSS-FE 1:

Virtual IMS Concepts LZU1082227

The following courses become prerequisites if HSS-FE 1 is a part of Ericsson Certified Cloud offering:

BSP 8100 Operation and Maintenance LZU1089779

Cloud Execution Environment 16A (CEE), LZU1082354

Ericsson Cloud Execution Environment 16A (CEE) System Administrator, LZU1082353

Duration and class size:

The length of the course is 2 days and the maximum number of participants per session is 8

Learning situation:

This course is based on theoretical and practical instructor-led lessons given in a technical environment using equipment and tools.



IPWorks 1 (Virtual) Operation and Maintenance for EPC

LZU1082428 R1A

Description:

Do you need to know how to configure IPWorks, do basic maintenance tasks, and learn some tips and tricks? IPWorks is an advanced product with several user interfaces, a layered architecture, and a combination of disk-based and memory-based databases. This course provides practical knowledge on the operation and maintenance of IPWorks. The course emphasizes the understanding of virtualized IPWorks deployment on the EPC network and the knowledge of configuring the DNS and AAA services and understanding the role of these services in an EPC network. The students are introduced to fault, node and performance management of the system. Furthermore, the course covers some security aspects of IPWorks. With the help of the manual provided in this course, and the guidance of the instructor, the attendees will be able to learn the most efficient ways of performing operation and maintenance procedures. Considerable part of the course is dedicated to WiFi Calling solution support.

Learning objectives:

On completion of this course the participants will be able to:

- 1 Understand the purpose of IPWorks and the services it provides
 - 1.1 Introduction to IPWorks features and functions
- 2 Explain the architecture of IPWorks
 - 2.1 Explain Virtualization concepts
 - 2.2 Describe Component Based Architecture and name relevant supporting components
 - 2.3 Review of Hardware and Software Architecture
- 3 Recount IPWorks redundancy options
 - 3.1 Describe the redundancy options
- 4 Describe IPWorks deployment scenarios in IMS network
 - 4.1 Relate IPWorks importance in EPC network
- 5 Work with IPWorks interfaces
 - 5.1 Apply COM CLI
 - 5.2 Get familiar to Netconf
- 6 Configure various parts of the system
 - 6.1 Configure DNS server
 - 6.2 Operate AAA server
 - 6.3 Configure ASDNS
- 7 Execute fault management



- 7.1 Inspect alarms and work with the SNMP agents
- 7.2 Configure and view logs
- 8 Practice maintenance tasks
 - 8.1 System backup and restore
 - 8.2 Configure and view statistics reports
- 9 Handle User management
 - 9.1 Managing User Profile and Access Control

Target audience:

This course is suitable for anyone who is required be able to configure/operate/maintain IPWorks 1 for EPC.

Prerequisites:

Successful completion of the following courses:

EPC System Survey, LZU1087977

Fundamental knowledge of IP protocol suite and Linux OS

Duration and class size:

The length of the course is 2 days and the maximum number of participants is 8.

Learning situation:

This course is based on theoretical and practical instructor-led lessons given in a technical environment using equipment and tools.



IPWorks 2 Operation and Maintenance for EPC

LZU1082660 R1A

Description:

Do you need to know how to configure IPWorks, do basic maintenance tasks, and learn some tips and tricks? IPWorks is an advanced product with several user interfaces, a layered architecture, and a combination of disk-based and memory-based databases.

This course provides practical knowledge on the operation and maintenance of IPWorks. The course emphasizes the understanding of virtualized IPWorks deployment on the EPC network and the knowledge of configuring the DNS, Active Select DNS, Radius AAA, Diameter AAA and DHCP services and understanding the role of these services in an EPC network. The students are introduced to fault, node and performance management of the system. With the help of the manual provided in this course, and the guidance of the instructor, the attendees will be able to learn the most efficient ways of performing operation and maintenance procedures. Considerable part of the course is dedicated to WiFi Calling solution support.

