MSS 18
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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APG 43L Native to Virtual Delta

LZU1082725 R1A

Description:

Do you need competence in how the virtual APG43 based on Linux (APG43L) differs from the native APG43L? Would you like to get used to the new vAPG43L ways of working based on a NFV structure in virtualization?
During this course the students will retain knowledge regarding the architecture and the functionality of the virtual APG43L.

Learning objectives:

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

1	Why vAPG43L
1.1	Describe what is new in the vAPG43L architecture
2	What is Virualization
2.1	Present the virtualization principles
2.2	Position the virtualization layer
2.3	Explain how the virtualization layer cooperates with the vAPG43L application
3	Virtualization Infrastructure
3.1	Describe the Hypervisor, Virtual Machine and Virtual Networking
3.2	Explain the Host and Guest machines in vAPG43L
3.3	Describe the functionality of virtual Network Interface Cards (vNIC) and Switches (vSwitch)
4	3GPP and ETSI Standardization of virtual networks
4.1	Recognize the ETSI VNF and NFVI layers
4.2	Position the VNF and NFVI in vAPG43L architecture
5	vAPG43L Functionality
5.1	Introduce the vAPG43L Application Layers
5.2	Present the vAPG43L Characteristics and Functionalities
6	APZ version using vAPG43L
6.1	Present the supported APZ versions together with vAPG43L
7	What is new in vAPG43L
7.1	Describe its differences to APG43L
7.2	List the removed commands
7.3	Present the software level in vAPG
8	Functional changes in vAPG43L due to virtualization

8.1   Explain how the virtualization affects the AP operational states
8.2   Present the single AP layout

Target audience:

This course is suitable for anyone who is required to be familiar with APG 43L.

Prerequisites:

Successful completion of the following courses:

The participants should be familiar with the previous APG43 releases.

Duration and class size:

The length of the course is 120 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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APG43L Delta

LZU1089225 R1A

Description:

Do you need competence in how the APG43 based on Linux (APG43L) differs from the APG43L based on Windows? Do you know that the APG43L can be deployed in a virtualized version? Would you like to get used to the new APG43L ways of working based on a Managed Object Model (MOM)? Do you want to know how to manage the APG43L physical HW layer in native and virtualized versions?
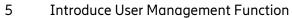
During this course the students will retain knowledge regarding the architecture and the functionality of the APG43L. The APG43L physical HW layer in native and virtualized versions is introduced.

The daily procedures used to perform the Operation and Maintenance of the APG43L is thoroughly explained.

Learning objectives:

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

1	Introduce the APG43L Application Layers and Characteristics
1.1	List the Major Changes in APG43L
1.2	Introduce the APG43L Main Functionalities
1.3	Present the supported APZ Versions together with APG43L
1.4	Acknowledge the APG43L Key Characteristics
2	Recognize the APG43L Hardware Types
2.1	Identify the Layout of the Subrack housing the APG43L
2.2	State the Boards used in APG43L
2.3	Describe the Front Cabling Connections and Interfaces in APG43L
2.4	Acknowledge the Hardware Differences between APG versions
2.5	Describe how High Availability is achieved in APG43L
3	Introduce the Managed Object Model (MOM) in APG43L
3.1	Acknowledge the Information Model entities
3.2	Describe the Functions provided by Managed Element Management
3.3	Explore Managed Objects in CPI Store – Alex
4	Describe how to Connect to the APG43L
4.1	Identify the Serial Console and Ethernet Ports in APG43L
4.2	Acknowledge the Session Types to Access the APG43L
4.3	Recognize the Northbound Interface (NBI)
4.4	Describe how to use the Ericsson Command Line Interface (ECLI) to operate AXE nodes with APG43L

5   Introduce User Management Function
5.1   Identify Local and Central User Management Concepts
5.2   List the Pre-defines Roles and Rules for APG43L users
5.3   Acknowledge the User Management Information Model

6   Acknowledge the Backup and Restore Functions
6.1   Identify System Backup Procedure differences in APG43L
6.2   Identify System Restore Procedure differences in APG43L
6.3   Identify the Software Inventory Function
6.4   Acknowledge the main steps of OS Upgrade from Windows to Linux Procedure

Target audience:

This course is suitable for anyone who is required to be familiar to new feature introduced in APG43L.

Prerequisites:

Successful completion of the following courses:

The participants should be familiar with the previous APG40/APG43 releases.

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 given in a technical environment.

APG43L Operation and Maintenance

LZU1089484 R1A

Description:

Do you want to know how APG43L works? Are you required to perform Operation and Maintenance activities on the APG43 such as backups, alarm list, types of sessions configuring statistical measurement programs?

This course describes the hardware and software structure of the APG43L 3.2. It also explains many of the features in APG43L while describing the procedures and commands used to configure them.

The participants will gain experience in handling the APG43L by performing a series of practical exercises designed to re-enforce the theoretical components of the course. The exercises include fault handling, file transfer definitions, backup procedures, configuration using managed object model and more.

Learning objectives:

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

1   Introduce main application layers in APG43L
1.1   List of the main characteristics in APG43L
1.2   Introduce the main APG43L functionalities
1.3   Provide a basic understanding of the APG43L software architecture
1.4   Describe the APG43L subsystem components
1.5   Explain APZ versions used with APG43L
1.6   Explain APG43L key characteristics

2   Describe the APG Hardware
2.1   Overview about the Blade Support Platform (BSP) and the main components
2.2   Describe the layout of the EGEM/EGEM2 subrack housing the APG43L
2.3   Describe the Ethernet star connections in the backplane
2.4   Describe the boards used in APG43L
2.5   Describe the front cabling connections in APG43L
2.6   Explain the hardware differences between APG
2.7   Introduce the basic principal about how High Availability is achieved in APG43L

3   Introduce the concept of Managed Object Model - MOM
3.1   Define the concepts that are needed for the comprehension of information model entities
3.2   Describe the functions provided by Managed Element Management
3.3   Explore Managed Object in CPI store — Alex

Target audience:

This course is suitable for anyone who is required be able to configure/operate/maintain APG43L.

Prerequisites:

 Successful completion of the following courses:

APG43L Delta, LZU1089225

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.

APG43L Recovery Procedures

LZU1089485 R1A

Description:

Do you want to know how to recover the APG43L when it is not working normally? Do you want to know how to find the correct indication to recover the APG43L? This course will bring all these answers by engaging you in theoretical and practical sessions.You will have the opportunity to explore the APG43L functionalities with recovery procedures.
After attending this course the students will know how to recover the APG43L in a fast and correct manner.

Learning objectives:

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

1	Present the prerequisites for recovery of APG43L
1.1	Recognize what recovery is
1.2	Present APG43L aspects related to recovery
1.3	List the information that needs to be included in the CSRs
1.4	Perform data collection for recovery of APG43L
1.5	Describe the health check for APG43L
1.6	List the recovery procedures available on APG43L
1.7	Present some common symptoms of APG43L problems
2	Describe how to create a backup and restore the APG43L
2.1	Practice to backup the APG43L
2.2	Practice to store the backup on an external media and to transfer it to another computer
2.3	Practice to restore an APG43L from a previously created backup
2.4	Recognize the actions to be taken in case the being restored backup does not include all latest configuration data
3	Describe the system recovery methods for APG43L
3.1	Describe the system recovery methods for APG43L
3.2	Identify the type of recovery functions before to choose the most appropriated recovery action
3.3	Check APG43L statuses
3.4	Practice Single Node Repair procedure
3.5	Practice System Double Node Disaster Recovery
4	Describe the Data Disk recovery procedure
4.1	Recognize when a Data Disk Procedure should be executed
4.2	Practice a Single Data Disk recovery procedure
5	Describe the hardware replacement procedures in APG43L

5.1   Explain the GED DVD and GEA Board repair procedure
5.2   Explain the AP Board repair procedure
5.3   Explain the GED Data Disk repair procedure
5.4   Recognize other recovery procedures

Target audience:

This course is suitable for anyone who is required be able to perform APG43L recovery activities.

Prerequisites:

Successful completion of the following courses:

APG43L Operation and Maintenance, LZU1089484

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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APZ 212 60F Operation and Maintenance

LZU1089746 R1A

Description:

The APZ 212 60F is an essential part of the AXE system, especially as a new platform for the MSC-Servers, IP-STP and HLR-FE applications.

Through practical exercises the participants will gain experience in handling the APZ 212 60F central processor by checking its operational states, feeling how the APZ 212 60F reacts in different situations like a system backup or reloading procedures, and extracting of system logs that can be further used for troubleshooting.

