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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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<tr>
<th>Icon</th>
<th>Delivery Method</th>
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<tbody>
<tr>
<td>![Icon]</td>
<td>Instructor Led Training (ILT)</td>
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<tr>
<td>![Icon]</td>
<td>Seminar (SEM)</td>
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<td>![Icon]</td>
<td>Workshop (WS)</td>
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<td>![Icon]</td>
<td>Virtual Classroom Training (VCT)</td>
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<tr>
<td>![Icon]</td>
<td>Web Based Learning/eLearning (WBL)</td>
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<td>![Icon]</td>
<td>Structured Knowledge Transfer (SKT)</td>
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**Delivery Enablers**

- Remote Training Lab (RTL)
GPRS System Survey

Description
If you want to gain knowledge about the main principles around the mobile packet network (GPRS and EDGE), this course is for you. You will understand the basic concepts about GSM (including EDGE) and WCDMA air interface (including HSPA) and the main Ericsson products involved in the GPRS core network.

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

1. **Explain the purpose of implementing packet switching in the existing GSM/WCDMA systems**
   1.1 Understand the differences between Circuit switching and Packet switching
   1.2 Describe few GPRS Applications
   1.3 Describe the GSM/GPRS/WCDMA network architecture
   1.4 List and explain GPRS system architecture
   1.5 Introduce 3GDT features
   1.6 List GPRS terminal features
   1.7 Explain briefly the network evolution of GSM/WCDMA into EPC

2. **Explain on overview level the air interface in GPRS covering the GSM network, including EDGE**
   2.1 Explain GPRS Radio resource management
   2.2 Understand GPRS throughput announcement, Coding schemes, Number of timeslots allocated, Protocol headers added to payload and Cell charging in GPRS
   2.3 Describe EDGE enhancement compared to GSM

3. **Explain on overview level the air interface covering the WCDMA networks including HSPA**
   3.1 Briefly understand the QoS concept
   3.2 Describe the Radio Resource control states
   3.3 Describe the User plane bearers for WCDMA systems
   3.4 Understand how the bandwidth is managed across the air Interface
   3.5 Briefly understand HSPA.
4 Understand and briefly describe the GPRS/WCDMA traffic cases
4.1 Show the GPRS transport architecture
4.2 Explain the mobility management states
4.3 State how the session management is handled
4.4 List the Gb Concepts
4.5 Explain on an overview level SGSN Pool Proxy functionality

5 List the functions and hardware for the WPP based SGSN for both GSM and WCDMA Systems as well as GGSN based on J20
5.1 List the main hardware components in the GPRS network
5.2 Explain the GPRS connectivity
5.3 List the protocol stack in the GPRS interfaces

6 Describe the BSS and RAN architecture for GPRS in GSM/WCDMA
6.1 Understand the configuration for Gb over IP connected to the PCU
6.2 List the interfaces on the WCDMA RAN architecture

7 Explain on an overview level the packet switching network in Mobile-PBN
7.1 Understand architectural and function overview of Mobile-PBN
7.2 Describe the Mobile Softswitch Network Structure
7.3 List the interfaces on the WCDMA RAN architecture
7.4 Understand IP transport as in GP and IP
7.5 Briefly understand DNS and Roaming
7.6 Briefly understand Corporate Connectivity

Target audience

The target audience for this course is:

Field Technician, System Technician, System Engineer, Service Engineer, Network Design Engineer, Network Deployment Engineer, Service Design Engineer, Service Deployment Engineer.

This audience includes personnel in charge of the operation or engineering of Ericsson GSM SGSN and/or WCDMA SGSN nodes.

Prerequisites

The participants should have successfully completed the following courses:

Ericsson WCDMA System overview (2 days ILT or VCT) Lzu108 5418
GSM System Survey (4 days ILT) Lzu 108 852
Duration and class size

Duration and class size depend on the course being delivered in either version:

1. Instructor Led Training (ILT) Version:
The length of the course is 2 days and the maximum number of participants is 16.

2. Virtual Classroom Training (VCT) Version:
The length of the course is 2 days and no more than 16 students participating in the VCT Sessions are recommended. Ericsson does not recommend Centra Sessions longer than 3 hours a day.

Learning situation

This course is based on theoretical instructor-led lessons given in a classroom environment, or given in a virtual classroom over the net by an instructor.

Time schedule

The time required always depends on the knowledge of the attending participants and the hours stated below can be used as estimate. (This paragraph is mandatory).

<table>
<thead>
<tr>
<th>Day</th>
<th>Topics in the course</th>
<th>Estimated time</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>• Introduction</td>
<td>0,5h</td>
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<tr>
<td></td>
<td>• GSM/WCDMA Network Overview for GPRS</td>
<td>1.0h</td>
</tr>
<tr>
<td></td>
<td>• GSM Air Interface for GPRS</td>
<td>2.0h</td>
</tr>
<tr>
<td></td>
<td>• WCDMA Air Interface for GPRS</td>
<td>2.5h</td>
</tr>
<tr>
<td>2</td>
<td>• Transport and Traffic Management</td>
<td>2,5h</td>
</tr>
<tr>
<td></td>
<td>• SGSN and GGSN Hardware</td>
<td>1h</td>
</tr>
<tr>
<td></td>
<td>• BSS and WRAN Architecture for GPRS</td>
<td>1h</td>
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<tr>
<td></td>
<td>• Mobile-PBN</td>
<td>1h</td>
</tr>
<tr>
<td></td>
<td>• Conclusion</td>
<td>0.5</td>
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</table>
EPC Signaling

Description
Evolved Packet Core (EPC) is part of the Evolved Packet System (EPS) that provides packet data services to mobile communication.

This course describes the protocols and signaling in the EPC infrastructure. It covers the interfaces in the EPC and also interworking with GPRS and non 3GPP architectures. Traffic cases for the EPC describing the various scenarios such as Mobility and Bearer are explained.

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

1 Describe the EPC services
   1.1 List and describe the function of the nodes in the EPC
2 Explain the EPC Interfaces
   2.1 Describe the LTE Access Interfaces such as S1 and X2
   2.2 Describe the EPC Core Interfaces such as S10, S11, S6a, S5 and S8 interfaces
   2.3 Describe Interfaces to external networks such as Gxc and SGi
3 Explain the Signaling and Protocols between the nodes
   3.1 List and Describe the protocols used in the EPC nodes
   3.2 Describe the Control and User Planes in the EPC nodes
4 Understand, describe and explain how different traffic cases are handled by the EPC nodes
   4.1 List nodes involved in traffic cases
   4.2 Describe the Identity, Authentication and Location Management procedures
   4.3 Describe the Session Management and QoS procedure
   4.4 Describe selected Handover procedures
5 Explain the supporting services for EPC
   5.1 Describe signaling from the Home Subscriber Server (HSS) and AAA
   5.2 Explain the function of the Domain Name System (DNS)
   5.3 Describe the DNS procedures for EPC

Target audience
The target audience for this course is: Network Design Engineer, Network Deployment Engineer, Service Deployment Engineer, System Technician, System Engineer, Field Technician, Service Design Engineers.
Prerequisites

Participants should be familiar with Evolved Packet Core at Survey level. The Evolved Packet Core Overview LZU 108 7579 course is a prerequisite.

