



Ericsson Network Manager (ENM) 19

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)



ENM 18 Operations for Transport Network

LZU1082737 R1A

Description:

This course provides students with an understanding of the Ericsson Network Manager (ENM) applications available for managing the Transport Networks. Students will learn to access and navigate the ENM tools using practical (hands-on) sessions. This course assumes that students have previously used an Ericsson Domain Management application, e.g. ServiceOn EM or OSS-RC to manage the network.

Learning objectives:

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

- 1 Provide a high-level overview of the Ericsson Network Management functionality
 - 1.1 Describe the overall functionality of the Ericsson Network Manager (ENM)
 - 1.2 Briefly compare ENM and ServiceOn EM
 - 1.3 Describe at a high level the ENM Fault Management (FM) features
 - 1.4 Explain at a high level the ENM Configuration Management (CM) features
 - 1.5 Discuss at a high level the ENM Performance Management (PM) features
 - 1.6 Review at a high level the ENM Security Management features
 - 1.7 Elaborate at a high level the ENM Node License Management features
 - 1.8 Outline at a high level the ENM Node Hardware Management features
 - 1.9 Discuss at a high level the ENM Node Backup Management features
 - 1.10 Explain at a high level the ENM Node Software Management features
 - 1.11 List the nodes supported by ENM (with focus on Transport Domain)
- 2 Provide an overview of the Common Applications and Tools in ENM
 - 2.1 List the general ENM tools
 - 2.2 Describe ENM documentation features
 - 2.3 Explain ENM Network Explorer features
 - 2.4 List the supported node tools
 - 2.5 Discuss ENM Topology Browser features
 - 2.6 Introduce ENM Log Viewer features
 - 2.7 Describe ENM Command Line Interface features
- 3 Access the ENM Server
 - 3.1 Describe the ENM access environment
 - 3.2 Review how ENM user roles are used in ENM
 - 3.3 Access the ENM Server and log into ENM
 - 3.4 View your user profile
 - 3.5 Change your user password
 - 3.6 Log out of ENM



- 4 Launch ENM Applications
 - 4.1 List the features of the Application Launcher
 - 4.2 Describe the Application Launcher Page Layout
 - 4.3 Access the Application Launcher online help
 - 4.4 View basic description of an application and launch applications.
 - 4.5 List applications by categories
 - 4.6 List applications in alphabetical order
 - 4.7 Create favorite applications and access applications from the favorites view.
 - 4.8 Search for applications
- 5 Access the ENM documentation
 - 5.1 List the available ENM documentation
 - 5.2 Access and view ENM online help
 - 5.3 Access and view the Customer Product Information (CPI) using ALEX
 - 5.4 Access and view ENM command documentation using the Command Line Interface
- 6 Use Network Explorer Application
 - 6.1 Describe the features and functions of the Network Explorer application
 - 6.2 Launch the Network Explorer and access the application's online help
 - 6.3 Describe the Network Explorer application layout
 - 6.4 Create and delete collections and saved searches
 - 6.5 Manage existing collections and saved Searches
- 7 Automatically Discover your Network
 - 7.1 Describe the features and functions of the AutoDiscovery application
 - 7.2 Create AutoDiscovery Activity
 - 7.3 Create Connection Profile
- 8 Use the Network Viewer Application
 - 8.1 Describe the features and functions of the Network Viewer Application
 - 8.2 Launch the Network Viewer and access the application's online help
 - 8.3 Describe the Network Viewer application layout
 - 8.4 Add and delete nodes in Network Viewer
 - 8.5 Set node location, locate and search node in topology
- 9 Use the Topology Browser Application
 - 9.1 Describe the features and functions of the Topology Browser application.
 - 9.2 List and describe the Topology Browser application windows.
 - 9.3 View the Object Model of a selected node
 - 9.4 View and Edit Managed Object Attributes
- 10 Navigate the ENM Command Line Interface (CLI)
 - 10.1 Describe the common features of the ENM CLI
 - 10.2 Launch the ENM CLI and access the application's online help
 - 10.3 Create ENM CLI command aliases
 - 10.4 Create and use batch files in the ENM CLI
 - 10.5 Import and Export CLI commands

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- 10.6 Use the ENM Shell Terminal to access nodes using ssh
- 10.7 List and describe the ENM CLI command sets
- 11 Use the ENM Log Viewer
 - 11.1 Describe features and functions of the ENM Log Viewer application
 - 11.2 Launch the Log Viewer and use the application's online help
 - 11.3 Describe the layout of Log Viewer application
 - 11.4 Use the Log Viewer to search the ENM logs and view the log details
- 12 Provide an overview of Network Monitoring in ENM
 - 12.1 Describe at a high level the network monitoring functionality in ENM
 - 12.2 Review how alarms are managed in ENM
 - 12.3 List and describe the purpose of the graphical user applications used for monitoring the network
 - 12.4 Describe how the ENM CLI functionality can be used to monitor the network
- 13 Monitor Active Alarms using the Alarm Monitor
 - 13.1 Describe features and functions of the Alarm Monitor application
 - 13.2 Launch the Alarm Monitor and access the application's online help
 - 13.3 Describe and configure the Alarm Monitor application layout
 - 13.4 Use the Alarm Monitor filtering function to view selected alarms
 - 13.5 View alarm details, acknowledge/un-acknowledge and export alarms
 - 13.6 Enable/Disable Alarm Supervision and Initiate Alarm Synchronization
- 14 Use the Alarm Overview to monitor Alarm Statistics in the Network
 - 14.1 Describe features and functions of the Alarm Overview application
 - 14.2 Launch the Alarm Overview and access the application's online help
 - 14.3 Describe and configure the Alarm Overview application widgets
 - 14.4 Use the Alarm Overview application to monitor the network faults in a dashboard view
- 15 View active and historical alarms using Alarm Search
 - 15.1 Describe features and functions of the ENM Alarm Search application
 - 15.2 Launch the Alarm Search and access the application's online help
 - 15.3 Describe Alarm Search application layout
 - 15.4 Configure the Alarm Search criteria
 - 15.5 View and export the Alarm Search results
- 16 Use the Alarm Supervision Status to Monitor Alarms collection in the Network
 - 16.1 Describe features and functions of the Alarm Supervision Status application
 - 16.2 Launch the Alarm Supervision Status application and access the application's online help
 - 16.3 Describe Alarm Supervision Status application layout
 - 16.4 View the network supervision summary
 - 16.5 Filter the network supervision details by network element and supervision states
 - 16.6 Enable/Disable Alarm Supervision and Initiate Alarm Synchronization.
- 17 Use the Network Health Monitor to verify the health of the Network
 - 17.1 Describe features and functions of the Network Health Monitor application
 - 17.2 Launch the Network Health Monitor and access the application's online help