Learning objectives:

On completion of this course the participants will be able to:

- 1 Understand the purpose of IPWorks and the services it provides
 - 1.1 Introduction to IPWorks features and functions
- 2 Explain the architecture of IPWorks
 - 2.1 Explain Virtualization concepts
 - 2.2 Describe Component Based Architecture and name relevant supporting components
 - 2.3 Review of Hardware and Software Architecture
- 3 Recount IPWorks redundancy options
 - 3.1 Describe the redundancy options
- 4 Describe IPWorks deployment scenarios in EPC networks
 - 4.1 Understand IPWorks importance in EPC network
- 5 Work with IPWorks interfaces
 - 5.1 Apply COM CLI
 - 5.2 Get familiar to Netconf
- 6 Configure various parts of the system
 - 6.1 Configure DNS server
 - 6.2 Operate AAA server
 - 6.3 Configure ASDNS
 - 6.4 Operate DHCP Server
- 7 Execute fault management



- 7.1 Inspect alarms and work with the SNMP agents
- 7.2 Configure and view logs
- 8 Practice maintenance tasks
 - 8.1 System backup and restore
 - 8.2 Configure and view statistics reports
- 9 Handle User management
 - 9.1 Managing User Profile and Access Control

Target audience:

This course is suitable for anyone who is required be able to configure/operate/maintain IPWorks 2 for EPC.

Prerequisites:

Successful completion of the following courses:

EPC System Survey, LZU1087977

Fundamental knowledge of IP protocol suite and Linux OS

Duration and class size:

The length of the course is 2 days and the maximum number of participants is 8.

Learning situation:

This course is based on theoretical and practical instructor-led lessons given in a technical environment using equipment and tools.



SAPC 1 Online Delta

LZU1082710 R1A

Description:

The SAPC 1 delta course includes a training module covering the new features and feature enhancements corresponding to each deployment package beginning from SAPC 1.0 up to 1.2.

Learning objectives:

On completion of this course the participants will be able to:

- 1 Explain new features and feature enhancements for SAPC releases 1.0, 1.1 and 1.2.

Target audience:

This course is suitable for anyone who is required to be familiar with new features in SAPC 1.0-1.2

Prerequisites:

Successful completion of the following courses:

Successful completion of the following courses:

SAPC 1 Overview - LZU1082609

SAPC 1 Operation, Configuration and Troubleshooting - LZU1082500

Duration and class size:

The length of the course is 1.5 hours.

Learning situation:

This is a web-based interactive training course with multimedia content.



SAPC 1 Operation, Configuration and Troubleshooting

LZU1082500 R1A

Description:

Mobile broadband is taking off and moving forward to LTE era and Cloud Solutions. It is very important to understand the Fair Usage Policy Control, QoS, Access Policy Control and VoLTE traffic cases. You may need to operate and configure the main equipment in order to manage all these new characteristics using a Classical SAPC or a virtual SAPC.

The SAPC 1 Operation and Configuration course is recommended for those who are working with operation and configuration tasks related to the SACC solution. It defines how SAPC provides centralized policy management for access control and QoS control per subscriber, service and bearer basis according to the 3GPP Policy Charging and Control (PCC) architecture. This course includes the main operation, maintenance and configuration activities in release 1 using both Physical Node Function (PNF) and/or VNF (Virtual Node Function).

Learning objectives:

On completion of this course the participants will be able to:

- 1 Describe the SAPC or solutions.
 - 1.1 Explain the SAPC 1 reference model.
 - 1.2 Describe the SAPC main functions.
 - 1.3 Explain the SAPC interfaces and their protocols.
 - 1.4 Describe the main features in SAPC release 1.
- 2 Describe the SAPC architecture
 - 2.1 Describe the classical SAPC 1 architecture.
 - 2.2 Describe the virtual SAPC 1 architecture.
- 3 List the main operation activities in SAPC 1
 - 3.1 Execute the SAPC Operation: logging management, fault management, performance management.
 - 3.2 Work on OAM tools for SAPC.
 - 3.3 Interpret the CM connection and GUI in SAPC
 - 3.4 Explain the SAPC backup and restore
- 4 Describe the SAPC 1 configuration.
 - 4.1 Operate and perform the SAPC 1 configuration
 - 4.2 Modify rules and conditions in the SAPC
 - 4.3 Create services (static, dynamic) in SAPC to be installed in PCEF
 - 4.4 Explain the Policy Studio.
- 5 Describe the main SAPC troubleshooting activities.
 - 5.1 Explain the non-graphical tools available for troubleshooting.
 - 5.2 Describe the main log files when troubleshooting.

