Packet Core Network 2019

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)
Blended Learning/Training (BLD)

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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.

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Cloud Packet Core Overview

LZU1082769 R1A

Description:

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 technology that provides users with access to packet data services. This technology is an evolution from GSM, GPRS, EDGE and WCDMA technology that enables interconnectivity from RAN perspectives so that users could stay connected to their mobile network. The impacts of the 5G EPC and of 5GC in the existing networks is also explained in this course.
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 vEPC VNFs (virtual network functions) 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 in the path to 5GC.

Learning situation:

This is a Web-Based Learning.

This is a self-paced interactive learning with multimedia content, delivered online.

Learning objectives:

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

1 Provide an overview of EPC
1.1 Explain the evolution of GPRS for GSM & WCDMA nodes and functionality to EPS
1.2 Describe the Ericsson Evolved Packet System (EPS)
1.3 Outline the 5G EPC nodes and the 5GC nodes
1.4 Introduce the concepts of 5GC micro-services

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

3 Discuss the Virtual Network Services of vEPC Solution
3.1 Explain the advantages of the massive IoT

4 Describe EPG and its functionality
4.1 Identify the supported interfaces and nodes that provide inter-working with EPG-S

4.2 Explain the advantages of vEPG
4.3 Describe the main enhancements in EPG 2.0

5 Provide an overview of SGSN-MME
5.1 List the main hardware components (MkVIII, MkX) in the SGSN-MME. Explain the vSGSN-MME
5.2 Review the SGSN-MME features and functions used to connect the user to the EPS network.

6 Explain SAPC
6.1 Describe the main features and interfaces in SAPC 1 in 4G
6.2 Outline the main features and interfaces in SAPC 1 in 5G EPC
6.3 List the main features and interfaces of the Policy Controller in 5GC

7 Review WMG functionality
7.1 Describe the main features and interfaces in WMG

8 Explain the Operation & Maintenance (O&M) system of EPC
8.1 Introduce Ericsson Network Management System
8.2 Explain the advantages of the Core Network Operations Manager (CNOM), ENM and Automated Acceptance Test (AAT) tool

Target audience:

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

Prerequisites:

Successful completion of the following courses:

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

Duration and class size:

The length of the course is approximately 1 hour and 30 minutes.

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EPC Signaling in 4G/5G

LZU1082853 R2A

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 SAPC.
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 have detailed knowledge of EPC Signaling in 4G/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.

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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 it's 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.

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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.

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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 EPG2.

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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.

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EPG 2 Operation and Configuration

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 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).

Learning situation:

This is a Blended Learning.

The WBL component(s) is self-paced interactive learning with multimedia content, delivered online and the ILT component is based on theoretical and practical instructor-led lessons given in a technical environment using equipment and tools.

Learning objectives:

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

1 (WBL) 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 (WBL) 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 (WBL) Describe 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 Explain the native and virtual EPG2 platform level configuration
5.1 Configure cards and management ports
5.2 Explain the configuration of contexts, bindings and interfaces in EPG
5.3 Perform static and dynamic routing protocols configuration
5.4 Show different security configurations available on EPG such as packet filtering and Access Control Lists (ACLs)
5.5 Explain the Generic Routing Encapsulation (GRE)
5.6 Outline the Layer 2 Tunneling Protocol (L2TP)
5.7 Describe the Link Aggregation

6 Configure the EPG applications level
6.1 Explain the logical interfaces configuration at the node, PGW and SGW levels
6.2 Illustrate how to perform Access Point Names (APNs), Radius and QoS configuration for the EPG
6.3 Explain the Control Plane and User Plane Separation (CUPS) in EPG 2 and configure it.
6.4 Describe the Bearer Throttling
6.5 Outline the QoS and GTP Echo Level Configuration
6.6 Explain the charging Configuration in EPG
6.7 Describe the DNS configuration

