VoLTE and IMS

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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Enriched Communication Survey

LZU1082213 R1A

Description:

The course provides a survey of the Enriched Communication business solution based on Rich Communication Services (RCS). End user benefits and what Enriched Communication services an operator can offer are explained. The features, nodes and signaling aspects are described for Enriched Communication end-to-end sessions.

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 Explain the concept of Enriched Communication
1.1 Explain the need for Enriched Communication
1.2 Present operator and end-user benefits of Enriched Communication.
1.3 List standardization bodies that define Enriched Communication and related services
1.4 Describe how Enriched Communication follow GSMA Network 2020
1.5 Describe charging Enriched Communication services
1.6 Describe subscriber devices

2 Describe the Enriched Communication features
2.1 Explain Registration and Authentication
2.2 Explain Capability Discovery
2.3 Describe the Enriched Messaging services
2.4 Describe the Content Sharing and File Transfer services
2.5 Describe the Geo-Location Services
2.6 Describe the Enriched Calling services
2.7 Describe the RCS IP Voice and Video Calling services
2.8 Outline the Multi-device Aspects

3 Describe basic Enriched Communication End-to-End session set-ups
3.1 Describe the call case for Registration and Authentication
3.2 Describe the call case for Capability Discovery
3.3 Describe the call case for Enriched Messaging
3.4 Describe the call case for Enriched Calling

4 Describe the Ericsson Enriched Communication Reference network

4.1 List the IMS System Nodes and Interfaces and Protocols
4.2 Outline the IMS nodes with specific Enriched Communication functions
4.3 Describe the bearer requirements for Enriched Communication services

Target audience:

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

Prerequisites:

Successful completion of the following courses:

IMS Overview, LZU1082585

Duration and class size:

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

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HSS-FE 1 Operation and Configuration for Volte

LZU1082587 R1A

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 VoLTE 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 network solutions Ericsson HSS-FE is a part of
1.2 Describe HSS-FE functions in VoLTE environment
1.3 Explain HSS-FE interworking, interfaces and protocols

2 Explain the HSS-FE node architecture
2.1 Explain the native HSS-FE implementation
2.2 Explain the HSS-FE implementation as a VNF
2.3 Explain External Connectivity and eVIP functionality
2.4 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 Describe the role of HSS-FE in IMS
4.1 Describe how HSS-FE supports basic IMS procedures
4.2 Configure Cx/Dx interface between HSS-FE and CSCF
4.3 Configure Sh/Dh interface between HSS-FE and Application Servers
4.4 Configure Service Profiles containing Triggers in HSS-FE
4.5 Configure Charging Profiles in HSS-FE

5 Describe the role of HSS-FE in EPC
5.1 Describe how HSS-FE supports basic EPC procedures
5.2 Configure ESM parameters (ESM Configuration Container)
5.3 Configure the S6a interface between HSS-FE and MME
5.4 Configure SWx interface between HSS-FE and AAA
5.5 Configure MAP interface between HSS-FE and HLR

6 Describe the role of HSS-FE in VoLTE
6.1 Describe how HSS-FE supports VoLTE specific procedures
6.2 Configure VoLTE specific parameters on HSS-FE

7 Explain HSS-FE common functions
7.1 Configure the interface between HSS-FE and CUDB

8 Configure AVG Module in HSS-FE
8.1 Configure AVG in HSS-FE

Target audience:

This course is suitable for anyone who is required be able to configure/operate/maintain HSS-FE in IMS networks.

Prerequisites:

Successful completion of the following courses:

IMS Overview LZU1082585
Virtual EPC Overview LZU1082264
IMS Signaling LZU1087193
EPC Signaling LZU1087580
VoLTE Concepts LZU1089425
VoLTE e2e Use Cases LZU1089426
Virtual IMS Concepts LZU1082227
The following course is a prerequisite for native HSS-FE 1:
BSP 8100 Operation and Maintenance LZU1089779
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 3 days and the maximum number of participants is 8.

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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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IMS Introduction

LZU1082765 R1A

Description:

This web based learning provides an introduction to IMS and IMS based solutions. It describes the node functions in the IMS architecture, and the service enabling mechanisms provided by IMS. The main focus of the course is on five IMS-based solutions: Multimedia Telephony (MMTel), Voice over LTE (VoLTE), Wi-Fi Calling, Rich Communication Services (RCS), and Voice in 5G.

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 Identify the role and purpose of IMS
1.1 Explain why there is a need for IMS
1.2 Present operator and end-user benefits of IMS
1.3 Describe IMS standards

2 Describe the IMS architecture and service enabling mechanisms
2.1 Introduce the IMS/MMTel architecture
2.2 Explain basic IMS use cases
2.3 Describe addressing and routing in IMS
2.4 Explain service invocation in IMS/MMTel

3 Outline the nodes and interfaces in Ericsson IMS/MMTel
3.1 Explain the functional nodes in Ericsson IMS/MMTel
3.2 Identify the signaling and media protocols used in Ericsson IMS/MMTel

4 Explain the concept of Multimedia telephony (MMTel)
4.1 List the services provided in MMTel
4.2 Describe the MMTel architecture and involved nodes
4.3 Explain some basic MMTel use cases

5 Explain the concept of Voice over LTE (VoLTE)
5.1 Explain what VoLTE is and why it is needed
5.2 Introduce the VoLTE architecture and involved nodes
5.3 Describe how VoLTE coexists with CS voice
5.4 Explain some basic VoLTE use cases

6 Explain the concept of Wi-Fi Calling
6.1 Explain what Wi-Fi Calling is and why it is needed
6.2 Describe how Wi-Fi Calling relates to VoLTE
6.3 Explain some basic Wi-Fi Calling use cases

7 Explain the concept of Rich Communication Services (RCS)
7.1 Describe the services provided by GSMA RCS

8 Describe the role of IMS in a 5G network
8.1 Introduce 5G EPC and the 5G core
8.2 Describe network slicing
8.3 Discuss the role of IMS in future networks

Target audience:

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

Prerequisites:

Successful completion of the following courses:

Participants should have a good general knowledge of telecommunications.

