IMS 16 System & Products
Training Programs

Catalog of Course Descriptions
# 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:

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CSCF 16 Operation and Configuration

LZU1082210 R1A

Description
This course will provide the participants with a thorough understanding of Call Session Control Function CSCF and its role in MMTel, VoLTE and WiFi Calling solutions. The course focuses on the node architecture, traffic support functions as well as Surveillance, Operation and Configuration activities on CSCF 16.

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

1. Describe CSCF node functions and interworking
   1.1 Describe CSCF node functions
   1.2 Explain node interworking, interfaces and protocols
   1.3 Describe CSCF node architecture
   1.4 Explain how CSCF support basic session establishment procedures

2. Explain and Handle CSCF Operational support functions
   2.1 Describe O&M Interface and Navigate the Element Manager
   2.2 Use the CPI Description documents to identify the function of CSCF parameters and to perform basic configuration checks of the CSCF nodes and interfaces
   2.3 Perform system backups and software checks
   2.4 Explain the alarms connected to CSCF, view alarm lists, perform alarm searches and fetch relevant logs
   2.5 Perform CSCF nodes status checks
   2.6 Handle Performance management for CSCF
   2.7 Perform User Data Output

3. Explain and Handle the DIAMETER Interface management in CSCF
   3.1 Explain how to configure and handle Diameter Own Node
   3.2 Explain how to configure and handle Diameter Peer Node
   3.3 Explain how to configure and handle Diameter Routing

4. Describe and Handle Charging management in CSCF
   4.1 Explain how to configure Charging Triggers
   4.2 Explain how to configure Charging Profiles

5. Explain and Handle CSCF Access Authorization and Authentication support
   5.1 Configure Control of Number of Contacts per User
   5.2 Explain and Configure CSCF for Subscribed Media Profile (SMP) support
5.3 Configure Digest and IMS-AKA authentication methods
6 Explain and Handle CSCF Registration support
6.1 Explain CSCF Registration and 3:rd party registration support
6.2 Explain and Configure Access Awareness
7 Explain and Handle CSCF Services and Application support
7.1 Explain service invocation in CSCF
7.2 Explain and Configure Shared Initial Filter Criteria (shared IFC)
8 Explain and Handle CSCF Traffic support
8.1 Configure the interface between CSCF and DNS/ENUM
8.2 Configure & Verify Number Normalization tables in CSCF
8.3 Configure & Verify BGCF (External Network Selection)
9 Explain and Handle CSCF Emergency Call support
9.1 Configure Emergency Call Handling in E-CSCF
9.2 Explain Emergency Access Transfer Function (EATF) and the Emergency SRVCC support for VoLTE

Target audience
The target audience for this course is:
System Engineer, Service Engineer

Prerequisites
Successful completion of the following courses:
IMS 16 Overview LZU1082217
IMS Signaling LZU1087193
TSP Operation and Maintenance LZU1087341
BSP8100 Operation and Maintenance LZU1089779

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 classroom environment using equipment and tools, which are accessed remotely.
## Time schedule

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

<table>
<thead>
<tr>
<th>Day</th>
<th>Topics in the course</th>
<th>Estimated Time (hours)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>CSCF node functions and interworking</td>
<td>2</td>
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<tr>
<td></td>
<td>CSCF Operational support functions</td>
<td>3</td>
</tr>
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<td></td>
<td>CSCF Diameter Management</td>
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<td>2</td>
<td>CSCF Charging Management</td>
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<td>CSCF Access Authorization and Authentication support functions</td>
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<td>CSCF Registration support functions</td>
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<tr>
<td></td>
<td>CSCF Services and Application support functions</td>
<td>2</td>
</tr>
<tr>
<td>3</td>
<td>CSCF Traffic support functions</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>CSCF Emergency Call Support</td>
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CSCFv 16 Operation and Configuration

LZU1082211 R1A

Description
This course will provide the participants with a thorough understanding of Virtualized Call Session Control Function CSCFv and its role in MMTel, VoLTE and WiFi calling solutions. The course focuses on the node architecture, traffic support functions as well as Surveillance, Operation and Configuration activities on CSCFv 16.

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

1. Describe CSCFv node functions and interworking
   1.1 Describe CSCFv node functions
   1.2 Explain node interworking, interfaces and protocols
   1.3 Describe CSCFv node architecture
   1.4 Explain how CSCFv support basic session establishment procedures

2. Explain and Handle CSCFv Operational support functions
   2.1 Describe O&M Interface towards the CSCF VNF
   2.2 Use the CPI Description documents to identify the function of CSCF parameters and to perform basic configuration checks of the CSCFv nodes and interfaces
   2.3 Perform system backups and software checks
   2.4 Explain the alarms connected to CSCFv, view alarm lists, perform alarm searches and fetch relevant logs
   2.5 Perform CSCFv VNF status checks
   2.6 Handle Performance management for CSCFv
   2.7 Explain the Cx/Dx interface between CSCFv and HSS/SLF
   2.8 Explain the Rf/Ro interface between CSCFv and a Charging Mediator
   2.9 Configure Charging Profiles in CSCFv
   2.10 Explain User Redistribution support
   2.11 Perform User Data Output

3. Explain and Handle CSCFv Access Authorization and Authentication support
   3.1 Configure Control of Number of Contacts per User
   3.2 Explain and Configure CSCFv for Subscribed Media Profile (SMP) support
   3.3 Configure Digest and IMS-AKA authentication methods

4. Explain and Handle CSCFv Registration support
   4.1 Explain CSCFv Registration and 3:rd party registration support
   4.2 Explain and Configure Access Awareness

5. Explain and Handle CSCFv Services and Application support
5.1 Explain service invocation in CSCFv
5.2 Explain and Configure Shared Initial Filter Criteria (IFC)

6 Explain and Handle CSCFv Traffic support
6.1 Configure the interface between CSCFv and DNS/ENUM
6.2 Configure & Verify Number Normalization tables in CSCFv
6.3 Configure & Verify BGCF (External Network Selection)

7 Explain and Handle CSCFv Emergency Call support
7.1 Configure Emergency Call Handling in E-CSCF
7.2 Explain Emergency Access Transfer Function (EATF) and the Emergency SRVCC support for VoLTE

**Target audience**
The target audience for this course is:
System Engineer, Service Engineer

**Prerequisites**
Successful completion of the following courses:
IMS 16 Overview, LZU1082217
IMS Signaling, LZU1087193
Virtual IMS Concepts LZU1082227
The following courses become prerequisites if CSCFv is a part of Ericsson Certified Cloud offering:
BSP 8100 Operation and Maintenance LZU1089779
ECM Fundamentals LZU1089914

**Duration and class size**
The length of the course is 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 classroom environment using equipment and tools, which are accessed remotely.
Time schedule

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

<table>
<thead>
<tr>
<th>Day</th>
<th>Topics in the course</th>
<th>Estimated Time (hours)</th>
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<tbody>
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<td>1</td>
<td>CSCFv node functions and interworking</td>
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Enriched Communication Survey

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

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

1. Identify the role and purpose of Enriched Communication
   1.1 Explain why there is a need for Enriched Communication
   1.2 Present operator and end-user benefits of Enriched Communication.
   1.3 List the Enriched Communication features
   1.4 Describe the GSMA consumer brands used for Enriched Communication
   1.5 Describe charging Enriched Communication services
   1.6 Describe subscriber devices

2. List which standardization bodies define Enriched Communication and related services
   2.1 List the GSMA specifications for RCS

3. Describe Enriched Communication features in detail
   3.1 Explain Registration and Authentication
   3.2 Explain Capabilities Discovery
   3.3 Explain Enriched Messaging
   3.4 Explain Content Sharing and File Transfer
   3.5 Explain Network Address Book and Social Presence Services
   3.6 Explain Geo-Location Services
   3.7 Explain F-RCS IP Voice and Video Call

4. Describe Ericsson Enriched Communication Reference network
   4.1 Describe IMS System Nodes
   4.2 Describe IMS nodes with specific RCS functions
   4.3 List RCS Interfaces and Protocols
   4.4 Describe RCS bearer requirements

5. Explain basic Enriched Communication end-to-end session set-ups
   5.1 Explain the call case for Registration and Authentication
5.2 Explain the call case for Capabilities Discovery
5.3 Explain the call case for RCS IP Voice and Video Call

**Target audience**

The target audience for this course is:

Fundamentals

**Prerequisites**

Successful completion of the following courses:

IMS 16 Overview, LZU1082217

**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 environment.

**Time schedule**

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

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<tr>
<th>Day</th>
<th>Topics in the course</th>
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<td>Enriched Communication End to End Sessions</td>
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HSS 16 Operation and Configuration for EPC

Description
This course provides participants with the knowledge and skills necessary to perform Surveillance, Operation and Configuration activities on the HSS 16 node in the Evolved Packet Core (EPC) environment.

