



# Mobile@Home R3 Training Programs

## Catalog of Course Descriptions



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## Introduction

Ericsson has developed a comprehensive Training Programs service to satisfy the competence needs of our customers, from exploring new business opportunities to expertise required for operating a network. The Training Programs service is delineated into packages that have been developed to offer clearly defined, yet flexible training to target system and technology areas. Each package is divided into flows, to target specific functional areas within your organization for optimal benefits.

**Service delivery is supported using various delivery methods including:**

<b>Icon</b>	<b>Delivery Method</b>
	Instructor Led Training (ILT)
	Seminar (SEM)
	Workshop (WS)
	Virtual Classroom Training (VCT)
	Web Based Learning (WBL)
	Short Article (SA)
	Streaming Video (SV)
	CD-ROM (CD)
	Structured Knowledge Transfer (SKT)

### **Delivery Enablers**

	Remote Training Lab (RTL)
	Web Portal (WP)

### **Ericsson Education E-Learning**

	EEOnline @ <a href="http://learning.ericsson.net/eeonline/">http://learning.ericsson.net/eeonline/</a>
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## IP Networking



LZU 102 397 R2A

### Description

This course will give the students an insight and understanding of the TCP / IP protocol stack from the physical layer to the application layer. The students will learn the operation of different protocols within the TCP / IP suite such TCP, UDP, ICMP, HTTP, FTP, SMTP, ARP, DNS and DHCP. Students will learn about IP addresses, both classful and classless (CIDR) and how subnetting / aggregation operates. Students will learn about different network devices and will get a detailed understanding of Bridging, LAN Switching, Routing and Routing protocols. Throughout the course hands-on labs and analysers are used to pinpoint important aspects of theory sessions.

### Learning objectives

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

- 1 Explain IPv4 and IPv6 protocol, addressing and sub netting / aggregation**
  - 1.1 Explain the functions of the different bodies involved in IP standards / RFCs
  - 1.2 Explain IPv4 packet structure, protocol header and features
  - 1.3 Explain and perform exercises on IPv4 addresses, CIDR, sub netting and aggregation
  - 1.4 Explain IPv6 packet structure, protocol header, features and the different types of IPv6 addresses
- 2 Explain the purpose and operation of different protocols such as TCP, UDP, ICMP, HTTP, FTP, TFTP, SMTP, POP3, IMAP, ARP, DNS and DHCP**
  - 2.1 Explain the OSI reference model and how it relates to the TCP / IP stack
  - 2.2 Explain the TCP and UDP protocol structures, headers and functionality
  - 2.3 Explain and perform exercises and analysis on the operation of different protocols / applications (ARP, DHCP, DNS, HTTP, FTP, TFTP, SMTP, POP3, IMAP, etc.)
- 3 Explain the purpose and operation of different network devices and routing protocols used in IP networking**
  - 3.1 Explain the operation of Hubs, Bridges and Switches
  - 3.2 Explain and perform exercises and analysis on the operation of Spanning Tree Protocol (STP)
  - 3.3 Explain and perform exercises and analysis on the operation of Static and Dynamic routing protocols
  - 3.4 Explain and perform exercises and analysis on RIP routing protocol
  - 3.5 Explain and perform exercises and analysis on OSPF routing protocol



### **Target audience**

The target audience for this course are personnel who are involved in IP networking or those who require more knowledge on IP addressing, application and routing protocols:

- Service Planning Engineers
- Service Design Engineers
- Network Design Engineers
- Network Deployment Engineers
- Service Deployment Engineers
- System Technicians
- Service Technicians
- System Engineers
- Service Engineers
- Field Technicians
- System Administrators
- Application Developers
- Business Developers

### **Prerequisites**

The participants should be familiar with datacom fundamentals and data transmission principles or successful completion of the following course or equivalent:

Datacom Networking LZU 102 371

### **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.

**Time schedule**

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

<b>Day</b>	<b>Short description of the topics in the course</b>	<b>Estimated time</b>
1	• Explain the functions of the different bodies involved in IP standards / RFCs	1.0
	• Explain IPv4 packet structure, protocol header and features	1.0
	• Explain IPv4 addresses, CIDR and sub netting and aggregation	1.0
	• Explain IPv6 packet structure, protocol header, features, different types of IPv6 addresses	1.5
	• Perform exercise on IP addressing and sub netting	1.5
2	• Explain the OSI reference model and how it relates to the TCP / IP stack	0.5
	• Explain the TCP and UDP protocol structures, headers and functionality	1.0
	• Explain the operation of different applications (ARP, DHCP, DNS, HTTP, FTP, SMTP, POP3, IMAP, etc.)	1.5
	• Perform exercises and analysis on ARP, DHCP, DNS, HTTP, FTP, TFTP, Telnet, SMTP, POP3, IMAP, etc.	3.0
3	• Explain the operation of Hubs, Bridges, Switches, Collision Domains and Broadcast Domains	1.0
	• Explain the operation of Spanning Tree Protocol (STP)	1.0
	• Explain the operation of Static and Dynamic routing protocols	1.0
	• Explain RIP routing protocol	1.0
	• Perform exercises and analysis of protocols on Bridges, STP and Static routing	2.0
4	• Explain OSPF routing protocol	1.5
	• Perform exercises and analysis of RIP protocol	1.5
	• Perform exercises and analysis of OSPF protocol (areas, aggregation, authentication)	3.0

## TSP Node Management



LZU 102 665 R2B

### Description

This course is designed to provide participants with the skills and knowledge to operate and manage the TSP Platform. The course covers all aspects of node management including fault, configuration and performance management activities on the TSP Platform, the operation & maintenance procedures and the node management user interfaces on the TSP Platform. Participants will complete practical configuration and management exercises using on-line documentation and the TSP Node Management (NM) Toolbox GUIs.

### Learning objectives

On completion of this course the participants will be able to

- 1 Describe the architecture of the TSP Platform**
  - 1.1 Describe the TSP Platform hardware and software architecture
  - 1.2 Explain the concepts of processes, database objects and the distributed software execution environment
- 2 Explain TSP Operations and Maintenance functions**
  - 2.1 Describe the TSP Operation and Maintenance architecture
  - 2.2 Outline the Operational and Maintenance functional areas
  - 2.3 Navigate the embedded Element Managers – *TSP Node Management Toolbox*
  - 2.4 Use the on-line documentation
- 3 Perform TSP Fault Management.**
  - 3.1 Use the user interface for receiving alarms and notifications
  - 3.2 Find the relevant alarm information in the on-line documentation
- 4 Perform TSP Configuration Management**
  - 4.1 Describe Configuration Management on the TSP Platform
  - 4.2 Detail and perform System Backup, Restore and System Upgrade
  - 4.3 Configure and manage the TSP Platform Network Redundancy and Disk Log features
  - 4.4 Expand, repair and replace a faulty processor on the TSP Platform
- 5 Manage the SS7 function on the TSP Platform.**
  - 5.1 Describe the protocols available for SS7 communication on the TSP Platform
  - 5.2 Detail the component structure of the SS7 stack on the TSP Platform
  - 5.3 Manage the SS7 function via the SS7 management GUIs on the TSP Platform
- 6 Explain Virtual IP (VIP)**
  - 6.1 Describe the VIP function on the TSP platform
  - 6.2 Explain the distributed IP stack on the TSP platform
  - 6.3 Perform VIP management functions on the TSP platform via the Node Management interface



## **7 Explain the function of Performance Management on the TSP Platform**

- 7.1 Explain the Performance Management Framework (PMF)
- 7.2 Manage the TSP Platform measurements
- 7.3 Import and analyze Performance Management data via the Alarm Interfaces, LDAP Browser and the Performance Management Dashboard (PMD)

### **Target audience**

The target audience for this course is Ericsson and operator personnel responsible for management of the TSP Platform.

### **Prerequisites**

Successful completion of the following courses:

- TSP System Overview LZU 102 660
- UNIX Basics LZU 108 206
- UNIX Fundamentals LZUBB 108 170
- GSM Signaling in the Core Network LZU 108 897/2

### **Duration and class size**

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

### **Learning situation**

The course is based on instructor-led lessons and practical exercises on the TSP simulated environment, VEGA, and the TSP 4.0/NSP 4.0, 4.1 Platform.