Duration and class size:

The length of the course is approximately 2 hours.

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IMS Overview

LZU1082585 R1A

Description:

If you want to know how operators and end users can benefit from IMS and what the different Ericsson IMS solutions are, then this is the right course for you.
The course provides an overview of the IP Multimedia Subsystem (IMS) and the Ericsson solutions for IMS, based on Release 17 and vIMS 1. End user benefits and what IMS services an operator can offer are explained. The features, nodes & signaling aspects are described for the business offerings related to IMS 17 and vIMS 1.

Learning objectives:

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

1 Identify the role and purpose of IMS
1.1 Explain why there is a need for IMS
1.2 Present operator and end-user benefits of IMS.
1.3 Describe the IMS system in brief – the architecture and capabilities IMS provides
1.4 List which standardization bodies define IMS and IMS related services

2 Describe the Ericsson IMS/MMTel Services
2.1 Describe the Ericsson MMTel Supplementary and Regulatory Services
2.2 Describe Service Enabling Mechanisms in Ericsson IMS/MMTel
2.3 Outline the platforms used for the IMS nodes

3 Recognize Ericsson's IMS Solutions
3.1 Identify the purpose of Ericsson's IMS business solutions
3.2 Recognize the Mobile Telephony Evolution with VoLTE process and offerings
3.3 Recognize the Enriched Communication offerings
3.4 Recognize the PSTN to IP process and offerings
3.5 Recognize the Visual Communication offering
3.6 Recognize the Mobile Unified Communication offering
3.7 Recognize the Converged Transit offering

4 Interpret ‘typical’ IMS signaling flows
4.1 Express a basic understanding of SIP
4.2 Interpret the SIP & Diameter signaling sequence for Registration
4.3 Interpret the SIP signaling sequence for an IMS to IMS session
4.4 Interpret the SIP signaling sequence for an IMS to GSTN session
4.5 Interpret the SIP signaling sequence for an GSTN to IMS session

5 Outline the Nodes and Interfaces in Ericsson MMTel
5.1 Explain the functional nodes in Ericsson MMTel
5.2 Identify the signaling and media protocols used

Target audience:

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

Prerequisites:

Students should have a good general knowledge of telecommunications.

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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IMS Signaling

LZU1087193 R1A

Description:

This course provides a detailed introduction to signaling in IMS by presenting the protocols involved and different traffic cases from the IMS System.
The following protocols are described with reference to the Ericsson IMS solutions and to the relevant IETF and 3GPP specifications:
• SIP protocol and the most important IMS related extensions to SIP;
• SDP (Session Description Protocol);
• Diameter protocol and IMS related Diameter applications;
• H248/MeGaCo.
Actual signaling traces are used where possible to show the practical aspects of signaling in an IMS network.

Learning objectives:

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

1 Describe the architecture of IMS; the functions of the main logical nodes in the IMS System; the main IMS specifications and protocols.
1.1 Identify the roles of IETF, 3GPP, TISPAN, OMA and GSMA in IMS.
1.2 Review the main 3GPP specifications and IETF RFCs relating to IMS.
1.3 Introduce the concepts related to mobile and fixed access to IMS.
1.4 Recognize the main protocols, signaling flows and node functions for typical IMS Sessions, including Registration, IMS to IMS Sessions and IMS to CS sessions.

2 Discuss the structure, specifications and usage of Session Initiation Protocol (SIP) and Session Description Protocol (SDP) in IMS.
2.1 Describe what SIP is and the reasons why SIP is required in IMS.
2.2 List and describe the main RFCs related to SIP and SDP.
2.3 Explain the basic functions and capabilities of SIP and SDP.
2.4 Relate the function of SIP Components, SIP Proxies and SIP User Agents (UAC, UAS).
2.5 Interpret stateful and stateless SIP Proxies.
2.6 Explain the specifications, functions and usage of all the SIP methods and the more common SIP responses.
2.7 Outline SIP transactions and dialogs.
2.8 Discuss telephone numbers, SIP-URIs, Tel-URIs for addressing end-users.
2.9 Explain the routing and addressing principles of SIP messages and the function of the SIP routing header fields (Request URI, Via, Route, Record-Route, Contact and others).
2.10 Outline the function and uses of the more common SIP header fields used in IMS and their related RFCs.

2.11 Identify the function of SDP and the offer / answer model for SDP in IMS.
2.12 Review the structure of SDP and the function of the SDP fields with reference to the associated RFCs.
2.13 State the use of SDP in SIP and MeGaCo signaling sequences.

3 Recognize the structure, specifications and usage of the diameter Protocol in IMS
3.1 List the base functions and capabilities of diameter and the associated RFCs.
3.2 Review the routing principles of diameter in IMS.
3.3 Show the structure of commands.
3.4 Interpret the structure, types and format of AVPs.
3.5 Outline the main diameter base protocol messages and AVPs.
3.6 State vendor specific commands & AVPs
3.7 Describe the services provided by the Cx/Dx, Zx, Sh/Dh, Rx and Rf interfaces in IMS.
3.8 Relate the main IMS diameter messages and AVPs associated with the Cx/Dx, Zx, Sh/Dh, Rx and Rf interfaces in IMS.