Learning objectives:

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

1	Describe the APZ 212 60F in an overview level
1.1	Discuss the APZ Evolution
1.2	State the basic APZ concepts
1.3	Describe the APZ 212 60F architecture overview
1.4	Indicate the capacity and characteristics of different APZ versions
1.5	Discuss the key features of the APZ 212 60F
1.6	Recognize the APZ subsystems and functions
1.7	Discuss the IP stack on CP feature
2	Demonstrate use of the APZ 212 60F Hardware
2.1	Identify the hardware structure of the APZ 212 60F on cabinet level and subrack level
2.2	State the functions of the CPUB, MAUB and RPBI-S APZ 212 60F boards
2.3	State the functions of the EGEM / EGEM2 magazine infrastructure: SCB-RP/SCXB boards and Fan Units
2.4	Introduce the new GEP5-64GB in APZ 212 60/9
2.5	List the major physical and logical interfaces in the APZ 212 60F
2.6	Explain the RPB-E bus use in APZ 212 60F
3	Demonstrate the use of Operation Handling concepts of APZ 212 60F
3.1	Identify the main aspects affecting operation handling
3.2	Differentiate the APZ 212 60F operational states for CP, MAU and RPH
3.3	Execute the backup procedure in the APZ 212 60F
3.4	Manage the Hardware Configuration Table
3.5	Manage the infrastructure components: EGEM/ EGEM2, SCXB/SCB-RP and Power and Fan Module (PFM)
3.6	Load the APZ 212 60F Central Processor

4	Demonstrate use of Fault handling concepts of the APZ 212 60F
4.1	List the hardware fault recovery processes
4.2	Identify the procedures to repair hardware faults in APZ 212 60F hardware
4.3	Identify the procedures to repair faults in the infrastructure components SCXB/SCB-RP, CMXB, FAN and PFM
4.4	List the Software Fault recovery process
4.5	Extract restart information in case of CP Software faults
4.6	Use the Central Log Handler in APZ 212 60F

5	Discriminate the key features in the software structure of the APZ 212 60F
5.1	Recognize the APZ 212 60F software structure.
5.2	Explain how the APZ Virtual Machine operates within PLEX Engine
5.3	Explain how the ASA Compiler operates within PLEX Engine
5.4	Identify where the APZ 212 60F PLEX Engine software is stored in APG43L
5.5	Identify the Middleware, Firmware and SCB-RP/SCXB, PFM software upgrade procedures

Target audience:

This course is suitable for anyone who is required be able to configure/operate/maintain APZ 212 60F.

Prerequisites:

Successful completion of the following courses:

AXE Operation and Configuration, LZU1088620

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.

AXE on BSP 8100 Operation and Configuration

LZU1082241 R1A

Description:

Are you new to AXE? Do you need to practice operations and get hands-on an AXE? Do you know the difference between APG and APZ? Have you understood how to operate IP functions in APZ? Do you need to deploy nodes as HLR, CTC/MSC, IP-STP and TSS?
This course provides hands-on exercises on Compact AXE. The daily AXE operations are explained and practiced covering both APG and APZ functionalities.
The AXE Operation course adds value to the operator since the students receives practical AXE experience on BSP, as well as knowledge in basic IP, Sigtran and IPonCP handling.
This course is a requirement for all other MSS courses.

Learning objectives:

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

1	Recognize the AXE Architecture
1.1	Recognize the product structure of AXE
1.2	Explain differences between APG and APZ
1.3	Identify the AXE system components
2	Practice Command Handling
2.1	Explore CPI (Alex) documentation
2.2	Handle WinFIOL to communicate with AXE
2.3	Practice to identify parameters and interpret printouts
2.4	Practice to identify alarms and interpret printouts
3	Describe the APG43L System
3.1	Recognize the APG43L Functions
3.2	Access the AXE system through the APG43L
3.3	Check alarms and performance
3.4	Check file system and disk usage
3.5	Check cluster and APZ interworking
4	Present the APZ System
4.1	Discover the APZ Evolution
4.2	Identify APZ HW Layout
4.3	Check alarms and performance
5	Verify RP Operation
5.1	Handle the RPs on basic level
5.2	Handle EMs controlled by the RPs
5.3	Practice to identify databases used when defining RPs

Target audience:

This course is suitable for anyone who is required be able to configure/operate/maintain AXE on BSP 8100.

Prerequisites:

Successful completion of the following courses:

AXE Multi-Applications on BSP 8100, LZU1082240

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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Blade Cluster on BSP 8100 Overview

LZU1082242 R1A

Description:

What are the benefits and added values with Blade Cluster on BSP 8100? How is the new processor GEP5 providing scalable and great capacity?
The Blade Cluster on BSP 8100 Overview answers these questions. The course provides a comprehensive base for understanding all other Blade Cluster courses. The Blade Cluster architecture is presented using the Compact MSC as a reference and also from different perspectives, where its benefits, concepts, characteristics, hardware, signaling, software, operation and maintenance are briefly described with a broad audience in mind. When the course is finished, the students will be able to understand how MSC/CTC and HLR-FE are implemented with Blade Cluster on BSP 8100 and in the Multi-application environment.

Learning objectives:

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

1	Identify Benefits and Drivers for Blade Cluster Systems
1.1	Give an example of an MSS site before and after migration to MSC BC
1.2	Describe the reasons for introducing Blade Cluster
1.3	Recognize and list the added value introduced in Blade Cluster
2	Explain the Blade Cluster Concepts
2.1	Present the APZ architecture
2.2	Introduce new concepts, like Single-Sided-CP and Buddy-MSC
2.3	Demonstrate how traffic is handled within the MSC BC
3	Present the Blade Cluster Characteristics
3.1	Acknowledge the performance and footprint of the MSC /CTC/ HLR-FE
3.2	Describe the improved node availability and robustness mechanisms
3.3	Explore the recovery behavior
4	Identify the Physical Hardware in Blade Cluster
4.1	Explain BSP 8100 system and Multi-Application concepts
4.2	Define different MSC /CTC/ HLR-FE configuration and hardware options
4.3	Show the hardware components, from cabinet to blade
4.4	Explain briefly the purpose of the hardware components
5	Describe Protocols and Signaling in Blade Cluster
5.1	Introduce All-IP perspective and its Load Balancing in MSC BC
5.2	Identify different VLANs used in MSC /CTC/ HLR-FE
5.3	Explore the added benefits with different VLANs

Target audience:

This course is suitable for anyone who is required to be familiar with Blade Cluster on BSP 8100.

Prerequisites:

Successful completion of the following courses:

AXE Multi-Applications on BSP 8100, LZU1082240

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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Blade Cluster Platform Operation and Maintenance (BSP)

LZU1089750 R1A

Description:

Do you know that Blade Cluster is a system in which are involved more than one node configured differently in function and hardware as a MSC or a HLR application, and a Signalling Proxy (SPX)? Would you like to be able to able to understand, operate and maintain a CP Cluster System at Cluster and Blade level?

This course contains a balanced description of the classical AXE Platform Applications delivered by Ericsson and the APZ Blade Cluster system.

Through practical exercises the participants will gain experience in handling a Blade Cluster system by sending commands and analysing alarms and printouts.

Learning objectives:

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

1	Provide an overview of the APZ Blade Cluster system
1.1	State what an APZ Blade Cluster system is.
1.2	Discuss the APZ evolution.
1.3	Identify the basic O&M concepts applied to an APZ Blade Cluster system
1.4	Describe the BSP environment used by an APZ Blade Cluster system
2	Describe the APZ Blade Cluster and the SPX Hardware view
2.1	Identify the building blocks of the SPX: APZ 212 60F and AUP.
2.2	Describe the APZ 214 10 HW integrated into the BSP environment.
2.3	Describe the APG43/3 HW for an APZ Blade Cluster system.
3	I/O in BC Systems
3.1	Recognize the APG43L characteristics and command lines for APZ in Blade Cluster systems.
3.2	Use command lines to access the CP Cluster in both AXE and BSP environments.
3.3	Execute commands and analyze printouts in protected and unprotected modes.
4	Demonstrate use of the Cluster Handler (CH) in a CP Cluster system
4.1	Describe the CH software components.
4.2	Describe the Cluster Handler terminologies and concepts.
4.3	Describe Cluster CPs states and sub-states.
4.4	Execute commands and understand printouts used to support the CP Cluster operation and maintenance procedures.
5	Operate the APZ 214 10 in a CP Cluster system
5.1	Demonstrate use of Cluster and Blade backup functions.

5.2   Demonstrate use of the Function Change for Middleware, Plex, Cluster Handler and
        Program Correction deployment.
5.3   Present the Health Check feature.

6   Discriminate the Fault Handling recovery procedures for APZ 214 10
6.1   Demonstrate use of the Cloning function.
6.2   Demonstrate use of Cluster and Blade recovery functions and alarms.
6.3   List the Cluster Recovery mechanisms for the APZ Blade Cluster.
6.4   Recognize the APZ 214 10 logs located in APG43L.

7   Demonstrate use of the XPU (eXtra Processing Unit)
7.1   Describe the XPU execution domain
7.2   Use commands to operate the XPU
7.3   Demonstrate use of the procedures for XPU handling

Target audience:

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

Prerequisites:

Successful completion of the following courses:

APZ 212 60F Operation & Maintenance, LZU1089746
MSC-S Blade Cluster Overview, LZU1089007 (or equivalent knowledge)
The following knowledge is recommended:
APG43L Operation and Maintenance, LZU1089484 (or equivalent knowledge)

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.

BSP8100 Operation and Maintenance

LZU1089779 R1A

Description:

BSP (Blade Server Platform) 8100 is a generic hardware and infrastructure platform based on Ericsson Blade Server (EBS) component, suitable for all types of control nodes needing scalable processing capacity.

This course explore the main tasks for system operation and maintenance related workflows of the BSP. It includes BSP 8100 platform and the main available features. It shows how to identify hardware and software components, different management areas available in the BSP and how to perform software upgrades. Hands-on exercises allow participants to work with the BSP CLI focusing on operations and maintenance related commands and tools.

The lessons are complemented by practical exercises on a BSP site. Participants will complete practical site management exercises using the product documentation.