**Target audience:**

This course is suitable for anyone who is required be able to configure and operate SAPC 1.

Prerequisites:

Successful completion of the following courses:

For Native SAPC:

EPC System Survey LZU1087977

BSP 8100 Operation & Maintenance, LZU1089779

Basic knowledge on Unix, Cisco SCE, Cisco BRAS and Juniper CRAS configurations or equivalents

For the Virtual SAPC:

Virtual EPC (vEPC) Overview - LZU1082264

Ericsson Cloud System Overview - LZU1089909

Foundation Series - Ericsson Cloud Execution Environment (CEE) - LZU1082364

Basic knowledge on Unix, Cisco SCE, Cisco BRAS and Juniper CRAS configurations or equivalents

Duration and class size:

The length of the course is 3 days and the maximum number of participants is 8.

Learning situation:

This course is based on theoretical and practical instructor-led lessons given in a technical environment using equipment and tools.



SGSN-MME 1 Administration

LZU1082498 R1A

Description:

SGSN-MME 1 can be deployed both as a native node as well as Virtual Network Function (VNF).

The SGSN-MME 1 administration course provides participants competence to operate and maintain both native and virtual SGSN-MME 1 efficiently. If you are interested to know how to perform operation and administration activities like fault management, security management, software management and performance management on both native and virtual SGSN-MME, then this is the right course for you.

The course also illustrates Ericsson's virtual SGSN-MME architecture and its deployment in cloud solution.

Learning objectives:

On completion of this course the participants will be able to:

- 1 Explain the main procedures in SGSN-MME
 - 1.1 Recognize the basic SGSN-MME architecture, its functions and interfaces
 - 1.2 Outline the functionality of SGSN-MME in different implementations
 - 1.3 Describe basic procedures handled by SGSN-MME such as session management, mobility management and Quality of Service (QoS) handling
 - 1.4 Recognize some general call flows handled by SGSN-MME in GPRS and EPC Networks
 - 1.5 Explain the highlighted features of SGSN-MME 1
- 2 Describe the details of native SGSN-MME System Architecture
 - 2.1 Explain the software architecture of SGSN-MME MKVIII and MkX
 - 2.2 Understand the hardware architecture of SGSN-MME MKVIII and MkX and its different components
 - 2.3 Introduce the automatic health check function in SSGN-MME and its components
- 3 Discuss the virtual SGSN-MME architecture in cloud solution
 - 3.1 Introduce the concept of cloud and virtualization
 - 3.2 Identify the main elements in cloud solution
 - 3.3 Understand high level vEPC architecture and its key features
 - 3.4 Describe the vSGSN-MME 1 as a Virtual Network Function (VNF)
 - 3.5 List the benefits of virtual SGSN-MME
- 4 Explain the resilience in native and virtual SGSN-MME 1
 - 4.1 Discuss the session resilience and redundancy mechanisms available in native and virtual SGSN-MME



- 4.2 Explain the procedure of Application Processor (AP) takeover and Device Processor (DP) takeover
- 4.3 Outline the failure handling in vSGSN-MME
- 4.4 Identify automatic recovery functions and overload protection mechanisms in SGSN-MME
- 4.5 Describe the Traffic Mix Optimization (TMO) functionality
- 5 Explain the various management domains in SGSN-MME and how to handle fault management procedures
 - 5.1 Identify the Operation and Maintenance (O&M) architecture and various management domains in SGSN-MME
 - 5.2 Perform fault management on SGSN-MME using Command Line Interface (CLI)
 - 5.3 Identify the severity of a fault in the SGSN-MME and act according to the escalation procedure
 - 5.4 Describe the concept of log management in SGSN-MME
- 6 Perform the configuration management in SGSN-MME
 - 6.1 Explain how to perform basic node management using CLI
 - 6.2 Explore configuration management domain using ALEX and CLI
- 7 Execute the performance management tasks in SGSN-MME
 - 7.1 Review the concepts of performance management types and create performance management jobs and understand their practical use
 - 7.2 Explain Event Based Monitoring (EBM) feature for performance monitoring
- 8 Conduct the security management tasks in SGSN-MME
 - 8.1 Explain the concepts of security management, perform basic security management, perform user management and assign tailored roles for different users
- 9 Illustrate the software management tasks in SGSN-MME and virtual SGSN-MME 1 deployment procedure
 - 9.1 Perform systems administration tasks on the SGSN-MME
 - 9.2 Identify different ways of handling software configurations and create software configurations
 - 9.3 Describe enhanced SGSN-MME software upgrade procedure
 - 9.4 Discuss the virtual SGSN-MME deployment procedure
 - 9.5 Describe SGSN-MME license management
- 10 Explain the support systems for managing native and virtual SGSN-MME 1
 - 10.1 Describe the key functions of the OSS/ENM in managing native and virtual SGSN-MME
 - 10.2 Understand and run the updated backup and restore procedure in SGSN-MME
 - 10.3 Identify the various tools available in OSS/ENM for software management, fault management and performance management