4 Outline the structure, specifications and usage of H.248 (MeGaCo)
4.1 Describe the main function and usage of H.248 in IMS and the main RFCs.
4.2 Review the H.248 context model.
4.3 Discuss the H.248 commands, descriptors and parameters and their use in IMS.
4.4 Explain packages and profiles.
4.5 Interpret typical H.248 signaling sequences in IMS and their relationship with SIP and ISUP signaling.

5 Analyze detailed IMS signaling flows and Message content for registration, session establishment and other call scenarios
5.1 Describe SIP to SIP and SIP to ISUP session establishment.
5.2 Explain the Registration process, including Authentication.
5.3 Discuss SIP/ISUP interworking including the function and use of Number Normalization, ENUM and External Network Selection (Breakout – BGCF).
5.4 Explain SIP forking.
5.5 Relate detailed SIP and SDP signaling flows and messages from traces.
5.6 Interpret detailed diameter signaling flows and message content for registration (Cx/Dx and Sh/Dh), Session Establishment and Charging (Rf).
5.7 Analyze detailed H.248 signaling traces between SBG & BGF and MGC & MGW during call establishment and clearing.

Target audience:

This course is suitable for anyone who is required to be familiar with IMS Signaling principles.

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Prerequisites:

Successful completion of the following courses:

IMS Overview, LZU1082585, or equivalent.
In addition the students should have a good basic understanding of general datacom and telecom networks and good knowledge of IP networking and the TCP/IP protocol family.
The prerequisites are essential in order to ensure that all the course objectives are met.

Duration and class size:

The length of the course is 3 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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IPWorks 2 Operation and Maintenance for IMS

LZU1082659 R1A

Description:

Do you need to know how to configure a virtualized 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 IMS network and the knowledge of configuring the DNS and ENUM (with Number Portability) services as well as the Active Select DNS and DHCP. The students are introduced to fault, node and performance management of the system.

Learning objectives:

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

1 List 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 IMS 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 Configure ASDNS
6.3 Operate ENUM server
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 IP Works 2 in IMS networks.

Prerequisites:

Successful completion of the following courses:

IMS Overview, LZU1082585
Virtual IMS Concepts, LZU1082227
The following courses become prerequisites if IPWorks Virtualized is a part of Ericsson Certified Cloud offering:
BSP 8100 Operation and Maintenance LZU1089779
ECM Fundamentals, LZU1089914

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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SAPC 1 Operation, Configuration and Troubleshooting

LZU1082500 R3A

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).

This course consists of two parts – an online Video Recorded Session (Learning Objectives 1-2) and an Instructor-Led Training (Learning Objectives 3-5).

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

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vAFG 2 Operation and Maintenance

LZU1082800 R1A

Description:

Do you want to know how to operate and maintain the virtualized Authentication Federation Gateway (vAFG)? How to use the CPI to do your required tasks? Do you want to know more about fault management in vAFG? Are you interested in the vAFG system health checks and performance management? Do you want to be able to perform the necessary configuration on the vAFG? If so, then this course is for you.
This course follows on from the Authentication Federation Gateway (vAFG) Overview course. It explores the Operation and Maintenance (O&M) tasks using the CPI and will give students a good understanding of the fault management, system health checks, performance management, license validation and parameter configuration. The course uses hands-on exercises to teach the students everything they need to know about operating and managing vAFG

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 Outline vAFG overview
1.1 Explain vAFG virtualized architecture
1.2 Describe vAFG feature
1.3 Investigate different authentication mechanisms
1.4 Review vAFG Extended Features

2 Introduce vAFG Operation & Maintenance (O&M)
2.1 Navigate vAFG CPI O&M documentation
2.2 Access the system using MSA and explore the dashboard
2.3 Describe vAFG Fault Management
2.4 Assess vAFG Performance Management

3 Perform system health checks
3.1 Check node status
3.2 Perform Health Checks on vAFG
3.3 Review vAFG Logging and Tracing functions

4 Perform vAFG O&M tasks
4.1 Perform backup
4.2 Describe Restart, Start & Stop the vAFG
4.3 Perform restore
4.4 Create Dump Report
4.5 Validate vAFG licensing
4.6 Assess vAFG Synchronization

5 Manage the vAFG configuration and provision
5.1 Configure XDM AP
5.2 Provision XDM AP
5.3 Configure SLB
5.4 Configure and provision Cross-Network Proxy
5.5 Configure and provision Trusted Proxy
5.6 Configure and provision OpenID Connect
5.7 Configure and provision Trusted Proxy

Target audience:

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

Prerequisites:

Successful completion of the following courses:

IMS introduction WBL-LZU1082765

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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vCSCF 1 Operation and Configuration

LZU1082451 R3A

Description:

This course will provide the participants with a thorough understanding of Virtualized Call Session Control Function, vCSCF, and its role in MMTel, VoLTE and Wi-Fi calling solutions. The course focuses on the node architecture, traffic support functions as well as Surveillance, Operation and Configuration activities on vCSCF 1.