Remote access to this equipment is available to both the Ericsson and the operator's organizations.



## Time schedule

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

Day	Short description of the topics in the course	Estimated time
1	Describe the architecture of the TSP Platform	2.5 hours
	<ul style="list-style-type: none"><li>• Build the TSP site</li></ul>	
	Explain TSP Operation and Maintenance functions	1 hour
	<ul style="list-style-type: none"><li>• Run the O&amp;M GUIs</li></ul>	1 hour
2	Perform TSP Fault Management	1.5 hours
	<ul style="list-style-type: none"><li>• Analyze &amp; interpret Platform alarms and notifications</li></ul>	
	Perform TSP Configuration Management	
	Perform TSP Configuration Management	
	<ul style="list-style-type: none"><li>• Perform a system backup and restore</li></ul>	1.5 hour
3	<ul style="list-style-type: none"><li>• Perform a system upgrade</li></ul>	2 hours
	<ul style="list-style-type: none"><li>• Configure and test network redundancy between two TSP nodes</li></ul>	2.5 hours
	Perform TSP Configuration Management	
	<ul style="list-style-type: none"><li>• Continue network redundancy practical exercise</li></ul>	3 hours
	<ul style="list-style-type: none"><li>• Expand and replace a processor</li></ul>	1 hour
	<ul style="list-style-type: none"><li>• Configure the disk log function</li></ul>	2 hours



- |   |  |  |
|---|--|--|
| 4 | <p>Manage the SS7 function on the TSP Platform</p> <ul style="list-style-type: none"><li>• Connect to the SS7 management GUI and identify the configured SS7 network</li></ul> <p>Explain Virtual IP (VIP)</p> <ul style="list-style-type: none"><li>• Perform VIP management functions on the TSP platform via the Node Management interface</li></ul> <p>Explain the function of Performance Management on the TSP Platform</p> <ul style="list-style-type: none"><li>• Import and analyze Performance Management data via the Alarm Interfaces, LDAP Browser and the Performance Management Dashboard (PMD)</li></ul> | <p>2 hours</p> <p>2 hours</p> <p>2 hours</p> |
|---|--|--|

## GPRS/EDGE Overview



LZU 108 3994 R2A

### Description

Participants attending the GPRS Overview WBL course will be given a basic introduction to the 2nd generation Systems based on GSM. The GPRS core and radio network extension to the GSM network and possible GPRS services are explained on an overview level. The role of the GPRS nodes in WCDMA networks is discussed as well as the influence of the EDGE to the GPRS air interface. The focus is on general principles rather than specific technical details.

### Learning objectives

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

- 1 **Understand the purpose of implementing packet switching in the existing GSM/WCDMA system**
- 2 **Understand how a terminal (Laptop or Smart Phone) uses the GPRS system to access other networks such as corporate LAN or the internet**
- 3 **List and explain GPRS system architecture**
- 4 **Explain on overview level the air interface in GPRS covering the GSM systems and/or WCDMA System**
- 5 **Explain the influence of EDGE to the GPRS network in terms of infrastructure requirements, Air Interface and end-user service enhancements.**

### Target audience

This course is the starting point for courses related to the GSM and WCDMA in the area of GPRS.

### Prerequisites

The participants should be familiar with mobile telecommunications, especially, it is an advantage to be familiar with the 2G mobile systems

### Duration and class size

The length of the course is 3 hours.

### Learning situation

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

## GSM AXE Operation



LZU 108 5024/2 R4A

### Description

This task-oriented course will teach you how to operate the functions of the AXE 10 common to all AXE applications of the Core Network and the BSC. Through extensive hands-on training, you will raise your skills level to intermediate.