**Target audience:**

This course is suitable for anyone who is required be able to administer SGSN-MME 1.

Prerequisites:

Successful completion of the following courses:

EPC System Survey - LZU1087977

For Virtual SGSN-MME:

Virtual EPC Overview - LZU1082264

Ericsson Cloud System Overview - LZU1089909

Foundation Series - Ericsson Cloud Execution Environment (CEE)- LZU1082364

Duration and class size:

The length of the course is 4 days and the maximum number of participants per session is 8.

Learning situation:

This course is based on theoretical and practical instructor-led lessons given in a technical environment using equipment and tools.



SGSN-MME 1 Configuration and Troubleshooting

LZU1082501 R1A

Description:

SGSN-MME 1 can be deployed both as a native node, with support for MkVIII/MkX platform to secure high capacity needs and as Virtual Network Function (VNF) included in Ericsson' virtual Evolved Packet Core (vEPC) solution.

If you want to build competence in configuring, operating and troubleshooting both native and virtual SGSN-MME 1, then this is the right course for you. Several configuration areas related to all interfaces, DNS, NTP, Wi-Fi integration and virtual SGSN-MME implementation is covered for a comprehensive insight.

Furthermore, this course provides methods and guidelines to troubleshoot SGSN-MME and rectify issues quickly and effectively.

Learning objectives:

On completion of this course the participants will be able to:

- 1 Review the basic concepts of packet core network and the role of SGSN-MME
 - 1.1 Explain the role of SGSN-MME in the GPRS and EPC networks
 - 1.2 Identify SGSN-MME interfaces and protocols used
 - 1.3 Discuss basic mobility management and session management procedures
 - 1.4 List the highlighted features of SGSN-MME 1
 - 1.5 Introduction to the common configuration related to SGSN-MME
- 2 Explain the software and hardware configuration of native SGSN-MME
 - 2.1 Explain the software architecture of native SGSN-MME using MKVIII and MkX Hardware
 - 2.2 Discuss the hardware architecture of native SGSN-MME MKVIII and MkX and its different components
 - 2.3 List the various Plug In Unit (PIU) roles in SGSN-MME
- 3 Discuss Ericsson's virtual SGSN-MME 1 architecture in cloud solution
 - 3.1 Determine high level vEPC architecture and key features of vEPC Solution like IoT, distributed MBB Broadband
 - 3.2 Describe the virtual SGSN-MME 1 architecture
 - 3.3 Review the role of Ericsson's Cloud Execution Environment (CEE) and Ericsson Cloud Manager (ECM)
 - 3.4 Discuss the virtual SGSN-MME implementation in cloud architecture
- 4 Describe the concept of IP services and the routing mechanisms used for IP over Ethernet configuration in native and virtual SGSN-MME
 - 4.1 Introduce the concept of IP services and usage of service IP address in the concerned networks