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 vCSCF node functions and interworking
1.1 Review the vCSCF node functions
1.2 Explain the node interworking - Interfaces and Protocols
1.3 Explore how vCSCF supports basic session establishment procedures

2 (WBL) Describe the CSCF VNF implementation
2.1 Explain the VM types used for the CSCF VNF
2.2 Explore the CSCF VNF scalability

3 (WBL) Examine the vCSCF Operational support functions
3.1 Explore Configuration Management using ECLI
3.2 Discuss and perform Fault Management
3.3 Elaborate and perform Backup and Restore
3.4 Explain and handle External Connectivity - eVIP
3.5 Determine the vCSCF automated Health Check
3.6 Describe the vCSCF basic node checks
3.7 Identify the User Data Output

4 Describe the DIAMETER interface management in vCSCF
4.1 Explain how to configure Diameter Own Node
4.2 Explore how to configure Diameter Peer Node
4.3 Examine how to configure Diameter Routing

5 Describe and Handle Charging Management in vCSCF

5.1 Explain how to configure Charging Triggers
5.2 Explore how to configure Charging Profiles

6 Explain and Handle vCSCF Access Authorization and Authentication support
6.1 Configure control of number of contacts per user
6.2 Explain and configure vCSCF for Subscribed Media Profile (SMP) support
6.3 Configure Digest and IMS AKA authentication methods

7 Explain and Handle vCSCF Registration support
7.1 Explain vCSCF registration and 3rd party registration support
7.2 Explain and configure access awareness

8 Explain and Handle vCSCF Services and Application support
8.1 Explain service invocation in vCSCF
8.2 Explain and configure shared Initial Filter Criteria (IFC)

9 Explain and Handle CSCF Traffic support
9.1 Configure & verify number normalization tables in CSCF
9.2 Configure & verify BGCF (External Network Selection)

10 Explain and Handle CSCF Emergency Call support
10.1 Describe basic emergency call handling in E-CSCF
10.2 Explain Emergency Access Transfer Function (EATF) and the emergency SRVCC support for VoLTE

Target audience:

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

Prerequisites:

Successful completion of the following courses:

IMS Overview (WBL), LZU1082765
IMS Signaling, LZU1087193
Virtualization Concepts Introduction (WBL), LZU1082654

"Cloud Infrastructure 2019" training program are recommended if vCSCF is part of the Ericsson Cloud offering.

Duration and class size:

The length of WBL component(s) is approximately 3 hours.
The length of ILT component is 3 days and the maximum number of participants is 8.

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vDSC 1 Operation and Configuration

LZU1082574 R1A

Description

Do you need the skills and knowledge to operate and configure the vDSC which is used for Policy Control, Subscriber Registration, Charging & Roaming procedure in EPC and IMS ?

Ericsson virtual Diameter Signaling Controller (vDSC) is the key network component to secure and centralize Diameter communication. DSC is a product that supports standard IETF/ 3GPP Diameter functionalities.

This course is recommended for those who want to build competence in configuring and operating Virtual DSC 1. Hands-on exercises allow participants to work with the vDSC CLI focusing on operation and maintenance related commands and tools. This course explains the Diameter signaling and vDSC product positioning in the network.

Learning objectives

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

1 Describe the main concepts of Diameter signaling
1.1 Describe the evolution of Diameter signaling
1.2 Explain the challenges with Diameter signaling network and benefits of deploying DSC
1.3 Review the basic Diameter terminologies
1.4 Identify the DSC modes of operation
1.5 Describe Diameter Base Protocol, Messages and AVPs
1.6 Understand Diameter Message Routing

2 Describe Diameter Interfaces in Packet Core/ EPC
2.1 Describe S6a Interface, Command Codes and AVPs
2.2 Describe S6a signaling procedures using captured traces
2.3 Describe Gx Interface, Command Codes and AVPs
2.4 Describe Gx signaling procedures using captured traces
2.5 Describe Gy Interface, Command Codes and AVPs
2.6 Describe Gy signaling procedures using captured traces
2.7 Describe Rx Interface, Command Codes and AVPs
2.8 Describe Rx signaling procedures using captured traces

3 Describe Diameter Interfaces in IMS
3.1 Describe Cx Interface, Command Codes and AVPs

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3.2 Describe Cx signaling procedures using captured traces
3.3 Describe Sh Interface, Command Codes and AVPs
3.4 Describe Sh signaling procedures using captured traces

4 Explain the Virtual DSC architecture and features
4.1 Explain the concept of Cloud and Virtualization
4.2 Describe the vDSC architecture
4.3 Review vDSC certified solutions
4.4 Understand VNF Lifecycle Management
4.5 Outline vDSC characteristics and dimensioning
4.6 Understand vDSC Distributed Data Base
4.7 Describe the IP integration of vDSC in cloud network infrastructure
4.8 Compare vDSC with DSC
4.9 Review vDSC reference hardware
4.10 Describe vDSC features and functionalities

5 Describe the vDSC configuration
5.1 Explain DSC O&M access and ECLI functions
5.2 Understand IP address, Transport Endpoint and SCTP configuration
5.3 Describe Capability Profile and Node configuration
5.4 Explain configuration of Adjacent Realm, Peer and Peer Group
5.5 Describe Routing and Roaming Partner configuration
5.6 Understand AATM configuration
5.7 Describe configuration for DMI operations
5.8 Explain configuration of Session Binding
5.9 Understand SLF configuration
5.10 Describe configuration of Diameter Overload Indication Conveyance
5.11 Describe Diameter Routing Message Priority configuration
5.12 Describe HLR-R configuration
5.13 Describe Unified Signaling Firewall configuration

6 Explain the vDSC Operation and Maintenance procedures
6.1 Introduce DSC user management
6.2 Explain the health check procedure
6.3 Describe the fault management
6.4 Explain DSC performance management
6.5 Understand file management
6.6 Explain event reporting
6.7 Describe subscriber tracing feature
6.8 Describe Dashboard GUI functionality
6.9 Explain the Ericsson Netconf Browser
6.10 Explain the Backup and Restore procedure
6.11 Introduce Automated Acceptance Test support
6.12 Review OSS-RC for DSC
6.13 Introduce Ericsson Network Manager

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Target audience

The target audience for this course is:

Network Design Engineer, Network Deployment Engineer, System Technician, System Engineer, System Administrator

Prerequisites

Successful completion of the following courses:

EPC System Survey, LZU1087977
Virtual EPC Overview - LZU1082264
IMS Overview, LZU1082585

Knowledge of Cloud, Virtualzation and VMware is required. Recommended to attend below courses:
Ericsson Cloud System Overview, LZU1089909
Ericsson Cloud Execution Environment (CEE) 15B Overview, LZU1089908

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 both classroom and in a technical environment using equipment and tools, which are accessed remotely.