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- 17.3 Describe and configure the Network Health Monitor application
- 17.4 Monitor the network using the Network Health Monitor dashboard widgets
- 18 Manage Node Software, Hardware, Backup and License Jobs in the Software Hardware Manager
 - 18.1 Describe the features and functions of the SHM Manager
 - 18.2 Review the types of jobs supported by the Software Hardware Manager
 - 18.3 Launch the SHM Application and access the application's online help
 - 18.4 View SHM jobs, job details, job logs and node activities for selected jobs
 - 18.5 Filter, cancel, delete, and export SHM jobs
 - 18.6 Use SHM job logs for troubleshooting SHM jobs
- 19 Enhance Alarm Supervision via FMX
 - 19.1 Describe features and functions of the FMX application
 - 19.2 FMX modules management
 - 19.3 FMX modules parameter
 - 19.4 FMX modules statistics
 - 19.5 Filter active triggers
- 20 Use ENM CLI Alarm command set to view and manage alarms
 - 20.1 Describe the ENM CLI commands used to monitor alarms
 - 20.2 Launch the ENM CLI and access the online help for managing alarms using the CLI
 - 20.3 View open alarms using the ENM CLI
 - 20.4 View historical alarms using the ENM CLI
 - 20.5 Acknowledge and Unacknowledge alarms using the ENM CLI
 - 20.6 Enable/Disable Alarm Supervision
- 21 Provide an overview of Node Software, Hardware, Backup and License Administration in ENM
 - 21.1 Provide an overview of Node Software, Hardware, Backup and License Administration in ENM
 - 21.2 List applications and tools available in ENM for managing node software, hardware, backup and license
 - 21.3 List the node type support for hardware, backup and license administration in ENM
- 22 Manage Node Software
 - 22.1 Describe features and functions of Node Software Administration in the SHM application
 - 22.2 List the node types that support the Create Backup Job feature in ENM
 - 22.3 Launch the SHM Software Administration feature and access the features' online Help
 - 22.4 Describe and configure the SHM Software Administration page layout
 - 22.5 View the installed software on selected nodes using SHM
 - 22.6 Import and view available software packages in ENM
 - 22.7 Describe the process to import software and perform node upgrades using SHM
 - 22.8 Describe the ENM CLI commands available to manage node software
- 23 Extend ENM compatibility with Release Independence
 - 23.1 Describe features and functions of Release Independence application

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- 23.2 Model Validation
- 23.3 Add ENM Support
- 23.4 Remove ENM Support
- 24 Manage Node Backups
 - 24.1 Describe the features and functions of the node Backup Administration in ENM
 - 24.2 List the node types that support the node backup administration features in ENM
 - 24.3 Access the SHM Backup Management feature and access the features' online Help
 - 24.4 Describe and configure the Backup Administration application pages
 - 24.5 View and filter the node backup inventory in SHM
 - 24.6 View node backup details in SHM
 - 24.7 Create, manage, restore and delete node backups in SHM
 - 24.8 Manage backups using the ENM CLI
- 25 Manage Node Hardware Inventory
 - 25.1 Describe the features and functions of Node Hardware Administration in the ENM
 - 25.2 Access the SHM Hardware Administration feature and access the features' online Help
 - 25.3 Describe and configure the SHM Hardware Administration pages
 - 25.4 View, filter and export the node hardware information using SHM
 - 25.5 Use the ENM CLI to view node hardware information
 - 25.6 View and filter license key summaries using SHM
- 26 Manage Node Licenses
 - 26.1 Describe features and functions of the Node License Administration in ENM
 - 26.2 Access the SHM License Administration feature and access the features' online Help
 - 26.3 Describe and configure the SHM License Administration application
 - 26.4 View, filter and export License Key features and capacities using SHM
 - 26.5 Describe the process to import, install and delete Node License Keys Files using SHM
 - 26.6 View the status of node's License features and capacities using the Topology Browser and ENM CLI
- 27 Provide an overview of Node Performance Management in ENM
 - 27.1 Describe the features and functions of ENM Node Performance Management
 - 27.2 List and describe how network performance data is initiated, collected, and managed in ENM
 - 27.3 List and describe the purpose of the ENM Node Performance graphical and CLI user applications
- 28 Manage Statistical Based Subscriptions Using ENM
 - 28.1 List the types of Statistical Subscriptions supported by ENM
 - 28.2 Describe features and functions of the PMIC application
 - 28.3 Launch the PMIC application and access the application's online help
 - 28.4 Describe the PMIC application page layout
 - 28.5 View and analyze the PMIC subscription dashboard
 - 28.6 Review the common and specific steps for creating different types of Statistics Based Subscriptions in PMIC

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- 28.7 View, Create, modify, and delete Statistics Based Subscriptions Profiles
- 28.8 Activate and Deactivate Subscription Profiles
- 28.9 View Statistics Based Performance data using the ENM CLI
- 28.10 Describe the PMIC features for Managing Event Based Subscriptions
- 29 Use the KPI Management Application to Create and manage KPIs
 - 29.1 Describe features and functions of the KPI Management Application
 - 29.2 Launch the KPI Management Application and access the application's online Help
 - 29.3 Describe KPI Management application page layout
 - 29.4 View existing KPIs details and status
 - 29.5 Create, activate, deactivate and delete KPIs
- 30 Provide an overview of Node Configuration Management in ENM
 - 30.1 Describe how network configuration management data is managed in ENM
 - 30.2 List and describe the purpose of the CM graphical user applications.
 - 30.3 List and describe the purpose of the CM CLI functionality
- 31 Node configuration via Auto Provisioning
 - 31.1 Describe how Auto Provisioning feature and node dependencies
 - 31.2 Node integration via auto-provisioning
 - 31.3 Node reconfiguration via auto-provisioning
 - 31.4 Hardware replacement management with auto-provisioning
- 32 Use Link Management to handle physical links between endpoints on network elements.
 - 32.1 Describe how to create links between endpoints
 - 32.2 Describe how to edit links between endpoints
 - 32.3 Describe how to view links between endpoints
 - 32.4 Describe how to delete links between endpoints
 - 32.5 Describe how to import / export links between endpoints
- 33 Review node tools available in ENM
 - 33.1 Access node CLI for supported nodes.
- 34 Use Configuration Management CLI to manage the network configuration
 - 34.1 Describe purpose and function of the ccredit command set
 - 34.2 Describe the ccredit configuration related commands
 - 34.3 Launch the ENM CLI and access the ccredit documentation
 - 34.4 Use ccredit command set to view and edit node configuration data
- 35 Manage Node Configuration handling using the ENM CLI
 - 35.1 Understand the ENM configuration concepts of Live and Non-live configurations
 - 35.2 List the operations that can be performed using ENM configurations
 - 35.3 List existing configurations
 - 35.4 Create a Non-Live Configurations
 - 35.5 Activate a Non-Live Configuration
 - 35.6 Compare Configurations
 - 35.7 Delete a Non-Live Configuration

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- 36 Import and export node configurations using the ENM CLI Describe the ENM Configuration export and import features
 - 36.1 Describe the export file formats
 - 36.2 Explain how to create export filters
 - 36.3 Review the configuration export process
 - 36.4 Export a configuration using CLI
 - 36.5 Describe the import file formats
 - 36.6 Review the configuration import process
 - 36.7 Import a configuration using the ENM CLI and Bulk Configuration GUI

Target audience:

This course is suitable for Engineers and technicians who require the use of ENM tools to configure, monitor and troubleshoot Transport networks.