Having an understanding of GPRS and signaling in GPRS will be an advantage to participants in understanding EPC signaling concepts but is not strictly required.

Duration and class size

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

Learning situation

This course is based on theoretical instructor-led lessons given in a 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</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>EPC Nodes and Services</td>
<td>1 hour</td>
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<tr>
<td></td>
<td>EPC Interfaces</td>
<td>3 hour</td>
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<tr>
<td></td>
<td>EPC Signaling and Protocols</td>
<td>2 hours</td>
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<tr>
<td>2</td>
<td>EPC Signaling and Protocols</td>
<td>1 hours</td>
</tr>
<tr>
<td></td>
<td>Traffic Cases</td>
<td>3.5 hours</td>
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<tr>
<td></td>
<td>Supporting Services</td>
<td>1.5 hour</td>
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</table>
Evolved Packet Core (EPC) System Survey

Description

With the emergence of Long Term Evolution (LTE) as the future proof technology, this course is designed to examine how Evolved Packet Core (EPC) can become an integral part of the Evolved Packet System (EPS). EPC is the next generation technology that provides users with access to packet data services. This technology is an evolution from GSM, GPRS, EDGE and WCDMA technology that enables interconnectivity from RAN perspectives so that users could stay connected to their mobile network.

This is an introductory course aimed at providing an overview of EPC infrastructure and its associated nodes, EPC protocols and interfaces, EPC mobility architecture, EPC transport domain and operation and maintenance of EPC. This is an ideal course for those who wish to gain fundamental technical understanding for topics such as Access Point Names (APNs), IP connectivity, bearers and QoS, user plane, signaling plane from an end-to-end perspective.

Learning objectives

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

1. Get an overview of the EPC according to 3GPP R8
   1.1 Show the evolution of GPRS for GSM & WCDMA nodes and functionality to EPS.
   1.2 Describe EPC according to 3GPP R8.
   1.3 Describe the Ericsson Evolved Packet System (EPS) inclusive of LTE and EPC.
   1.4 Explain the benefits of Ericsson EPS to the operator and end user.

2. Explain the infrastructure of EPC
   2.1 Describe the function of Mobile Management Entity (MME), Home Subscriber Server (HSS), Policy and Charging Rules Function (PCRF), Serving Gateway (SGW), Packet Data Network Gateway (PGW), Domain Name System (DNS) and IP Multimedia Subsystem (IMS).
   2.2 Describe the SGSN-MME node and features.
   2.3 Describe the HSS node and features.
   2.4 Describe the Service Aware Policy Controller (SAPC) node which provides PCRF functionality.
   2.5 Describe Converged Packet Gateway (CPG) node which provides SGW and PGW functionality.
   2.6 Describe Mobile Packet Gateway (MPG) node which also provides SGW & PGW functionality.
   2.7 Describe IPWorks node which provides DNS functionality.
2.8 Describe IMS Common System (ICS) nodes which provide IMS core network functionality.

3 Overview of Converged Packet Gateway (CPG) 2010A
3.1 Identify the supported interfaces and nodes that provide inter-working with the CPG.
3.2 Analyze the architecture of the CPG in terms of its hardware and software components.
3.3 Understand the capacity, characteristics and ISP of the CPG.
3.4 Describe the new router features in SmartEdge Operating System (SEOS)
3.5 Understand on an overview level the general In Service Performance features of the CPG with session resilience.

4 Overview of SGSN-MME 2010A
4.1 Describe the functions and hardware of the Wireless Packet Platform (WPP) based SGSN-MME 2010A.
4.2 List the main hardware components in the SGSN-MME 2010A.
4.3 Illustrate the SGSN-MME 2010A features and functions used to connect the user to the EPS network.

5 Explain the different protocols and interfaces of EPC
5.1 Describe the different interfaces and their functions.
5.2 Describe the GTPv2 and Proxy Mobile IP (PMIP) protocol and usage scenario.
5.3 Explain the PDN connection and bearers.
5.4 Describe PDN types for IPv4 & IPv6.
5.5 Describe charging services for EPC.

6 Explain the mobility architecture of EPC
6.1 List traffic scenarios for mobility, handover, session continuity and voice traffic.
6.2 Describe user plane (bearers) and signaling plane during mobility scenarios.
6.3 Describe APNs and Quality of Service.

7 Describe the transport domain of EPC
7.1 Mobile Packet Backbone Network.
7.2 Packet RAN.

8 Explain the Operations & Maintenance System of EPC
8.1 OSS-RC overview.
8.2 Explain OSS-RC functions.
8.3 Understand basic software and hardware management on the CPG.
8.4 Understand concepts related to basic fault and performance monitoring on the CPG.
8.5 Explain the node management terminal implementation in SGSN-MME 2010A.
8.6 Describe the OSS-RC usage to operate and maintain the SGSN-MME 2010A.

Target audience
The target audience for this course is:
Service Design Engineers, Network Design Engineers, Network Deployment Engineers,
Service Deployment Engineers, System Technicians, System Engineers, Service Engineers
and Field Technicians.

Prerequisites
Some basic IP knowledge is desirable, but not necessary.

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

Learning situation
This course is based on theoretical instructor-led lessons given in a 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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<th>Estimated time</th>
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<tbody>
<tr>
<td>1</td>
<td>Overview of the EPC according to 3GPP R8</td>
<td>1 hour</td>
</tr>
<tr>
<td></td>
<td>Infrastructure of EPC</td>
<td>2 hour</td>
</tr>
<tr>
<td></td>
<td>Overview of CPG 2010A</td>
<td>2.5 hour</td>
</tr>
<tr>
<td></td>
<td>Overview of SGSN-MME 2010A</td>
<td>1.5 hour</td>
</tr>
<tr>
<td>2</td>
<td>EPC Protocols and Interfaces</td>
<td>1 hour</td>
</tr>
<tr>
<td></td>
<td>EPC Mobility Architecture</td>
<td>1 hour</td>
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<tr>
<td></td>
<td>EPC Transport Domain</td>
<td>1 hour</td>
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<tr>
<td></td>
<td>EPC Operations and Maintenance</td>
<td>2 hour</td>
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</table>
MME 2010 Configuration

LZU 108 7978 R1A

Description

If you are involved in the configuration of the Mobility Management Entity (MME) used in Evolved Packet Core (EPC) networks, then this course is for you. It covers interface management for the MME in the EPC network. It also covers in detail the configuration procedure for integrating the interfaces of the MME.