Time schedule

The time required always depends on the knowledge of the attending participants and the hours stated below can be used as estimate.

Day	Topics in the course	Estimated Time (hours)
1	Main Concepts of Diameter Signaling	2.5
	Diameter Signaling in PC/ EPC	2.5
	Diameter Signaling in IMS	1
2	vDSC Overview	4
	vDSC Configuration including Exercises (Part 1 of 2)	2
3	vDSC Configuration including Exercises (Part 2 of 2)	6

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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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Virtual IMS Concepts

LZU1082227 R1A

Description:

This course provides explanation of the virtualization and cloud concepts needed to undetstand the deployment of the virtualized IP Multimedia Subsystem (IMS) and the Ericsson Virtualized Network Functions (VNFs) for IMS. The Network Functions Virtualization (NFV) architecture according to ETSI NFV, the open source platform OPNFV and the Ericsson Cloud System will be explained

Learning objectives:

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

1 Explain virtualization and cloud concepts
1.1 Explain the virtualization efficiency and revenue opportunities
1.2 Understand what is meant by a Virtual Machine (VM)
1.3 Explain the cloud concept according to the US National Institute of Standards and Technology (NIST)

2 Explain the ETSI Network Functions Virtualization (NFV) Reference Architecture
2.1 Explain the functionality and interfaces for NFVI, VNF, VNFC, MANO and Hypervisor
2.2 Explain what is meant by VNF Instantiation and Transition
2.3 Explain what is meant with VNF scaling
2.4 Explain virtual switching

3 Explain the open source platform OPNFV
3.1 Explain how OPNFV relates to ETSI NFV
3.2 Explain the main OPNFV software components

4 Explain the Ericsson Cloud System offering
4.1 Explain how Ericsson Cloud System relates to ETSI NFV and OPNFV
4.2 Explain the Cloud Execution Environment (CEE)
4.3 Understand the Ericsson Cloud Manager (ECM)

5 Explain Ericsson's VNF offering for IMS
5.1 Relate the Ericsson IMS VNFs to ETSI NFV
5.2 Explain the VM types for IMS VNFs
5.3 Explain high availability and robustness concepts for IMS VNFs
5.4 Explain Ericsson NFV delivery Models

6 Give examples on how different Ericsson virtual IMS functions are deployed
6.1 Explain deployment of vMTAS and vCSCF
6.2 Explain deployment of vSBC

Target audience:

This course is suitable for anyone who is required to be familiar with virtualization principles in IMS.

Prerequisites:

Successful completion of the following courses:

IMS Overview LZU1082585

Duration and class size:

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

Learning situation:

This course is based on theoretical instructor-led lessons.

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Virtualization Concepts Introduction

LZU1082654 R2A

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 Cloud Native 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.

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 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)
1.4 Discuss the concept of Cloud Native

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 Explain components and some services provided by Ericsson Cloud Execution Environment
4.1 Identify the CEE components Compute, Network, and Storage
4.2 List some services such as Fuel, Atlas, Cloud Infrastructure Controller

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 concept.

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 approximately 2 hours.

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vMRF 1 Operation and Configuration

LZU1082589 R1A

Description:

This course provides the participants with a thorough understanding of Virtualized Media Resource Function, vMRF, and its role in MMTel, VoLTE and WiFi calling solutions. The course focuses on the node architecture, traffic support functions as well as Surveillance, Operation and Configuration activities on vMRF 1.

Learning objectives:

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

1 Describe vMRF node functions and interworking
1.1 Discuss vMRF node functions
1.2 Identify node interworking - Interfaces and Protocols
1.3 Review how vMRF supports basic session establishment procedures

2 Discuss the MRF VNF implementation
2.1 Review the VM types used for the MRF VNF
2.2 Explain MRF VNF enabled cloud features

3 Elaborate and handle vMRF operational support functions
3.1 Perform Configuration Management using ECLI
3.2 Show how to perform Fault Management
3.3 Illustrate and perform Performance Management
3.4 Recognize and perform Backup and Restore
3.5 Elaborate and handle External Connectivity
3.6 Perform vMRF basic node checks
3.7 Perform Media Stream Recording

4 Perform H.248 interface management in vMRF
4.1 Configure and Verify the H.248 interface in vMRF

5 Discuss how to handle Tone Sending
5.1 Configure Tones to be played in connection to a call
5.2 Configure Tones to be played in connection to a voice conference

6 Interpret how to handle Audio Announcements
6.1 Handle Basic Narrowband (NB) and Wideband (WB) announcements
6.2 Configure variable and multi-language NB and WB announcements

7 Explain and Handle DTMF Tone support
7.1 Configure DTMF tone detection

8 Explain and Handle Audio Conferencing
8.1 Configure audio conferencing support in vMRF
9 Discuss the vMRF Emergency and Priority Call support

Target audience:

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

Prerequisites:

Successful completion of the following courses:

IMS Overview, LZU1082585
IMS Signaling, LZU1087193
Virtual IMS concepts, LZU1082227
The following courses become prerequisites for the System Verified offering:
Foundation Series - Ericsson Cloud Execution Environment (CEE) (WBL), LZU 108 2538
Ericsson CEE R6 System Administrator, LZU 108 2536
Foundation Series - Ericsson Hyperscale Datacenter Systems 8000 (WBL), LZU 108 2539
Ericsson HDS 8000 Command Center Manager 2.4 System Administration, LZU 108 2537 or
BSP 8100 Operation and Maintenance, LZU1089779

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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vMTAS 1 Operation and Configuration

LZU1082455 R3A

Description:

This course provides the participants with a thorough understanding of a Virtualized Multimedia Telephony Application Server vMTAS 1 and its role in MMTel, VoLTE/Wi-Fi Calling, SIP Trunking, and Unified Communication solutions. The course focuses on the node architecture, data structure as well as Surveillance, Operation and Configuration activities on vMTAS 1.