Prerequisites:

Successful completion of the following courses:

Students should have prior experience using an Ericsson Domain Management application, e.g. ServiceOn EM or OSS-RC to manage their Network.

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 delivered either in a classroom or remotely.





Python in ENM

LZU1082735 R1A

Description:

Ericsson Network Manager (ENM) is making extensive use of scripting; combining the flexible and approachable syntax of Python, with the comprehensive ENM Command Line (CLI) interfaces. But how much do you understand of the existing scripts? Could you leverage these capabilities to improve your productivity? How close are you to designing a script that feeds off the ENM Northbound Interface (NBI)?

This course will re-enforce your Python fundamentals, introduce you to the built-in ENM scripting Python Library, and familiarize you with the ENM Northbound REST interfaces. Making you more comfortable with building future-proof Python skills within ENM.

Learning objectives:

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

- 1 Recognize the connection between ENM and Python
 - 1.1 Confirm common Ericsson Network Manager (ENM) command line interface (CLI) use cases
 - 1.2 Clarify the place of Python scripting in ENM
 - 1.3 Access the general scripting virtual machines (Scripting VM's) from ENM
 - 1.4 Describe the Python scripting environment in ENM
- 2 Demonstrate mastery of basic programming skills
 - 2.1 Access the Python interactive mode to practice with instant feedback
 - 2.2 Check the Python version installed on the scripting VM
 - 2.3 Write a basic Python script (output and comments)
 - 2.4 Edit a script in Linux using vi
 - 2.5 Ensure the program is executable in Linux
- 3 Master enough fundamental Python programming for ENM
 - 3.1 Future-proof the "print" function by using the Python 3 "future" module
 - 3.2 Identify the most common datatypes available to Python variables
 - 3.3 Check the mathematical operators, and the operation's order of priority
 - 3.4 Work with sequences
 - 3.5 Compare variable
 - 3.6 Experience the importance of indents in Python programming
 - 3.7 Write a conditional statement ("if, elif, else")
 - 3.8 Iterate a command over a range of values ("loop, while")
 - 3.9 Access individual indexed values within a sequence (string, list, tuple, dictionary, set)
 - 3.10 Manipulate values in a sequence (initialize, add, edit, delete)

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- 3.11 Request user-input and assign the value to a variable ("raw_input")
- 3.12 Call built-in functions and object methods
- 3.13 Define and call a Python function (e.g., to create an interactive menu)
- 3.14 Use "stubs" to ear-mark placeholders and test your script prior to completion
- 4 Leverage ENM CLI commands using the ENM scripting library
 - 4.1 Search the ENM online documentation
 - 4.2 Choose the CLI commands to work with, in list or table mode
 - 4.3 Import the "enmscripting" library
 - 4.4 Open and close a session (authenticate and return an "EnmSession" object)
 - 4.5 Distinguish between "terminal" list and "command" object to execute CLI
 - 4.6 Compare the printouts of the objects created, of the response from the command, and of the output of the response
 - 4.7 Analyze the printout using iterations and conditions
 - 4.8 Access information via ENM scripting methods and attributes
 - 4.9 Define a function (with arguments) to show a "status" in a supported technology
 - 4.10 Modify a parameter in a node's managed information model
- 5 Enable scripts to leverage the ENM REST-NBI
 - 5.1 Experience REpresentational State Transfer (REST) in ENM
 - 5.2 Authenticate a REST session using user-tokens and cookies
 - 5.3 Execute Create, Read, Update, Delete (CRUD) via REST-endpoints
 - 5.4 Handle REST requests and JavaScript Object Notation (JSON) responses with a Python script
 - 5.5 List all ENM REST-endpoint on the ENM NBI
 - 5.6 Explore some use-cases of the REST interface for configuration management
- 6 Run scripts from outside ENM
 - 6.1 Set-up an SSH shared key authentication for external access to a scripting VM
 - 6.2 Install Python locally on a PC with access to ENM Launcher
 - 6.3 Authenticate a Python session by safely passing a username and password
 - 6.4 Authenticate a Python session using an Single Sign-on (SSO) token
- 7 Self-discover and practice further ENM and Python skills
 - 7.1 Schedule a crontab job on the preferred VM
 - 7.2 Add help text to a function
 - 7.3 Format the print output
 - 7.4 Feed arguments to a Python function from the Linux command line
 - 7.5 Explore the implications of namespace management (local vs global)
 - 7.6 Issue OS commands
 - 7.7 Write to files, and read from files
 - 7.8 Handle exceptions
 - 7.9 Work with timestamps
 - 7.10 Explore more advanced Python aspects (regular expressions, classes, ...)

**Target audience:**

This course is suitable for anyone who is required be able to configure network using Python in ENM

Prerequisites:

Successful completion of the following courses:

ENM 18 Operations for Radio Access Network, LZU1082671

Or

ENM Operations for Core Network, LZU1082672

The participants should be familiar with using managed objects for LTE nodes, ENM CLI, basic programming concepts, basic Linux skills.

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.





An Overview of ENM for Classical OSS Users

LZU1082519 R2A

Description:

This online training develops fundamental overview of the Ericsson Network Manager (ENM) applications. It is the first step to using ENM in RAN or Core Network and is a prerequisite for attending other training in ENM Portfolio.

It consists of two modules focused at Ericsson Network Manager User Interface and ENM Applications and their salient features. This covers all aspects of what ENM as a Network Management system does. Applications for fault, configuration, accounting, performance and security (FCAPS) are explained here. It prepares participants to go through deeper dive on various hands-on training after its completion.

Learning objectives:

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

- 1 Navigate Ericsson Network Manager's user interface
- 2 Access various configuration management applications via ENM's Application launcher
- 3 Describe the salient features of each application in brief
- 4 Access various Fault Management applications via ENM's Application launcher
- 5 Access Performance Management applications via ENM Application launcher
- 6 Access Security Management through ENM Application launcher
- 7 Describe the salient features of each application in brief
- 8 Explain ENM 5G Management

Target audience:

This course is suitable for anyone who is required to have detailed knowledge of ENM prior to taking the technical advanced training on ENM.

**Prerequisites:**

Successful completion of the following courses:

Basic knowledge of Classic OSS Network Operations and Administration will be useful for better understanding.