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

1. Describe HSS node functions and interworking
   1.1 Describe EPC architecture and nodes
   1.2 Describe HSS node functions in EPC
   1.3 Explain HSS node interworking, interfaces and protocols
   1.4 Describe the difference between HSS Classic Deployment and HSS-FE Deployment.
   1.5 Describe HSS node architecture and hardware implementations
   1.6 Explain Multi-Application support

2. Perform surveillance tasks on HSS
   2.1 Describe O&M Interface and navigate Element Manager
   2.2 Use the CPI Description documents to identify the function of HSS parameters and to perform basic configuration checks of the HSS node and interfaces
   2.3 Perform system backups and schedule maintenance tasks
   2.4 Perform software checks
   2.5 Check the status of the HSS node and perform a health check
   2.6 Explain the alarms connected to HSS, view alarm lists and fetch relevant logs

3. Configure and verify HSS components and interfaces
   3.1 Configure ESM parameters (ESM Configuration Container)
   3.2 Configure and verify the interface between HSS-FE and CUDB
   3.3 Configure and verify the S6a interface between HSS and MME
   3.4 Configure and verify MAP interface between HSS and HLR
   3.5 Configure and verify SWx interface between HSS and AAA
   3.6 Configure AVG in HSS
   3.7 Configure SLF parameters
   3.8 Configure VoLTE Access Support

4. Explain how to configure HSS in a secure and redundant way
   4.1 Explain how node hardening is achieved for HSS
4.2 Explain parameters in HSS that are important for security
5 Perform Fault management in the HSS
5.1 Resolve HSS related alarms
6 Handle Performance management for HSS
6.1 Explain how to monitor the performance of the HSS
6.2 Configure and verify HSS measurements

Target audience
The target audience for this course is:
System Engineer, Service Engineer

Prerequisites
Successful completion of the following courses:
EPC System Survey LZU1087977
EPC Signaling LZU1087580
TSP Operation and Maintenance LZU1089924
The following course is required if BSP hardware is used:
BSP 8100 Operation and Maintenance LZU1089779

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

Learning situation
This course is based on theoretical and practical instructor-led sessions given in both classroom and in a technical environment using equipment and tools, which can be accessed remotely.
**Time schedule**

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

<table>
<thead>
<tr>
<th>Day</th>
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<th>Estimated Time (hours)</th>
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</thead>
<tbody>
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<td>HSS node functions and interworking</td>
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<td>Configuration parameters and surveillance tasks</td>
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HSS 16 Operation and Configuration for IMS

Description
This course will provide the participants with the knowledge to perform Surveillance, Operation and Configuration activities on the IMS HSS 16 node.

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

1. Describe IMS HSS node functions and interworking
   1.1 Describe HSS node functions
   1.2 Explain nodes interworking, interfaces and protocols
   1.3 Explain how HSS support basic IMS session establishment procedures
   1.4 Describe the difference between HSS Classic Deployment and HSS-FE Deployment.
   1.5 Describe HSS nodes architecture and hardware implementations
   1.6 Explain multi-application support

2. Perform surveillance tasks on HSS
   2.1 Describe O&M Interface and navigate Element Manager
   2.2 Use the CPI Description documents to identify the function of HSS parameters and to perform basic configuration checks of HSS node and interfaces
   2.3 Perform system backups and schedule maintenance tasks
   2.4 Perform software checks
   2.5 Check the status of the HSS node and perform a health check
   2.6 Explain the alarms connected to IMS HSS, view alarm lists, perform alarm searches and fetch relevant logs

3. Configure HSS components and interworking interfaces
   3.1 Configure Cx/Dx interface between HSS and CSCF
   3.2 Configure Sh/Dh interface between HSS and Application Servers
   3.3 Configure interface between HSS-FE and CUDB
   3.4 Configure Service Profiles containing Triggers in HSS
   3.5 Configure Charging Profiles in HSS
   3.6 Configure SLF Parameters
   3.7 Configure VoLTE Access Support

4. Handle Performance management for HSS
   4.1 Explain how to monitor the performance of HSS
   4.2 Configure HSS measurements

5. Explain how to configure HSS in a secure and redundant way
5.1 Explain how to configure HSS in a secure and redundant way

Target audience
The target audience for this course is:
System Engineer, Service Engineer

Prerequisites
Successful completion of the following courses:
IMS 16 Overview LZU1082217
IMS Signaling LZU1087193
TSP Operation and Maintenance LZU1089924
The following course is required if BSP hardware is used:
BSP 8100 Operation and Maintenance LZU1089779

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

Learning situation
This course is based on theoretical and practical instructor-led lessons given in both classroom and in a technical environment using equipment and tools, which are accessed remotely.

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

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<tr>
<td>1</td>
<td>HSS node functions and interworking</td>
<td>3</td>
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<tr>
<td></td>
<td>Configuration parameters and surveillance tasks</td>
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<td>Configuration of interworking interfaces and parameters</td>
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<tr>
<td></td>
<td>Security and redundancy</td>
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HSS 16 Operation and Configuration for VoLTE

Description
This course provides participants with the knowledge and skills necessary to perform Surveillance, Operation and Configuration activities on the HSS 16 node in the VoLTE environment.

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

1. Describe VoLTE HSS node functions and interworking
   1.1 Describe VoLTE Architecture and Nodes
   1.2 Describe HSS node functions in VoLTE environment
   1.3 Explain nodes interworking, interfaces and protocols
   1.4 Explain how HSS support basic IMS session establishment procedures
   1.5 Describe the difference between HSS Classic Deployment and HSS-FE Deployment.
   1.6 Describe HSS nodes architecture and hardware implementations
   1.7 Explain multi-application support

2. Perform surveillance tasks on HSS
   2.1 Describe O&M Interface and navigate Element Manager
   2.2 Use the CPI Description documents to identify the function of HSS parameters and to perform basic configuration checks of HSS node and interfaces
   2.3 Perform system backups and schedule maintenance tasks
   2.4 Perform software checks
   2.5 Check the status of the HSS node and perform a health check
   2.6 Explain the alarms connected to HSS, view alarm lists and fetch relevant logs

3. Configure IMS HSS components and interworking interfaces
   3.1 Configure Cx/Dx interface between HSS and CSCF
   3.2 Configure Sh/Dh interface between HSS and Application Servers
   3.3 Configure interface between HSS-FE and CUDB
   3.4 Configure Service Profiles containing Triggers in HSS
   3.5 Configure Charging Profiles in HSS
   3.6 Configure SLF Parameters

4. Configure and EPC HSS components and interfaces
   4.1 Configure ESM parameters (ESM Configuration Container)
   4.2 Configure the interface between HSS-FE and CUDB
   4.3 Configure the S6a interface between HSS and MME
4.4 Configure MAP interface between HSS and HLR
4.5 Configure SWx interface between HSS and AAA
4.6 Configure AVG in HSS
4.7 Configure SLF parameters
5 Configure VoLTE HSS components
5.1 Explain VoLTE Support in HSS
5.2 Configure VoLTE specific parameters on HSS
6 Handle Performance management for HSS
6.1 Explain how to monitor the performance of HSS
6.2 Configure HSS measurements
7 Explain how to configure HSS in a secure and redundant way
7.1 Explain how to configure HSS in a secure and redundant way

Target audience
The target audience for this course is:
System Engineer, Service Engineer

Prerequisites
Successful completion of the following courses:
IMS 16 Overview Lzu1082217
EPC System Survey Lzu1087977
IMS Signaling Lzu1087193
EPC Signaling Lzu1087580
VoLTE Concepts Lzu1089425
VoLTE e2e Use Cases Lzu1089426
TSP Operation and Maintenance Lzu1089924
The following course is required if BSP hardware is used:
BSP 8100 Operation and Maintenance Lzu1089779

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

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</thead>
<tbody>
<tr>
<td>1</td>
<td>HSS node functions and interworking</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Configuration parameters and surveillance tasks</td>
<td>3</td>
</tr>
<tr>
<td>2</td>
<td>Configuration of interworking interfaces and parameters</td>
<td>6</td>
</tr>
<tr>
<td>3</td>
<td>Configuration of interworking interfaces and parameters</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>Security and redundancy</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>Performance Management</td>
<td>2</td>
</tr>
</tbody>
</table>
IMS 16 Overview

LZU1082217 R1A

Description
Do you want to know how operators and end users can benefit from IMS and what the different Ericsson IMS solutions are; then this is a course for you.
The course provides an overview of the IP Multimedia Subsystem (IMS) and the Ericsson solutions for IMS, based on Release 16. End user benefits and what IMS services an operator can offer are explained. The features, nodes & signalling aspects are described for the business offerings related to IMS 16.