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 vMTAS node functions and its role in vIMS-based solutions
1.1 Review the vMTAS node functions as a part of the MMTel solution
1.2 Explain the vMTAS node functions as a part of the VoLTE/Wi-Fi calling solution
1.3 Identify the vMTAS node functions as a part of the SIP Trunking solution
1.4 Describe the vMTAS node functions as a part of the VoLTE for Unified Communication solution
1.5 Explain the vMTAS node interworking, interfaces and protocols

2 (WBL) Explain the vMTAS node architecture
2.1 Explore MTAS implementation as a VNF
2.2 Describe the ECLI O&M interface
2.3 Identify the External Connectivity and eVIP functionality
2.4 Review Scaling Management

3 (WBL) Explain vMTAS operation and maintenance principles
3.1 Examine Compute Resources check
3.2 Explore Fault Management principles
3.3 Identify MTAS Health Check
3.4 Describe Performance Management principles
3.5 Discuss system backup and restore
3.6 Review NeLS licensing

4 Configure general vMTAS components and interworking
4.1 Configure the SIP interface towards CSCF
4.2 Explain the subscriber data handling concept in vMTAS and the role of HSS
4.3 Configure the Sh/Dh interface towards HSS
4.4 Configure vMTAS charging and the Rf/Ro interfaces towards the charging mediator
4.5 Configure the XDMS subsystem
4.6 Configure SIP Overload Control reporting
4.7 Configure subscriber rebalancing in vMTAS

5 Configure MMTel AS components and interworking interfaces
5.1 Describe some major MMTel supplementary services
5.2 Configure the Mp interface between vMTAS and MRFP
5.3 Configure Number Normalization tables in vMTAS

6 Configure SCC AS components and interworking interfaces
6.1 Describe basic VoLTE/Wi-Fi Calling use cases and the role of SCC AS
6.2 Configure SCC AS parameters and interfaces

7 Configure ST AS components
7.1 Discuss basic SIP Trunking use cases and the role of SCC AS
7.2 Configure ST AS Parameters

8 Configure NW AS (IWF) components
8.1 Elaborate on the basic NW AS use cases and the role of NW AS
8.2 Configure NW AS parameters

9 Configure Business Line AS (BL AS) components
9.1 Explain basic Unified Communication use cases and the role of BL AS
9.2 Configure BL AS parameters

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Target audience:

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

Prerequisites:

Successful completion of the following courses:

IMS Introduction (WBL), LZU1082765
Virtualization Concepts Introduction (WBL), LZU1082654
IMS Signaling, LZU1087193

"Cloud Infrastructure 2019" training program are recommended if vMTAS is part of the Ericsson Cloud offering.

Duration and class size:

The length of WBL component(s) is approximately 3 hours.
The length of ILT component is 2 days and the maximum number of participants per session is 8.

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Voice in 5G Introduction

LZU1082764 R1A

Description:

The journey to 5G has several possible migration paths and steps. Voice must be supported in all 5G evolution steps. In initial 5G deployments using option 3, 5G EPS includes NR non-standalone in the RAN. 4G voice (VoLTE) and other IMS services continues to be used without the need for any core network upgrades.
At least initially, a 5G system (5GS) will not be deployed with full network coverage. Therefore, the 5GS needs to be tightly coupled to an existing 4G VoLTE deployment to provide a seamless voice service across the whole network with good characteristics.
EPS Fallback is used in early 5GS deployments; the UE falls back from NG-RAN to LTE during call establishment in such deployments.
Native voice in 5GS implies that voice calls can be made on NG-RAN. This requires NG-RAN to support all voice related capabilities and being dimensioned for voice coverage.
This course outlines the voice service aspects and recommendations and the intended audience for this course is familiar with 4G VoLTE and wants to know how to take the voice service into 5G.

Learning objectives:

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

1 Explore the background and prerequisites for Voice in 5G
1.1 Discuss the industry actions for voice in 5G
1.2 Explain the five different options for RAN – packet core connectivity in 5G

2 Review Voice in 5G for option 3 deployment
2.1 Explain the conceptual architecture for IMS services in packet core and RAN for option 3.
2.2 Analyze use of radio bearers for VoLTE and Internet for option 3.

3 Explain Voice in 5G for option 2 deployment
3.1 Explain the conceptual architecture for IMS services 5GS with tight coupling to 4G VoLTE.
3.2 Explore early deployments with EPS fallback for voice.
3.3 Analyze native voice support in 5GS
3.4 Elaborate on the migration from EPS fallback to native voice in 5GS

4 Discuss Voice in 5G beyond option 3 and option 2.
4.1 Elaborate on 3GPP Release 16 study items like 5G SRVCC and roaming

Target audience:

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

Prerequisites:

Successful completion of the following courses:

General knowledge of 4G VoLTE

Duration and class size:

The length of the course is 60 minutes and the maximum number of participants per session is 1

Learning situation:

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

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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 Advanced

LZU1082456 R3A

Description:

This course provides the participants with competence needed to perform advanced operation and maintenance tasks on the complete VoLTE network.
The course is mainly practical and includes tasks like resolving alarms as well as locating and solving end-to-end session establishment faults which requires an understanding of complex signaling traces.
Most of the course time is dedicated to the fault-finding activity in a e2e VoLTE lab with a detailed analysis and discussions. Special attention is paid to the node interworking and signaling protocols.
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 Analyze e2e signaling traces in the VoLTE network
1.1 Explain basic VoLTE e2e signaling traces; attach, registration, call establishment and call termination
1.2 Explain service specific signaling traces concerning SRVCC and ICS

2 Use protocol traces to locate, analyze and solve faults
2.1 Configure and use Wireshark to capture and display relevant data in traces.
2.2 Perform Wireshark traces to locate, analyze and solve end-to-end session faults in the VoLTE network.