Duration and class size:

The length of the course is 2 hours and the maximum number of participants per session is 1

Learning situation:

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



Fault Management in ENM using FMX

LZU1082744 R1A

Description:

This course is based on ENM with the completely new and modernized FMX. The student will gain knowledge about the purpose of FMX regarding the contents, functionality and the connection to other applications in the management system.

The course will discuss the use of FMX as a tool to develop and maintain an expert system for intelligent alarm handling, that is, to incorporate and apply expert knowledge in rules, which are put into FMX modules. The main focus will be on how to create, develop and administer FMX modules and rules.

In a safe training environment, the students are guided through structured exercises, where mistakes are turned into a learning opportunity rather than creating network problems.

Learning situation:

This course is based on theoretical lessons and practical exercises. The course is given in a classroom by a qualified instructor.

Learning objectives:

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

- 1 Describe FMX
- 2 Use the different FMX user applications
- 3 Use the FMX building blocks for rule design
- 4 Administrate and use advanced features in FMX

**Target audience:**

This course is suitable for system administrators or anyone who is required to understand the features of FMX and how to perform fault management using this tool in ENM.

Prerequisites:

Successful completion of the following courses:

ENM 18 System Administration LZU1082670

or

ENM on Open-stack cloud System Administration LZU1082738

or

the participants should be familiar with Fault Management. Experience in programming or object-oriented programming is an advantage.

Duration and class size:

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



ENM 19 Operations for Core Networks

LZU1082809 R1A

Description:

Is your Core network management moving from OSS-RC to the latest Ericsson Network Manager (ENM)? Are you concerned with the competence needed to manage your Core network with ENM?

This course provides you with an understanding of the Ericsson Network Manager (ENM) applications available for managing networks with a focus on Packet Core and IMS nodes. This course is extremely instrumental in enabling you to operate the core network using ENM tools.

The training will be delivered through Digital media as well as Classroom Instructor-led sessions for maximizing the potential of both and enabling participants to capture more through self-paced learning and interacting with the instructor in the same training.

Learning situation:

This is a Blended Learning.

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

Learning objectives:

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

- 1 Describe Ericsson Network Manager tools and interfaces
 - 1.1 Describe the overall functionality of the Ericsson Network Manager (ENM)
 - 1.2 Describe ENM Tools at a high level
 - 1.3 Accessing the ENM Server
 - 1.4 Navigating the ENM Graphical User Interface
 - 1.5 Access the ENM Documentation
- 2 Using the Network Explorer Application
- 3 Access the Node Tools
- 4 Use the Topology Browser Application
- 5 Navigate the ENM Command Line Interface (CLI)
- 6 Describe Fault Management in ENM
 - 6.1 Monitor Active Alarms using the Alarm Monitor



- 6.2 Use the Alarm Overview to Monitor Alarm Statistics in the Network
- 6.3 View Active and Historical Alarms using Alarm Search
- 6.4 Use the Alarm Supervision Status to Monitor Alarms collection in the Network
- 7 Describe Network Monitoring in ENM
 - 7.1 Use the Network Health Monitor to verify the health of the Network
 - 7.2 Use Node Monitor to monitor the network status
 - 7.3 Use ENM CLI to monitor Network Elements
- 8 Describe Software and Hardware Management in ENM
 - 8.1 Describe features and functions of the Software and Hardware Manager (SHM) Application
 - 8.2 Manage Node Backups
 - 8.3 Manage Node Hardware Inventory
 - 8.4 Manage Node Software
- 9 Describe Performance Management in ENM
 - 9.1 Provide an Overview of ENM Performance Management
 - 9.2 Manage network Performance Initiation and Collection (PMIC)
- 10 Initiate and view network traces
- 11 Describe Configuration Management in ENM
 - 11.1 Provide an overview of Configuration Management (CM) in ENM
 - 11.2 Use Configuration Management CLI to manage the network configuration
 - 11.3 Manage Live and Non-live configurations for network configuration
- 12 Use the Core Network Operations Manager (CNOM) to manage a core network

Target audience:

This course is suitable for anyone who is required be able to operate ENM for core networks.

Prerequisites:

Successful completion of the following courses:

Students should have prior experience using the OSS-RC to manage the network. Students should also have prior experience with Packet Core or IMS nodes.

Duration and class size:

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



Time schedule

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

The entire training is divided into five modules. Each module contains different topics covered as web-based learning, classroom sessions, and practice exercises.

Day	Topics in the course	Estimated Time (hours)
1	ENM Introduction & ENM Tools	
	Self-paced WBL: Chapter 1.1-1.2 (attend prior to reaching the training center) Classroom Sessions and Practical Exercises: Chapters 1.3-5	1 5
2	ENM Network Monitoring	
	Classroom Sessions and Practical Exercises: Chapter 6	1.5
	Self-paced WBL: Chapter 7-8.1	0.5
	Classroom Sessions and Practical Exercises: Chapters 8.2-8.4	2.5
	Self-paced WBL: Chapter 9.1	0.5
Classroom Sessions and Practical Exercises: Chapter 9.2	1	
3	Node Software and Hardware Administration	
	Classroom Sessions and Practical Exercises: Chapters 10	1.5
	Self-paced WBL: Chapter 11.1	0.5
	Classroom Sessions and Practical Exercises: Chapters 11.2-12	4





ENM 19 Operations for Radio Access Network

LZU1082810 R1A

Description:

This blended training provides participants with an excellent opportunity in understanding the Ericsson Network Manager (ENM) applications available for managing the LTE, WCDMA and GSM Radio Access Networks. The training will be delivered through Digital media as well as Classroom Instructor-led sessions for maximizing the potential of both and providing participants to capture more through self-paced learning and interacting with the instructor in the same training. Students will learn to access and navigate the ENM tools using practical (hands-on) sessions. This course assumes that students have previously used OSS-RC to manage the network.

Learning situation:

This is a Blended Learning.