- 4.2 Explain the concept of DSCP marking
- 4.3 Explain the routing methods and protocols supported in native SGSN-MME and virtual SGSN-MME 1
- 4.4 Outline high level network configurability for virtual SGSN-MME 1
- 4.5 Review the packet filtering rules and policies
- 4.6 Configure the external interfaces based on IP/ETH
- 4.7 Configure static and dynamic routing protocols
- 5 Configure and maintain the Gb over IP interface
 - 5.1 Explain the concept, advantages and network impact of Gb over IP
 - 5.2 Explain the concept of dynamic configuration for Gb over IP and related procedures
 - 5.3 Configure and verify Gb over IP interface
- 6 Configure non-sctp based interfaces like Gom, Gn, S3, S4, S11, S10, U2 and U1a
 - 6.1 Explain the functionality of Gom, Gn, S11, S10, S3, S16, S4 ,U2 and U1a interfaces
 - 6.2 Outline the usage of IP addresses in Gn, S11, S10, S3, S1 ,S4 ,U2 and U1a related networks
- 7 Configure and maintain SCTP based Interface S1-MME, SGs and SBc
 - 7.1 Explain the concept of the control plane (S1-MME) and user plane (S1-U) in S1 interface
 - 7.2 Explain the S1-AP and NAS procedures
 - 7.3 State the SCTP usage in S1-MME interface
 - 7.4 Configure and verify S1-MME interface
 - 7.5 Outline the functionality of SBc and SGs Interface
 - 7.6 Configure and verify the SBc and SGs interfaces
- 8 Configure diameter based interfaces in SGSN-MME like S6a, Sx and S13
 - 8.1 Explain diameter protocol and diameter configurations
 - 8.2 Describe the functionality of S6a,S13 and Sx interface and the protocol used
 - 8.3 Explain the signaling procedures performed in the S6a, S13 and Sx interface
 - 8.4 Indicate the usage of SCTP in the S6a interface
 - 8.5 Configure and verify S6a , S13 and Sx Interface
- 9 Configure Domain Name Service (DNS) and Network Time Protocol (NTP) connectivity in SGSN-MME
 - 9.1 State the concept of using DNS and configure DNS
 - 9.2 Explain the usage of NTP in the network and configure NTP
- 10 Explain troubleshooting methods and tools available in SGSN-MME
 - 10.1 Discuss EBM functionality and usage of EBM logs for troubleshooting mobility and session management related issues
 - 10.2 Run through the various toolbox commands available in SGSN-MME useful for troubleshooting
 - 10.3 Resolve subscriber related issues with CLI commands and UE trace functionality
 - 10.4 Identify and troubleshoot interface faults using CLI commands and Integrated Traffic

**Target audience:**

This course is suitable for anyone who is required be able to configure SGSN-MME 1.

Prerequisites:

Successful completion of the following courses:

EPC System Survey - LZU1087977

SGSN-MME 1 Administration - LZU10892498

For virtual SGSN-MME:

Virtual EPC Overview - LZU1082264

Ericsson Cloud System Overview - LZU1089909

Foundation Series - Ericsson Cloud Execution Environment (CEE)- LZU1082364

Duration and class size:

The length of the course is 5 days and the maximum number of participants is 8.

Learning situation:

This course is based on theoretical and practical instructor-led lessons given in a technical environment using equipment and tools.



SGSN-MME 1 Online Delta

LZU1082526 R1A

Description:

This course is intended for those who wish to update their knowledge on the new features and enhancements introduced from SGSN-MME 1.0 to SGSN-MME 1.19.

The SGSN-MME 1 delta course includes a training module covering the new features and feature enhancements corresponding to each deployment package beginning from SGSN-MME 1.0 up to 1.19.

Learning objectives:

On completion of this course the participants will be able to:

- 1 Outline the new features and feature enhancements from SGSN-MME 1.0 to 1.19

Target audience:

This course is suitable for anyone who is required to be familiar with new SGSN-MME 1.0 - 1.19 features.

Prerequisites:

Successful completion of the following courses:

SGSN-MME 1 Administration - LZU1082498

SGSN-MME 1 Configuration & Troubleshooting - LZU1082501

Duration and class size:

The length of the course is 4 hours.

Learning situation:

This is a web-based interactive training course with multimedia content.



UDC in 5G EPC Introduction

LZU1082649 R1A

Description:

This course is a web based learning, describing the feature and function delta between UDC for LTE/EPC networks and UDC used for 5G RAN (NR)/5G EPC networks according to 3GPP option 3. The course is divided into three e-learning modules.