3 Solve alarms related to the VoLTE network nodes
3.1 Determine the root cause of the alarms and solve them using VoLTE Customer Product Information (CPI) library.

Target audience:

This course is suitable for anyone who is required to have detailed knowledge of VoLTE e2e.

Prerequisites:

Successful completion of the following courses:

VoLTE Concepts, LZU1089425
VoLTE e2e Use Cases, LZU1089426
Students are required to have at least 6 months VoLTE practical experience. These prerequisites are essential in order to ensure that all the course objectives can be met.

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 sessions given in both classroom and in a technical environment using an VoLTE System, which can be accessed remotely.

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VoLTE e2e Use Cases

LZU1089426 R7A

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 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 VoLTE is, 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 SRVCC
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 have detailed knowledge of signaling in VoLTE networks.

Prerequisites:

Successful completion of the following courses:

VoLTE Concepts LZU1089425

Other 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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VoLTE Introduction

LZU1082763 R1A

Description:

This course provides an overview of the VoLTE components from a core perspective. It describes the VoLTE architecture, and the role of the EPC and IMS nodes. It explains the QoS mechanism, VoLTE and CS voice coexistence (CSFB, ICS and SRVCC), and emergency call handling. It also describes the signaling for basic VoLTE traffic cases.

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 Explain what VoLTE is and why it is needed
1.1 Recognize the need of telephony in LTE
1.2 Elaborate on the concept of GSMA VoLTE

2 Describe the VoLTE network architecture, its components, and functions of the different nodes
2.1 Review the EPS general architecture
2.2 Describe the MMTel general architecture and review the services provided by MMTel
2.3 Recognize the VoLTE/CS voice network architecture

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

4 Elaborate on how VoLTE QoS is assured in LTE/EPC

5 Review the VoLTE roaming solutions
5.1 Describe the S8 Home Routing (S8HR) roaming solution
5.2 Describe the Local Breakout (LBO) roaming solution

6 Describe how SIP Preconditions is used in VoLTE
6.1 Explain the need for SIP Preconditions in VoLTE
6.2 Describe a VoLTE session setup with SIP preconditions

7 Explain how Emergency Calls are handled in VoLTE with SRVCC

Target audience:

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

Prerequisites:

Successful completion of the following courses:

IMS Introduction, LZU1082765
Cloud Packet Core Overview, LZU1082769

Duration and class size:

The length of the course is approximately 2 hours.

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vSBC 1 Operation and Configuration

LZU1082515 R1A

Description:

This course will cover architecture, main features, operational aspects, and configuration of the Ericsson Virtual Session Border Controller (vSBC). The vSBC is a merge of functionality that was previously implemented in three different products:
- Virtual Session Border Gateway (vSBG)
- Virtual Web Communication Gateway (vWCG)
- Virtual Border Gateway Function (vBGF)

The vSBC is a product for virtualized communication networks. It provides one commercial offering for Voice over LTE (VoLTE), Voice over Wifi (VoWiFi), Video over LTE (ViLTE), Rich Communications Services (RCS), Interconnect, Fixed VoIP, and Web communication solutions. The course is practical and includes tasks like configuring signaling interfaces, security functions, communication related functions and new logical network connections. The practical tasks are performed on vSBG and vBGF.

Learning objectives:

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

1 Describe the vSBC Network implementation
1.1 Describe the vSBC role in VoLTE/ViLTE, VoWiFi, RCS, Interconnect, and Web
1.2 Review the different network functions implemented by vSBC
1.3 List the vSBC Interfaces and supported Protocols

2 Discuss the vSBC main functions
2.1 Describe the vSBC Security functions
2.2 Explain the vSBC Connection Admission Control functions
2.3 Elaborate the vSBC Media Control functions
2.4 Explain the vSBC Load Control and Overload Protection functions

3 Introduce the vSBC signaling session handling and basic signaling sequences
3.1 Review how SIP sessions are handled in vSBC
3.2 Elaborate how Web access is handled in vSBC
3.3 Explain vSBC basic signaling sequences for Registration, Session Establishment,

4 Elaborate the SBC Virtual Network Functions (VNFs) and perform basic O&M tasks
4.1 Discuss the software architecture for the different SBC VNFs
4.2 Outline and perform Configuration Management using the ECLI
4.3 Recognize and perform Fault Management
4.4 Review and perform Performance Management
4.5 Interpret and perform Backup and Restore

4.6 Explain and handle vSBC Logs
4.7 Review and handle QoS Monitoring
4.8 Explain vSBC processor and network architecture

5 Configure vSBC signaling interworking interfaces
5.1 Configure SIP signaling interfaces
5.2 Configure Diameter and DNS signaling interfaces
5.3 Configure H.248 signaling interfaces
5.4 Configure HTTP signaling interfaces
5.5 Configure XCAP signaling interfaces