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
7.3 Run the YANG-model based fault management procedures in EPG2
7.4 Run the YANG-model performance management procedures in EPG2
7.5 Describe the YANG-model based Backup and Restore Management (BRM)
7.6 Describe the YANG-model based Software inventory management (SWiM)
7.7 Outline the operation and maintenance procedures in EPG2
7.8 Outline the procedures to start and stop the PGW and the SGW
7.9 Describe the control plane UE trace, the user plane UE trace and the available UE trace tools
7.10 Explain the context specific logging and the syslog configuration
7.11 Describe the SNMP configuration

8 Understand the Service Aware Charging and Control (SACC) concept and architecture
8.1 Describe the PGW role inside the SACC solutions and the SACC related interfaces
8.2 List the SACC main functions
8.3 Outline the PISC functionality
8.4 Configure the SACC
8.5 Detail the Rating Group concept and the Charging Method

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9 Perform basic EPG2 troubleshooting
9.1 Discuss the available toolboxes.
9.2 Explain Event Base Monitoring (EBM) in EPG
9.3 Illustrate how UE Trace and ITC trace are useful in troubleshooting
9.4 Describe how to perform the health check in EPG and the Support Package

Target audience:

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

Prerequisites:

Successful completion of the following courses:

Successful completion of the following courses:
EPC System Survey – LZU1087977
For virtual EPG:
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 WBL component is 1 hour and the length of the ILT component is 4 days. The maximum number of participants is 8.

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HSS-FE Operation and Configuration for EPC and IoT

LZU1082584 R2A

Description:

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

Learning situation:

This is an Instructor-Led Training.

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

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 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 IoT
1.4 Explain HSS-FE interworking, interfaces and protocols

2 Explain the HSS-FE node architecture
2.1 Explain the 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 Explain the HSS-FE configuration parameters in EPC
4.1 Examine the interface between HSS-FE and CUDB
4.2 Describe how HSS-FE supports basic EPC procedures
4.3 Configure ESM parameters (ESM Configuration Container)
4.4 Analyze the S6a/S6d interface between HSS-FE and MME/S4-SGSN
4.5 Recognize the MAP interface between HSS-FE and HLR

4.6 Explain the role of HSS in 5G EPC
4.7 Explain the role of HSS in NB-IoT and the S6t interface between HSS-FE and SCEF
4.8 Describe the role of HSS in Wi-Fi Calling and the SWx interface between HSS-FE and AAA

5 Describe the AVG Module in HSS-FE
5.1 Explain how authentication vectors are created in AVG
5.2 Describe the configuration parameters in the AVG module

Target audience:

This course is suitable for anyone who is required be able to configure and operate HSS-FE in EPC networks.

Prerequisites:

Successful completion of the following courses:

Cloud Packet Core Overview LZU1082769
EPC Signaling LZU1087580
The following course is a prerequisite for native/virtual HSS-FE 1 on BSP:
BSP 8100 Operation and Maintenance LZU1089779

Duration and class size:

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

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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.

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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.

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Massive IOT Packet Core e2e Use Cases

LZU1082770 R1A

Description:

Do you want to know about the enhancements introduced in the Ericsson Virtual Evolved Packet Core (vEPC) relating to Internet of things (IoT) technology? This course is ideal for the technical staff who need to update their knowledge on the IoT features and enhancements introduced in SGSN-MME, EPG and SAPC. Participants will explore the configuration activities in IoT and review the IoT related protocols and interfaces. The course focuses on IoT processes which take place between the eNB and MME, between MME and SGW, between MME and HSS and between SAPC and EPG.
The course describes details of the Ericsson Packet Core IoT solution, which is based on new 3GPP standard technologies including NB-IoT, Cat-M1 and EC-GSM-IoT.
The course also explains the interaction between the IoT Accelerator and the Packet Core and provides an overview of the Ericsson Network Manager (ENM) and of the Core Network Operations Manager (CNOM).

Learning situation:

This is an Instructor-Led Training.

This course is based on theoretical instructor-led lessons.