Learning objectives

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

1. Explain on overview level the EPC Network and its elements
   1.1 Explain EPC network and SGSN-MME relations and the technology behind the nodes.
   1.2 List and explain the different interfaces involved in the SGSN-MME.
   1.3 Discuss the process for a User Equipment accessing and using the network.
   1.4 Describe the concepts of internal VPNs, IP service addresses, IP interfaces, IP Packet Filters in SGSN-MME.
   1.5 Describe the basic configuration of SGSN-MME

2. Provide student with necessary knowledge to configure and handle S1-MME Interface.
   2.1 Explain the concept of the Control Plane (S1-MME) and User Plane (S1-U) in S1 interface.
   2.2 Explain the S1-AP and NAS procedures.
   2.3 Describe the SCTP usage in S1-MME interface.
   2.4 Configure and verify S1-MME interface towards the eNodeB.
   2.5 Connect SGSN-MME to the eNodeB.

3. Provide student with an overview of the use and functions of the S6a interface connecting SGSN-MME to HSS.
   3.1 Discuss on an overview level the S6a interface.
   3.2 Explain the signaling procedures performed in the S6a interface.
   3.3 Describe the usage of SCTP in the S6a interface.
   3.4 Configure IMSI Series Analysis tables in SGSN-MME.
   3.5 Discuss the DIAMETER protocol and DIAMETER configuration.
   3.6 Configure the S6a Interface.
4 Provide student with information about S11 and Gom interface and the configuration of the interfaces in SGSN-MME.
4.1 Discuss on overview level the S11 and Gom interface.
4.2 Explain and configure the IP address usage in the S11 and Gom network.
4.3 Configure the S11 and Gom Interface.

5 Provide student with information about how to configure Domain Name Service and Network Time Protocol in SGSN-MME.
5.1 Explain the concept of using DNS.
5.2 Configure Domain Name System (DNS).
5.3 Explain the concept of using NTP.
5.4 Configure the Network Time Protocol.

Target audience
The target audience for this course is:
Service Planning Engineers, Network Design Engineers, Network Deployment Engineers, System Technicians, and System Engineers

Prerequisites
- Knowledge of basic GPRS concepts is helpful, but is not required.

Successful completion of the following courses:
- EPC System Survey LZU 108 7977 R1A
- MME System Administration LZU 108 7979 R1A

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, potentially via remote access.
### 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</th>
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<tbody>
<tr>
<td>1</td>
<td>Introduction, S1-MME Interface Configuration</td>
<td>1 ½ hours</td>
</tr>
<tr>
<td>2</td>
<td>S6a Interface Configuration</td>
<td>4 ½ hours</td>
</tr>
<tr>
<td>3</td>
<td>S11 and Gom Interface Configuration, DNS and NTP Configuration</td>
<td>6 hours</td>
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<td></td>
<td></td>
<td>4 hours</td>
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<td>2 hours</td>
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</table>
MME System Administration

LZU 108 7979 R1A

Description
The Mobility Management Entity (MME) 2010A provides packet switching functionality in the Evolved Packet Core (EPC) towards the Long Term Evolution (LTE) radio networks allowing end users the ability to connect to external packet data networks such as the Internet and corporate networks.

The MME 2010A Operation course provides participants information from introduction to intermediate levels of knowledge including basic MME architecture, MME operation and administration as well as fault management and security management skills.

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

1 Explain the functionality and purpose of an SGSN-MME in an EPC systems network.
   1.1 Describe basic procedures handled by the SGSN-MME such as Create Bearer Request, Periodic TAU and Downlink Data Notification.
   1.2 Explore the SGSN-MME software and hardware architecture.
   1.3 Discover IP address usage in the SGSN-MME and how different components are identified.
   1.4 List changes and updates to the compatibility and migration paths to SGSN-MME 2010A.

2 Identify basic features and functionalities of the SGSN-MME 2010A including logging and charging as well as optional features of MME Pooling, ANR, DAF and Equivalent PLMN List.
   2.1 Identify capacity figures for the SGSN-MME 2010A.
   2.2 Explain the concept of log management and list the available logs in SGSN-MME 2010A.
   2.3 Identify SGSN-MME resilience functionalities of restart, session resilience and Overload Protection (OLP).
   2.4 Discuss the license management necessary on SGSN-MME 2010A.
   2.5 Identify the optional feature of MME Pooling, Automatic Neighbor Relation (ANR), Dual Address Bearer Flag (DAF) and Equivalent PLMN list.

3 Perform basic node management using the Command Line Interface as well as the Packet Exchange Manager according to work orders.
   3.1 Understand the different management domains in the SGSN-MME.
   3.2 Explore the configuration management domain using tools such as ALEX, PXM and CLI.
   3.3 Start and handle OSS-RC with exercises to perform basic operational tasks (optional).

4 Perform basic security management including user and role administration on the SGSN-MME 2010A.
4.1 Explain the concepts of security management
4.2 Manage users in terms of creating, modifying and deleting users account
4.3 Assign the tailored roles for different users

5 Perform systems administration tasks on the SGSN-MME 2010A using available functions and the online system documentation (CPI Library)
5.1 Identify the severity of a fault in the SGSN-MME and act according to the escalation procedure.
5.2 Handle the Fault Management with PXM and CLI.
5.3 Identify different software management on SGSN-MME and the various methods of creating a Software Configuration (SC).
5.4 Detail and perform Checkpoint operation.
5.5 Prepare an SGSN-MME for software patch (SuperCP) Installation.

6 Discuss support systems available to the SGSN-MME 2010A such as the GSS and OSS RC 10
6.1 Administer system software management with the GSS/GSA functionality including listing installed software, verifying and performing backup and restore as well as system checkpoint procedures.
6.2 Describe the key functions of the OSS RC 10 in managing the EPC network.
6.3 Identify tools in OSS such as the GPRS Configuration Management, Test and Monitoring as well as FM, PM and Pool Management features

Target audience
The target audience for this course is: Network Deployment Engineers, Service Deployment Engineers, System Technicians, Service Technicians, System Engineers, Service Engineers, Field Technicians and System Administrators.

Prerequisites
Successful completion of the following courses:

1 EPC System Survey (LZU1087977 R1A)

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

This is an Instructor Led Training (ILT) course based on theoretical and practical instructor-led lessons given both in a classroom and 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>
<th>Topics in the course</th>
<th>Estimated time</th>
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<tr>
<td>1</td>
<td>Introduction</td>
<td>4 hrs</td>
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<tr>
<td></td>
<td>Features and Functions</td>
<td>4 hrs</td>
</tr>
<tr>
<td>2</td>
<td>Node Management</td>
<td>4 hrs</td>
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<tr>
<td>3</td>
<td>Security Management</td>
<td>3 hrs</td>
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<tr>
<td></td>
<td>Systems Administration</td>
<td>3 hrs</td>
</tr>
<tr>
<td>4</td>
<td>Support Systems</td>
<td>6 hrs</td>
</tr>
</tbody>
</table>
CPG 2010 Operation & Configuration

Description

The advent of LTE/SAE has changed the landscape mobile industry in the meeting both operators’ business objectives and technological reform needed to meet the ever increasing demand for growing bandwidth requirements. The technology enabler - CPG 2010A has been Ericsson solution in meeting those business challenges by leveraging SmartEdge 1200 platform coupled with its powerful processor embedded in ASIC modules in handling multitude of traffic types. For years CPG has been the proven multi-function routers under Ericsson Evolved Packet Core (EPC) product.