6 Configure vSBC media interworking interfaces
6.1 Configure vBGF media interfaces for trusted and untrusted networks

7 Configure vSBC for external BGFs
7.1 Explain the distributed BGF concept
7.2 Discus BGF detection and selection mechanisms
7.3 Configure vSBC for Optimized BGF selection

8 Configure emergency call support in vSBC
8.1 Explain emergency call support in vSBG
8.2 Configure emergency identities
8.3 Configure emergency bearers

9 Handle the SIP Message Manipulation (SMM) function
9.1 Import and export SMM Rules
9.2 Configure and activate SMM Filters

10 Configure vSBC to enable SRVCC functionality
10.1 Explain the use of the CS network type
10.2 Review the call cases involved in access transfer
10.3 Configure Access Transfer Control Function (ATCF)
10.4 Configure Access Transfer Gateway (ATGW)

11 Configure vSBC to enable VoWiFi support
11.1 Configure vSBC to enable Multi Device handling
11.2 Configure vSBC to enable Non-SIM Device Handling12.1 Configure Capability Exchange support

12 Configure vSBC to enable Web communication
12.1 Configure Calling Services
12.2 Configure Instant Messaging Services
12.3 Configure Content Share Services
12.4 Configure the WebRTC GW functionality

13 Configure signaling tracing in vSBG
13.1 Configure a trace session
13.2 Explain the trace file format

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Target audience:

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

Prerequisites:

Successful completion of the following courses:

IMS Overview, LZU1082585
IMS Signaling, LZU1087193
Virtual IMS Concepts, LZU1082227
The following courses become prerequisites for the System Verified offering:
Foundation Series - Ericsson Cloud Execution Environment (CEE) (WBL), LZU 108 2538
Ericsson CEE R6 System Administrator, LZU 108 2536
Foundation Series - Ericsson Hyperscale Datacenter Systems 8000 (WBL), LZU 108 2539
Ericsson HDS 8000 Command Center Manager 2.4 System Administration, LZU 108 2537
or
BSP 8100 Operation and Maintenance, LZU1089779

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.

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vSBC 2 Operation and Configuration

LZU1082762 R1A

Description:

This course will cover architecture, main features, operational aspects, and configuration of the Ericsson Virtual Session Border Controller (vSBC). The vSBC is a merge of functionality that was previously implemented in three different products:
- Virtual Session Border Gateway (vSBG)
- Virtual Border Gateway Function (vBGF)
- Virtual Web Communication Gateway (vWCG)

The focus of the course is on the vSBG and the vBGF network functions. Training on the vWCG network function can be added upon customer request.

The course is practical and includes tasks like configuring signaling interfaces, security functions, communication related functions and new logical network connections.

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 Describe the vSBC Network implementation (WBL)
1.1 Describe the vSBC role in VoLTE/ViLTE, VoWiFi, RCS, Interconnect, and Web communication network architectures
1.2 Describe the different network functions implemented by vSBC
1.3 List the vSBC Interfaces and supported Protocols

2 Discuss the vSBG and vBGF main functions (WBL)
2.1 Describe the vSBG and vBGF Security functions
2.2 Explain the vSBG and vBGF Connection Admission Control functions
2.3 Elaborate the vSBG and vBGF Media Control functions
2.4 Explain the vSBG and vBGF Load Control and Overload Protection functions

3 Elaborate the SBC Virtual Network Functions (VNFs) and explain basic O&M functions (WBL)
3.1 Discuss the Software Architecture for the different SBC VNFs

3.2 Outline and perform Configuration Management using the ECLI
3.3 Recognize and perform Fault Management
3.4 Review and perform Performance Management
3.5 Interpret and perform Backup and Restore

4 Explain vSBG and vBGF system architecture and logs
4.1 Explain vSBG and vBGF processor and network architecture
4.2 Explain and handle vSBG Logs

5 Explain SBG routing procedures and basic signaling sequences
5.1 Explain how SIP routing is performed in IBCF, P-CSCF and ATCF
5.2 Review SBG basic signaling sequences for Registration, Session Establishment and Session Termination

6 Configure vSBG and vBGF signaling interworking interfaces
6.1 Configure SIP signaling interfaces
6.2 Configure Diameter and DNS signaling interfaces
6.3 Configure H.248 signaling interfaces

7 Configure vBGF media interworking interfaces
7.1 Configure media interfaces for trusted and untrusted networks

8 Configure vSBC for external BGFs
8.1 Explain the distributed BGF concept
8.2 Discuss BGF detection and selection mechanisms
8.3 Configure vSBG for Optimized BGF selection

9 Configure emergency call support in vSBC
9.1 Explain emergency call support in vSBC
9.2 Configure emergency identities
9.3 Configure emergency bearers
9.4 Configure emergency number manipulation

10 Handle the SIP Message Manipulation (SMM) function
10.1 Import and export SMM Rules
10.2 Configure and activate SMM Filters

11 Configure vSBC to enable SRVCC functionality
11.1 Explain the use of the CS network type
11.2 Review the call cases involved in access transfer
11.3 Configure Access Transfer Control Function (ATCF)

12 Configure signaling tracing in vSBC
12.1 Configure a trace session in SBG
12.2 Explain the trace file format
12.3 Perform system debug tracing in SBG

13 Configure Transcoding in vSBDiscuss BGF Codec Selection principalExplain SBG Transcoding FunctionConfigure Proactive Transcoding

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Target audience:

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

Prerequisites:

Successful completion of the following courses:

IMS Overview, LZU1082585
IMS Signaling, LZU1087193
Virtualization Concepts Introduction, LZU1082654

"Cloud Systems 2019" training program is recommended if vSBC is a part of Ericsson Cloud offering.

Duration and class size:

The length of WBL component(s) is approximately 2 hours.

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

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