Learning objectives:

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

1 Describe the Virtual Evolved Packet Core (vEPC) in 4G+, in 5G EPC and in 5GC.
1.1 Explain the Internet of Things (IoT) solution.
1.2 List the IoT Value Packages.

2 Outline the virtual application categories in an IoT environment.
2.1 Outline the vEPC deployments.
2.2 Review the Ericsson CEE main categories.
2.3 Describe the Ericsson ECM main categories.
2.4 Explain the resilience and scaling in vEPG, vMME and vSAPC.

3 Explain the main IoT processes on interfaces Gb and S1-MME and show configuration activities such as feature activation and the configuration needed in the context of the feature.
3.1 Explain the IoT/M2M low complexity UE Support and the handling of NB-IoT RAT.
3.2 Describe the general NAS Mobility Management Congestion Control and enhancements.
3.3 Outline the data over NAS (DoNAS).
3.4 Outline the extended coverage concept in GSM and LTE.

3.5 Describe the UE Power Saving Mode (PSM) for GSM and for LTE.
3.6 Review the Extended Battery Life with a Shorter Active Timer Period
3.7 Outline the Extended Idle Mode Discontinuous Reception (eDRX) in LTE and in GSM.
3.8 Explain the configurable battery saving. Describe the lower bound for periodic TAU timer.
3.9 Outline the adaptive paging and the High Latency Communication (HLCOM) with flexible buffer size.
3.10 Explain the DoNAS Support for TAU with Dataflow.
3.11 Explain the DoNAS with Robust Header Compression (ROHC).
3.12 Outline the DoNAS, Multiple PDN over S11-U interface.
3.13 Describe the Rate Control for CIOT EPS Optimization
3.14 Review the MSISDN-less Support in Gn-SGSN
3.15 Explain the APN-Based Congestion Control
3.16 Outline the Automatic Device Detection in LTE4
3.17 Explain the main IoT processes on the interfaces S11, S1-U, S5/S8, SGs and Gx and show configuration activities such as feature activation and the configuration needed in the context of the feature.

4 Explain the main IoT processes on the interfaces S11, S1-U, S5/S8, SGs and Gx and show configuration activities such as feature activation and the configuration needed in the context of the feature.
4.1 Explain the RAT Type NB-IoT and the S11-U Data over NAS (DoNAS) support in EPG.
4.2 Outline the S11-U interface support.
4.3 Outline the DoNAS Short Message (SMS) Support over the SGs Interface.
4.4 Describe the Non-IP based DoNAS.
4.5 Outline the DDN Throttling in MME and EPG.
4.6 Explain the Virtual Service Forwarder (VSFO).
4.7 Describe the Dedicated Core Network (DeCOR).
4.8 Explain the NB-IoT Non-IP Data Delivery over SCEF (NIDD) and the interface T6a.
4.9 Describe the Monitoring Enhancements (MONTE)
4.10 Outline the GTPC-C load control information in MME and SGW.

5 List the main operation and basic troubleshooting activities in an IoT environment.
5.1 Explain the O&M activities.
5.2 List the main log files.
5.3 Describe the main troubleshooting toots, such as UE Trace, Integrated Traffic Capturing (ITC) and Event-Based Monitoring (EBM).

6 Describe the overall functionality of the Ericsson Network Manager (ENM).
6.1 Describe the main O&M tools of ENM.
6.2 Explain at a high level the ENM features for Fault Management (FM) and Performance Management (PM) and Configuration Management (CM).
6.3 List the networks elements supported by ENM.
6.4 Explain the advantages of the Core Network Operation and Maintenance (CNOM).

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Target audience:

This course is suitable for anyone who is required to be familiar with Massive IOT Packet Core e2e Use Cases.

Prerequisites:

Successful completion of the following courses:

SGSN-MME 1 Administration - LZU1082498
SGSN-MME 1 Configuration - LZU1082792
EPG 2 Operation and Configuration - LZU1082788
SAPC 1 Operation, Configuration and Troubleshooting - LZU1082500
Foundation Series - Ericsson Cloud Execution Environment (CEE) - LZU1082364

Duration and class size:

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

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SAPC 1 Operation, Configuration and Troubleshooting

LZU1082500 R2A

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 solutions requiring policy management. 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 using both Physical Node Function (PNF) and/or VNF (Virtual Node Function).