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

Learning objectives:

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

- 1 Provide a high-level overview of the Ericsson Network Management functionality
- 2 Provide an overview of the Common Applications and Tools in ENM
- 3 Access the ENM Server
- 4 Launch ENM Applications
- 5 Access the ENM documentation
- 6 Use Network Explorer Application
- 7 Use the Network Viewer Application
- 8 Access the Node Tools
- 9 Use the Topology Browser Application
- 10 Use the ENM Log Viewer
- 11 Provide an overview of Network Monitoring in ENM
- 12 Monitor Active Alarms using the Alarm Monitor



- 13 Use the Alarm Overview to monitor Alarm Statistics in the Network
- 14 View active and historical alarms using Alarm Search
- 15 Use the Alarm Supervision Status to Monitor Alarms collection in the Network
- 16 Use the Network Health Monitor to verify the health of the Network
- 17 Monitor Nodes Details Using Network Health Analysis
- 18 Use the Node Monitor to Monitor Individual Nodes and Node Cells
- 19 Verify Node Health using Node Health Check
- 20 Use ENM Cell Management to view and manage cells
- 21 Use ENM CLI ccredit command set to monitor Radio Access Nodes
- 22 Use ENM CLI Alarm command set to view and manage alarms
- 23 Create ENM CLI Batches and Aliases
- 24 Provide an overview of Node Software, Hardware, Backup and License Administration in ENM
- 25 Manage Node Software, Hardware, Backup and License Jobs in the Software Hardware Manager
- 26 Manage Node Backups
- 27 Manage Node Hardware Inventory
- 28 Manage Node Licenses
- 29 Manage Node Software
- 30 Provide an overview of Node Performance Management in ENM
- 31 Manage Statistical Based Subscriptions Using ENM
- 32 Manage Node Event Based Subscriptions
- 33 Use the KPI Management Application to Create and manage KPIs
- 34 Describe the purpose of the Automatic ID Management Application in ENM
- 35 Provide an overview of Node Configuration Management in ENM
- 36 Perform Configuration Management using Parameter Management
- 37 Use Configuration Management CLI to manage the network configuration
- 38 Manage Node Configuration handling using the ENM CLI
- 39 Import and export node configurations using the ENM
- 40 Add new Radio Access Nodes using ENM provisioning applications

**Target audience:**

This course is suitable for anyone who is required be able to operate ENM for Radio Access Network.

Prerequisites:

Successful completion of the following courses:

Students should have prior experience using OSS-RC to manage the Radio Access Networks. Participants should also attend the following WBL training prior to attending this detailed hands-on course:

An Overview of ENM for Classical OSS Users (LZU1082519)

Duration and class size:

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



Time schedule

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

The entire training is divided into five modules. Each module contains different topics covered as Web-based learning, classroom sessions, and practice exercises.

Day	Topics in the course	Estimated Time (hours)
1	ENM Introduction & ENM Tools Self-paced WBL: Chapters 1-2 (attend prior to reaching the training center)	1
	Classroom Sessions and Practical Exercises: Chapters 3-10	6
2	ENM Network Monitoring Self-paced WBL: Chapter 11	0.5
	Classroom Sessions and Practical Exercises: Chapters 12-23	5.5
3	Node Software and Hardware Administration Self-paced WBL: Chapter 24	0.5
	Classroom Sessions and Practical Exercises: Chapters 25-29	5.5
4	ENM Performance Management Self-paced WBL: Chapter 30	0.5
	Classroom Sessions and Practical Exercises: Chapters 29-34	5.5
5	ENM Network Element Configuration Management Self-paced WBL: Chapter 35	0.5
	Classroom Sessions and Practical Exercises: Chapters 36-40	5.5



ENM on Open Stack Cloud System Administration

LZU1082811 R1A

Description:

Are you a System Administrator and responsible for administering and maintaining the Ericsson Network Manager (ENM) on OpenStack Cloud?

If yes, this is the right course for you. This course provides you the competence required to administer the ENM application running on an Open Stack cloud. This course prepares ENM System Administrators to handle maintenance activities and backup key ENM components, manage ENM user accounts, monitor the status of ENM services and log files, and perform basic troubleshooting of issues in preparation for opening Customer Service Requests with Ericsson support. The core ENM concepts of the system are overviewed on the first day.

Learning situation:

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 ENM Overview functionality
 - 1.1 Relate origins and evolution of ENM
- 2 Understand Cloud Computing Fundamentals
 - 2.1 Describe principle components in Openstack
 - 2.2 Recount prerequisites for ENM on Openstack cloud
- 3 Explain Availability Management in ENM application
 - 3.1 Describe Availability Management in ENM
- 4 List main ENM Use Cases and explore Application Navigation
 - 4.1 List main Use Cases and explore Application Navigation in ENM
 - 4.2 Identify main ENM applications by functional area
 - 4.3 Describe principle ENM use cases
 - 4.4 Connect to ENM and Practice Navigation of ENM System
- 5 Explain ENM Disk Volume and Database Management
 - 5.1 List different data storage types used in ENM
 - 5.2 Describe Database Management Systems in ENM
 - 5.3 Work with relevant utilities for Database Management Systems
- 6 Implement the ENM Workspaces
 - 6.1 Place ALEX Libraries

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- 6.2 Demonstrate OPI Access set up
- 6.3 Implement collections in ENM Workspaces
- 6.4 Perform configuration of collection parameters
- 7 Practice User Account and Policy Management
- 7.1 Interpret use of Single Sign-on (SSO) in ENM
- 7.2 Describe User Management in ENM
- 7.3 Perform Add, Remove, Enable & Disable tasks on ENM User Accounts
- 7.4 Implement modification of User Authority and Policies
- 7.5 Perform Monitoring of user related Managed Component status and logs
- 7.6 Discuss User Management housekeeping activities
- 8 Discuss and apply Security Management in ENM
- 8.1 List Security concepts deployed in ENM
- 8.2 Explain and Demonstrate Credential Management configuration
- 8.3 Explore Perimeter Security and Node Hardening in ENM
- 8.4 Use Log Viewer to search for Security Related Activities
- 9 Acknowledge and activate Logging and Monitoring in ENM
- 9.1 Locate different logs in ENM
- 9.2 Perform Queries using Log Viewer in ENM
- 9.3 Demonstrate Use of ESM Monitoring Tool and Activating Monitoring Alerts
- 10 Define and describe ENM License Handling and SHM
- 10.1 Define and describe Software Hardware Manager functionality
- 10.2 Recognize and Configure Parameters for SHM Housekeeping Jobs
- 10.3 Describe Licence Control Management functionality in ENM
- 10.4 Execute LCM ADM CLI Commands to determine ENM license usage
- 11 List NB and SB interfaces and discuss integration of ENM with other systems
- 11.1 List ENM Interfaces (NB/SB) & Protocols
- 11.2 Explain main concepts of Northbound and Southbound interfaces in Network Management
- 11.3 Identify protocols employed in ENM 1 on Northbound and Southbound interfaces
- 11.4 Discuss integration of ENM with other systems
- 11.5 Identify and describe ENM North Bound Interfaces (NBIs)
- 11.6 Recognize and Configure the NBI Parameters
- 12 Describe ENM O&M Backup Solution
- 12.1 Explain ENM Backup and Restore Operations
- 12.2 Discuss ENM Backup and Restore Administration tasks
- 12.3 Describe Minimise Data Loss in ENM
- 13 Identify and cite examples of Housekeeping Tasks in ENM
- 13.1 Identify and cite examples of housekeeping tasks in ENM
- 13.2 Perform checks on Bulk Export File System
- 13.3 Identify and perform Health Checks in ENM
- 13.4 Describe Guideline System Administrator Tasks