Learning objectives:

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

1   Explain the BSP 8100 System Architecture and Hardware
1.1   Describe the BSP 8000 Family Overview
1.2   Explain its features and function
1.3   Recognize the BSP Hardware to ensure the proper operation of all HW components
1.4   List the Hardware Inventory showing all HW items of the BSP to a certain shelf, blade, or PFM
1.5   Describe CEE implementation on BSP
1.6   List the Operation and Maintenance architecture and Management Domains in BSP
1.7   Describe BSP8100 Architecture with CAX, APP and SMX.

2   Manage the Access Connectivity functions
2.1   Be familiar with networks for BSP Management: NBI and LCT
2.2   Hands-on to connect to the BSP8100 platform
2.3   Navigate in the MOM for modifying BSP system configuration settings using ECLI
2.4   Explain the Security Management mechanisms in the BSP system

3   Handle Tenants to monitor applications defined in BSP
3.1   Describe the management functions to check Tenants
3.2   Retrieve hardware information for slots and blades belonging to Tenants
3.3   Verify operator-defined VLAN data for Tenants
3.4   Explain the Networks and Interfaces to control the BSP: NTP, ARP, BGCI and internal networks

4   Explain Transport Management functions in BSP

Target audience:

This course is suitable for anyone who is required be able to configure/operate/maintain BSP 8100.

Prerequisites:

Successful completion of the following courses:

IP Networking, LZU102397 (or equivalent knowledge)

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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CTC Overview

LZU1082419 R1A

Description:

Are you prepared for Internation VoLTE Revenues? Do you have end-to-end HD Voice?
Do you understand how the Converged Transit Controller (CTC) can add value and reduce OPEX in your Network?
How Virtualization concept may be applied to CTC?
This Course gives an Introduction to CTC/vCTC and explains how the operators can benefit from a Converged IMS and MSC Transit Deployment.
The course prepares the student with a Basic Understanding of AXE Operation and Maintenance and serves as a Prerequisite for further Operation and Configuration courses, like AXE Operation, MSS Network Configuration and SIP/SIP-I Advanced, etc.
This course is valid both for Native and Virtualized CTC

Learning objectives:

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

1   Provide an Introduction of CTC/vCTC - Why CTC?
1.1   Explain Benefits and Opportunities with CTC/vCTC
1.2   Recognize Added Values by using CTC/vCTC
1.3   Explain Virtualization Concept

2   Explain CTC/vCTC Network Topology
2.1   Describe Transit VoLTE Scenarios
2.2   Identify HD Voice End-to-End Signaling

3   Analyze CTC/vCTC Concepts and Functionalities
3.1   Compare CTC/vCTC with IMS and MSC Platforms
3.2   Demonstrate Internal CTC/vCTC Components
3.3   Describe MGCF for Interworking with IMS (Enhanced)
3.4   Acknowledge MGCF for Interworking with SIP-I based Networks
3.5   Describe LTE to GSM Handover (SRVCC) (Enhanced)
3.6   Describe LTE to WCDMA Handover (SRVCC) (Enhanced)
3.7   Explain WiFi to CS Handover (DRVCC)
3.8   Describe IMS Centralized Services
3.9   Explain Enhanced Capacity Based MGw Selection
3.10   Explain Real Time System Data View

4   Describe the CTC/vCTC Hardware
4.1   Acknowledge HW Structure
4.2   List HW Deployment Options

5   CTC/vCTC Operation and Maintenance
5.1   Describe Some Printout Commands
5.2   Explain how to recover from Backup

Target audience:

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

Prerequisites:

Successful completion of the following courses:

VoLTE Interworking Concepts, LZU1082265

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.

DSC 1 Operation and Configuration

LZU1082569 R1A

Description:

Do you need the skills and knowledge to operate and configure the DSC which is used for Policy Control, Subscriber Registration, Charging & Roaming procedure in EPC and IMS ?
Ericsson Diameter Signaling Controller (DSC) 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 DSC 1. Hands-on exercises allow participants to work with the DSC CLI focusing on operation and maintenance related commands and tools. This course explains the Diameter signaling and DSC 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
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

Target audience:

This course is suitable for anyone who is required be able to configure/operate/maintain DSC1.

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Prerequisites:

Successful completion of the following courses:

EPC System Survey, LZU1087977
IMS Overview, LZU1082585

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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DSC 17 to DSC 1 Delta - live virtual

LZU1082570 R1A

Description:

This is an ideal course for those who wish to update their knowledge on new and enhanced functionalties introduced in DSC 1 release. This course focuses on the enhancements introduced from DSC 17 to DSC 1 release.

Learning objectives:

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

1	Introduce Ericsson Diameter Signaling Controller
1.1	Review Diameter signaling network
1.2	Explain benefits of deploying DSC
1.3	Identify the DSC modes of operation

2	Understand DSC Architecture and Application
2.1	Identify DSC deployment options
2.2	Explain the concept of Cloud and Virtualization
2.3	Describe the benefits of Virtualization
2.4	Explain DSC/ vDSC 1 Architecture
2.5	Review vDSC 1 Solution Variants
2.6	Describe DSC Application
2.7	Review DSC/ vDSC 1 Use Cases

3	Describe New and Enhanced features of DSC/ vDSC 1
3.1	Understand vDSC 1 improvements
3.2	Explain new features of DSC/ vDSC 1
3.3	Describe the Server Lookup Function enhancements
3.4	Explain Distributed Data Base improvements
3.5	Describe Unified Signaling Firewall enhancements
3.6	Explain the OAM enhancements in DSC/ vDSC 1

Target audience:

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

Prerequisites:

Successful completion of the following courses:

LZU1082452 vDSC 17 Operation and Configuration
The participants having the prior experience of handling Ericsson DSC is an added advantage.

Duration and class size:

The length of the course is 3 hours 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.

IMS Centralized Services (ICS) Concepts

LZU1082252 R1A

Description:

How will IMS Centralized Service (ICS) impact on future services? Do you know that ICS will replace the existing CS supplementary services with IMS supplementary services for VoLTE users?
The IMS Centralized Service (ICS) Concepts course answers these questions, providing an overview of existing MSS Services, and explaining how IMS is planned to overtake the MSS Services.
This course adds value as it will help the operator to utilize and benefit from ICS.

Learning objectives:

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

1	Discuss Future Services
1.1	Consider User Needs
1.2	Observe Operator Potential
1.3	Evaluate Service Benefits
2	Present CAMEL Services
2.1	Explain the CAMEL Service Concept
2.2	Acknowledge CAMEL Nodes and Functions
2.3	Explore CAMEL Call Flows
2.4	Explore some CAMEL Service scenarios
3	Recognize the Mg interface based ICS solution concepts
3.1	Explain the ICS Service Concept
3.2	Differentiate the ICS Reference Architecture
3.3	Acknowledge Mobile Originating and Terminating call flows
3.4	Recognize how Supplementary Services are managed
3.5	Explore Emergency and Announcement Handling scenarios
4	Explore Service Interaction in MSS
4.1	Explain the Dual Service Engine (DSE) Concept
4.2	Acknowledge Dual Originating and Dual Terminating Service Scenarios
4.3	Acknowledge ICS Roaming Scenarios

Target audience:

This course is suitable for anyone who is required to be able to be familiar with ISC concepts and how ICS is implemented in MSS.

Prerequisites:

Successful completion of the following courses:

VoLTE Interworking Concepts, LZU1082265

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 given in a classroom.

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IP-STP and/or SPX Configuration

LZU1082259 R1A

Description:

Do you know IP Signaling Transfer Point (IP-STP) is playing a key role for efficient handling of SS7 signaling in both mobile and wireline core networks, both circuit and packet based? Would you like to be able to understand and configure an IP-STP? How Virtualization concepts may be applied to IP-STP?

This course provides a general description of Ericsson IP-STP product available for both mobile (WCDMA, GSM and LTE) and wireline core networks, use of SPX to provide STP function is considered as well.

Aspects related to IP-STP Scenarios, functionalities and configuration of IP-STP are also treated.

Practical exercises will also help students in understanding some points related to configuration of IP-STP

Learning objectives:

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

1   Provide an overview of the IP-STP
1.1   Explain what is an IP-STP
1.2   Describe essential core functions of IP-STP and its benefits
1.3   Introduce Virtualization Concept

2   IP-STP function in MSS Network
2.1   Acknowledge different cases of Scenarios of IP-STP
2.2   Describe IP-STP function in MSS Network

3   Describe some Security concepts for IP-STP
3.1   Introduce some aspects on SS7 Security
3.2   Describe threats to SS7 Network
3.3   Explain how to protect SS7 Network from attackers
3.4   Explain some configuration procedures for SS7 Network protection

4   Describe functionalities of IP-STP
4.1   Describe feature Real-Time System Data View
4.2   Describe Generic Message Screening and Re-Routing (GMSr)
4.3   Describe Function SCCP Policing
4.4   Explain enhanced aspects of SCCP Policing and GMSr functions
4.5   Describe IP Network and Transport for Signaling
4.6   Explain Scenario related to Signaling SCCP Relay Point
4.7   Describe IP-STP used for VoLTE Roaming Scenarios

4.8   Explain Benefit of using SPX as STP
4.9   Describe IP Network and Transport for Signaling
4.10   Describe Network Function Virtualization Support
4.11   Explain VNF Connectivity Enhancements: IP Router Path Supervision
4.12   Describe function Support for VNF Lifecycle Management
4.13   Describe GMSR Tool

5   Practice to Configure IP-STP
5.1   Practice Advanced SCCP Configuration
5.2   Practice Configuration of SPC, GT, GT Routing, Sigtran
5.3   Describe Commands of feature M2PA in IP-STP node
5.4   Practice Configuration of TDM links
5.5   Practice Configuration of IP on RP
5.6   Explain enhancement parameters on SCCP Policing and GMSr configuration in MSS18
5.7   Explain configuration of Real System Data View function
5.8   Practice configuration in GMSR Tool

Target audience:

This course is suitable for anyone who is required be able to configure IP-STP and SPX.