For years CPG has been customer choice for telecommunication operators network, there is a need for an overall understanding in the aspects of architecture, services, configuration, troubleshooting and maintenance of the node. This course provides a comprehensive view on these matters by incorporating standard practices and vital information for this purpose.

This course is ideal for those seeking to get familiarized with EPC for the first time or intermediate network administrator wishes to gain further information on how to handle the network effectively. It covers the basic operation and maintenance routine tasks comprise of the necessary information in fault management, configuration management, accounting management and performance management.

Learning objectives

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

1. EPC Overview
   1.1 Identify interfaces and peers to the CPG in the EPC network architecture.
   1.2 Identify interfaces and peers to the CPG in the EPC network architecture.
   1.3 Analyze hardware and software architecture of the CPG.
   1.4 Understand the basic procedures and characteristics of the CPG including Evolved Packet Systems (EPS) Bearer & Session Management and Data Plane Services among others.
   1.5 Describe the characteristics of SmartEdge Storage Engine (SSE) and the associated CLI configurations and alarms

2. Navigating the CPG 2010A
2.1 Understand the basic architecture of the SmartEdge Operating System (SEOS) 6.2 used in the CPG and navigate through the system using CLI commands.

2.2 Configure basic system parameters such as system hostname, location and contact information among others.

3 CPG Interface Configuration
3.1 Explore the steps to configure the S11 and S1-U interfaces.
3.2 Understand the steps to configure S5/S8 GTP interface.
3.3 List the steps in configuring Gn interface

4 EPS Services
4.1 Identify the implementation of the CPG in the network and perform configuration on EPS services.
4.2 Identify configuration aspects for the CPG for the Serving GW and Packet Data Network (PDN) GW.
4.3 Understand configuration for Rf and diameter services on the CPG.

5 Advanced Configuration – Addressing and Routing
5.1 Configure Access Point Names necessary for user access.
5.2 CPG restart counter and network cleanup
5.3 CDR charging configuration.
5.4 Understand routing protocols and configure basic routing parameters to be implemented.
5.5 Analyze IP security and implementing firewalls and filters as well as providing traffic separation via VPNs.

6 Operation and Maintenance
6.1 Explore system management configuration including logging and SNMP node monitoring features.
6.2 Identify common faults on the CPG and analyze troubleshooting procedures.
6.3 Describe configuration of Ethernet CFM.

7 Performance Monitoring
7.1 Discuss basic performance monitoring on the CPG
7.2 Configuration management on the CPG
7.3 Identify the counters and gauges for performance management
7.4 Describe load balancing on CPG

Target audience
The target audience for this course is:
Prerequisites
Successful completion of the following courses:
EPC System Survey (LZU108 7977)
SmartEdge R6 System Operations and Maintenance (LZU 108 2108)
The participants having knowledge of the new LTE/EPC networks is an added advantage.

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

Learning situation
This is an Instructor Led Training (ILT) course based on theoretical and practical instructor-led lessons given both in a classroom and 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>
<th>Topics in the course</th>
<th>Estimated time</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>EPC Overview</td>
<td>2 hours</td>
</tr>
<tr>
<td></td>
<td>Navigating the CPG 2010A</td>
<td>2 hours</td>
</tr>
<tr>
<td></td>
<td>CPG Interface and Configuration</td>
<td>2 hours</td>
</tr>
<tr>
<td>2</td>
<td>EPS Services</td>
<td>1 hour</td>
</tr>
<tr>
<td></td>
<td>Advanced Configuration – Addressing and Routing</td>
<td>2 hours</td>
</tr>
<tr>
<td></td>
<td>Operation and Maintenance</td>
<td>2 hours</td>
</tr>
<tr>
<td></td>
<td>Performance Monitoring</td>
<td>1 hour</td>
</tr>
</tbody>
</table>
GGSN 2010 Delta

Lzu1087981 R1A

Description

Is there a GGSN that needs upgrade in the network? Looking to deploy a new GGSN to improve subscriber experience? Need to know new features introduced with the GGSN 2010 revision?

Upon completion of this course, the participant will be able to identify new features introduced in GGSN 2010.

Learning objectives

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

1 Identify major feature updates with the release of GGSN 2010
   1.1 Describe and understand inter working between the GGSN 2010 and other network elements
   1.2 Identify feature updates that related to M20 hardware platform based GGSN
   1.3 Explain feature updates on heuristic classification

2 Describe new features introduced in the release of GGSN 2010
   2.1 Briefly describe EPC and MPG functionality
   2.2 Describe the feature Maximum Segment Size (MSS) adjustment

3 Identify feature enhancements in GGSN 2010
   3.1 Describe the improvement of signaling capacity and throughput
   3.2 Explain updates on the Gx+ Policy and Charging Control support such as IP-Connectivity Access Network (IP-CAN) and Time of Day (ToD)
   3.3 Discuss updates on RADIUS functionality including new RADIUS accounting attributes, new IP address allocation method and configurable RADIUS attributes
   3.4 Explain various features changes on the Toolbox, Performance Data Collection (PDC), GGSNCMD, trouble reporting and common PDC analyzer.
   3.5 Identify updates on the Packet Inspection and Service Classification (PISC) functionality including SMTP/IMAP Content Enrichment
4. Describe the GGSN 2010 operation & maintenance updates
   4.1 Explain changes and updates in the areas of Fault Management and Performance Management including changes in counters and CLI commands
   4.2 Describe the OSS-RC support
   4.3 Identify migration paths available from previous releases to GGSN 2010 (software upgrade and hardware migration)

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

**Prerequisites**
The participants should be familiar with earlier Ericsson GGSN 2009A and 2009B releases. Completion of the following flow: GGSN R4 Network Engineer Lzu1086589 or GGSN R5 Network Engineer Lzu1087270 is highly recommended.

**Duration and class size**
The length of the course is approximately 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>
<th>Topics in the course</th>
<th>Estimated time</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>• GGSN 2010 – Major System Changes</td>
<td>30mins</td>
</tr>
<tr>
<td></td>
<td>• New Features in GGSN 2010</td>
<td>1 hour</td>
</tr>
<tr>
<td></td>
<td>• Feature Enhancements</td>
<td>3 hours</td>
</tr>
<tr>
<td></td>
<td>• Operation &amp; Maintenance</td>
<td>1 hour</td>
</tr>
</tbody>
</table>
SGSN 2010A Delta

Description
The SGSN 2010A is the latest Ericsson SGSN, building on the previous SGSN 2009B by adding the new and advanced features. The objective is to provide an MME for real commercial LTE/EPC networks as well as minimizing SGSN-MME Total Cost of Ownership (TCO) and improving the signaling capacity and handling for Mobile Broadband.