Learning objectives:

On completion of this course the participants will be able to:

- 1 Describe the 5G (NR) subscription authorization support
- 2 Explain support for extended bit rates for Subscribed AMBR
- 3 Explain the Slicing Routing Database (DB) support
- 4 Explain 5G NR support in SAPC
- 5 Explain the extension of the HSS-EPC profile in CUDB to support 5G EPC
- 6 Explain the Slicing Routing Data Base (DB) in CUDB

Target audience:

This course is suitable for anyone who is required to be familiar with UDC in 5G EPC.

Prerequisites:

Successful completion of the following courses:

Virtual EPC Overview, LZU1082264

5G Core Concepts, LZU1082641



Duration and class size:

The length of the course is 1 hour.

Learning situation:

This is a web-based interactive training course with multimedia content.



Wi-Fi Mobility Gateway (WMG) 1 Operation and Configuration

LZU1082553 R1A

Description:

Operators are consolidating their networks and providing the same services to different types of access technologies. Ericsson Wi-Fi Mobility Gateway (WMG) is the node which helps the operator to connect the trusted and non-trusted Wi-Fi access domain to EPC.

This hands-on course explains the position of WMG in the network, its functionalities, hardware and software architecture. Participants will learn about the WMG configuration and its operation in a native and cloud environment.

Learning objectives:

On completion of this course the participants will be able to:

- 1 Provide introduction to Ericsson Wi-Fi Mobility Gateway (WMG)
 - 1.1 Recognize the need of WMG in the network
 - 1.2 Expand WMG positioning and its various interfaces
 - 1.3 Recall SWu interface and its protocol stack
 - 1.4 Relate SWm interface and its protocol stack
 - 1.5 Illustrate the S2b interface and its protocol stack
 - 1.6 Identify the S2a interface and its protocol stack
- 2 Elaborate the Mobility & Session Management in WMG
 - 2.1 Analyze session management in WMG
 - 2.2 Demonstrate different handoff procedures
- 3 Examine the Wi-Fi Mobile Gateway (WMG)
 - 3.1 Evaluate the WMG application
 - 3.2 Illustrate native and virtual WMG architecture
 - 3.3 Differentiate the WMG deployment scenario
 - 3.4 Explore the WMG scalable deployment options
 - 3.5 Inspect WMG 1 features
- 4 Investigate the configuration of WMG
 - 4.1 Classify WMG system configuration
 - 4.2 Execute IPSec and certificate installation configurations
 - 4.3 Configure the node configuration
- 5 Elaborate WMG Operations
 - 5.1 Perform WMG user management
 - 5.2 Categorize WMG health check procedure
 - 5.3 Explore WMG performance management
 - 5.4 Inspect WMG backup and restore procedure



- 6 Investigate WMG Maintenance procedure
- 6.1 Practice file management in WMG
- 6.2 Elaborate basic fault management
- 6.3 Determine the software management procedure

Target audience:

This course is suitable for anyone who is required be able to configure and operate WMG 1.

Prerequisites:

Successful completion of the following courses:

Wi-Fi Mobility Gateway (WMG) 1 Overview - LZU1082554

Ericsson Cloud System Overview - LZU1089909

Duration and class size:

The length of the course is 3 days and the maximum number of participants is 8.

Learning situation:

This course is based on theoretical and practical instructor-led lessons given in a technical environment using equipment and tools.



Virtual EPC Network Services

LZU1082361 R1A

Description:

Ericsson virtual Evolved Packet Core provides tested and validated solutions addressing a large number of vertical use-cases. It enables an unprecedented scalability and flexibility from small-scale local deployments, with EPC in-a-box, to large-scale datacenter deployments. This means that virtual Evolved Packet Core can be deployed in large centralized datacenters but also distributed close to the radio network.

This course will help you to understand the highlights and detail technical descriptions of different network services offered by Virtual EPC (vEPC) network, its advantages, different deployment scenario, offered value packages.