Prerequisites:

Successful completion of the following courses:

AXE on BSP 8100 Operation and Configuration, LZU1082241

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.

IP-STP, CTC, MSS 17 to 18A Features Delta

LZU1082571 R1A

Description:

Do you wish to learn more about AXE Cloud? Are you protected against SS7 Cyber Hacking? Do you need to provide handover for Voice over WiFi (VoWiFi)?
Then the MSS 18 Software Release is for you. This course describes the major changes in MSS 18A, like functions Mid Call Codec Modification, IP Redirect Support, Virtualized Network Function Support, for IP-STP, CTC and MSC. The course brings value for the operator since it guides the students how to apply and benefit from the new features. This course is valid for both Native and Virtual Nodes.

Learning objectives:

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

1	Introduce IP-STP, CTC and MSS 18A Delta
1.1	Identify MSS 18A domains
1.2	Indicate new MSS18A functions
2	Explain Virtualization and Cloud Readiness impact
2.1	Explain Network Function Virtualization Support
2.2	Recognize IP Router Path Supervision
2.3	Describe Support for VNF Lifecycle Management
3	Describe Network and Operational Efficiency impact
3.1	Explain MSC controlled subscriber redistribution
3.2	Describe Enhanced MSC Pool balance for MO transactions
3.3	Recognize Integrated subscriber trace for SGs and Sv Interfaces
3.4	Describe Parallel Radio Resource Assignment
3.5	Explain GMSr Tool
3.6	Explore SIP redirect support (3xx)
4	Describe Communication Services Evolution and System Improvements impact
4.1	Explore ICS I2 for MO calls (drop1)
4.2	Describe Robust SRVCC
4.3	Explain Mid-call codec Modification
4.4	Explore Paging Improvements
4.5	Describe End User Pager KPI
4.6	Recognize SIP Transport Protocol Failover
4.7	Explain Improved handling of malformed SIP headers
5	Identify IP-STP, CTC and MSS 18 Training Flow
5.1	Illustrate Virtual MSS Course Flow

5.2 Arrange Training Courses for IP-STP, CTC and MSC-S

Target audience:

This course is suitable for anyone who is required to be familiar with the new features introduced in MSC-S, CTC and IP-STP 18A.

Prerequisites:

Successful completion of the following courses:

Working experience with IP-STP, CTC or MSS.

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 and practical instructor-led lessons given classroom.

Mobile Signaling Concepts

LZU1082256 R1A

Description:

Do you need to work with Signaling in Mobile networks? Do you understand the changes made for 4G? Do you want to know the different protocols and traffic cases in the network with CTC/MSC/STP nodes?

This course describes the communication between Mobile network nodes and the User Equipment (UE) using POTS, PRA, GERAN, UTRAN and eUTRAN. The Mobile Application Part Protocol (MAP) is explained, and how it relates to call flows in different scenarios including Voice over LTE (VoLTE) and Single Radio Voice Call Continuity (SRVCC).

The Mobile Signaling Concepts course adds value to the operator since it explains the interfaces in the CTC/MSC/STP nodes network.

Learning objectives:

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

1	Introduce the 2G/3G/4G mobile network
1.1	Describe the main logical nodes in the network
1.2	Acknowledge the organizations and signaling standards
1.3	Describe how Mobile Signaling has evolved
1.4	Explore CTC/MSC/STP Interfaces and Protocols
2	Present Call Handling Overview
2.1	Introduce Terminating Call
2.2	Explain Location Update
2.3	Demonstrate Call Flow Examples
3	Investigate MSS Interworking Principles
3.1	Explain UE Stratum
3.2	Explore Mobile OSI Model
3.3	Summarize High Level Architecture
4	Present MAP Concepts
4.1	Describe MAP structure
4.2	Show MAP messages
4.3	Illustrate MAP use cases: CSFB, MTRF, SRVCC
4.4	Introduce CAP protocol concepts
5	Explore ISUP & BICC Protocols
5.1	Present ISUP services and protocol messages
5.2	Present BICC services and protocol messages
5.3	Illustrate scenarios with BICC and ISUP

6   Investigate SIP/SIP-I Interworking in CTC/MSC/STP
6.1   Acknowledge SIP/SIP-I scenarios
6.2   Describe SIP/SIP-I interwork aspects: codec negotiation, DTMF interworking, CMN, ASN.

7   Show IPBCP protocol
7.1   Describe high level concept
7.2   Illustrate examples
7.3   Show signaling messages

8   Show SGsAP and GTPv2-C protocols
8.1   Describe SGsAP protocol messages
8.2   Illustrate Examples with SGsAP: CSFB
8.3   Describe GTPv2-C protocol messages
8.4   Illustrate Examples with GTPv2-C: SRVCC

9   Show RANAP functions and protocol
9.1   Describe RANAP Principles and protocol messages
9.2   Illustrate traffic scenarios

10   Show BSSAP functions and protocol
10.1   Describe BSSAP Principles and protocol messages
10.2   Illustrate traffic scenarios

11   Describe GCP Signaling
11.1   Describe M-MGW interaction
11.2   Illustrate examples
11.3   Show signaling messages

Target audience:

This course is suitable for anyone who is required to be familiar with mobile signaling concepts.

Prerequisites:

Successful completion of the following courses:

Ericsson WCDMA System Overview, LZU1085418

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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MRS Operation and Configuration

LZU1082588 R1A

Description:

Do you need competence in how to operate and configure the Ericsson Media Resource System (MRS)? This course covers just that. It will provide the participants with the knowledge to perform Surveillance, Operation and Configuration activities on the MRS.
It consists of theory and practical exercises on how to operate and configure the IM-MGW, Mobile Access, Multimedia Resource Function Processor (MRFP), Multimedia Resource Function Controller (MRFC) and Border Gateway Function (BGF) functions included in the MRS. This includes configuration of media interfaces towards IP and TDM networks.
The course provides hands-on training with the MRS Node Manager, as well as Command Line Interface (CLI) and some applications in Operation Support System-Radio and Core (OSS-RC) related to MRS operation and configuration.

Learning objectives:

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

1   Describe MRS System Architecture and functions
1.1   Understand the benefits of the Base Packages and Value Packages
1.2   State the different functions included in the MRS

2   Describe the Media Resource Platform (MRP) functions and concepts
2.1   Explain the MRP concept
2.2   Describe the MRP hardware Architecture
2.3   Describe how Fault Tolerant Execution is achieved by the use of Reliable Programs, State Data Storage, the node File System and the Database
2.4   Explain Error Recovery functions, supervision, escalation staircase and the Trace and Error log principle
2.5   Explain the Configuration Version (CV) concept and how a node is started

3   Perform basic fault management on a MRS node as described in the Customer Product Information (CPI)
3.1   Explain the O&M architecture for MRS
3.2   Explain the use of CPI documents
3.3   Read the Alarm List and Alarm Log to manage faults in MRS
3.4   Follow an Operational Procedure to solve an alarm

4   Understand the role of different Management Interfaces for MRS
4.1   Understand the role of Node Manager
4.2   Understand the role of OSS-RC for management of MRS

Target audience:

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

Prerequisites:

None

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.

MRS Operation with AMOS

LZU1082436 R1A

Description:

The main focus of this course is to give a detailed survey of the Advanced Managed Object Scripting (AMOS) and the participant will after the course have a broad knowledge about the commands and printouts on the CPP based MRS (Media Resource System) nodes.

This course will give you the opportunity to acquire the specific skills necessary for getting information about the configuration and applications running on the MRS node in the MSS/IMS network. Hands-on practice in getting configuration in MRS nodes is provided, dealing with the operation and maintenance of the MRS nodes.

Learning objectives:

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

1	Give a high-level overview of AMOS
1.1	Explain and describe the AMOS tool
1.2	Explain the Managed Object Model concept
1.3	Browse MOM from AMOS
1.4	List and describe the AMOS command line syntax and regular expressions
1.5	Explain how filtering works in AMOS
1.6	Describe the commands for setting the configuration and environment variables
1.7	Describe basic AMOS commands for interacting with the MIB
1.8	Use AMOS commands to get information about HW equipment resources
1.9	Describe the file system and software loading
1.10	Use AMOS commands to get access to Log files
1.11	List the AMOS commands for CV backups and software upgrades
1.12	List the AMOS commands used for performance handling
1.13	Describe the use of Mobatch and AMOS multi mode
1.14	Understand how to use the AMOS Offline mode
1.15	Describe how to create and run MO scripts in AMOS
1.16	Describe how to send COLI commands from AMOS
1.17	Use the logfiles to obtain system information
2	Describe how AMOS applies to CPP NCH (Network and Connection Handling)
2.1	Use AMOS commands to obtain a view of the ET boards
2.2	Describe the supervision methods of fault management on the physical layer
2.3	List the AMOS commands in order to get Synchronization information
2.4	List the AMOS commands to obtain a view of the IP/TDM transport network configuration

2.5   Use AMOS commands to obtain a view of the signaling protocol stack
2.6   Use AMOS commands to obtain a view of BGF/MGw and MRFP configurations and status
2.7   Use AMOS commands to obtain a view of the MRS parameters

Target audience:

This course is suitable for anyone who is required be able to operate MRS with AMOS.