Learning situation:

This is a Blended Learning.

The WBL component(s) is self-paced interactive learning with multimedia content, delivered online and the ILT component is based on theoretical and practical instructor-led lessons given in a technical environment using equipment and tools.

Learning objectives:

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

1 Discuss the SAPC solutions
1.1 Explain the SAPC reference model
1.2 Describe the SAPC main functions
1.3 Explain the SAPC interfaces and their protocols
1.4 Describe the SAPC in 5G EPC and as well the micro-services-based Policy Controller in 5GC
1.5 List the main features in SAPC 1

2 Explain the SAPC 1 architecture
2.1 Describe the virtual SAPC 1 architecture
2.2 Outline the architecture of SAPC 1 on BSP 8100
2.3 Describe the architecture of SAPC 1 on NAP 6.1

3 Review the main operation activities in SAPC
3.1 Demonstrate the OAM tools for SAPC
3.2 Interpret the NETCONF CLI and GUI
3.3 Show and explain the ECLI

3.4 Review the configuration templates used by SAPC
3.5 Execute the SAPC Operation: logging management, fault management and performance management
3.6 Describe the main log files in SAPC
3.7 Explain the SAPC backup and restore
3.8 Outline the restart and reboot alternatives in SAPC

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. Explain the use of configuration guides, of profiles for PRA, for mobility-based policies and for event triggers management
4.5 Describe both the GeoRed Active-STB and Active-Active solutions

5 Outline the main SAPC troubleshooting activities
5.1 Explain the non-graphical tools available for troubleshooting
5.2 Describe the recommended maintenance intervals
5.3 Outline the license management
5.4 List the main GeoRed troubleshooting activities
5.5 Show the UE trace for SAPC
5.6 Describe the EBM enhancements

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Target audience:

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

Prerequisites:

Successful completion of the following courses:

For the Classical 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 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 WBL component(s) is approximately 1 hour and 30 minutes.

The length of ILT component is 2 days and the maximum number of participants per session is 8.

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SGSN-MME 1 Administration

LZU1082498 R2A

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 within 4G EPC or 5G EPC.

Learning situation:

This is a Blended Learning.

The WBL component(s) is self-paced interactive learning with multimedia content, delivered online and the ILT component is based on theoretical and practical instructor-led lessons given in a technical environment using equipment and tools.

Learning objectives:

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

1 (WBL) Describe the details of native SGSN-MME System Architecture
1.1 Explain the software architecture of SGSN-MME MKVIII and MkX and of virtual SGSN-MME
1.2 Outline the control hierarchy levels in SGSN-MME
1.3 Understand the main parts of the hardware architecture of SGSN-MME MKVIII and MkX

2 (WBL) Explain the resilience in native and virtual SGSN-MME 1
2.1 Discuss the session resilience and redundancy mechanisms available in native and virtual SGSN-MME
2.2 Explain the procedure of Application Processor (AP) takeover and Device Processor (DP) takeover
2.3 Describe the Traffic Mix Optimization (TMO) functionality
2.4 Outline the restart levels with manual invocation in SGSN-MME
2.5 Explain the GUTI Reallocation at Service Request

3 Explain the various management domains in SGSN-MME and how to handle fault management procedures
3.1 Identify the Operation and Maintenance (O&M) architecture and various management domains in SGSN-MME

3.2 Recovery procedures in SGSN-MME
3.3 Perform fault management on SGSN-MME using Command Line Interface (CLI)
3.4 Outline the REST Event Service for Fault Management
3.5 Describe the concept of log management in SGSN-MME
3.6 Explain the configurable Log retention times

4 Perform the configuration management in SGSN-MME
4.1 Explain how to perform basic node management using CLI
4.2 Explore configuration management domain using ELEX and CLI