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

1. Identify the role and purpose of IMS
   1.1 Explain why there is a need for IMS
   1.2 Present operator and end-user benefits of IMS.
   1.3 Describe the IMS system in brief – the architecture and capabilities IMS provides
   1.4 List which standardization bodies define IMS and IMS related services
   1.5 Explain what is meant by the IMS eco system
   1.6 Recognize the Mobile Unified Communication offering

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

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

4. Interpret ‘typical’ IMS signaling flows
   4.1 Express a basic understanding of SIP
   4.2 Interpret the SIP & Diameter signaling sequence for Registration
   4.3 Interpret the SIP signaling sequence for an IMS to IMS session
   4.4 Interpret the SIP signaling sequence for an IMS to GSTN session
   4.5 Interpret the SIP signaling sequence for an GSTN to IMS session
5 Outline the Nodes and Interfaces in Ericsson MMTel
5.1 Explain the functional nodes in Ericsson MMTel

Target audience
The target audience for this course is:
Fundamentals

Prerequisites
Successful completion of the following courses:
Students should have a good general knowledge of telecommunications.

Duration and class size
The length of the course is 1 days and the maximum number of participants is 16.

Learning situation
This course is based on theoretical instructor-led lessons given in a classroom environment.
**Time schedule**

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

<table>
<thead>
<tr>
<th>Day</th>
<th>Topics in the course</th>
<th>Estimated Time (hours)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Introduction (Chapter 1)</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Ericsson IMS/MMTel (Chapter 2)</td>
<td>1,5</td>
</tr>
<tr>
<td></td>
<td>Ericsson IMS Solutions (Chapter 3)</td>
<td>1,5</td>
</tr>
<tr>
<td></td>
<td>IMS End-to-End Session Setup (Chapter 4)</td>
<td>1,5</td>
</tr>
<tr>
<td></td>
<td>Ericsson MMTel Nodes and Interfaces (Chapter 5)</td>
<td>0,5</td>
</tr>
</tbody>
</table>
IMS e2e Advanced

LZU1089610 R3A

Description
This course provides the participants with competence needed to perform advanced operation and maintenance tasks on the complete IMS network. The course is mainly practical and includes tasks like resolving alarms as well as locating and solving end-to-end session establishment faults which requires an understanding of complex signaling traces. Most of the course time is dedicated to the fault finding activity in the fully configured IMS lab with a detailed analysis and discussions. Special attention is paid to the node interworking and signaling protocols. The course covers several network nodes like CSCF, HSS/SLF, IP Works, SBG, MGC, MRS, Application Servers.

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

1. Analyze signaling traces in the IMS network.
   1.1 Explain common signaling traces.
   1.2 Explain service specific signaling traces.
2. Use protocol traces to locate, analyze and solve faults.
   2.1 Configure and use Wireshark to capture and display relevant data in traces.
   2.2 Perform Wireshark traces in order to locate, analyze and solve end-to-end session faults in the IMS network.
3. Solve alarms related to the IMS network nodes.
   3.1 Locate the root cause of the alarms and solve them using IMS Customer Product Information (CPI) library.

Target audience
The target audience for this course is:
System Engineer, Service Engineer
Prerequisites

Successful completion of the following courses:

IMS 16 Overview LZU1082217
IMS Signaling LZU1087193

Students are required to have at least 6 months IMS Core (or MMTel) practical experience. These prerequisites are essential in order to ensure that all the course objectives can be met.

The following courses are recommended:

TSP Operation and Maintenance LZU1087341
CSCF 16 Operation & Configuration LZU1082210 or CSCFv 16 Operation & Configuration LZU1082211
HSS 16 Operation and Configuration for IMS LZU1082215
MGC 16 Operation and Configuration for IMS LZU1082221
MRS 16 Operation and Maintenance LZU1082222
SBG 16 Operation and Configuration for VoLTE LZU1082225 or SBGv 16 Operation and Configuration for VoLTE LZU1082226
IPWorks 15 Operation and Configuration for IMS LZU1082219
MTAS 16 Operation and Configuration LZU1082223 or MTASv 16 Operation and Configuration LZU1082224
MMTel Provisioning LZU1089067

Duration and class size

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

Learning situation

This course is based on theoretical and practical instructor-led sessions given in both classroom and in a technical environment using an MMTel System, which can be accessed remotely.
## Time schedule

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

<table>
<thead>
<tr>
<th>Day</th>
<th>Topics in the course</th>
<th>Estimated Time (hours)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Examination of different signaling traces</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Locate and solve end-to-end session faults and alarms CSCF, HSS/SLF, IP Works, SBG, MGC, MRS, Application Servers.</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Analysis and Discussions</td>
<td>3</td>
</tr>
<tr>
<td>2</td>
<td>Locate and solve end-to-end session faults and alarms CSCF, HSS/SLF, IP Works, SBG, MGC, MRS, Application Servers.</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>Analysis and Discussions</td>
<td>6</td>
</tr>
<tr>
<td>3</td>
<td>Locate and solve end-to-end session faults and alarms CSCF, HSS/SLF, IP Works, SBG, MGC, MRS, Application Servers.</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>Analysis and Discussions</td>
<td>6</td>
</tr>
</tbody>
</table>
IMS Signaling

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

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

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

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

2.11 Explain the function of SDP and the offer / answer model for SDP in IMS.

2.12 Describe the structure of SDP and the function of the SDP fields with reference to the associated RFCs.

2.13 Describe the use of SDP in SIP and MeGaCo signaling sequences.

3 Understand and describe the structure, specifications and usage of the Diameter Protocol in IMS

3.1 Describe the base functions and capabilities of Diameter and the associated RFCs.

3.2 Describe the routing principles of Diameter in IMS.

3.3 Describe the structure of Commands.

3.4 Describe the structure, types and format of AVPs.

3.5 Describe the main Diameter base protocol messages and AVPs.

3.6 Describe Vendor specific Commands & AVPs.

3.7 Describe the services provided by the Cx/Dx, Zx, Sh/Dh, Rx and Rf interfaces in IMS.

3.8 Describe the main IMS Diameter messages and AVPs associated with the Cx/Dx, Zx, Sh/Dh, Rx and Rf interfaces in IMS.

4 Understand and describe the structure, specifications and usage of H.248 (MeGaCo)

4.1 Describe the main function and usage of H.248 in IMS and the main RFCs.

4.2 Describe the H.248 Context Model.

4.3 Describe the H.248 Commands, Descriptors and Parameters and their use in IMS.

4.4 Describe Packages and Profiles.

4.5 Describe typical H.248 signaling sequences in IMS and their relationship with SIP and ISUP signaling.

5 Analyze detailed IMS signaling flows and Message content for Registration, Session Establishment and other call scenarios

5.1 Describe SIP to SIP and SIP to ISUP Session establishment.

5.2 Describe the Registration process, including Authentication.

5.3 Describe SIP/ISUP interworking including the function and use of Number Normalization, ENUM and External Network Selection (Breakout – BGCF).

5.4 Explain SIP forking.

5.5 Analyze detailed SIP and SDP signaling flows and messages from traces.

5.6 Analyze detailed Diameter signaling flows and Message content for Registration (Cx/Dx and Sh/Dh), Session Establishment and Charging (Rf).

5.7 Analyze detailed H.248 signaling traces between SBG & BGF and MGC & MGW during call establishment and clearing.

Target audience

The target audience for this course is:

Fundamentals
Prerequisites
Successful completion of the following courses:
IMS 16 Overview LZU1082217 or equivalent.

In addition the students should have a good basic understanding of general datacom and telecom networks and good knowledge of IP networking and the TCP/IP protocol family.