Prerequisites:

Successful completion of the following courses:

The participants should be familiar with the MRS or have attended the course:
MRS 16 Operation and Configuration - LZU1082222 or
MRS 17 VoLTE Interworking Configuration - LZU1082434 or
be familiar with the M-MGw.

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.

MRS VoLTE Interworking Configuration

LZU1082572 R1A

Description:

Do you need the skills and knowledge to configure the MRS VoLTE Interworking in your network? The Border Gateway Function (BGF) is the key for VoLTE to interact with 2G/3G systems.
This course will give the students good understanding about the evolution of the hardware and the flexibility in the configuration. It will also give a good understanding about the different Base Packages and Value packages such as the SRVCC (Single Radio Voice Call Control).
The course provides hands-on training with the Node Manager. The exercises cover configuration of the BGF media interfaces as well as the H.248 signaling interfaces

Learning objectives:

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

1	Explain the VoLTE Interworking solution
1.1	Verify the benefits of the BGF Base Package
1.2	Explain the Base Package for BGF SIP Trunking
1.3	Identify the Value Package for Web Access
1.4	Explain the SRVCC concept is achieved with the Access Transfer Gateway
1.5	Identify the Value package for SRVCC
1.6	Describe how the MRS can support Media Resource Function (MRF) for Multimedia and voice/video Conferencing
1.7	Explain the interconnect with IMS/MSS
1.8	Explain function of Mid-Call Codec Modification
2	Configure the Border Gateway Function
2.1	Be able to configure the BGF Media Interfaces
2.2	Configure the H.248 signaling interface from the SBG (Session Border Gateway)
2.3	Be able to configure the Media Resource Function interfaces

Target audience:

This course is suitable for anyone who is required be able to configure VoLTE interworking in MRS.

Prerequisites:

Successful completion of the following courses:

MSS Overview, LZU1082437
or
IMS 16 Overview, LZU1082217

Duration and class size:

The length of the course is 1 day 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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MSS Network Configuration

LZU1082318 R1A

Description:

Do you need to configure the interaction between CTC/MSC nodes?
This course explains how to gain efficiency in transit scenarios, charging and traffic cases, both physically and in terms of charging for PSTN, GERAN, UTRAN traffic scenarios. In addition the course adds value for the operator since the students get trained in configuring the CTC/MSC in DB and BC.

Learning objectives:

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

1	Show the MSS Network Topology
1.1	State the definitions and Terminology related to MSS
1.2	Verify Local and Neighbor Location Area concepts
1.3	Define Primary and Secondary Site concept
1.4	Verify the MSC Properties
2	State the interfaces with other systems
2.1	Show the PSTN, PRA, GERAN, UTRAN interfaces connectivity
2.2	List the overview of features and services
2.3	Verify the rule and purpose with MSS
3	Introduce Codec Negotiating concept
3.1	Explain the purpose with Codecs
3.2	Show Codec options per access type
3.3	Describe the TrFO for HD voice
3.4	State the G722 HD Voice
3.5	Show the AMR enhancement
4	Verify Mobile Access MGw Selection functionality
4.1	Show Mobile Access MGw terminology
4.2	List the criteria for Mobile Access MGw selection
4.3	State the recommendations for Mobile Access MGw selection
4.4	Explore the Mobile Access MGw Selection
4.5	Verify the Mobile Access MGw Selection Capacity Based
5	Verify transit efficient scenarios in MSS network
5.1	Define the Call Mediation Node feature
5.2	Show efficiency with CMN Feature
5.3	Verify the CMN impacts in CTC/MSC Configuration
5.4	Explain CMN for SIP-I Enhancement

13.5   Show outputs from the charging analysis

14   Explain Call Data Record (CDR) Generation and administration
14.1   Explain Call Data Record (CDR) Generation and administration
14.2   Show the APZ commands and parameters for CDR generation
14.3   List the APG commands and parameters for CDR administration
14.4   Analyze CDR Generation

Target audience:

This course is suitable for anyone who is required be able to perform network configuration in MSS.

Prerequisites:

Successful completion of the following courses:

MSS Traffic Configuration, LZU1082247

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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MSS Overview

LZU1082437 R1A

Description:

What is Mobile Softswitch (MSS)? How do Cloud, Internet of Things (IoT), Voice over WiFi (VoWiFi) and Voice over LTE (VoLTE) relate to MSS? What benefits does MSS bring the operator?
This course will teach you all this and more. The students will learn to distinguish between Access Domain providing Voice and Service Domain providing IMS Centralized Services (ICS) for the MSS subscriber. The course shows how the AXE platform can give MSC Blade Cluster Server near unlimited capacity, and how Media Resource System (MRS) handles both MSS and IMS related calls. In addition, the course brings value for the operator as it
introduces key functionality, concepts, call flows, and provides an overall vision how to learn and master the Mobile Softswitch, step by step.

Learning objectives:

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

1	Introduce some Mobile Softswitch (MSS) Concepts
1.1	Clarify how MSS relates to Cloud and Internet of Things (IoT)
1.2	Show how MSC Server, MRS and M-MGw work together
1.3	Explain how MSS handles Voice over 4G, 5G and WiFi
1.4	Compare MSS with IMS Centralized Services (ICS)
2	Recognize the Mobile Switching Center (MSC) Server
2.1	Analyze how AXE Architecture has near unlimited capacity
2.2	Demonstrate how IP-STP, CTC, HLR and MSC-S are related
2.3	Observe Base and Value Packages for IP-STP, CTC and MSC-S
3	Explore MRS and M-MGw Media handling and features
3.1	Present applications: SGw, M-MGw, BGF, IM-MGw and MRF
3.2	Discover internal components, architecture and O&M activities
3.3	Acknowledge Base and Value Packages for MRS and M-MGw
4	Survey MSS Call Flow examples and Training Concepts
4.1	Review an MSC Server Call Flow example with MRS
4.2	Interpret an MSC Server Call Flow example with IMS
4.3	Correlate an MSC Server Call Flow example with ICS
4.4	Summarize MSC Server and MRS Training Concepts

Target audience:

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

Prerequisites:

Successful completion of the following courses:

The participants should be familiar with basic concepts of telecommunication.

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.

MSS Statistics Operation and Configuration

LZU1088628 R1A

Description:

How is the mobile network performing? Statistics is used to monitor the quality of the Mobile Softswitch Solution (MSS) Network, native as virtualized. Are there any statistics for Virtualized Performance, Voice over LTE or MSC in Pool? Is everything ok?

The MSS Statistics Operation and Configuration course introduces the students in the statistics of MSS and vMSS, that can take a life time to master. The course provides practical exercises in both operation and configuration of Statistics in Media Resoure System (MRS) and Mobile Switching Center Server (MSC-S) including the APG 43L, and prepares the students for the (v)MSS Troubleshooting courses.

The MSS Statistics Operation and Configuration course adds value to the operator since knowledge in configuring MSS Statistics is necessary for a successful Mobile Network Business.

Learning objectives:

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

1	Present the MSS and vMSS Statistics Process
1.1	Identify the node elements involved and their purposes
1.2	Explain the MSS performance management process flow
1.3	Explain how to use statistics from the MSS nodes
1.4	Compare MSC-S and MRS performance management principles
2	Introduce Statistics Operation in OSS
2.1	Identify which tools that exist and what they are used for
2.2	Practice to collect statistics from MSC-S and MRS
2.3	Practice to view reports in ENIQ
3	Describe Statistics Operation in MRS
3.1	Identify Performance Indicators (PI) used for MRS
3.2	Verify examples of how performance indicators are calculated
3.3	Explain possible reasons for falling below the healthy value range
4	Demonstrate Statistics Configuration in MRS
4.1	Show how to configure statistics in MRS
4.2	Identify MRS counter types
4.3	Practice how to find counters using the Managed Object Model
4.4	View counter values using the Node Manager
4.5	Practice to configure statistics in MRS

Target audience:

This course is suitable for anyone who is required be able to operate and configure MSS Statistics.

Prerequisites:

Successful completion of the following courses:

MSS Traffic Configuration, LZU 108 2247
MSS Network Configuration, LZU 108 2318
M-MGw or MRS Operation & Configuration
It is also an advantage to have attended the following courses:
MSS Pool Configuration, LZU 108 8625
APG 43L Operation & Maintenance, LZU 108 9484
Basic OSS-RC knowledge, or have equivalent working experience

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.

MSS Traffic Configuration

LZU1082247 R1A

Description:

Do you need to connect a Mobile Softswitch (MSS) to the network? Are you aware of the configuration needed for making a call in MSS? Do you need to know the MSC interfaces towards for 4G networks?

This course explores the configuration needed for the signaling within MSC-Server when connecting the User Equipment (UE) for GERAN, UTRAN and EUTRAN.

The course provides both theory and practice in a simulated MSS environment, where calls can be made in order to verify that the signaling flow is correct.

The MSS Traffic Configuration course adds value to the operator since the students get trained in connecting MSS, which also serve as a base for other MSS courses.