### Learning objectives

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

- 1 **Efficiently make use of command files and log files in daily routines, using the OSS-RC applications Command File Developer and Command Handling.**
- 2 **Fetch exchange related documentation from the system databases.**
- 3 **Explain how the control path is realized in the switch by defining the corresponding units.**
- 4 **Explain how the switching path is implemented by following a call through the GS and setting the necessary exchange data to establish the connections in the node.**
- 5 **Configure hardware for new routes as defined in Customer Product Information (CPI).**
- 6 **Define routes and connect/disconnect devices.**
- 7 **Describe the units and concepts related to # 7 signaling.**
- 8 **Perform system backups (IOG 20 or APG 40).**
- 9 **Handle the file transfer (IOG 20 or APG 40).**
- 10 **Understand and modify the file system of an AXE 10 (IOG 20 or APG 40).**
- 11 **Collect Data on Request as input to Trouble Reports to Ericsson FSC.**
- 12 **Set supervision data on DIP, SNT and SS7.**
- 13 **Modify Size Alteration Events on request from a work order.**
- 14 **Retrieve Statistics from MSC/BSC**
- 15 **Perform changes in the pre-analysis and B-number analysis tables.**
- 16 **Perform changes in the routing analysis table.**
- 17 **Perform changes in the Charging analysis tables.**
- 18 **Analyze EOS and Cause codes.**
- 19 **Trace and solve faults related to the analysis tables.**
- 20 **Handle the charging analysis and charging output.**
- 21 **Solve a Managed Object (MO) Fault upon alarm in the BSC.**
- 22 **Reconfigure MOs and BTSs using the OSS-RC applications Cellular Network.**
- 23 **Administration and Base Station SW management.**
- 24 **Load RBS software using Base Station SW management in OSS-RC.**



### **Target audience**

The target audience for this course is: System Technicians, System Engineers.

### **Prerequisites**

Successful completion of the following training flow:

GSM RAN Network Surveillance

FAB 102 1465

### **Duration and class size**

The length of the course is 9 days and the maximum number of participants is 8.

### **Learning situation**

This is a task-oriented learning course based on tasks in the work process given in a technical environment using equipment and tools, which can also 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.

### **Learning Product Plan**

The task-oriented course is divided into 3 different modules:

- AXE General module 5 days
- MSC Basic Operation 3 days
- BSC Basic Operation 1 day

## GSM/WCDMA Core Network Overview



LZU 108 5201 R2A

### Description

This course provides students with an overview of the GSM/WCDMA Core Network, with all its components, functions and characteristics.

### Learning objectives

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

- 1 **State the main functions of the GSM/Wideband Code Division Multiple Access (WCDMA) Core Network**
  - 2 **Explain the difference between a second generation (2G) Core Network and a third generation (3G) Core Network**
  - 3 **Explain the migration path from a 2G Core Network to a 3G Core Network**
  - 4 **State the main functions of the nodes which comprise the WCDMA Core Network**
- Detailed Learning Objective

### Target audience

The target audience for this course is: Service Planning Engineers, Service Design Engineers, Network Design Engineers, Network Deployment Engineers, Service Deployment Engineers, System Technicians, Service Technicians, System Engineers, Service Engineers, Field Technicians, System Administrators, Application Developers, Business Developers, Customer Care Administrators.

### Prerequisites

The participants should be familiar with telecommunication basics.

### Duration and class size

The length of the course is 3 hours.

### Learning situation

Web-based learning

## GSM BSC Maintenance



LZU 108 5458/4 R2A

### Description

The learning product enables the students to perform hardware maintenance on the BSC. The course will provide radio network technicians and radio network engineers with basic abilities to act on hardware faults, do hardware replacement, and follow maintenance routines using the system documentation and local Operation and Maintenance (O&M) tools.

The course is modular, being built up of cases, each case consisting of one or more related events. A sufficient pool of cases and events is provided so that maintenance of all supported GSM BSC hardware configurations may be trained.