The prerequisites are essential in order to ensure that all the course objectives can be met.

Duration and class size
The length of the course is 3 days and the maximum number of participants is 16.

Learning situation
This course is based on theoretical instructor-led lessons and theoretical exercises based on WireShark traces.
**Time schedule**

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

<table>
<thead>
<tr>
<th>Day</th>
<th>Topics in the course</th>
<th>Estimated Time (hours)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>IMS Revision &amp; Standards</td>
<td>1.5</td>
</tr>
<tr>
<td></td>
<td>SIP Theory</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>SIP Message Routing exercise</td>
<td>1.5</td>
</tr>
<tr>
<td>2</td>
<td>SIP Theory part 2 and SDP</td>
<td>1.5</td>
</tr>
<tr>
<td></td>
<td>Diameter Theory</td>
<td>1.5</td>
</tr>
<tr>
<td></td>
<td>Exercises: Analysis of SIP Session establishment traces: SIP Register; SIP to SIP Session incl. Charging</td>
<td>3</td>
</tr>
<tr>
<td>3</td>
<td>Megaco Theory</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>SIP to GSTN Breakout Theory</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Analysis of SIP Traces continued: IMS to PSTN Call</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>SIP Forking exercise</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Summary &amp; Close</td>
<td>1</td>
</tr>
</tbody>
</table>
Introduction to IMS - live virtual

LZU1089861 R2A

Description
Do you want to know how operators and end users can benefit from IMS and what the different Ericsson IMS solutions are; then this is a course for you. The course provides an overview of the IP Multimedia Subsystem (IMS) and the Ericsson solutions for IMS, based on Release 16. End user benefits and what IMS services an operator can offer are explained.

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

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

2. Describe the Ericsson IMS Product Portfolio
   2.1 Explain the services provided by the IMS Core and MMTel

3. Identify the purpose of Ericsson’s IMS business solutions
   3.1 Recognize the Mobile Telephony Evolution with VoLTE process and offerings
   3.2 Recognize the Wi-Fi Calling offerings
   3.3 Recognize the Enriched Communication offerings
   3.4 Recognize the PSTN to IP process and offerings
   3.5 Recognize the Mobile Unified Communication offering
   3.6 Recognize the Converged Transit Evolution offering

Target audience
The target audience for this course is:

Fundamentals

Prerequisites
Successful completion of the following courses:

Students should have a good general knowledge of telecommunications.
**Duration and class size**

The length of the course is 3 hours spread over 1 session and the maximum number of participants is 12.

**Learning situation**

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

**Time schedule**

The time required always depends on the knowledge of the attending participants. The time for covering the topics which is stated below can be used as an estimate.

<table>
<thead>
<tr>
<th>Session</th>
<th>Topics in the course</th>
<th>Time (min)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Introduction</td>
<td>1</td>
</tr>
<tr>
<td>1</td>
<td>Ericsson IMS Services</td>
<td>1</td>
</tr>
<tr>
<td>1</td>
<td>Ericsson IMS Business Solutions</td>
<td>1</td>
</tr>
</tbody>
</table>
IPWorks 15 Operation and Maintenance for EPC

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

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

1. Understand the purpose of IPWorks and the services it provides
   1.1 Introduction to IPWorks features and functions
2. Explain the architecture of IPWorks
   2.1 Review of Hardware and Software Architecture
3. Recount IPWorks redundancy options
   3.1 Describe the redundancy options
4. Describe IPWorks deployment scenarios in EPC networks
   4.1 Understand IPWorks importance in EPC network
5. Work with IPWorks interfaces
   5.1 Using Server Control Panel
   5.2 Using Graphical User Interface
   5.3 Using Command Line Interface
6. Configure various parts of the system
   6.1 Configure DNS server
   6.2 Operate AAA server
   6.3 Configure ASDNS
7. Execute fault management
7.1 Inspect alarms and work with the SNMP agents
7.2 Configure and view logs
8 Practice maintenance tasks
  8.1 System backup and restore
  8.2 Configure and view statistics reports
9 Handle User management
  9.1 Managing User Profile and Access Control

Target audience
The target audience for this course is:
Service Deployment Engineer, Network Deployment Engineer, System Engineer, Service Engineer, System Administrator

Prerequisites
Successful completion of the following courses:
EPC System Survey, LZU1087977
Fundamental knowledge of IP protocol suite and Linux OS

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

Learning situation
This course is based on theoretical and practical instructor-led lessons given in both classroom and in a technical environment using equipment and tools, which are accessed remotely.
**Time schedule**

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

<table>
<thead>
<tr>
<th>Day</th>
<th>Topics in the course</th>
<th>Estimated time (hours)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Introduction</td>
<td>1.0</td>
</tr>
<tr>
<td></td>
<td>Architecture</td>
<td>1.0</td>
</tr>
<tr>
<td></td>
<td>Deployment scenarios</td>
<td>1.0</td>
</tr>
<tr>
<td></td>
<td>User interfaces</td>
<td>1.0</td>
</tr>
<tr>
<td></td>
<td>Configuration Management</td>
<td>2.0</td>
</tr>
<tr>
<td>2</td>
<td>Configuration Management</td>
<td>3.0</td>
</tr>
<tr>
<td></td>
<td>Fault management</td>
<td>1.0</td>
</tr>
<tr>
<td></td>
<td>Backup and restore</td>
<td>1.0</td>
</tr>
<tr>
<td></td>
<td>Performance Management</td>
<td>0.5</td>
</tr>
<tr>
<td></td>
<td>User Management</td>
<td>0.5</td>
</tr>
</tbody>
</table>
IPWorks 15 Operation and Maintenance for IMS

Description
Do you need to know how to configure IPWorks, do basic maintenance tasks, and learn some tips and tricks? IPWorks is an advanced product with several user interfaces, a layered architecture, and a combination of disk-based and memory-based databases. This course provides practical knowledge on the operation and maintenance of IPWorks. The course emphasizes the understanding of IPWORKS deployment on the IMS network and the knowledge of configuring the DNS and ENUM (with Number Portability) services as well as the Active Select DNS feature. The students are introduced to fault, node and performance management of the system. Furthermore, the course covers some security aspects of IPWorks. With the help of the manual provided in this course, and the guidance of the instructor, the attendees will be able to learn the most efficient ways of performing operation and maintenance procedures.

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

1. Understand the purpose of IPWorks and the services it provides
   1.1 Introduction to IPWorks features and functions
2. Explain the architecture of IPWorks
   2.1 Review of Hardware and Software Architecture
3. Recount IPWorks redundancy options
   3.1 Describe the redundancy options
4. Describe IPWorks deployment scenarios in IMS network
   4.1 Understand IPWorks importance in IMS network
5. Work with IPWorks interfaces
   5.1 Using Server Control Panel
   5.2 Using Graphical User Interface
   5.3 Using Command Line Interface
6. Configure various parts of the system
   6.1 Configure DNS server
   6.2 Configure ASDNS
   6.3 Operate ENUM server
7. Execute fault management
7.1 Inspect alarms and work with the SNMP agents
7.2 Configure and view logs

8 Practice maintenance tasks
8.1 System backup and restore
8.2 Configure and view statistics reports

9 Handle User management
9.1 Managing User Profile and Access Control

Target audience
The target audience for this course is:
Service Deployment Engineer, Network Deployment Engineer, System Engineer, Service Engineer, System Administrator

Prerequisites
Successful completion of the following courses:
IMS 16 Overview, Lzu1082217

Duration and class size
The length of the course is 2 days hours and the maximum number of participants is 8.