Learning objectives:

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

1	Acknowledge MSS at Network Level
1.1	Verify the MSS network and Identities
1.2	Acknowledge the MSC interfaces and functions
1.3	Configure IP on RP in MSC-S
2	Connect MSC-Server Blade Cluster to an IP Network
2.1	Recall Blade Cluster concepts
2.2	Describe signaling and interfaces
2.3	Configure the IP on CP in MSC-S
2.4	Configure MSC-S Blade Cluster signaling interfaces
3	Describe and configure the Signaling Connection Control Part (SCCP) protocol
3.1	Analyze SCCP routing using GTT, SSN, SPC
3.2	Configure the SCCP signaling
4	Configure MSC connection to MGw
4.1	Analyze the MGw connection options
4.2	Configure the MGw
5	Configure MSC Connection to BSC
5.1	Explain 2G concept
5.2	Show how to connect MSC to BSC
5.3	Configure the GERAN call handling
6	Configure MSC Connection to RNC
6.1	Explain 3G concept

Target audience:

This course is suitable for anyone who is required to be able to perform traffic configuration in MSS.

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Prerequisites:

Successful completion of the following courses:

AXE Multi-Applications on BSP 8100, LZU1082240
Mobile Signaling Concepts, LZU1082256

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.

MSS Troubleshooting

LZU1082249 R1A

Description:

Are there many IP or SIP troubles in the network? Does it take long time to fix the troubles? Are you prepared to troubleshoot MSC Server Blade Cluster? Is your company prepared for Voice over LTE? Are you planning to have a Multi-Application System (MAS) in your network? This course will help the students to troubleshoot problems in the MSS Network. The theory is generic, while the practical exercises provide examples from the MSS reality. The course explains how to troubleshoot IP and SIP based Signaling, not limited to any protocol analyzer like Wireshark, as well as the difference between MSC-S Dual Blade and MSC-S Blade Cluster. This course adds value to the operator, since the students will learn how to communicate between each other when solving the fault, and also understand how to solve a trouble quicker.

Learning objectives:

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

1	Identify ways how to solve the problem
1.1	Identify and solve the problem – Introduction
1.2	List different general troubleshooting techniques
1.3	Describe some white-box information sources
2	Investigate Theory & Strategy
2.1	Introduce the troubleshooting procedure
2.2	Describe how to reproduce a problem
2.3	Explain the troubleshooting strategy
3	Demonstrate typical network troubles
3.1	Present end-to-end communication troubles
3.2	List network topology troubles
3.3	Explore troubles between packet switched and circuit switched protocols
4	List MSS Interfaces and Protocols
4.1	Present MSC Interfaces and Protocols
4.2	Describe MGw Interfaces and Protocols
4.3	Introduce MPBN Layers and Functionality
5	Introduce troubleshooting methodology
5.1	Identify the trouble
5.2	Surround the trouble
5.3	Fix the trouble

Target audience:

This course is suitable for anyone who is required be able to troubleshoot MSS.

Prerequisites:

Successful completion of the following courses:

MSS Network Configuration, LZU1082318
M-MGW Operation with AMOS, LZU1088012 or
MRS Operation with AMOS, LZU1082436 or
Extensive MSC-S and M-MGW working experience

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.

MSS VoLTE Configuration

LZU1082250 R1A

Description:

Are you prepared for 4G with Voice over LTE (VoLTE) in MSC18A? Do you need to practice how to configure SMS over SGs, CSFB and SRVCC functions?

This course lets the students practice 4G related configuration in MSC and verify traffic scenarios in a simulated network environment with both Compact MSC-S and MSC-S Blade Cluster exchanges.

The MSS VoLTE Configuration course adds value to the operator since it enables 4G related revenues. After finishing this course, the students will be able to attend IMS Centralized Services (ICS) training course

Learning objectives:

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

1	Manage the Circuit Switch Fallback (CSFB) and SMS over SGs functions
1.1	Describe VoLTE scenarios
1.2	Configure the MME over the SGs interface
1.3	Analyze a traffic case involving CSFB
1.4	Acknowledge how SMS over SGs function is enabled in MSC

2	Coordinate Inter-MSC communication
2.1	Practice Mobile Terminating Roaming Forwarding (MTRF) function
2.2	Practice Inter-MSC handover

3	Manage the Service Continuity function
3.1	Configure the MME over the Sv Interface
3.2	Verify traffic cases involving Single Radio Voice Call Continuity (SRVCC)
3.3	Explore SRVCC new features
3.4	Investigate I2 based ICS network solution

Target audience:

This course is suitable for anyone who is required to be able to perform VoLTE configurations in MSS.

Prerequisites:

Successful completion of the following courses:

VoLTE Interworking Concepts, LZU1082265
MSS Network Configuration, LZU1082318

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.

www.ericsson.com/ourportfolio/services/learning-services

Sigtran Advanced

LZU1088630 R3A

Description:

What is SIGTRAN?Why is SCTP reliable for TELECOM Signaling? How is the configuration optmized? How can you trace and analyze the protocols over SCTP/IP in Mobile Softswitch Solution (MSS)?

This course describes all protocols that exclusively use SCTP/IP as base, like M3UA, Blade Cluster (SUA), Mgw (GCP), PRA (IUA), IP-STP (M2PA) and MME (SGsAP). The course provides knowledge in some parameter configurations, protocol specification and analyzing using Wireshark protocol tracer. The SIGTRAN Advanced course adds value for the operator since SCTP/IP and its related protocols carry the signaling in MSS.

Learning objectives:

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

1	Present the SIGTRAN perspective
1.1	Explain standardization background
1.2	Define the SIGTRAN scope covered in the course
1.3	Map the protocols with the OSI model
2	Present the Layer 1 in MSS
2.1	Explain the hardware used in AXE platform (MSC-S)
2.2	Explain the hardware used in CPP platform (M-MGw)
2.3	Identify the boards used for signaling
3	Explain how to configure Layer 2&3 in MSS
3.1	Clarify difference between IPonRP and IPonCP
3.2	Identify which parameters that are important
3.3	Show how to verify IP in MSS
3.4	Practice to trace IP packets in Wireshark
4	Explain the Stream Control Transmission Protocol (SCTP) protocol in MSS
4.1	Present the SCTP protocol messages and parameters
4.2	Describe SCTP commands in MSC-S and the MOS for SCTP in M-MGw
4.3	Practice to change SCTP parameters in simulated MSC-S environment
4.4	Trace SCTP messages during a call in simulated MSC-S environment
5	Explain the MTP3 User Adaptation layer (M3UA) protocol in MSS
5.1	Describe conceptual differences between IETF-M3UA and Ericsson-M3UA
5.2	Present the M3UA protocol messages and parameters
5.3	Practice to change M3UA parameters in simulated MSC-S environment
5.4	Trace M3UA messages during a call in simulated MSC-S environment

Target audience:

This course is suitable for anyone who is required to be able to perform advanced sigtran configurations in vMSS.

Prerequisites:

Successful completion of the following courses:

MSS Traffic Configuration, LZU 108 8629, or equivalent knowledge about MSC-S DB and MSC-S BC.

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 and practical instructor-led lessons given in a technical environment using equipment and tools.

SIP/SIP-I Advanced in MSS

LZU1082291 R1A

Description:

What is SIP? How is SIP routed? Will SIP replace SS7 traffic signaling? What is the difference between SIP and SIP-I?
The SIP/SIP-I Advanced course provides knowledge in SIP, its protocol structure and gives hands-on practice in configuring and analyzing SIP/SIP-I with wireshark in MSC.
The course also presents some SIP/SIP-I features that can help you during your daily operations.
The SIP/SIP-I Advanced course adds value to the operator since SIP/SIP-I is replacing SS7 more and more as traffic signaling protocol.

Learning objectives:

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

1	Introduction — What is SIP?
1.1	List the SIP and SIP-I features
1.2	Explain SIP functionality
1.3	Present MSS and SIP/SIP-I Scenarios
1.4	Explore the interfacing networks for SIP/SIP-I
1.5	Name the main logical nodes in the IMS (IP Multimedia Subsystem)
2	Explain the functions and capabilities of SIP protocol
2.1	Explain generic architecture and terminology
2.2	Name the IETF protocols related to SIP
2.3	Understand the most important SIP protocol header fields
2.4	Relate the steps in a basic session establishment between MSS and external networks
3	Clarify DNS routing
3.1	Explain the routing principles for SIP messages
3.2	Demonstrate cases where DNS is invoked
3.3	Practice to configure DNS resolver routing in MSS
4	Explore SIP with ISUP encapsulation (SIP-I)
4.1	Compare SIP-I, SIP-T and BICC protocols in MSS
4.2	Present SIP-I and ISUP interworking
4.3	Explain how SIP-I can fallback to BICC using ASNEE
4.4	Use the ISUP MIME encapsulation body
4.5	Recognize some interworking traffic cases
5	Clarify IP Connectivity support in MSC-S for SIP/SIP-I/DNS
5.1	Introduce SIP/SIP-I Single Node View

Target audience:

This course is suitable for anyone who is required to be able to perform advanced SIP configurations in MSS.

Prerequisites:

Successful completion of the following courses:

Mobile Signaling Concepts, LZU1082256
MSS Network Configuration, LZU1082318

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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vAPG43L Operation and Maintenance

LZU1082726 R1A

Description:

Do you want to know how vAPG43L works? Are you required to perform Operation and Maintenance activities on the vAPG43 such as backups, alarm list, types of sessions configuring statistical measurement programs?
This course describes the software structure of the vAPG43L 3.5. It also explains many of the features in vAPG43L while describing the procedures and commands used to configure them. The participants will gain experience in handling the vAPG43L by performing a series of practical exercises designed to re-enforce the theoretical components of the course. The exercises include fault handling, file transfer definitions, backup procedures, configuration using managed object model and more.