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

1. Explain in brief the new features in SGSN-MME 2010A.
   1.1 Describe the SGSN-MME architecture path.
   1.2 Describe the migration paths to SGSN-MME 2010A.
   1.3 Explain the compatibility of the SGSN-MME 2010A.

2. List the new counters and gauges.
   2.1 Understand the use of the new MM and SM counters.
   2.2 Explain the function of the new MM/SM gauges.
   2.3 Understand the purpose of the new GTPP counters.
   2.4 Understand the use of the new Network Service counters.
   2.5 Explain the use of the new SS7 stack counters.

   3.1 Explain the functionality SMS Redirection & Blocking.
   3.2 Describe the functionality Fetch IMSI Over the Air.
   3.3 Describe the enhancement in SS7.
   3.4 Explain the new feature QoS Based on RNC.
   3.5 Describe the new feature RAN Cause Codes in S-CDR.

Target audience
The target audience for this course is: Network Design Engineer, Network Deployment Engineer, Service Deployment Engineer, System Technician, System Engineer, Field Technician
Prerequisites
The participants should be familiar and have working experience with SGSN 2009B or successful completion of the following courses:
- GPRS System Survey, LZU 108 876 R7A
- SGSN 2009B Delta, LZU 108 7617 R1A
- GSM/WCDMA Operation Handling in SGSN 2008B, LZU 108 2139 R1A
- GSM/WCDMA SGSN 2009B Configuration, LZU108 7933 R1A
- GSM/WCDMA SGSN 2008B Troubleshooting, LZU 108 2145 R1A

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>
<th>Topics in the course</th>
<th>Estimated time</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>• Introduction</td>
<td>2 hrs</td>
</tr>
<tr>
<td></td>
<td>• New Counter and Gauges</td>
<td>2 hrs</td>
</tr>
<tr>
<td></td>
<td>• SGSN Characteristics</td>
<td>2 hrs</td>
</tr>
</tbody>
</table>
GGSN 2010 Network Engineer

LZU 108 7983 R1A

Description

Within the Packet Core Network, the Gateway GPRS Support Node acts as a medium to connect the mobile telecommunications world to the Internet as well as Virtual Private and Corporate networks alike. In order to be able to configure the GGSN to support these services, proper knowledge of the Ericsson GGSN should be acquired.

Upon completion of this course, the student will be able to identify the Ericsson GGSN 2010 revision of the GGSN software. Configuration exercises are introduced to enhance the students' knowledge of configuration in the JUNOS environment with the proper CLI commands. In addition to this, hardware architecture is also included to allow students to understand the components of an Ericsson GGSN.

Learning objectives

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

1. Explain on an overview level the Packet Core Network and its components.
1.1 Detail the functions and services provided by the GGSN, with concepts such as PDP Context and Session Management procedures.
1.2 Understand GGSN 2010 architecture.
2. Explain and perform basic configurations for the GGSN 2010.
2.1 Understand basic JUNOS software components.
2.2 Navigate through GGSN CLI and configure basic system properties
2.3 General overview of GGSN configuration flows.
3. Understand and describe routing policies.
3.1 Understand and perform configuration for interfaces supported on the GGSN 2010.
3.2 Execute and understand routing configurations with application of filters and policies.
4. Detail configuration of services available on the GGSN 2010.
4.1 Observe IP addressing used in GGSN 2010.
4.2 Understand and perform configuration of GGSN 2010 services such as PIC configuration and GTP properties, as well as APNs and QoS parameters.
5. Describe security features on the GGSN 2010.
5.1 Explain and understand the security features available on the GGSN such as packet filtering and firewalls.
5.2 Understand tunneling protocols features of GGSN 2010.
6. Describe and configure Operation & Maintenance components in the GGSN 2010
6.1 Perform basic node monitoring procedures on the GGSN 2010 such as logs, charging, etc.
6.2 Understand and troubleshoot various components of the GGSN.
6.3 Introduction of GGSN Toolbox
6.4 Perform node backup and restore procedures on the GGSN
6.5 Identify connectivity and features related to OSS RC
6.6 Identify migration paths available from previous releases to GGSN 2010 (software upgrade and hardware migration)

Target audience
The target audience for this course is:
• Network Design Engineers, Network Deployment Engineers,
  System Technicians, System Engineers, System Administrators

Prerequisites
Successful completion of the following courses:
• GPRS System Survey (LZU 108 876 R8A)

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

Learning situation
This is an Instructor Led Training (ILT) course based on theoretical and practical instructor-led lessons given both in a classroom and 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>
<th>Topics in the course</th>
<th>Estimated time</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>• Introduction</td>
<td>2h</td>
</tr>
<tr>
<td></td>
<td>• Software Configuration</td>
<td>4h</td>
</tr>
<tr>
<td>2</td>
<td>• Routing Configuration</td>
<td>4h</td>
</tr>
<tr>
<td></td>
<td>• Services Configuration</td>
<td>2h</td>
</tr>
<tr>
<td>3</td>
<td>• Services Configuration</td>
<td>4h</td>
</tr>
<tr>
<td></td>
<td>• Security Configuration</td>
<td>2h</td>
</tr>
<tr>
<td>4</td>
<td>• Security Configuration</td>
<td>2h</td>
</tr>
<tr>
<td></td>
<td>• General Operation &amp; Maintenance</td>
<td>4h</td>
</tr>
</tbody>
</table>
SGSN System Administration

Description
The SGSN 2010 provides packet switching functionality in the GSM and WCDMA radio networks allowing end users the ability to connect to external packet data networks such as the Internet and corporate networks.

The SGSN 2010 System Administration course provides participants information from introduction to intermediate levels of knowledge including basic SGSN architecture, SGSN operation and administration as well as fault management and security management skills.

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

1. Explain on overview level the SGSN in relation to other network elements in a GSM and WCDMA Systems Network including Session and Mobility Management events in the SGSN architecture.
   1.1 Explain the functionality and purpose of an SGSN in a GSM and WCDMA systems network.
   1.2 Describe basic procedures handled by the SGSN such as GPRS Attach, PDP Context Activation and Inter-SGSN Routing Area Update.
   1.3 Explore the SGSN software and hardware architecture.
   1.4 Discover IP address usage in the SGSN and how different components are identified.
   1.5 List changes and updates to the compatibility and migration paths to SGSN 2010A.

2. Identify basic features and functionalities of the SGSN 2010A including logging and charging, as well as optional features such as 3GDT and Traffic Mix Optimization (TMO).
   2.1 Explain the concept of log management and list the available logs in SGSN 2010A.
   2.2 Identify SGSN resilience functionalities of restart, session resilience and Overload Protection (OLP).
   2.3 Discuss the license management necessary on SGSN 2010A.
   2.4 Discuss new enhancements to the SMS functionality.
   2.5 Identify optional features of SGSN Pool, 3GDT and TMO.