Learning situation
This course is based on theoretical and practical instructor-led lessons given in both classroom and in a technical environment using equipment and tools, which are accessed remotely.
**Time schedule**

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

<table>
<thead>
<tr>
<th>Day</th>
<th>Topics in the course</th>
<th>Estimated Time (hours)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Introduction</td>
<td>1.0</td>
</tr>
<tr>
<td></td>
<td>Architecture</td>
<td>1.0</td>
</tr>
<tr>
<td></td>
<td>Deployment scenarios</td>
<td>1.0</td>
</tr>
<tr>
<td></td>
<td>User interfaces</td>
<td>1.0</td>
</tr>
<tr>
<td></td>
<td>Configuration Management</td>
<td>2.0</td>
</tr>
<tr>
<td>2</td>
<td>Configuration Management</td>
<td>3.0</td>
</tr>
<tr>
<td></td>
<td>Fault management</td>
<td>1.0</td>
</tr>
<tr>
<td></td>
<td>Backup and restore</td>
<td>1.0</td>
</tr>
<tr>
<td></td>
<td>Performance Management</td>
<td>0.5</td>
</tr>
<tr>
<td></td>
<td>User Management</td>
<td>0.5</td>
</tr>
</tbody>
</table>
IPWorks v16 Operation and Maintenance for IMS

Description
Do you need to know how to configure a virtualized IPWorks, do basic maintenance tasks, and learn some tips and tricks? IPWorks is an advanced product with several user interfaces, a layered architecture, and a combination of disk-based and memory-based databases.
This course provides practical knowledge on the operation and maintenance of IPWorks. The course emphasizes the understanding of virtualized IPWorks deployment on the IMS network and the knowledge of configuring the DNS and ENUM (with Number Portability) services as well as the Active Select DNS feature. The students are introduced to fault, node and performance management of the system.

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

1. Understand the purpose of IPWorks and the services it provides
   1.1 Introduction to IPWorks features and functions
2. Explain the architecture of IPWorks
   2.1 Explain Virtualization concepts
   2.2 Describe Component Based Architecture and name relevant supporting components
   2.3 Review of Hardware and Software Architecture
3. Recount IPWorks redundancy options
   3.1 Describe the redundancy options
4. Describe IPWorks deployment scenarios in IMS network
   4.1 Understand IPWorks importance in IMS network
5. Work with IPWorks interfaces
   5.1 Use COM CLI
   5.2 Get familiar to Netconf
6. Configure various parts of the system
   6.1 Configure DNS server
   6.2 Configure ASDNS
   6.3 Operate ENUM server
7. Execute fault management
   7.1 Inspect alarms and work with the SNMP agents
7.2 Configure and view logs
8 Practice maintenance tasks
8.1 System backup and restore
8.2 Configure and view statistics reports
9 Handle User management
9.1 Managing User Profile and Access Control

**Target audience**

The target audience for this course is:
Service Deployment Engineer, Network Deployment Engineer, System Engineer, Service Engineer, System Administrator

**Prerequisites**

Successful completion of the following courses:
IMS 16 Overview, LZU1082217
Virtual IMS Concepts LZU1082227
The following courses become prerequisites if IPWorks Virtualized is a part of Ericsson Certified Cloud offering:
BSP 8100 Operation and Maintenance LZU1089779
ECM Fundamentals
ECM Foundations

**Duration and class size**

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

**Learning situation**

This course is based on theoretical and practical instructor-led lessons given in both classroom and in a technical environment using equipment and tools, which are accessed remotely.
Time schedule

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

<table>
<thead>
<tr>
<th>Day</th>
<th>Topics in the course</th>
<th>Estimated Time (hours)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Introduction</td>
<td>1.0</td>
</tr>
<tr>
<td></td>
<td>Architecture</td>
<td>1.0</td>
</tr>
<tr>
<td></td>
<td>Deployment scenarios</td>
<td>1.0</td>
</tr>
<tr>
<td></td>
<td>O&amp;M Interface</td>
<td>1.0</td>
</tr>
<tr>
<td></td>
<td>Configuration Management</td>
<td>2.0</td>
</tr>
<tr>
<td>2</td>
<td>Configuration Management</td>
<td>3.0</td>
</tr>
<tr>
<td></td>
<td>Fault management</td>
<td>1.0</td>
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<tr>
<td></td>
<td>Backup and restore</td>
<td>1.0</td>
</tr>
<tr>
<td></td>
<td>Performance Management</td>
<td>0.5</td>
</tr>
<tr>
<td></td>
<td>User Management</td>
<td>0.5</td>
</tr>
</tbody>
</table>
MGC 16 Operation and Configuration for IMS

Description
Do you need competence in how to operate and configure the IS MGC? This course covers just that. It will provide the participants with the knowledge to perform Surveillance, Operation and Configuration activities on the MGC when used in an IMS context. It consists of theory and practical exercises on how to operate and configure the MGC on Ericsson Integrated Site (IS). This includes configuration of signaling interfaces towards IP and TDM networks, number analysis and routing including the latest features.

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

1. Describe MGC 16 with its Features and Functions
   1.1 Understand the position of the MGC within the IMS 15 based solutions
   1.2 Name the MGC Interfaces and Protocols
   1.3 List and Describe the MGC Features and Functions
   1.4 Explain the terminology used in the MGC
2. Describe MGC System Architecture
   2.1 Present the logical architecture of MGC
   2.2 Describe the Hardware and Software implementation
   2.3 Explain the High Availability feature of the MGC
3. Handle Surveillance activities on the MGC
   3.1 Use the MGC element manager together with the node documentation
   3.2 Check the MGC Status and Interfaces
   3.3 Interpret MGC Alarms and Events
   3.4 Create and fetch the MGC logs
   3.5 Perform MGC Backup
   3.6 Initiate and collect MGC statistics
4. Explain network use cases with MGC
   4.1 Illustrate the call flows for the break out and in scenarios via MGC
5. Configure the MGC Interworking interfaces
   5.1 Configure the MGC H.248 interface
   5.2 Configure the MGC interface towards IMS core network
   5.3 Configure the MGC interface towards PSTN network
   5.4 Define MGC number and routing analysis
   5.5 Test MGC number and routing analysis
5.6 Create the MGC DNS and Charging interfaces
6 Understand how to configure a secure and redundant MGC
6.1 Present the redundancy method and concepts applied to secure MGC

Target audience
The target audience for this course is:
System Engineer, Service Engineer

Prerequisites
Successful completion of the following courses:
IMS 16 Overview, LZU1082217
IMS Signaling, LZU1087193
IS 3.1 Overview, LZU1087566
IS 3.1 Operation and Configuration, LZU1087567

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

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

<table>
<thead>
<tr>
<th>Day</th>
<th>Topics in the course</th>
<th>Estimated Time (hours)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>MGC Introduction and Architecture</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>MGC Surveillance activities and Practical Exercises</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>MGC Network Use cases and Practical Exercises</td>
<td>1</td>
</tr>
<tr>
<td>2</td>
<td>MGC Initial Node Configuration and Practical Exercises</td>
<td>4</td>
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<td>MGC Configuration and Practical Exercises</td>
<td>2</td>
</tr>
<tr>
<td>3</td>
<td>TDM Side configuration (SS7/ISUP) and Practical Exercises</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>SIGTRAN Configuration (SS7/ISUP and IP transport) and Practical Exercises</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>Number Analysis and Call Routing and Practical Exercises</td>
<td>2</td>
</tr>
</tbody>
</table>
MRS 16 Operation and Configuration

LZU1082222 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
4.3 Check and understand existing configuration in a MRS using the Node Manager and/or OSS-RC
4.4 Understand the role of Command Line Interface (CLI) and Node Command Line Interface (NCLI) in MRS
4.5 List and run some useful CLI and NCLI commands

5 Describe the Configuration Process for MRS
5.1 Explain the CCR Collection form
5.2 Describe the MRS initial start process
5.3 Describe the MRS Traffic Configuration process

6 Explain the MRS configuration and use Node Manager and/or OSS-RC to change or configure parts of the different interfaces
6.1 Describe and configure IP transport
6.2 Describe and configure TDM transport
6.3 Configure the IM-MGW interworking interfaces
6.4 Configure the Mobile Access interworking interfaces
6.5 Configure the BGF interworking interfaces
6.6 Configure the MRFP/MRFC interworking interfaces
6.7 Explain and configure the signaling bearer in MRS
6.8 Explain and define Virtual Media Gateway, Virtual Media Resource Function Processor/Controller and Virtual Border Gateway Function.

Target audience
The target audience for this course is:
System Engineer, Service Engineer

Prerequisites
Successful completion of the following course:
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 both classroom and in a technical environment using equipment and tools, which are accessed remotely.