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.

Learning objectives:

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

1	Introduce virtual APG43L
1.1	List of the main characteristics in vAPG43L
1.2	Describe the vAPG43L subsystem components
1.3	Explore the NFV concepts for vAPG43L
2	Introduce the concept of Managed Object Model - MOM
2.1	Define the concepts that are needed for the comprehension of information modelentities
2.2	Describe the functions provided by Managed Element Management
2.3	Explore Managed Object in CPI store — Alex
3	Explain how to connect to the vAPG43L
3.1	Describe all types of session
3.2	Acknowledge Northbound interface - NBI
3.3	Recognize Ericsson Command-Line Interface — ECLI
4	Introduce User Management Information Model
4.1	Define Central User Management using LDAP server for central user authentication
4.2	Define Local User Management authentication for Troubleshooting users
4.3	Explain concepts for User Management in vAPG43L
4.4	Introduce all pre-defined Roles for vAPG43L users
4.5	Explain user administration in vAPG43L using User Management information model

5 Introduce the principles of the alarm system on the vAPG43L
5.1 Verify the alarm system in vAPG43L
5.2 Explain routing of alarm printouts
5.3 Explain Audit Logging Management

6 Describe the File Management Subsystem (FMS) implemented in vAPG43L
6.1 Describe the main file handling functions used in FMS
6.2 Verify how to handle files in FMS using MOM
6.3 Describe the CP backup functions supported in vAPG43L
6.4 Recognize Command Log Management
6.5 Describe Data Transfer Management
6.6 Explain Direct Data Transfer Management

7 Describe the principles of the Statistics and Traffic Measurement subsystem STS in vAPG43L
7.1 Introduce Statistics and Traffic Measurement Information model
7.2 Have a basic understanding of STS concepts and their implementation in vAPG43L
7.3 Describe the Data Record Management principals

8 Explain how to perform a backup of the vAPG43L
8.1 Explain the backup procedure
8.2 Explain how to restore an vAPG43L from a previously created backup
8.3 Describe the software upgrade process

Target audience:

System Technician

Prerequisites:

Successful completion of the following courses:

APG 43L Native to Virtual Delta, LZU1082725 (WBL)

Duration and class size:

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

vAPG43L Recovery Procedures

LZU1082727 R1A

Description:

Do you want to know how to recover the vAPG43L when it is not working normally? Do you want to know how to find the correct indication to recover the vAPG43L? This course will bring all these answers by engaging you in theoretical and practical sessions.You will have the opportunity to explore the vAPG43L functionalities with recovery procedures.
After attending this course the students will know how to recover the vAPG43L in a fast and correct manner.

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	Present the prerequisites for recovery of vAPG43L
1.1	Recognize what recovery is
1.2	Present vAPG43L aspects related to recovery
1.3	Perform data collection for recovery of vAPG43L
1.4	Describe the health check for vAPG43L
1.5	List the recovery procedures available on vAPG43L
1.6	Recognize the information that needs to be included in the CSRs
2	Describe how to perform a backup and restore for the vAPG43L
2.1	Explain the backup procedure
2.2	Explain how to restore an vAPG43L from a previously created backup
2.3	Acknowledge the software upgrade process
3	Describe the system recovery methods for vAPG43L
3.1	Identify the type of recovery functions before to choose the most appropriated recovery action
3.2	Check vAPG43L statuses
3.3	Practice Single Node Repair procedure
4	Describe the Data Disk recovery procedure
4.1	Recognize when a Data Disk Procedure should be executed
4.2	Practice a Single Data Disk recovery procedure

Target audience:

This course is suitable for anyone who is required be able to configure/operate/maintain vAPG43L

Prerequisites:

Successful completion of the following courses:

vAPG43L Operation and Maintenance, LZU1082726

Duration and class size:

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

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vAPZ 212 70 Operation and Maintenance

LZU1082472 R1A

Description:

Why virtualize? Do you know how to maintain APZ 212 70 secure and reliable in the cloud? Do you need to operate a virtual IP-STP, SPX, CTC and/or virtual MSC-S? This course will teach the student how to operate and maintain APZ 212 70 secure and free from alarms in a Data Center (DC).

The student will learn and practice how to operate the virtual Dual Blade platform for vIP-STP, vSPX, vCTC and vMSC-S, required when deploying the new generation of virtual Compact and High Capacity nodes. The course will also guide the student to intepret the APZ requirements on the Network Functions Virtualization Infratructure (NFVI).

Learning objectives:

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

1	Explain why a virtual APZ is needed
1.1	Review computer industry challenges
1.2	Reflect how to protect CAPEX and OPEX
1.3	Show how virtualization reduces cost
2	Introduce Virtualized APZ Infrastructure
2.1	Relate AXE Platform with an End-user
2.2	Describe the virtualized APZ Hardware
2.3	Define VNF and NFVI Resource Views
3	Compare Virtual APZ System Delta
3.1	Summarize Compute Resource Impact
3.2	Observe Network Resource Impact
3.3	Present Storage Resource Impact
4	Practice traditional APZ exercises
4.1	Check Health
4.2	Clear Alarms
4.3	Take Backup
4.4	and more
5	Clarify Cloud Compute Architecture
5.1	Explain relevant processor terminology
5.2	Compare processor signaling options
5.3	Consider compute capacity vs. security

Target audience:

This course is suitable for anyone who is required be able to configure/operate/maintain vAPZ 212 70.

Prerequisites:

Successful completion of the following courses:

MSS Overview, LZU1082437 AXE on BSP 8100 Operation and Configuration, LZU1082241
Virtualization Concepts in MSS, LZU1082453
APG43L Operation and Maintenanace, LZU1089484

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.

www.ericsson.com/ourportfolio/services/learning-services

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
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

Target audience:

This course is suitable for anyone who is required be able to configure/operate/maintain DSC1.

Prerequisites:

 Successful completion of the following courses:

EPC System Survey, LZU1087977
Virtual EPC Overview - LZU1082264
IMS Overview, LZU1082585
Knowledge of Cloud, Virtualization 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 a technical environment using equipment and tools.

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Virtual AXE Operation and Configuration

LZU1082728 R1A

Description:

Are you new to AXE? Do you need to practice operations and get hands-on an AXE? Do you know the difference between virtual APG (vAPG) and virtual APZ (vAPZ)? Have you understood how to operate IP functions in virtual APZ? Do you need to deploy nodes as HLR, CTC/MSC, IP-STP and TSS?
This course provides hands-on exercises on Compact AXE. The daily virtual AXE operations are explained and practiced covering both vAPG and vAPZ functionalities.
The AXE Operation course adds value to the operator since the students receives practical AXE experience, as well as knowledge in basic IP.
This course is a requirement for all other MSS courses.

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.

Learning objectives:

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

1	Explain Virtualization Concepts
1.1	Describe Virtualization Network Function in AXE
1.2	Explain Virtual Machine concept
1.3	Describe Cloud Infrastructure
2	Describe vAXE structure
2.1	Explain virtual AXE components
2.2	Describe Network Function Virtualization Infrastructure
2.3	Compare Native and Virtual APZ
3	Practice Command Handling and how to use winfiol in AXE
3.1	Handle WinFIOL to communicate with AXE
3.2	Practice winfiol resources
3.3	Practice how to login to vAXE node
3.4	Practice how to switch from APG to CP
3.5	Introduce Managed Object structure
3.6	Learn AXE command structure
3.7	Practice to identify parameters and interpret printouts
4	Practice operation actions in AXE
4.1	Explain general operation procedures in AXE

Target audience:

System Technician

Prerequisites:

Successful completion of the following courses:

MSS Overview, LZU1082437

Duration and class size:

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

www.ericsson.com/ourportfolio/services/learning-services

Virtual Blade Cluster Operation and Maintenance

LZU1082729 R1A

Description:

Do you know that Virtual Blade Cluster is a system in which are involved more than one node configured differently in function and Virual Machine as a MSC or a HLR application, and a Signaling Proxy (SPX)? Would you like to be able to able to understand, operate and maintain a Virtual CP Cluster System at Cluster and Blade level on a Virtualized Network Function?

This course contains a balanced description of the classical AXE Platform Applications delivered by Ericsson and the APZ Blade Cluster system operating in a Network Function Virtualized Infrastructure

Through practical exercises the participants will gain experience in handling a Blade Cluster system by sending commands and analyzing alarms and printouts

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   Provide an overview of the Virtual APZ Blade Cluster system
1.1   State what a Virtual APZ Blade Cluster system is.
1.2   Discuss the APZ evolution.
1.3   Identify the basic O&M concepts applied to a Virtual APZ Blade Cluster system
1.4   Introduce new concepts, like Single-Sided-CP and Buddy-MSC
1.5   Describe Protocols and Signaling in Blade Cluster
1.6   Explore how the MSC functionality is spread out equally on the blades

2   Describe NFV and NVFI for Virtual Blade Cluster
2.1   Recognize Architecture of Virtual Blade Cluster
2.2   Describe VNF Internal and External Traffic Network
2.3   Explain separation of SCTP based traffic in Virtual Blade Cluster
2.4   Describe how to instantiate and boot a new MSC VM
2.5   Explain how to remove Cloud resources
2.6   Compare Native (BSP) and Virtual Blade Cluster

3   I/O in BC Systems
3.1   Recognize the Virtual APG43L characteristics and command lines for Virtual APZ in Blade Cluster systems.