5 Execute the performance management tasks in SGSN-MME
5.1 Review the concepts of performance management types and create performance management jobs and understand their practical use
5.2 Describe the REST Event Service for Performance Management
5.3 Explain Event Based Monitoring (EBM) feature for performance monitoring
5.4 Outline the Performance Data Collection

6 Conduct the security management tasks in SGSN-MME
6.1 Conduct the security management tasks in SGSN-MME
6.2 Explain the concepts of security management, perform basic security management, perform user management and assign tailored roles for different users
6.3 Describe the removal of root Login

7 Illustrate the software management tasks in SGSN-MME and virtual SGSN-MME 1 deployment procedure
7.1 Identify different ways of handling software configurations and create software configurations.
7.2 Describe enhanced SGSN-MME software upgrade procedure
7.3 Discuss the virtual SGSN-MME deployment procedure
7.4 Describe the SGSN-MME license management
7.5 Explain the support for Network Licenses (NELS)

8 Explain the support systems for managing native and virtual SGSN-MME 1
8.1 Understand and run the updated backup and restore procedure in SGSN-MME
8.2 Identify the various tools available in OSS/ENM for software management, fault management and performance management
8.3 Explain the YANG Data Modeling for Backup & Restore

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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 WBL component is 1 hour, the length of the ILT component is 3 days and the maximum number of participants is 8.

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SGSN-MME 1 Configuration

LZU1082792 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 a Virtual Network Function (VNF) included in Ericsson's virtual Evolved Packet Core (vEPC) solution in the context of 3G, 4G and 5G EPC.
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, are covered for a comprehensive insight.
Furthermore, this course provides methods and guidelines to troubleshoot SGSN-MME and rectify issues quickly and effectively.
The course consists of two parts – a Web-Based Learning (WBL, Learning Objectives 1-2) and an Instructor-Led Training (ILT, Learning Objectives 3-9).

Learning situation:

This is a Blended Learning.

The WBL component(s) is self-paced interactive learning with multimedia content, delivered online and the ILT component is based on theoretical and practical instructor-led lessons given in a technical environment using equipment and tools.

Learning objectives:

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

1 (WBL) Discuss the 4G EPC, the cloud solution, 5G EPC and 5GC
1.1 Describe the architecture of MkX, MkVIII and virtual SGSN-MME
1.2 Explain the main interfaces in 4GC, in 5G EPC and the combined 5GC solution
1.3 Review the role of Ericsson's Cloud Execution Environment (CEE), Ericsson Cloud Manager (ECM), Core Network Operations Manager (CNOM) and Ericsson Network Manager (ENM)
1.4 Determine the high level vEPC architecture and key features of vEPC Solution like IoT, distributed Mobile Broadband (MBB), Enterprise and Communication

2 (WBL) Describe the concept of IP services and the routing mechanisms used in SGSN-MME
2.1 Introduce the concept of IP service and its configuration
2.2 Explain the concept of DSCP marking

2.3 Explain the routing methods and protocols supported in native SGSN-MME and virtual SGSN-MME 1
2.4 Outline high level network configurability for virtual SGSN-MME 1

3 Outline the IP over Ethernet configuration in SGSN-MME
3.1 Describe the hardware used by the external interfaces in SGSN-MME
3.2 Configure static and dynamic routing protocols
3.3 Review the inbound packet filtering rules and policies
3.4 Configure the external interfaces

4 Configure non-SCTP based interfaces like Gom, Gn, S3, S4, S10, S11 and S16
4.1 List the CLI commands used to configure external interfaces
4.2 Outline the usage of IP addresses in Gom, Gn, S3, S4, S10, S11 and S16
4.3 Outline the OAM Interface on NCB with Floating IP-Address
4.4 Explain the Wi-Fi integration

5 Configure and maintain the Gb over IP interface
5.1 Explain the concept, advantages and network impact of Gb over IP
5.2 Describe the SGSN Pool Proxy
5.3 Explain the concept of dynamic configuration for Gb over IP
5.4 Configure and verify Gb over IP interface