3. Perform basic node management using the Command Line Interface as well as the Packet Exchange Manager according to work orders.
   3.1 Identify the O&M network supporting the GPRS network.
   3.2 Understand the different management domains in the SGSN.
   3.3 Explore the configuration management domain using tools such as ALEX, PXM and CLI.

4. Perform basic security management including user and role administration on the SGSN 2010A.
   4.1 Explain the concepts of security management.
4.2 Manage users in terms of creating, modifying and deleting users account
4.3 Assign the tailored roles for different users

5 Perform systems administration tasks on the SGSN 2010A using available functions and the online system documentation (CPI Library)
5.1 Identify the severity of a fault in the SGSN and act according to the escalation procedure.
5.2 Handle the Fault Management with PXM and CLI.
5.3 Identify different software management on SGSN and the various methods of creating a Software Configuration (SC).
5.4 Detail and perform Checkpoint operation.
5.5 Prepare an SGSN for software patch (SuperCP) Installation.

6 Discuss support systems available to the SGSN 2010A such as the GSS and OSS RC 10
6.1 Administer system software management with the GSS/GSA functionality including listing installed software, verifying and performing backup and restore as well as system checkpoint procedures.
6.2 Describe the key functions of the OSS RC 10 in managing the GPRS network.
6.3 Identify tools in OSS such as the GPRS Configuration Management, Test and Monitoring as well as FM, PM and Pool Management features

Target audience
The target audience for this course is: Network Deployment Engineers, Service Deployment Engineers, System Technicians, Service Technicians, System Engineers, Service Engineers, Field Technicians and System Administrators.

Prerequisites
Successful completion of the following courses:

• GPRS System Survey (LZU108876 R7A).

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

This is an Instructor Led Training (ILT) course based on theoretical and practical instructor-led lessons given both in a classroom and 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>
<th>Topics in the course</th>
<th>Estimated time</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Introduction</td>
<td>4 hrs</td>
</tr>
<tr>
<td></td>
<td>Features and Functions</td>
<td>4 hrs</td>
</tr>
<tr>
<td>2</td>
<td>Node Management</td>
<td>6 hrs</td>
</tr>
<tr>
<td>3</td>
<td>Security Management</td>
<td>3 hrs</td>
</tr>
<tr>
<td></td>
<td>Systems Administration</td>
<td>3 hrs</td>
</tr>
<tr>
<td>4</td>
<td>Support Systems</td>
<td>6 hrs</td>
</tr>
</tbody>
</table>
Description

The SGSN 2010A is the latest Ericsson SGSN product release, building on the previous SGSN by adding the new and advanced features. With the release of the 2010A revision, the SGSN-MME will provide enhanced features in the functionalities of SMS over packet switched, Event-based monitoring, MOCN and new RAN cause codes inclusion into S-CDRs.

As the SGSN 2010A also supports MME functionalities for the EPC network, session and mobility management features are also enhanced in the MME domain.

This learning product will provide delta information between the previous release of the SGSN 2009B and the new release of SGSN 2010A.

Learning objectives

To provide the student with an overview of the configuration areas of a GSN for both GSM and WCDMA. In addition an overview of GPRS mobility and session management is included.

1. Explain on overview level the GSM/WCDMA Network and its elements.
   1.1 Understand the GSM/WCDMA GPRS network and SGSN relations and the technology behind the nodes.
   1.2 List and explain the different interfaces involved in the SGSN.
   1.3 Discuss the process for a MS/UE accessing and using the network.

2. To provide the student with the knowledge about how to configure the Gb interface.
   2.1 Connect the SGSN to the BSC.
   2.2 Configure the Gb over Frame Relay interface.
   2.3 Recognize the protocol for the Gb Interface.

3. Describe the Gb interface on an overall level.
   3.1 Explain the concept of Gb over IP.
   3.2 Explain the advantages and network impact of Gb over IP.
   3.3 Explain the concepts of dynamic configuration for Gb over IP.
   3.4 Explain the main procedures to achieve Gb over IP dynamic configuration.
   3.5 Explain how the Gb over IP configuration is plan & active on the SGSN & BSC with OBM & GCM.
   3.6 Demonstrate that the dynamic configuration of Gb over IP is performed successfully based on O&M prospective.
   3.7 List the node properties for Gb over IP based on O&M prospective.
   3.8 List the new alarms, events and counters for Gb over IP based on O&M prospective.
3.9 Explain steps on configuring Gb over IP from FR.
3.10 Explain steps on fallback in the event of an unsuccessful migration.

4 To provide the student with the knowledge about how to configure the Iu interface.
4.1 Connect the SGSN to the RNC.
4.2 Configure the Iu interface.
4.3 SS7 signaling connectivity type.
4.4 Explain and configure the IP Addresses for Iu-C over IP.

5 To provide the student with the knowledge about how to configure the Gr interface.
5.1 Connect the SGSN to the HLR.
5.2 Explain the connection of the SGSN to a SS7 network.
5.3 Configure the IMSI Series Analysis tables in the SGSN.
5.4 Configure the Gr interface.
5.5 Connect the SGSN to the SMS-GMSC/SMS-IWMSC
5.6 Configure the Gd interface
5.7 Connect the SGSN to the MSC/MSC-S
5.8 Configure the Gs interface.
5.9 Connect the SGSN to the SCP.
5.10 Configure the SGSN to the EIR.
5.11 Configure the Gf interface.
5.12 Connect the SGSN to the GMLC
5.13 Configure the Lg interface.

6 To provide the student with the knowledge about how to configure the Gn & Gom Configuration.
6.1 Discuss on the overview level the Gn interface.
6.2 Explain and configure the IP address usage in the Gn network.
6.3 Explain the packet filter on the Gn interface.
6.4 Configure the Gn interface.
6.5 Discuss on overview level the Gom interface.
6.6 Explain and configure the IP address usage in Gom network.
6.7 Configure the Gom interface.

7 To provide the student with the knowledge about how to configure the Charging Configuration.
7.1 Describe the different charging methods available on the SGSN.
7.2 Briefly discuss on the CAMEL and CDR based charging methods.
7.3 List charging information based on the PS service usage.
7.4 Describe the CDR-based charging principle on the SGSN.
7.5 Understand triggering and closing of CDR.
7.6 Explain near-real-time output of CDR.
7.7 Explain file-based output of CDR.
7.8 Configuration for charging functions on the SGSN.
7.9 Discuss configuration management on the SGSN.
7.10 Explain configuration procedures for CDR-based charging.
7.11 Explain configuration procedures for CAMEL-based charging.

8 To provide the student with information about how to configure the Domain Name Service in SGSN 2010A.

8.1 Explain the concept of using DNS.

8.2 Configure the Domain Name System (DNS).

9 To provide the student with the principles of the Network Time Protocol connectivity to the SGSN.

9.1 Explain the concept of using NTP

9.2 Configure the Network Time Protocol (NTP)

**Target audience**

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

**Prerequisites**

GPRS System Survey (LZU108876 R7A)

SGSN 2010A System & Administration (LZU1087984 R1A)

**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 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. (This paragraph is mandatory).