3.2   Use command lines to access the CP Cluster in Virtual APZ Environment.

3.3   Execute commands and analyze printouts in protected and unprotected modes.

4   Demonstrate use of the Cluster Handler (CH) in a CP Cluster system

4.1   Describe the CH software components

4.2   Describe the Cluster Handler terminologies and concepts.

4.3   Describe Cluster CPs states and sub-states.

4.4   Execute commands and understand printouts used to support the CP Cluster operation and maintenance procedures.

5   Operate the APZ 214 20 in a CP Cluster system

5.1   Demonstrate use of Cluster and Blade backup functions.

5.2   Demonstrate use of the Function Change for Middleware, Plex, Cluster Handler and Program Correction deployment.

5.3   Present the Health Check feature.

6   Discriminate the Fault Handling recovery procedures for APZ 214 20

6.1   Demonstrate use of the Cloning function.

6.2   Demonstrate use of Cluster and Blade recovery functions and alarms.

6.3   List the Cluster Recovery mechanisms for the Virtual APZ Blade Cluster.

6.4   Recognize the APZ 214 20 logs located in APG43L.

Target audience:

This course is suitable for anyone who is required be able to configure/operate/maintain Virtual Blade Cluster Operation and Maintenance

Prerequisites:

Successful completion of the following courses:

vAPZ 212 60 Operation and Maintenance - LZU1082472
APZ 212 60F Operation & Maintenance, LZU1089746
The following course is recommended:
APG43L Operation and Maintenance, LZU1089484 (or equivalent knowledge)

Duration and class size:

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

Virtualization Concepts in MSS

LZU1082453 R1A

Description:

What are the benefits with Virtualized IP-STP, CTC and MSC-S nodes in a Network? Can a Native AXE based Node convert to a Virtualized AXE based Node? Is it possible and secure to deploy a Virtualized AXE based Node in a third party Data Center? Can a Virtualized Node coexist seamlessly with Native Node?

The Virtualization Concepts in MSS course answers these questions and in addition it provides a comprehensive base for understanding how Ericsson continues to provide and support Telco grade total solutions.

vIP-STP (1+1), vCTC (1+1) and vMSC-S (1+1) are the first released AXE based virtualized configurations. The 1+1 redundancy scheme, represents the Dual Blade entry configuration for low/medium capacity. Full feature parity with the Native MSC is achieved, hence same features are available as for the Compact MSC-S.

Learning objectives:

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

1	Explore 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	Describe the new architecture terminology
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	Identify benefits with virtualized AXE based nodes
3.1	Acknowledge the APZ/APG Platform Evolution towards Telco Data Center
3.2	Evaluate Multi-Applications Environment on BSP8100 Hardware and Decoupled Hardware for Virtualization Ready Systems
3.3	Compare GEP board utilization in BSP 8100 Multi-Application vs. Core Utilization in Virtualized Systems
3.4	Explore Virtual Machines required for Virtualized AXE Based Nodes

4	Clarify the impact from Compute, Network and Storage
4.1	Explain major Architectural Changes
4.2	Describe how IPMI, HW Watchdogs etc, are simulated by SW

4.3   Introduce vAPZ (APZ21270), vAPG products and Virtualized MAU (MAUS)
4.4   Explore L2/L3 connectivity in cloud
4.5   Recognize Support of IPonCP - IP address administration- on vCP
4.6   Explain how NTP is handled in virtualized systems
4.7   Explore the different storage options for the vAPG

5   Demonstrate the process to deploy a virtual AXE based node
5.1   Introduce Standard Procedure for deploying a VNF
5.2   Recognize the main steps for vMSC deployment (HOT, YAML, ISO, QCOW)
5.3   Explore how to apply L2/L3 to the operator needs

Target audience:

This course is suitable for anyone who is required to be familiar with virtualization concepts in MSS.

Prerequisites:

Successful completion of the following courses:

MSS Overview, LZU1082437

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.

vMSS Traffic Configuration

LZU1082575 R1A

Description:

Do you need to connect a virtual Mobile Softswitch (MSS) to the network? Are you aware of the configuration needed for making a call in MSS? Do you need to know the vMSC interfaces towards for 4G networks?

This course explores the configuration needed for the signaling within vMSC Server when connecting the User Equipment (UE) for GERAN, UTRAN and EUTRAN. The course provides both theory and practice in a simulated MSS environment, where calls can be made in order to verify that the signaling flow is correct. The vMSS Traffic Configuration course adds value to the operator since the students get trained in connecting MSS, which also serve as a base for other MSS courses.

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.

Learning objectives:

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

1	Acknowledge vMSS at Network Level
1.1	Verify the vMSS network and Identities
1.2	Acknowledge the vMSC interfaces and functions
1.3	Introduce Virtualization Concepts

2   Connect Virtual MSC-Server Blade Cluster to an IP Network
2.1   Recall Virtual Blade Cluster Concepts
2.2   Describe signaling and interfaces
2.3   Configure the IP on CP in virtual MSC-S
2.4   Configure virtual MSC-S Blade Cluster signaling interfaces

3   Describe and configure the Signaling Connection Control Part (SCCP) protocol
3.1   Analyze SCCP routing using GTT, SSN, SPC
3.2   Configure the SCCP signaling

4   Configure vMSC connection to MGw
4.1   Analyze the MGw connection options
4.2   Configure the MGw

5   Configure vMSC Connection to BSC and RNC
5.1   Explain 2G concept
5.2   Show how to connect vMSC to BSC

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Target audience:

System Engineer

Prerequisites:

Successful completion of the following courses:

AXE Multi-Applications on BSP 8100, LZU1082240
Mobile Signaling Concepts, LZU1082256
Virtualization Concepts in MSS - LZU1082453

Duration and class size:

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

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vMSS Troubleshooting

LZU1082576 R1A

Description:

Are there many IP or SIP troubles in the network? Does it take long time to fix the troubles? Is your company prepared for Voice over LTE?
This course will help the students to troubleshoot problems in the vMSS Network. The theory is generic, while the practical exercises provide examples from the vMSS reality. The course explains how to troubleshoot IP and SIP based Signaling, not limited to any protocol analyzer like Wireshark, not limited to any protocol
analyzer like Wireshark, as well as the difference between vMSC-S Compact and vMSC-S High. vMSC-S Compact is the commercial name when using the virtual Dual Blade platform, while vMSC-S High capacity is the commerical name when using the virtual Blade Cluster Platform.
This course adds value to the operator, since the students will learn how to communicate between each other when solving the fault, and also understand how to solve a trouble quicker.

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	Identify ways how to solve the problem
1.1	Identify and solve the problem — Introduction
1.2	List different general troubleshooting techniques
1.3	Describe some white-box information sources
2	Investigate Theory & Strategy
2.1	Introduce the troubleshooting procedure
2.2	Describe how to reproduce a problem
2.3	Explain the troubleshooting strategy
3	Demonstrate typical network troubles
3.1	Present end-to-end communication troubles
3.2	List network topology troubles
3.3	Explore troubles between packet switched and circuit switched protocols
4	List MSS Interfaces and Protocols

Target audience:

This course is suitable for anyone who is required to have detailed knowledge of MSC-S and M-MGW working experience

Prerequisites:

Successful completion of the following courses:

Extensive MSC-S and M-MGW working experience

Duration and class size:

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

VoLTE Interworking Concepts

LZU1082265 R1A

Description:

What is Voice over LTE Interworking? Why are SRVCC and DRVCC needed? How are they interworking with MSS? How can the operators benefit from this new technology?
The course provides a theoretical overview of SMS over SGs, CS Fallback (CSFB), Mobile Terminating Roaming Forward (MTRF), Single Radio Voice Call Continuity (SRVCC), Dual Radio Voice Call Continuity (DRVCC) and how they relate to Voice over LTE (VoLTE) explaining how the eUTRAN (4G) communicates with GERAN (2G), UTRAN (3G) and the MSS. The course describes the mobile interworking with IMS and other Voice over IP (VoIP) interworkings.
The VoLTE Interworking Concepts course adds value to the operator since it gives insight in how to manage the new technology and stay ahead of the market

Learning objectives:

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

1	Introduction – Why voice over LTE in MSS?
1.1	Analyze Business Perspective
1.2	Observe Subscriber Perspective
1.3	Summarize Operator Perspective
2	Demonstrate different Voice over LTE Solutions
2.1	Present Subscriber Options
2.2	Show Operator Options
2.3	Brief 3GPP Solutions
3	Investigate Voice over LTE using IMS
3.1	Introduce IMS Concept
3.2	Describe IMS Components
3.3	Illustrate VoLTE Call Flow
4	Analyze Voice over IP in MSS
4.1	Explore Mobile OSI Model
4.2	Explain MSS IMS Adaptation
4.3	Exemplify MSS IMS Interworking: SIP concepts
5	Coordinate Services, Handover and Fallback
5.1	Identify Network Interworking
5.2	Compare Network Design
5.3	Show Service Implementation
6	Discover Payload perspective

6.1   Distinguish FAX handling
6.2   Clarify HD Voice handling
6.3   Mid call codec negotiation
6.4   Recognize Quality of Service

Target audience:

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

Prerequisites:

Successful completion of the following courses:

Mobile Signaling Concepts, LZU1082256

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.