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- 14 Explore Operation and Maintenance of System tasks in ENM
- 14.1 Interpret Performance Management application and execute Performance Management Initiation and Collection Administration Tasks
- 14.2 Interpret and perform changes to Configuration Management application parameters
- 14.3 Identify SMRS Administration Tasks
- 14.4 Describe AMOS Administration Tasks
- 14.5 Explore how to Commission Nodes for Management in ENM
- 15 Understand VNF Lifecycle Management Administration
- 15.1 Describe VNF Lifecycle Management architecture and Functionality
- 15.2 List the VNF Lifecycle Management Administration Tasks
- 15.3 Explain how to configure the ENM VNF-LCM Parameters
- 15.4 Describe the VNF-LCM System Backup and Restore procedures

Target audience:

ENM System Administrators

Prerequisites:

Successful completion of the following courses:

Successful completion of the following external courses or equivalent knowledge would be advantageous:

Cloud Fundamentals
RedHat Enterprise Linux
Neo4J
PostgreSQL
LDAP

Duration and class size:

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





CNOM in ENM

LZU1082844 R1A

Description:

If you want to learn about core network operations using the Core Network Operations Manager (CNOM), this is the course for you. The course covers CNOM operations of both Packet Core and IMS nodes, and it suitable for all types of CNOM deployments, both as a part of ENM and as a stand-alone VNF.

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 Explain the role of CNOM in core network operations
 - 1.1 Explain the different ENM deployment options
 - 1.2 Describe the CNOM architecture
- 2 Describe the different applications in CNOM and their use cases
 - 2.1 Describe the Network Monitor application
 - 2.2 Describe the Alarm Monitor application
 - 2.3 Describe the PM monitor application
 - 2.4 Describe the Health Check application
 - 2.5 Describe the Traffic Analysis application
 - 2.6 Describe the UE Trace application
 - 2.7 Describe the Integrated Traffic Capture (ITC) application
 - 2.8 Describe the Data Manager application
- 3 Perform operation tasks on Packet Core/IMS nodes using CNOM
 - 3.1 Perform network monitoring using CNOM
 - 3.2 Perform alarm monitoring using CNOM
 - 3.3 Monitor Packet Core PM data using CNOM
 - 3.4 Collect health check reports using CNOM
 - 3.5 Perform Traffic Analysis on Packet Core nodes
 - 3.6 Create UE trace sessions and analyze trace data from Packet Core/IMS nodes
 - 3.7 Create ITC sessions and analyze ITC data from SGSN-MME



Target audience:

This course is suitable for anyone who is required be able to operate Packet Core and/or IMS nodes using CNOM.

Prerequisites:

Successful completion of the following courses:

General knowledge about operation of Packet Core and/or IMS network nodes.

Duration and class size:

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



An Overview of ENM for 5G

LZU1082807 R1A

Description:

Transforming today's networks to 5G is key to keeping pace with the demands of an evolving Networked Society, where opportunities span new high-bandwidth applications, low latency powered internet of Things (IoT) services and beyond. ENM is a suite of Network Management Applications (NAM) supporting operation and maintenance of 5G Radio and Core Networks. This course explains the role of ENM in 5G System. It describes the ENM interworking with 5G RAN and 5G Core. It is essential to attend this training prior to attending technical hands-on training on ENM Operations for 5G RAN.

Learning situation:

This is a Web-Based Learning.

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

Learning objectives:

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

- 1 Explore the background and reasons for developing the 5G System
 - 1.1 Define the scope of 5G
 - 1.2 Identify the operator challenges to enable new types of business
 - 1.3 Explain the new technical requirements arising from new customer segments
- 2 Provide a high level overview of ENM functionality in 5G System
 - 2.1 Explain the 5G System Architecture
 - 2.2 List the 5G nodes supported by ENM
 - 2.3 Identify the role of ENM in 5G RAN
 - 2.4 Identify the role of ENM in 5G Core
- 3 Provide an overview of the Common Applications and Tools for 5G System
 - 3.1 List the general ENM Tools
 - 3.2 List the supported node tools in 5G System
 - 3.3 Describe ENM Command line features for 5G System
- 4 Access the ENM documentation for 5G System
 - 4.1 List the available ENM documentation
 - 4.2 Access and view ENM online help
 - 4.3 Access and view the Customer Product Information(CPI)



Target audience:

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

Prerequisites:

Successful completion of the following courses:

5G Overview

Duration and class size:

The length of the course is 3 hours and the maximum number of participants is 1



ENM 19 Delta Q1

LZU1082808 R1A

Description:

Are you interested to know the vital changes in Ericsson Network Manager in the intervening period between the end Q3 2018 and end Q1 2019? If so, then this training is definitely going to help you achieve this.

Learning situation:

This is an Instructor-Led Training.

This course is based on theoretical instructor-led lessons.

Learning objectives:

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

- 1 List the functional enhancements in ENM
- 2 Review the new and enhanced features of the ENM Monitoring Applications
- 3 Explain the new and enhanced features of the ENM Provisioning Applications
- 4 Outline the new and enhanced features of the ENM Performance and Optimization Applications
- 5 Identify the new Network Elements supported by ENM.
- 6 Describe the impacts on the main ENM interfaces.

**Target audience:**

This course is suitable for anyone who is required to be familiar with ENM 19.1 and has prior working experience on ENM 18.

Prerequisites:

Successful completion of the following courses:

- ENM 18 Delta Q3 - LZU1082736
- ENM 18 System Administration - LZU1082670
- ENM 18 Operations for Radio Access Network - LZU1082671
- ENM 18 Operations for Core Network - LZU1082672
- VNF LCM in ENM - LZU1082742

Duration and class size:

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



ENM 19 System Administration

LZU1082855 R1A

Description:

Are you a System Administrator? Will you be working with Ericsson Network Manager? This course will give the student thorough knowledge required to administer the ENM product. This course prepares ENM System Administrators to handle maintenance activities and backup key ENM components, manage ENM user accounts, monitor the status of ENM services and log files, and perform basic troubleshooting of issues in preparation for opening Customer Service Requests with Ericsson support. The core ENM concepts and technical fundamentals of the system are overviewed on the first day.