<table>
<thead>
<tr>
<th>Day</th>
<th>Topics in the course</th>
<th>Estimated time</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>SGSN2010A Introduction</td>
<td>1 h</td>
</tr>
<tr>
<td>1</td>
<td>Gb over Frame Relay configuration – theory</td>
<td>2 h</td>
</tr>
<tr>
<td>1</td>
<td>Gb over Frame Relay configuration – practical</td>
<td>1 h</td>
</tr>
<tr>
<td>1</td>
<td>Gb over IP configuration – theory</td>
<td>2 h</td>
</tr>
<tr>
<td>1</td>
<td>Gb over IP configuration – practical</td>
<td>1 h</td>
</tr>
<tr>
<td>2</td>
<td>Iu/SS7 Configuration – theory</td>
<td>2 h</td>
</tr>
<tr>
<td>2</td>
<td>Iu/SS7 Configuration – practical</td>
<td>1 h</td>
</tr>
<tr>
<td>2</td>
<td>Gr configuration - theory</td>
<td>2 h</td>
</tr>
<tr>
<td>3</td>
<td>Gr configuration – practical</td>
<td>1 h</td>
</tr>
<tr>
<td>3</td>
<td>Gn &amp; Gom Configuration - theory</td>
<td>3 h</td>
</tr>
<tr>
<td>3</td>
<td>Gn &amp; Gom Configuration - practical</td>
<td>1 h</td>
</tr>
<tr>
<td>3</td>
<td>Charging configuration – theory (part 1)</td>
<td>1 h</td>
</tr>
<tr>
<td>4</td>
<td>Charging configuration – theory (part 2)</td>
<td>3 h</td>
</tr>
<tr>
<td>4</td>
<td>Charging configuration - practical</td>
<td>2 h</td>
</tr>
<tr>
<td>4</td>
<td>DNS configuration – theory (part 1)</td>
<td>1 h</td>
</tr>
<tr>
<td>5</td>
<td>DNS configuration – theory (part 2)</td>
<td>2 h</td>
</tr>
<tr>
<td>5</td>
<td>DNS configuration - practical</td>
<td>1 h</td>
</tr>
<tr>
<td>5</td>
<td>NTP configuration - theory</td>
<td>2 h</td>
</tr>
<tr>
<td>5</td>
<td>NTP configuration - practical</td>
<td>1 h</td>
</tr>
</tbody>
</table>
SGSN Troubleshooting

Description

Are you an operator running a network with Ericsson SGSN? Want to learn more about the SGSN to be able to troubleshoot and rectify issues quickly and effectively?

This course provides methods and guidelines to detect, isolate and correct configuration faults and isolate software faults on a SGSN 2010A. Participants learn how to perform a health check, analyse logs for traffic disturbances and trace subscribers using the ITC (Integrated Traffic Capture) feature.

Learning objectives

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

1. Explain the architecture of the SGSN
   1.1 Understand the node layout of the SGSN 2010A (G/W)
   1.2 Describe the different PIU roles
   1.3 Describe the subsystem structure of the SGSN 2010A (G/W)
   1.4 Describe the function of the different Software Devices
   1.5 Describe traffic flow in the SGSN 2010A

2. List and interpret the SGSN logs and the related log files
   2.1 Explain the difference between Built-in and System logs
   2.2 Explain and interpret the content of the log files
   2.3 Perform a routine Health Check

3. Understand and solve Interface Faults
   3.1 Troubleshoot the SS7/IP/Frame Relay Interfaces
   3.2 Explain procedures for configuration troubleshooting

4. Know how to trace subscribers with the tools provided by SGSN
   4.1 Understand and use Integrated Traffic Capture (ITC) on supported interfaces
   4.2 Understand the concept of capturing traffic from each interface
   4.3 Describe the capture process, storage, filters, limitations and improvements
   4.4 Initiate the capturing of data and store the files
   4.5 Read out the captures

5. Identify Mobility and Session Management Faults
   5.1 Understand how an attach and PDP context is performed and handled by SGSN
   5.2 Trace and log mobility and session events with the use of SGSN tools
   5.3 Identify different reasons for attach and PDP failures
   5.4 Analyse Cause Codes for problem resolution

6. Understand the built-in Toolbox useful for troubleshooting
   6.1 List the different tools, which are part of the toolbox, and use these to determine and isolate faults
   6.2 Determine the tools available in SGSN 2010A
List and interpret the different restart levels

7.1 Explain and react on the escalation procedures on the SGSN 2010A
7.2 Explain and manage the different HW and SW recovery functions of the SGSN 2010A
7.3 Describe Session Resilience

8 Explain the fault handling and CSR escalation
8.1 Determine if the fault is related to a configuration or software error
8.2 Isolate the fault
8.3 Correct the fault if it is a configuration error
8.4 Write a CSR, which contains all needed information for the next support level

Target audience
The target audience for this course is: System Engineers

Prerequisites
The participants should have successfully completed the following courses:
SGSN 2009B Configuration for GSM (LZU 108 7931 R1A); and
SGSN 2009B Configuration for WCDMA (LZU 108 7932 R1A); or
GSM/WCDMA SGSN 2008B System Administration (LZU 108 6992 R1A); or
SGSN 2009B Configuration for GSM/WCDMA (Dual Access) (LZU108 7933 R1A)

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

Learning situation
This is an Instructor Led Training (ILT) course based on theoretical and practical instructor-led lessons given both in a classroom and 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>
<th>Topics in the course</th>
<th>Estimated time</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>SGSN Architecture</td>
<td>2hrs</td>
</tr>
<tr>
<td></td>
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<td>Interface Faults</td>
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<td></td>
<td>Mobility &amp; Session Management</td>
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<tr>
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<tr>
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</tbody>
</table>
SACC 6 Overview

LZU 108 8091 R1A

Description

If you want to gain knowledge about the main principles around the Service Aware Charging and Control Solution as well as its main benefits, this course is for you. You will understand the components, protocols and enhancements that this solution is able to provide to the packet data network.

Learning objectives

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

1  Understand the Service Aware Charging and Control concept
   1.1 Detail the service control needs
   1.2 Explain charging enhancements enabled by SACC solution
   1.3 List SACC solution benefits

2  List SACC components
   2.1 Explain on overview level the main functionality of each SACC node.
   2.2 Understand SACC architecture

3  Explain the GGSN role inside SACC solution
   3.1 List GGSN functionalities and features
   3.2 Understand GGSN interfaces

4  List the Service Aware Policy Controller main functions
   4.1 Describe Access Control and QoS Control functionalities
   4.2 Understand the SAPC interaction with other nodes

5  Define SASN primary functionalities needed for SACC Solution
   5.1 List SASN general features
   5.2 Understand SASN Traffic Analysis
   5.3 Describe the SARA support functionality

6  Understand the SACC 6 Operation in the Network
   6.1 Identify features and nodes applied to a SACC 6 solution
   6.2 Recognize different traffic cases inside the solution
   6.3 Describe actions related to a PDP context.
Target audience
The target audience for this course is: Network Design Engineers, Service Planning Engineers, Service Design Engineers, Network Deployment Engineers, System Technicians, and System Engineers.