Learning objectives:

On completion of this course the participants will be able to:

- 1 Underline the Virtual Evolved Packet Core Network
 - 1.1 Identify the Evolved Packet Core Network
 - 1.2 Discuss the Virtual EPC Solution
 - 1.3 Recognize the benefits of Virtual EPC solution
- 2 Illustrate the Internet of Things (IoT) Solution
 - 2.1 IoT is a Different Business
 - 2.2 Elaborate the Benefits of IoT
 - 2.3 Recognize different value package of IoT
- 3 Differentiate the network services for implementing Distributed MBB
 - 3.1 Investigate the vEPC Distributed Mobile Broadband
 - 3.2 State different value package of Distributed Mobile Broadband
- 4 Evaluate Virtual EPC Enterprise Solution
 - 4.1 What is the different functions supported in Enterprise solution
 - 4.2 Explain the benefits of Enterprise solution
 - 5.1 Elaborate the market opportunity of MVNO
- 5 Explore the MVNO Solution
 - 5.1 Elaborate the market opportunity of MVNO
- 6 Inspect the Mobile Broadband Solution
 - 6.1 List the different deployment options of MBB Solution
 - 6.2 State the benefits of MBB

**Target audience:**

This course is suitable for anyone who is required to be familiar with vEPC network services.

Prerequisites:

Successful completion of the following courses:

Virtual EPC Overview - LZU1082264

Duration and class size:

The length of the course is 1 day and the maximum number of participants per session is 16.

Learning situation:

This course is based on theoretical instructor-led lessons given in a classroom environment.



Virtual EPC Onboarding and Management

LZU1082651 R1A

Description:

The course provides an overview of the Ericsson Evolved Packet Core (EPC) solution implemented as Virtualized Network Functions (VNFs). The course helps the participants to understand the prerequisite of installing the vEPC on NFVI, its preparation, steps to onboard it with manual process and also automatic deployment using the orchestration tools. The participants will also learn implementation and management of vEPC on a cloud environment by performing practical exercises.

Learning objectives:

On completion of this course the participants will be able to:

- 1 Identify the role and purpose of virtual EPC (vEPC).
 - 1.1 Explain why there is a need for a vEPC.
 - 1.2 Describe the vEPC solution in brief – its architecture and capabilities.
 - 1.3 Prepare the templates based on the lab setup.
- 2 Onboard a virtual EPC VNF.
 - 2.1 Explain the orchestration possibilities using ATLAS GUI, CLI and ECM.
 - 2.2 Instantiate the VNF appropriate tools.
- 3 Verify the VNF.
 - 3.1 Check the connectivity for the instantiated VNF.
 - 3.2 Perform health check of the instantiated VNF.

Target audience:

This course is suitable for anyone who is required be able to perform onboarding and management of an EPC VNF.

Prerequisites:

Successful completion of the following courses:

5G Cloud NFVI Administration
Virtual EPC Overview – LZU1082264
Virtualization Concepts Introduction, LZU1082654



Duration and class size:

The length of the course is 1 day and the maximum number of participants per session is 8.

Learning situation:

This course is based on theoretical and practical instructor-led lessons given in a technical environment using equipment and tools.



Virtual EPC Overview

LZU1082264 R1A

Description:

This course highlights the technical descriptions and offerings of Virtual EPC (vEPC) and remarks the advantages of working in vEPC Network. You will learn the overview of Ericsson's vEPC VNFs (Virtual Network Function) implementation architecture and understand the main architectural concepts when deploying EPC applications in a cloud environment. In short, this course will take you through the first steps in the virtualization journey for EPC.

Learning objectives:

On completion of this course the participants will be able to:

- 1 Underline the Evolved Packet Core Network
 - 1.1 Identify the Evolved Packet Core Network
 - 1.2 Differentiate between EPC Control Plane and User Plane
 - 1.3 Discuss the vEPC Solution
 - 1.4 Recognize the benefits of vEPC solution
- 2 Describe the vEPC and its components
 - 2.1 Identify the main elements of the Cloud Execution Environment (CEE)
 - 2.2 Indicate the role of the Ericsson Cloud Manager (ECM)
 - 2.3 List the main steps when adding a VNF into a CEE
 - 2.4 Investigate the architecture of vEPC in cloud solution
 - 2.5 State the vEPC Implementation
 - 2.6 Determine the vEPG architecture in vEPC Network
 - 2.7 Recognize the vSGSN-MME architecture
 - 2.8 Restate the vSAPC architecture in vEPC Network
 - 2.9 Illustrate the vWMMG architecture in vEPC Network
- 3 List the network services of vEPC Solution
 - 3.1 Describe the Ericsson's vEPC for Internet of things IoT, meaning the solution for IoT
 - 3.2 Explain the Ericsson's Distributed MBB broadband
 - 3.3 Explain other network services of vEPC Business Solution

Target audience:

This course is suitable for anyone who is required to be familiar with virtual EPC.