6 Configure and maintain SCTP based Interface as S1-MME, SGs and SBc
6.1 Describe the Stream Control Transmission Protocol (SCTP)
6.2 Outline, configure and verify the S1-MME interface
6.3 Explain the functionality of SBc and SGs Interface

7 Configure diameter-based interfaces as S6a, Smp and S13
7.1 Explain diameter protocol and diameter configurations
7.2 Describe the functionality of S6a interface and the protocol used
7.3 Describe the functionality of S13 interface and the protocol used
7.4 Describe the functionality of Smp interface and the protocol used
7.5 Explain the S6a reset-id support
7.6 Explain the diameter network overload and congestion control

8 Configure Internet of Things (IoT) and New Radio (NR) related settings
8.1 Explain the New Radio (NR) settings in MME
8.2 Describe the Massive Internet of Things (IoT)

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 tools available in SGSN-MME
10.1 Discuss Event Based Monitoring (EBM) functionality
10.2 Describe the Integrated Traffic Capture (ITC) trace
10.3 Outline the UE Trace

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10.4 Explain the health check procedure in SGSN-MME
10.5 Describe the additional Troubleshooting Toolboxes in SGSN-MME

Target audience:

This course is suitable for anyone who is required be able to configure/operate/maintain SGSN-MME

Prerequisites:

Successful completion of the following courses:

EPC System Survey - LZU1087977
SGSN-MME 1 Administration - LZU1082498
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 WBL component(s) is approximately 1 hour
The length of ILT component is 4 days and the maximum number of participants per session is 8.

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Wi-Fi Calling e2e Use Cases

LZU1082229 R1A

Description:

The course provides a detailed overview of Wi-Fi Calling end2end use cases. It includes exercises with a thorough analysis of Wi-Fi Calling signaling captures previously taken in a live Wi-Fi Calling networks. Attach and registration in Packet Core and MMTel, session setup, service entitlement and Wi-Fi – VoLTE mutual handovers are among the cases studied.

Learning objectives:

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

1 Explain basic use cases in Wi-Fi Calling network
1.1 Explain Wi-Fi and EPC attach procedures
1.2 Explain service entitlement and MMTel registration procedures
1.3 Explain Wi-Fi Calling session setup procedures
1.4 Explain ICS in Wi-Fi Calling
1.5 Explain seamless handover procedures between Wi-Fi and VoLTE

2 Analyze traces of Wi-Fi Calling use cases
2.1 Perform analysis of Wi-Fi and EPC attach procedures
2.2 Perform analysis of service entitlement and MMTel registration procedures
2.3 Perform analysis of Wi-Fi Calling session setup procedures with ICS
2.4 Perform analysis of handover procedures between Wi-Fi and VoLTE

Target audience:

This course is suitable for anyone who is required be able to configure/operate/maintain Wi-Fi Calling Solution.

Prerequisites:

Successful completion of the following courses:

Wi-Fi Calling Solution Overview LZU1089981
Recommended courses:
IMS Signaling LZU1087193
VoLTE e2e Use Cases LZU1089426

Duration and class size:

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

Learning situation:

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

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Wi-Fi Calling Solution Overview

LZU1089981 R1A

Description:

The course provides a detailed overview of the Wi-Fi Calling Solution components from an end2end perspective. It describes the Ericsson Wi-Fi Calling solution for SIM and Multi-Device. The solution architecture and the roles of the EPC and IMS components are explained in detail. The Wi-Fi Calling Use Cases including interworking with VoLTE technology are described.