Prerequisites
The participants should be familiar with (have knowledge and working experience of) 2.5 G and 3G packet networks and service offerings. Charging principles is also desirable.
GPRS System Survey LZU 108 876 (Course knowledge as a prerequisite)

Duration and class size
The duration 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 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</th>
</tr>
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<tbody>
<tr>
<td>1</td>
<td>Introduction</td>
<td>40 min</td>
</tr>
<tr>
<td>1</td>
<td>SACC Components</td>
<td>40 min</td>
</tr>
<tr>
<td>1</td>
<td>Exercises</td>
<td>20 min</td>
</tr>
<tr>
<td>1</td>
<td>GGSN</td>
<td>40 min</td>
</tr>
<tr>
<td>1</td>
<td>Exercises</td>
<td>20 min</td>
</tr>
<tr>
<td>1</td>
<td>Service Aware Policy Controller (SAPC)</td>
<td>40 min</td>
</tr>
<tr>
<td>1</td>
<td>Exercises</td>
<td>20 min</td>
</tr>
<tr>
<td>1</td>
<td>SASN</td>
<td>40 min</td>
</tr>
<tr>
<td>1</td>
<td>Exercise</td>
<td>20 min</td>
</tr>
<tr>
<td>1</td>
<td>SACC Operation</td>
<td>60 min</td>
</tr>
<tr>
<td>1</td>
<td>Exercises</td>
<td>20 min</td>
</tr>
</tbody>
</table>
SAPC & SASN System Administrator

LZP 101 151 R1A

Description
The Service Aware solutions are being employed to many different customer, to attend the new data services requirements such as policy control and charging control. The Ericsson solution for Service Aware is named SACC (Service Aware Charging and Control). SACC is composed by many nodes, including SAPC acting as PCRF 3GPP and SASN acting as PCEF 3GPP.

This practical training course is designed to accelerate learning and deliver an intermediate level of competence to participants in a short amount of time. Engineers gain a specialized understanding of their roles and responsibilities while operating and maintaining their live SAPC and SASN system.

Target audience
The target audience for this SAPC and SASN practical training is the Technicians/Engineers responsible for maintenance and operation of their Service Aware solution referred to SAPC and SASN nodes.

Prerequisites
The participants should be familiar with IP and GPRS concepts and have successfully completed the following instructor led training courses, mandatory for participation;

SASN 2009 Operation and Configuration LZU1087745
SAPC 2009 Operation and Configuration LZU1087747
SACC 6 Overview LZU1088091
GPRS System Survey LZU108876
UNIX Basics (or equivalent knowledge) LZU1085134

Duration and class size
The length of the combined SAPC/SASN training course is 4 days. The training includes the following activities: SACC tasks, SASN tasks and SAPC tasks.

The minimum number of participants is two (2), and the maximum number of participants is four (4).
Learning situation

This training is delivered in the form of a Structured Knowledge Transfer (SKT) in order to provide structured and practical hands on training for students in their working environment and is a mentor-based training. The mentor ensures that each participant has access to the equipment, and correctly accesses reference documentation required for each duty/task/step. The mentor then presents, demonstrates, and follow participants’ performance on each duty/task/step required to operate and maintain the SASN and SAPC.

TABLE OF CONTENTS FOR SAPC&SASN SKT

SACC Concepts

DUTY A: SACC CONCEPTS
TASK A-1: Identify nodes for the SACC solution according to the 3GPP standards
TASK A-2: Describe the SASN Functionalities
TASK A-3: Describe the SAPC Functionalities
TASK A-4: Describe the QBAU feature in SACC solution

Service Aware Support Node (SASN)

DUTY B: Service Aware Support Node (SASN)
TASK B-1: Identify the Basic Hardware and Cluster Concept
TASK B-2: Start the SASN Node and Verify Application and Status
TASK B-3: Understand the SASN User Accounts and Create Users
TASK B-4: Use the Linux as “root” to find a Parameter
TASK B-5: Save the Last Loaded Configuration
TASK B-6: Generate Low Level Files and Apply Configuration
TASK B-7: Identify and Create a Packet Inspection Rule
TASK B-8: Identify and Create a Rule for QoS
TASK B-9: Verify and Explain a Control Server Configuration
TASK B-10: Understand the R99 CDR Configuration
TASK B-11: Understand the Customizable CDR Configuration
TASK B-12: Understand the EDR Configuration
TASK B-13: Locate folders, CDRs and Performance
TASK B-14: Configure and Execute SASN Back-UP
TASK B-15: Execute Rollback and Verify History
TASK B-16: Verify a Specific Session for an User, and Verify Statistics
TASK B-17: Verify the Node Status
TASK B-18: Stop the SASN Node
TASK B-19: Create a Diagnostic File for SASN
TASK B-20: Create a Diagnostic File for SASN Switches
Service Aware Policy Control Node (SAPC)

DUTY C: Service Aware Policy Control Node (SAPC)

TASK C-1: Identify the Basic Hardware and Node Management Toolbox
TASK C-2: Understand the Loader Processor and Access the IO2
TASK C-3: Identify and recognize an alarm in the Alarm Viewer, and find the meaning using the CPI
TASK C-4: Identify a Notification
TASK C-5: Verify History for Alarms
TASK C-6: Execute TSP Platform Back-UP
TASK C-7: Activate the Back-UP
TASK C-8: Execute a TSP Platform Restore
TASK C-9: Access the IO and Locate Performance Files for the TSP Platform
TASK C-10: Accessing the SAPC GUI and Understanding the Available TABs
TASK C-11: Create a Service
TASK C-12: Create a Subscriber Group
TASK C-13: Create a Subscriber and associate it to the Subscriber Group created
TASK C-14: Create a Rule and Policy for Access
TASK C-15: Create a Rule and Policy for QoS
TASK C-16: Associate an Access Policy to a Subscriber Group
TASK C-17: Associate a QoS Policy to a Service
TASK C-18: Define Usage Limits and Notification for a Subscriber
TASK C-19: Find the Configuration using LDAP and Save LDIF file

Time schedule

<table>
<thead>
<tr>
<th>Day</th>
<th>Topics in the course</th>
<th>Estimated time</th>
</tr>
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<tbody>
<tr>
<td>1</td>
<td>• SACC Concepts</td>
<td>3 hours</td>
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<tr>
<td></td>
<td>• Service Aware Support Node (SASN)</td>
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<tr>
<td>2</td>
<td>• Service Aware Support Node (SASN)</td>
<td>6 hours</td>
</tr>
<tr>
<td>3</td>
<td>• Service Aware Policy Control Node (SAPC)</td>
<td>6 hours</td>
</tr>
<tr>
<td>4</td>
<td>• Service Aware Policy Control Node (SAPC)</td>
<td>6 hours</td>
</tr>
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