Learning objectives:

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

- 1 Discuss ENM 19 System Goals
 - 1.1 Relate the origins and evolution of ENM
 - 1.2 Identify the basic components of ENM 19
- 2 Explain ENM Architecture Fundamentals
 - 2.1 Describe the architecture underlying ENM
 - 2.2 Interpret ENM Platform Environment and high availability concepts
 - 2.3 Connect to the ENM System and navigate to the peer servers
- 3 Recognize ENM Supported Hardware Configurations
 - 3.1 Describe the hardware on which ENM is based
- 4 List and Identify the main 3PP products in use in ENM
 - 4.1 Describe the purpose and function of the main 3PPs and Databases in ENM 19
 - 4.2 Connect to Veritas Access and investigate the ENM shared file systems
- 5 Explain Virtualization and Redundancy in ENM
 - 5.1 Describe availability Management in ENM
 - 5.2 Run Veritas Cluster Service Commands in ENM
- 6 List the ENM Interfaces (NB/SB) & Protocols
 - 6.1 Explain the main concepts of Northbound and Southbound interfaces in Network
 - 6.2 Identify the protocols employed in ENM 19 on Northbound and Southbound
- 7 Recount the Security concepts in ENM
 - 7.1 Cite Examples of the ENM Security Mechanisms
 - 7.2 Describe Defense in Depth in ENM
- 8 List the Main ENM Use Cases and Explore the Navigation of Applications in ENM

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- 8.1 Identify the main ENM 19 applications by functional area
- 8.2 Describe the principle ENM use cases
- 8.3 Connect to ENM and Practice Navigation of the ENM 19 System
- 9 Explain ENM Disk Volume and Database Management
 - 9.1 List the different data storage types used in ENM
 - 9.2 Describe the Database Management Systems in ENM
 - 9.3 Work with the relevant utilities for the Database Management Systems
- 10 Implement the ENM Workspaces
 - 10.1 Place the ALEX Libraries
 - 10.2 Demonstrate OPI Access set up
 - 10.3 Implement collections in ENM Workspaces
 - 10.4 Perform configuration of collection parameters
- 11 Practice User Account and Policy Management
 - 11.1 Interpret the use of Single Sign-on (SSO) in ENM
 - 11.2 Describe User Management in ENM
 - 11.3 Perform the Add, Remove, Enable & Disable tasks on ENM User Accounts
 - 11.4 Implement the modification of a User's Authority and Policies
 - 11.5 Perform Monitoring of user related Managed Component status and logs
 - 11.6 Discuss User Management housekeeping activities
- 12 Discuss and apply Security Management in ENM
 - 12.1 List the Security concepts deployed in ENM
 - 12.2 Explain and demonstrate Credential Management configuration
 - 12.3 Explore Perimeter Security and Node Hardening in ENM
 - 12.4 Use the Log Viewer to search for Security Related Activities
- 13 Acknowledge and activate Logging and Monitoring in ENM
 - 13.1 Locate the different logs in ENM
 - 13.2 Perform Queries using the Log Viewer in ENM
 - 13.3 Demonstrate Use of the ESM Monitoring Tool and Activating Monitoring Alerts
- 14 Define and describe Software Hardware Manager functionality
 - 14.1 Recognize and Configure Parameters for SHM Housekeeping Jobs
 - 14.2 Describe License Control Management functionality in ENM
 - 14.3 Execute LCM ADM CLI Commands to determine ENM license usage
- 15 Discuss the integration of ENM with other systems
 - 15.1 Identify and describe the North Bound Interfaces (NBIs)
 - 15.2 Recognize and Configure the NBI Parameters
- 16 Describe the ENM O&M Backup Solution
 - 16.1 Describe the OMBS Hardware & Software Architecture
 - 16.2 Investigate the use of the GUI/Command line interfaces to configure Backups
 - 16.3 Describe the functionality of Bare Metal Restore as part of OMBS
- 17 Identify and cite examples of housekeeping tasks in ENM



- 17.1 Perform a check on the Bulk Export File System
- 17.2 Identify and perform Health Checks in ENM
- 17.3 Describe Guideline System Administrator Tasks
- 18 Explore Operation and Maintenance System Administration tasks in ENM
 - 18.1 Explain the Fault Management Architecture in ENM
 - 18.2 Explore and execute Fault Management Application Administration Tasks
 - 18.3 Interpret Performance Management application and execute Performance
 - 18.4 Interpret and perform changes to Configuration Management application parameters
 - 18.5 Identify SMRS Administration Tasks
 - 18.6 Describe AMOS Administration Tasks
 - 18.7 Explore how to Commission Nodes for Management in ENM
- 19 Describe VNF Lifecycle Management architecture and Functionality
 - 19.1 List the VNF Lifecycle Management Administration Tasks
 - 19.2 Explain how to configure the ENM VNF-LCM Parameters
 - 19.3 Describe the VNF-LCM System Backup and Restore procedures
- 20 List ENM Hardware Maintenance Tasks
 - 20.1 Describe how to prepare the ENM System for Maintenance
 - 20.2 Demonstrate how to check System Firmware Levels
 - 20.3 List NAS Hardware Maintenance activities

**Target audience:**

This course is suitable for anyone who is required be able to administer ENM 19.

Prerequisites:

Successful completion of the following courses:

Successful completion of the following external courses or equivalent knowledge would be advantageous:

- An Overview of ENM for Classical OSS Users (LZU1082519) OR
- An Overview of ENM for Classical SO EM (LZU1082564)
- Red Hat Enterprise Linux
- Database Management Systems Administration

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.



Overview of ENM for Classical SO EM

LZU1082564 R2A

Description:

Do you currently manage your transport network using Service On ENM (SO-ENM)? This WBL offers a comprehensive first step towards transitioning an operator to the new Ericsson Network Manager (ENM).

If you are in any role which requires an understanding of how ENM achieves the transport network management functionality in comparison with SO-EM, then this training introduces the migration competencies required. This short WBL training prepares you for the deeper technical dives in subsequent courses.

Learning objectives:

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

- 1 Describe the ENM concept and how this differs from Classical SO-EM application
- 2 Understand the ENM Navigation and ENM Management tools
- 3 Describe Configuration Management in ENM
- 4 List Software and Hardware Management functionalities in ENM
- 5 Describe Fault Management in ENM
- 6 Discuss Performance Management in ENM
- 7 Describe Security, User and Access Management in ENM

Target audience:

This course is suitable for anyone who is required to be familiar with transitioning from SO EM to ENM

Prerequisites:

Successful completion of the following courses:

There are no specific prerequisites for this training. Prior knowledge of Classic SO-EM network operations and administration will be useful for better understanding.



Duration and class size:

The length of the course is 4 hours and the maximum number of participants per session is 1

Learning situation:

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



An Overview of ENM for 5G

LZU1082807 R1A

Description:

Transforming today's networks to 5G is key to keeping pace with the demands of an evolving Networked Society, where opportunities span new high-bandwidth applications, low latency powered internet of Things (IoT) services and beyond. ENM is a suite of Network Management Applications (NAM) supporting operation and maintenance of 5G Radio and Core Networks. This course explains the role of ENM in 5G System. It describes the ENM interworking with 5G RAN and 5G Core. It is essential to attend this training prior to attending technical hands-on training on ENM Operations for 5G RAN.

Learning situation:

This is a Web-Based Learning.