Time schedule

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

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<tr>
<th>Day</th>
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<tbody>
<tr>
<td>1</td>
<td>MRS Introduction and Functions</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>MRP Introduction and Concepts including practical exercises</td>
<td>4</td>
</tr>
<tr>
<td>2</td>
<td>Operation and Maintenance overview and practical exercises</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Fault Management, Command Line Interface and OSS-RC theory and practical exercises</td>
<td>5</td>
</tr>
<tr>
<td>3</td>
<td>Traffic and signaling concepts and practical exercises</td>
<td>6</td>
</tr>
<tr>
<td>4</td>
<td>IM-MGW, MRFP and BGF Node Configuration and practical exercises</td>
<td>6</td>
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</tbody>
</table>
MTAS 16 Operation and Configuration

LZU1082223 R1A

Description
This course will provide the participants with a thorough understanding of Multimedia Telephony Application Server MTAS 16 and its role in MMTel, VoLTE/Wi-Fi Calling and SIP Trunking solutions. The course focuses on the node architecture, data structure as well as Surveillance, Operation and Configuration activities on MTAS 16.

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

1. Describe MTAS node functions and its role in IMS based solutions
   1.1 Describe the MTAS node functions as a part of MMTel Solution
   1.2 Describe the MTAS node functions as a part of VoLTE/Wi-Fi Calling Solution
   1.3 Describe the MTAS node functions as a part of SIP Trunking Solution
   1.4 Explain the subscriber data handling concept in MTAS and the role of HSS
   1.5 Explain the MTAS node interworking, interfaces and protocols

2. Explain the MTAS node architecture
   2.1 Explain MTAS architecture
   2.2 Describe O&M interface

3. Explain MTAS Operation and Maintenance Principles
   3.1 Explain Fault Management principles
   3.2 Perform MTAS Health Check
   3.3 Explain Performance Management principles
   3.4 Perform Backup and Restore

4. Configure MMTel AS components and interworking interfaces
   4.1 Describe basic MMTel Use Cases and the role of MMTel AS
   4.2 Configure SIP interface towards CSCF
   4.3 Configure Sh/Dh interface towards HSS
   4.4 Configure MTASv Charging and Rf/Ro interfaces towards Charging Mediator
   4.5 Configure andMp interface between MTASv and MRFP
   4.6 Configure Number Normalization tables in MTASv
   4.7 Configure XDMS subsystem

5. Configure SCC AS components and interworking interfaces
   5.1 Describe basic VoLTE/Wi-Fi Calling Use Cases and the role of SCC AS
   5.2 Configure SDS parameters
5.3 Configure T-ADS parameters
5.4 Configure SRVSS parameters
5.5 Configure Additional SCC-AS features
6  Configure ST AS components
6.1 Describe basic SIP Trunking Use Cases and the role of ST AS
6.2 Configure ST AS Parameters
7  Configure MMTel AS and ST AS supplementary services and explain signaling sequences
   7.1 Configure and verify Communication Diversion service
   7.2 Configure and verify Communication Barring service
   7.3 Configure and verify Identity Presentation/Restriction service
   7.4 Configure and verify other supplementary services

Target audience
The target audience for this course is:
System Engineer, Service Engineer

Prerequisites
Successful completion of the following courses:
IMS 16 Overview LZU1082217
IMS Signaling LZU1087193
TSP Operation and Maintenance LZU1089924
The following course is required if BSP hardware is used:
BSP 8100 Operation and Maintenance LZU1089779
The following course is recommended but not a mandatory pre-requisite:
MMTel Provisioning LZU1089067

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

Learning situation
This course is based on theoretical and practical instructor-led sessions given in both classroom and in a technical environment using an MMTel System, which can be accessed remotely.
### Time schedule

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

<table>
<thead>
<tr>
<th>Day</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>MTAS node functions and interworking</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>MTAS node architecture</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>MTAS O&amp;M Principles</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>MMTel AS Operation and Configuration</td>
<td>1</td>
</tr>
<tr>
<td>2</td>
<td>MMTel AS Operation and Configuration</td>
<td>6</td>
</tr>
<tr>
<td>3</td>
<td>SCC AS Operation and Configuration</td>
<td>2</td>
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<tr>
<td></td>
<td>ST AS Operation and Configuration</td>
<td>2</td>
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<td></td>
<td>Configuration and verification of MTAS Supplementary Services parameters via O&amp;M GUI and user self-provisioning; Signaling traces analysis</td>
<td>2</td>
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</tbody>
</table>
MTASv 16 Operation and Configuration

LZU1082224 R1A

Description
This course will provide the participants with a thorough understanding of a Virtualized Multimedia Telephony Application Server MTASv 16 and its role in MMTel, VoLTE/Wi-Fi Calling and SIP Trunking solutions. The course focuses on the node architecture, data structure as well as Surveillance, Operation and Configuration activities on MTASv 16.

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

1. Describe MTASv node functions and its role in vI MS based solutions
1.1 Describe the MTASv node functions as a part of MMTel Solution
1.2 Describe the MTASv node functions as a part of VoLTE/Wi-Fi Calling Solution
1.3 Describe the MTASv node functions as a part of SIP Trunking Solution
1.4 Explain the subscriber data handling concept in MTASv and the role of HSS
1.5 Explain the MTASv node interworking, interfaces and protocols

2. Explain the MTASv node architecture
2.1 Explain MTAS implementation as a VNF
2.2 Describe O&M Interface
2.3 Explain External Connectivity and eVIP functionality
2.4 Perform Scaling Management

3. Explain MTASv Operation and Maintenance Principles
3.1 Perform Compute Resources Check
3.2 Explain Fault Management principles
3.3 Perform MTAS Health Check
3.4 Explain Performance Management principles
3.5 Perform Backup and Restore

4. Configure MMTel AS components and interworking interfaces
4.1 Describe basic MMTel Use Cases and the role of MMTel AS
4.2 Configure SIP interface towards CSCF
4.3 Configure Sh/Dh interface towards HSS
4.4 Configure MTASv Charging and Rf/Ro interfaces towards Charging Mediator
4.5 Configure and Mp interface between MTASv and MRFP
4.6 Configure Number Normalization tables in MTASv
4.7 Configure XDMS subsystem
5 Configure SCC AS components and interworking interfaces
  5.1 Describe basic VoLTE/Wi-Fi Calling Use Cases and the role of SCC AS
  5.2 Configure SDS parameters
  5.3 Configure T-ADS parameters
  5.4 Configure SRVSS parameters
  5.5 Configure Additional SCC-AS features

6 Configure ST AS components
  6.1 Describe basic SIP Trunking Use Cases and the role of ST AS
  6.2 Configure ST AS Parameters

7 Configure MMTel AS and ST AS supplementary services and explain signaling sequences
  7.1 Configure and verify Communication Diversion service
  7.2 Configure and verify Communication Barring service
  7.3 Configure and verify Identity Presentation/Restriction service
  7.4 Configure and verify other supplementary services

Target audience

The target audience for this course is:
System Engineer, Service Engineer

Prerequisites

Successful completion of the following courses:

IMS 16 Overview LZU1082217
IMS Signaling LZU1087193
Virtual IMS Concepts LZU1082227

The following courses become prerequisites if MTASv is a part of Ericsson Certified Cloud offering:

BSP 8100 Operation and Maintenance LZU1089779
ECM Fundamentals LZU1089914

The following course is recommended:

MMTel Provisioning LZU1089067

Duration and class size

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

Learning situation

This course is based on theoretical and practical instructor-led sessions given in both classroom and in a technical environment using a vIMS/MMTel System, which can be
accessed remotely.

**Time schedule**

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

<table>
<thead>
<tr>
<th>Day</th>
<th>Topics in the course</th>
<th>Estimated Time (hours)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>MTASv Node Functions and Interworking</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>MTASv Node Architecture</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>MTASv O&amp;M Principles</td>
<td>2</td>
</tr>
<tr>
<td>2</td>
<td>MMTel AS Configuration</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>SCC AS Configuration</td>
<td>2</td>
</tr>
<tr>
<td>3</td>
<td>SCC AS Configuration</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>ST AS Configuration</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>Configuration of Supplementary Services</td>
<td>3</td>
</tr>
</tbody>
</table>
SBG 16 Operation and Configuration for VoLTE

Description
Without SBG the IMS network is vulnerable to both internal and external attacks. This course will help you to understand the importance of SBG in VoLTE networks from a security point of view and its support for other features and functions. It will cover operational aspects and configuration so that you can operate and configure the Ericsson SBG 16 in your VoLTE network.

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

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

1. Describe the SBG Network implementation
   1.1 List SBG Interfaces and Protocols
   1.2 List SBG ensuring and enabling functions
   1.3 Describe the SBG roles in 3GPP and TISPAN network architectures
   1.4 Describe the node functions implemented by SBG.