**Prerequisites:**

Successful completion of the following courses:

General technical understanding of Packet Core (SGSN-MME, EPG-S, SAPC, WMG), IMS and Cloud will be required for better understanding of the course.

Duration and class size:

The length of the course is 1 day and the maximum number of participants per session is 16.

Learning situation:

This course is based on theoretical instructor-led lessons given in a classroom environment.



Virtualization Concepts Introduction

LZU1082654 R1A

Description:

The general Telecom Industry trend has been to move from networks that were dedicated and purpose built with hardware and software tightly integrated to support a certain network service to converged networks where different services and applications share the same IP transport functionality. The current evolution of the networks is to evolve into a platform supporting virtualization of applications and Cloud computing.

The course explains the virtualization and the cloud concepts and describes the deployment of applications implemented as Virtualized Network Functions (VNFs). It explores the Network Functions Virtualization (NFV) architecture according to ETSI NFV, the open source platform OPNFV with the OpenStack services and additional services provided by the Ericsson Cloud Execution Environment.

The course is given as a Web Based Learning (WBL).

Learning objectives:

On completion of this course the participants will be able to:

- 1 Explore the virtualization and cloud concepts
 - 1.1 Analyze the virtualization efficiency and revenue opportunities
 - 1.2 Discuss what is meant by a Virtual Machine (VM)
 - 1.3 Examine the cloud concept according to the US National Institute of Standards and Technology (NIST)
- 2 Review the ETSI Network Functions Virtualization (NFV) architecture
 - 2.1 Explore the functionality and interfaces for NFVI, VNF, VNFC, MANO and Hypervisor
 - 2.2 Discuss what is meant by VNF Instantiation and Transition
 - 2.3 Determine what is meant with VNF scaling
 - 2.4 Identify virtual switching
- 3 Review the open source platform OPNFV
 - 3.1 Demonstrate how OPNFV relates to ETSI NFV
 - 3.2 Explore the main OPNFV software components: OpenStack, KVM, OpenFlow, Open vSwitch (OVS) and Open Virtualization Format (OVF)
 - 3.3 Analyze the OpenStack services such as Nova, Neutron, Glance, Cinder, Keystone and Horizon and the Ericsson enhancements
- 4 Identify the additional services provided by Ericsson Cloud Execution Environment
 - 4.1 List additional services provided by CEE such as Fuel, Atlas, security, orchestration, performance and fault management
- 5 Compare Ericsson's VNF offerings



- 5.1 Relate the Ericsson VNFs to ETSI NFV
- 5.2 Determine the VM types for IMS, EPC, UDC VNFs
- 5.3 Discuss high availability and robustness concepts for VNFs
- 5.4 Explore the Ericsson NFV delivery Models

Target audience:

This course is suitable for anyone who is required to be familiar with virtualization concepts and principles.

Prerequisites:

Successful completion of the following courses:

General knowledge of Ericsson IMS, EPC and UDC.

Duration and class size:

The length of the course is 1,5 hours.

Learning situation:

This is a web-based interactive training course with multimedia content.



WMG 1 Online Delta

LZU1082711 R1A

Description:

This course is intended for those who wish to update their knowledge on the new features and enhancements introduced in WMG 1 release. The WMG 1 Online Delta course includes training modules covering new and enhanced features introduced in deployment packages 1.0 and 1.1 releases.

Learning objectives:

On completion of this course the participants will be able to:

- 1 Outline the new features and feature enhancements introduced from WMG 1.0 to 1.1 release

Target audience:

This course is suitable for anyone who is required to be familiar with new features in WMG 1.

Prerequisites:

Successful completion of the following courses:

Wi-Fi Mobility Gateway (WMG) 1 Overview - LZU1082554

Wi-Fi Mobility Gateway (WMG) 1 Operation and Configuration- LZU1082553

Duration and class size:

The length of the course is 1 hour.

Learning situation:

This is a web-based interactive training course with multimedia content.