Learning objectives:

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

1 Describe what Wi-Fi Calling is, and explain the solution's driving factors and benefits
1.1 Describe Wi-Fi Calling Driving Factors
1.2 Explain Wi-Fi Calling Benefits
1.3 Outline the Wi-Fi Calling for SIM-device architecture
1.4 Outline the Wi-Fi Calling for Multi device architecture
1.5 Outline the trusted Wi-Fi access architecture

2 Explain the Ericsson Wi-Fi Calling solution for SIM-device
2.1 Describe the steps for activating the Wi-Fi Calling service
2.2 List the solution specific nodes and their roles
2.3 Describe the call setup signaling for a Wi-Fi call
2.4 Explain how Wi-Fi calling interworks with VoLTE
2.5 Outline the entitlement solution for SIM-based Wi-Fi Calling

3 Explain the Ericsson Wi-Fi Calling solution for Multi-Device
3.1 Explain the Multi-Device Solution Network Architecture
3.2 List the solution specific nodes and their roles
3.3 Explain basic use cases and nodes interworking

Target audience:

This course is suitable for anyone who is required to be familiar with Wi-FI Calling solution.

Prerequisites:

Successful completion of the following courses:
IMS Overview LZU1082585
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.

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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.

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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 vWMG 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.

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VoLTE Concepts

LZU1089425 R1A

Description:

The course provides a detailed overview of VoLTE components from end2end perspective. It explains the concept of Mobile Telephony Evolution, the VoLTE architecture, VoLTE and CS voice coexistence, migration mechanisms (CSFB, ICS, SRVCC) and deployment scenarios. The QoS mechanism, emergency calls handling, media transport and signaling for basic traffic cases are also described.

Learning objectives:

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

1 Explain the concept of Mobile Telephony Evolution
1.1 Explain the need of telephony in LTE
1.2 Explain the concept of GSMA VoLTE

2 Describe VoLTE/CS Voice network architecture, its components and functions of different nodes
2.1 Describe MMTel general architecture and review services provided by MMTel
2.2 Describe EPS general architecture
2.3 Describe VoLTE/CS Voice network architecture
2.4 Describe VoLTE CS Voice network nodes and their function

3 Explain migration mechanisms for VoLTE/CS coexistence
3.1 Explain Circuit Switched Fall Back (CSFB) functionality and architecture
3.2 Explain IMS Centralized Services (ICS) functionality and architecture
3.3 Explain Single Radio Voice Call Continuity (SRVCC) functionality and architecture

4 Explain VoLTE deployment scenarios

5 Explain how QoS required for MMTel services is assured in LTE/EPC

6 Describe basic traffic cases in VoLTE/MMTel network.

Target audience:

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

Prerequisites:

Successful completion of the following courses:

IMS Overview, LZU1082585
EPC System Survey, LZU1087977

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.

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VoLTE e2e Use Cases

LZU1089426 R1A

Description:

The course provides a detailed overview of VoLTE end2end use cases. It includes exercises with a thorough analysis of VoLTE traces taken on a live VoLTE/CS network: VoLTE registration, Session setup, SRVCC and IMS Centralized Services (ICS).
The course is mainly oriented to the participants with Core (IMS, EPC, MSS) background. Students with RAN background are recommended to attend LZU1089466 "Voice over LTE e2e Realization and RAN Functionality" instead.

Learning objectives:

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

1 Review the basic concepts of VoLTE and its architecture
1.1 Explain what is VoLTE and its background
1.2 Explain the Ericsson VoLTE architecture

2 Explain VoLTE attach and registration
2.1 Describe VoLTE attach and registration procedures
2.2 Perform analysis of VoLTE attach and registration signaling captures

3 Explain VoLTE session setup
3.1 Describe VoLTE session setup procedures
3.2 Perform analysis of VoLTE session setup signaling captures

4 Explain SRVC
4.1 Describe SRVCC procedures
4.2 Perform analysis of SRVCC signaling captures

5 Explain ICS
5.1 Describe ICS procedures
5.2 Perform analysis of ICS signaling captures

Target audience:

This course is suitable for anyone who is required to be able to operate and maintain VoLTE solution.

Prerequisites:

Successful completion of the following courses:

VoLTE Concepts LZU1089425
Recommended courses:
IMS Signaling LZU1087193
EPC Signaling LZU1087508
MSS Signaling LZU1088627

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.

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