2. Describe the SBG key Network features
   2.1 Describe the network security features
   2.2 Describe the Quality of Service Assurance features
   2.3 Explain SBG monitoring of session activity
   2.4 Explain SBG connectivity support to users and networks
   2.5 Explain SBG Charging
   2.6 Explain Geographical Location support
   2.7 Explain Priority Service Support

3. Explain SBG routing procedures and basic signaling sequences
   3.1 Explain how SIP routing is performed in IBCF, P-CSCF and ATCF
   3.2 Explain SBG basic signaling sequences for Registration, Session Establishment and Session Termination

4. Describe the SBG System Architecture and perform basic O&M tasks
   4.1 Describe the IS System Architecture
   4.2 Describe the Operation and Maintenance Architecture
   4.3 Handle SBG Blades and Blade Systems
4.4 Handle SBG SW Backup and Restore
4.5 Handle SBG Alarms and Events
4.6 Handle SBG Logs
4.7 Handle VLAN's for SBG
4.8 Describe the SBG capacity and redundancy
5 Configure SBG interworking interfaces
5.1 Configure SIP session signaling interfaces
5.2 Configure Diameter and DNS Interworking Interfaces
6 Configure Emergency Call support in SBG
6.1 Configure Emergency Call support for mobile users
7 Configure SBG for external BGFs
7.1 Explain the distributed BGF concept
7.2 Explain BGF detection and selection mechanisms
7.3 Explain how to configure H.248 signaling connections in SGC towards an external BGF
7.4 Configure external BGF interface
7.5 Configure the SBG for Optimized BGF Selection
8 Configure SBG to enable SRVCC functionality
8.1 Explain the use of the CS network type
8.2 Explain the call cases involved in access transfer
8.3 Configure Access Transfer Control Function (ATCF)
9 Configure signaling tracing in the SBG
9.1 Configure the interface to the trace collection entity
9.2 Configure a trace session
9.3 Explain the trace file format
10 Configure additional SBG features
10.1 Configure SIP header blacklists
10.2 Configure User Agent White Lists
10.3 Configure SMM Rules
10.4 Configure SIP Request Throttling
10.5 Configure SIP Error response mapping
10.6 Configure LBO Inbound Roaming
10.7 Configure Connection Admission Control
10.8 Configure Transcoding
10.9 Configure Priority Service Support
10.10 Configure S8 Home Routed Roaming
**Target audience**
The target audience for this course is:
System Engineer, Service Engineer

**Prerequisites**
Successful completion of the following courses:
IMS 16 Overview, LZU1082217
IMS Signaling, LZU1087193
IS 3.1 Overview, LZU1087566
IS 3.1 Operation and Configuration, LZU1087567

**Duration and class size**
The length of the course is 4 days and the maximum number of participants is 8.

**Learning situation**
This course is based on theoretical and practical instructor-led lessons given in both classroom and in a technical environment using equipment and tools, which are accessed remotely.
**Time schedule**

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

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<th>Day</th>
<th>Topics in the course</th>
<th>Estimated Time (hours)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Introduction - Network Implementation</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Key network Features</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Routing procedures and basic signaling sequences</td>
<td>2</td>
</tr>
<tr>
<td>2</td>
<td>SBG Architecture</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>Basic O&amp;M tasks</td>
<td>4</td>
</tr>
<tr>
<td>3</td>
<td>Configure SBG Interworking Interfaces</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>Configure Emergency Call settings</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Distributed BGF configuration</td>
<td>1</td>
</tr>
<tr>
<td>4</td>
<td>SRVCC Configuration</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>Configure signaling tracing in SBG</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Configure Additional Features</td>
<td>3</td>
</tr>
</tbody>
</table>
SBGv 16 Operation and Configuration for VoLTE

Description
Without SBG the IMS network is vulnerable to both internal and external attacks. This course will help you to understand the importance of SBG in VoLTE networks from a security point of view and its support for other features and functions. It will cover operational aspects and configuration so that you can operate and configure the Ericsson SBGv 16 in your VoLTE network.

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

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

1. Describe the SBGv Network implementation
   1.1 List SBGv Interfaces and Protocols
   1.2 List SBGv ensuring and enabling functions
   1.3 Describe the SBGv roles in 3GPP and TISPAN network architectures
   1.4 Describe the node functions implemented by SBGv.

2. Describe the SBGv key Network features
   2.1 Describe the network security features
   2.2 Describe the Quality of Service Assurance features
   2.3 Explain SBGv monitoring of session activity
   2.4 Explain SBGv connectivity support to users and networks
   2.5 Explain SBGv Charging
   2.6 Explain Geographical Location support
   2.7 Explain Priority Service Support

3. Explain SBGv routing procedures and basic signaling sequences
   3.1 Explain how SIP routing is performed in IBCF, P-CSCF and ATCF
   3.2 Explain SBGv basic signaling sequences for Registration, Session Establishment and Session Termination

4. Describe the SBGv VNF and perform basic O&M tasks
   4.1 Explain the SBGv VNF deployment
   4.2 Describe O&M Interface
   4.3 Handle SBGv SW Backup and Restore
4.4 Handle SBGv Alarms and Events
4.5 Handle SBGv Logs
4.6 Handle SBGv Performance Monitoring

5 Configure SBGv interworking interfaces
5.1 Configure SIP session signaling interfaces
5.2 Configure Diameter and DNS Interworking Interfaces

6 Configure Emergency Call support in SBGv
6.1 Configure Emergency Call support for mobile users

7 Configure SBGv for external BGFs
7.1 Explain the distributed BGF concept
7.2 Explain BGF detection and selection mechanisms
7.3 Explain how to configure H.248 signaling connections in SBGv towards an external BGF
7.4 Configure external BGF interface
7.5 Configure the SBGv for Optimized BGF Selection

8 Configure SBGv to enable SRVCC functionality
8.1 Explain the use of the CS network type
8.2 Explain the call cases involved in access transfer
8.3 Configure Access Transfer Control Function (ATCF)

9 Configure signaling tracing in the SBGv
9.1 Configure the interface to the trace collection entity
9.2 Configure a trace session
9.3 Explain the trace file format

10 Configure additional SBGv features
10.1 Configure SIP header blacklists
10.2 Configure User Agent White Lists
10.3 Configure SMM Rules
10.4 Configure SIP Request Throttling
10.5 Configure SIP Error response mapping
10.6 Configure Inbound Roaming
10.7 Configure Connection Admission Control
10.8 Configure Transcoding
10.9 Configure Priority Service Support
Target audience
The target audience for this course is:
System Engineer, Service Engineer

Prerequisites
Successful completion of the following courses:
IMS 16 Overview, Lzu1082217
IMS Signaling, Lzu1087193
Virtual IMS Concepts Lzu1082227
The following courses become prerequisites if SBGv is a part of Ericsson Certified Cloud offering:
BSP 8100 Operation and Maintenance Lzu1089779
ECM Fundamentals Lzu1089914

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

Learning situation
This course is based on theoretical and practical instructor-led lessons given in both classroom and in technical environment using equipment and tools, which are accessed remotely.
### Time schedule

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

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</tr>
<tr>
<td>2</td>
<td>SBGv Architecture</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>Basic O&amp;M tasks</td>
<td>4</td>
</tr>
<tr>
<td>3</td>
<td>Configure SBGv Interworking Interfaces</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>Configure Emergency Call settings</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Distributed BGF configuration</td>
<td>1</td>
</tr>
<tr>
<td>4</td>
<td>SRVCC Configuration</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>Configure signaling tracing in SBGv</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Configure Additional Features</td>
<td>3</td>
</tr>
</tbody>
</table>
Wi-Fi Calling e2e Use Cases

Description
The course provides a detailed overview of Wi-Fi Calling end2end use cases. It includes exercises with a thorough analysis of Wi-Fi Calling traces previously taken in a live Wi-Fi Calling networks: Attach and Registration, Session setup and Seamless Handover.