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

Learning objectives:

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

- 1 Explore the background and reasons for developing the 5G System
 - 1.1 Define the scope of 5G
 - 1.2 Identify the operator challenges to enable new types of business
 - 1.3 Explain the new technical requirements arising from new customer segments
- 2 Provide a high level overview of ENM functionality in 5G System
 - 2.1 Explain the 5G System Architecture
 - 2.2 List the 5G nodes supported by ENM
 - 2.3 Identify the role of ENM in 5G RAN
 - 2.4 Identify the role of ENM in 5G Core
- 3 Provide an overview of the Common Applications and Tools for 5G System
 - 3.1 List the general ENM Tools
 - 3.2 List the supported node tools in 5G System
 - 3.3 Describe ENM Command line features for 5G System
- 4 Access the ENM documentation for 5G System
 - 4.1 List the available ENM documentation
 - 4.2 Access and view ENM online help
 - 4.3 Access and view the Customer Product Information(CPI)



Target audience:

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

Prerequisites:

Successful completion of the following courses:

5G Overview

Duration and class size:

The length of the course is 3 hours and the maximum number of participants is 1



ENM 19 Operations for 5G Radio Access Network

LZU1082850 R1A

Description:

This course provides students with an understanding of the Ericsson Network Manager (ENM) applications available for managing the 5G Radio Access Network. Students will learn to access and navigate the ENM tools using practical (hands-on) sessions. This course will boost your competence and understanding of 5G RAN Management through ENM.

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 a high-level overview of the Ericsson Network Management functionality
 - 1.1 Describe the overall functionality of the Ericsson Network Manager(ENM) in 5G RAN
 - 1.2 Explain Distributed RAN, Centralized RAN, Elastic RAN, and Virtualized RAN Architecture
 - 1.3 List the 5G nodes supported by ENM
 - 1.4 Describe the Ericsson Baseband (gnb) Architecture
- 2 Provide an overview of the Common Applications and Tools in ENM for 5G Network
 - 2.1 View the general ENM tools and common applications for 5G RAN
 - 2.2 List the Node tools available for 5G RAN in ENM
 - 2.3 Access AMOS and ECLI for supported 5G Nodes
- 3 Use Network Explorer and Topology Browser Applications for 5G RAN
 - 3.1 Create and collections and saved searches for 5G RAN Nodes in Network Explorer
 - 3.2 View and Edit Managed Object Model of a selected 5G RAN nodes in Topology Browser
- 4 Use ENM CLI command set to monitor 5G Radio Access Nodes
 - 4.1 View open and historical alarms of 5G Radio Access Network
 - 4.2 Check the status of 5G Radio Network managed objects
 - 4.3 Lock, Unlock and restart various units in 5G Radio Node
 - 4.4 Use the Network Health Check command set to create and export 5G node health reports
- 5 Add new 5G Radio Node using Add Node Application and ENM CLI
 - 5.1 Describe the steps for adding new 5G Radio Node using Add Node GUI
 - 5.2 Create 5G Radio Node using ENM CLI
 - 5.3 Start CM, FM supervision and synchronize created nodes



- 6 Use the Fault Management Applications to monitor 5G Radio Access Network
 - 6.1 Access the Alarm Monitor filtering function to view selected alarms for 5G RAN Node
 - 6.2 Use the Alarm Overview application to monitor 5G Network faults in a dashboard view
 - 6.3 View the 5G Network supervision summary using Alarm Supervision Status application
 - 6.4 Monitor the 5G Network using the Network Health Monitor dashboard widgets
 - 6.5 Use the Node Monitor Cell application to analyze the status of 5G Radio Network Cells
- 7 Manage 5G Radio Node Software, Hardware, Backup, and License Administration in ENM
 - 7.1 View the 5G Radio Node Backups, Hardware Inventory, Licenses, and Software Inventory using SHM and ENM-CLI
 - 7.2 Create, manage, restore, and delete 5G Radio Node backups in SHM
 - 7.3 Describe the process to import, install and delete 5G Radio Node License Keys using SHM and ENM-CLI
 - 7.4 Describe the process to import software and perform 5G Radio Node upgrades using SHM and ENM-CLI
- 8 Manage 5G Radio Access Network Performance Management in ENM
 - 8.1 List and describe how 5G Network performance data is initiated, collected, and managed in ENM using PMIC
 - 8.2 List the types of subscriptions supported for 5G Radio Node in ENM
 - 8.3 Review the steps for creating Statistics and Event based subscription in PMIC
- 9 Perform 5G Network Configuration Management using ENM-CLI and Parameter Management application
 - 9.1 Use ccredit command set to view and edit 5G node configuration data
 - 9.2 List existing 5G Radio Node Configurations
 - 9.3 View 5G Node parameters and make configuration changes using Parameter Management application

**Target audience:**

Engineers and technicians who require the use of ENM tools to configure, monitor and troubleshoot 5G networks

Prerequisites:

Successful completion of the following courses:

An Overview for ENM for 5G, LZU1082807

Students should have prior experience using OSS-RC to manage the Radio Access Networks.

Duration and class size:

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





VNF LCM in ENM

LZU1082742 R2A

Description:

Do you work with Ericsson Network Manager (ENM) and need to orchestrate the Virtual Network Functions (VNF)? Do you need to support the VNF Life Cycle Management (LCM) use cases, such as: VNF Onboarding, VNF Instantiation, VNF Scaling and VNF Termination? Then this course is for you, since it introduces the student to the ENM VNF Lifecycle Automation Framework provided by the cloud based application VNF-LCM. In addition, the course provides a base of understanding to evaluate and consider each VNF requirement on the Network Function Virtualization Infrastructure (NFVI).

Learning situation:

This is a Blended Learning.

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

Learning objectives:

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

- 1 Explain Cloud and VNF Architecture
 - 1.1 Describe the cloud computing concept through a short evolution of the computing
 - 1.2 Explain shortly concepts around hardware, operating systems, applications,
 - 1.3 Analyze VNF Architecture
- 2 Introduce VNF Lifecycle Manager
 - 2.1 Analyze VNF LCM concepts
 - 2.2 Check the new workflow areas
- 3 Verify Workflow Management
 - 3.1 Describe the overall functionality of the VNF-LCM GUI
 - 3.2 How to access the App Help to VNF-LCM GUI
 - 3.3 Describe how to run an Instance
 - 3.4 Describe the functionality of the VNF-LCM App Help
- 4 Describe VNF-LCM App Help



Target audience:

This course is suitable for anyone who is required to use VNF LCM in ENM.

Prerequisites:

Successful completion of the following courses:

An Overview of ENM for Classical OSS Users, LZU1082519

Ericsson Cloud System Overview, LZU1089909

Foundation Series – Cloud Services, Applications and NFV, LZU1082356

Duration and class size:

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

Time schedule:

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

Day	Topics in the course	Estimated Time (hours)
1	Chapters 1 and 2	3
	Classroom Sessions and Practical Exercises	2
	Self-paced Demo Videos	1
2	Chapters 3 and 4	3
	Classroom Sessions and Practical Exercises	2
	Self-paced Demo Videos	1