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

1. Explain basic use cases in Wi-Fi Calling network
   1.1 Explain Wi-Fi Calling attach and registration procedures
   1.2 Explain Wi-Fi Calling session setup procedures
   1.3 Explain seamless handover procedures between Wi-Fi Calling and VoLTE
2. Analyze traces of Wi-Fi Calling use cases
   2.1 Perform analysis of Wi-Fi Calling attach and registration signaling captures
   2.2 Perform analysis of Wi-Fi Calling session setup signaling captures
   2.3 Perform analysis of seamless handover signaling captures

Target audience
The target audience for this course is:
System Engineer, Service Engineer, Network Design Engineer, Network Deployment Engineer

Prerequisites
Successful completion of the following courses:
Wi-Fi Calling Solution Overview LZU1089981
Recommended courses:
IMS Signaling LZU1087193
VoLTE e2e Use Cases LZU1089426
Duration and class size
The length of the course is 1 day and the maximum number of participants is 16.

Learning situation
This course is based on theoretical instructor-led lessons and theoretical exercises on WireShark traces.

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

<table>
<thead>
<tr>
<th>Day</th>
<th>Topics in the course</th>
<th>Estimated Time (hours)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>• Wi-Fi Calling Basic Terms</td>
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</tr>
<tr>
<td></td>
<td>• Wi-Fi Calling use cases and trace analysis: Wi-Fi Calling attach, registration and originating session setup</td>
<td>5.5</td>
</tr>
</tbody>
</table>
Wi-Fi Calling Solution Overview

LZU1089981 R2A

Description
The course provides a detailed overview of Wi-Fi Calling Solution components from end2end perspective. It explains the basic principles of Wi-Fi access, describes Ericsson Network Integrated Wi-Fi Solution and focuses on Wi-Fi Calling. The Solution architecture and the roles of EPC and IMS components are explained in details. Wi-Fi Calling for Multi-device solution as well as Wi-Fi Calling Use Cases including interworking with VoLTE technology are described.

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

1. Explain Wi-Fi Calling Driving Factors and Benefits
   1.1 Wi-Fi Calling Driving Factors
   1.2 Wi-Fi Calling Benefits
2. Explain what is Wi-Fi
   2.1 Describe the Wi-Fi access and the added value of using Wi-Fi.
   2.2 Explain the standards that govern Wi-Fi.
   2.3 Explain the call flow related to associating and authenticating into a network.
3. Describe Ericsson Network Integrated Wi-Fi Solution
   3.1 Outline supported architectures and features
   3.2 Explain Trusted Wi-Fi access, its architecture, main features and components
   3.3 Explain Untrusted Wi-Fi access, its architecture, main features and components
4. Describe Ericsson Wi-Fi Calling Solution architecture
   4.1 Describe Wi-Fi Calling Solution architecture
   4.2 Outline networks, nodes and functions which form the Wi-Fi Calling Solution
   4.3 Name EPC nodes and their roles in Wi-Fi Calling
   4.4 Describe ePDG selection
   4.5 Describe user authentication and authorization
   4.6 Explain PDN connection for IMS APN
   4.7 Describe Mobility and QoS support
   4.8 Describe how the basic IMS procedures are supported for Wi-Fi Calling
   4.9 Name IMS nodes the explain their roles in Wi-Fi Calling
   4.10 Describe integration interfaces in Wi-Fi Calling Solution
5. Explain Use Cases and Wi-Fi Calling Solution Components Interworking
   5.1 Explain Wi-Fi Calling Initial Attach and Registration
   5.2 Describe Wi-Fi Calling Session Setup
5.3 Describe T-ADS support in a combined VoLTE/Wi-Fi Calling environment
5.4 Explain how handover between VoLTE and Wi-Fi Calling is implemented

Target audience
The target audience for this course is:
System Engineer, Service Engineer, Network Design Engineer, Network Deployment Engineer

Prerequisites
Successful completion of the following courses:
IMS 16 Overview LZU1082217
EPC System Survey LZU1087977

Duration and class size
The length of the course is 1 days and 0 hours and the maximum number of participants is 16.

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

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

<p>| | | |</p>
<table>
<thead>
<tr>
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<tbody>
<tr>
<td>1</td>
<td>• Introduction to Wi-Fi</td>
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<tr>
<td></td>
<td>• Wi-Fi Basics</td>
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<tr>
<td></td>
<td>• Ericsson Network Integrated Wi-Fi Solution</td>
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<tr>
<td></td>
<td>• Wi-Fi Calling Solution Architecture</td>
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</tr>
<tr>
<td></td>
<td>• Wi-Fi Use Cases and Components Interworking</td>
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</table>
Virtual IMS Concepts

LZU1082227 R1A

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

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

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

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

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

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

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

6. Give examples on how different Ericsson virtual IMS functions are deployed
   6.1 Explain deployment of MTASv and CSCFv
   6.2 Explain deployment of SBGv
Target audience
The target audience for this course is:
Network Technicians and Network Engineers

Prerequisites
Successful completion of the following courses:
IMS 16 Overview LZU1082217

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 environment.
### Time schedule

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

<table>
<thead>
<tr>
<th>Day</th>
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<tbody>
<tr>
<td>1</td>
<td>Virtualization and cloud concepts</td>
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</tr>
<tr>
<td></td>
<td>ETSI NFV</td>
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<tr>
<td></td>
<td>OPNFV</td>
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<tr>
<td></td>
<td>Ericsson Cloud System Offering</td>
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<tr>
<td></td>
<td>Ericsson IMS VNF Offering</td>
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</tr>
<tr>
<td></td>
<td>Different IMS VNF Deployments</td>
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</tr>
</tbody>
</table>
VoLTE Concepts

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

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

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

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

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

4. Explain VoLTE deployment scenarios

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

6. Explain VoLTE Roaming Models

7. Describe basic traffic cases in VoLTE/MMTel network

Target audience
The target audience for this course is:

System Engineer, Service Engineer, Network Design Engineer, Network Deployment Engineer
**Prerequisites**

Successful completion of the following courses:

- IMS 16 Overview LZU1082217
- EPC System Survey LZU1087977

**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.

**Time schedule**

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

<table>
<thead>
<tr>
<th>Day</th>
<th>Topics in the course</th>
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</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>• Introduction to VoLTE</td>
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</tr>
<tr>
<td></td>
<td>• LTE/EPC/MMTel architecture and nodes functions</td>
<td>1.5</td>
</tr>
<tr>
<td></td>
<td>• VoLTE migration mechanisms and deployment scenarios</td>
<td>1.5</td>
</tr>
<tr>
<td></td>
<td>• QoS in VoLTE</td>
<td>1.0</td>
</tr>
<tr>
<td></td>
<td>• VoLTE Roaming Models</td>
<td>0.5</td>
</tr>
<tr>
<td></td>
<td>• VoLTE / MMTel traffic cases</td>
<td>0.5</td>
</tr>
</tbody>
</table>
VoLTE e2e Use Cases

LZU1089426 R4A

Description
The course provides a detailed overview of VoLTE end2end use cases. It includes exercises with a thorough analysis of VoLTE traces taken on a live VoLTE/CS network: VoLTE registration, Session setup, SRVCC and IMS Centralized Services (ICS).

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

1. Explain basic use cases in VoLTE/MMTel network
   1.1 Explain VoLTE attach and registration procedures
   1.2 Explain VoLTE session setup procedures
   1.3 Explain SRVCC and ICS for VoLTE/CS Voice coexistence

2. Analyze traces of VoLTE use cases
   2.1 Perform analysis of VoLTE attach and registration signaling captures
   2.2 Perform analysis of VoLTE session setup signaling captures
   2.3 Perform analysis of SRVCC signaling captures
   2.4 Perform analysis of ICS signaling captures

Target audience
The target audience for this course is:
System Engineer, Service Engineer, Network Design Engineer, Network Deployment Engineer

Prerequisites
Successful completion of the following courses:
VoLTE Concepts LZU1089425
Recommended courses:
IMS Signaling LZU1087193
EPC Signaling LZU1087508
MSS Signaling LZU1088627
Duration and class size
The length of the course is 2 days and the maximum number of participants is 16.

Learning situation
This course is based on theoretical instructor-led lessons and theoretical exercises on WireShark traces.

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

<table>
<thead>
<tr>
<th>Day</th>
<th>Topics in the course</th>
<th>Estimated Time (hours)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>• VoLTE Basic Terms</td>
<td>0.5</td>
</tr>
<tr>
<td></td>
<td>• VoLTE use cases and trace analysis: VoLTE attach, registration and session setup</td>
<td>5.5</td>
</tr>
<tr>
<td>2</td>
<td>• VoLTE use cases and trace analysis: SRVCC and ICS</td>
<td>6.0</td>
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