Specifically, cases and events may be selected from the learning product to train configurations built up of the following hardware elements:

#### AXE Central Hardware Elements

- APZ 212 20
- APZ 212 25
- APZ 212 30 and 33
- IOG 20
- APG 40

#### AXE Subordinate Hardware Elements

- 128K GS
- RPs, EMs, RPGs
- BSC-specific elements (TRAU, SRS)

## Learning objectives

On completion of this course the participants will be able to (after completing all events in the case / event pool for the learning product):

- 1 Generate printouts according to a Work Order, using local Operation and Maintenance (O&M) tools and on-line system documentation**
  - 1.1 Log and save printouts, using local O&M tools
- 2 Locate and identify GSM hardware units, using online documentation**
  - 2.1 Determine the order number and release revision of hardware elements, using the Alex library
  - 2.2 Generate printouts per the Work Order, using local O&M tools and online documentation
  - 2.3 Exchange subordinate hardware elements, using online documentation
- 3 Perform repair sequences on GDM hardware elements (RPs, EMs), using WinFIOL / OSS-RC, online documentation, and data from a Work Order**
- 4 Determine the order and release revision of AXE central elements, using online documentation**
  - 4.1 Exchange hardware units in AXE central elements, using online documentation
  - 4.2 Perform repair sequences on AXE central hardware elements, using WinFIOL/ OSS-RC, online documentation, and data from a Work Order
  - 4.3 Generate status printouts of AXE central elements per a Work Order, using local O&M tools and online documentation
  - 4.4 Determine APZ system status, using visible hardware indicators
- 5 Locate and identify IOG 20 / APG 40 hardware units, using online documentation**
  - 5.1 Generate printouts of IOG 20 / APG 40 system status and hardware elements, using local O&M tools and online documentation
  - 5.2 Perform repair sequences on IOG 20 / AOG 40 hardware elements, using WinFIOL/ OSS-RC, online documentation, and data from a Work Order
- 6 Save a system backup copy on removable media, using online documentation and Work Order data**
  - 6.1 Generate printouts according to a Work Order, using local O&M tools and online documentation
  - 6.2 Transfer a file from removable media to hard disk, using online documentation and Work Order data
- 7 Test load a system backup copy, using online documentation and Work Order data**
- 8 Perform routine preventive maintenance on the AXE, using online documentation**
- 9 Perform repair sequences on BSC-specific hardware elements (TRAU, SRS), using WinFIOL/OSS-RC, online documentation, and data from a Work Order**

**Target audience**

The target audience for this course is: System Engineers, Service Engineers, Field Technicians

**Prerequisites**

Successful completion of the following courses:

GSM Network Fundamentals

FAB 102 1465

**Duration and class size**

The length of the course is 7 days and the maximum number of participants is 8.

Depending on the customer scenario the modules can be left out and the duration can be shortened to 5 days.

The duration of an AXE 810 only delivery is 5 days.

**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. Working in groups of two for most events, students are issued various Work Orders to resolve hardware faults, perform hardware replacement, and follow simple non-fault related maintenance routines using the system documentation. The instructor acts as facilitator, helping students to obtain the required competency

Wherever possible, the group size will be limited to two students, though larger groups may be required from time to time.

The instructor in general acts as guide or facilitator, allowing the students to proceed independently, assisting only where necessary to ensure that the students obtain the necessary competence. Infrequently, the instructor will also present instructional material, either to preface an event or in summation. Instances of pure lecture, however, are limited.

## GSM/WCDMA Transport Network Overview (WBL)



LZU 108 6114 R1A

### Description

This course provides a general introduction to the WCDMA Transport Network and explains on overview level the Transport Network components and underlying Transport Network technologies.

The features and functionality of the Transport Network elements are explored along with a description of Ericsson Transport Network products.

### Learning objectives

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

- 1 **State the main functions of the Transport Network**
- 2 **Explain the purpose and usage main Transport Network protocols SDH, ATM and IP**
- 3 **Outline the implementation of the Transport Network in the WCDMA Core Network**
- 4 **List the Ericsson Transport Network ATM and IP products and outline their capabilities**

### Target audience

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

### Prerequisites

Successful completion of the course:

WCDMA Core Network Overview (WBL)

LZU 108 5201

### Duration and class size

The length of the course is 3 hours.

### Learning situation

Web-based learning

## GSM/WCDMA Traffic Cases (WBL)



LZU 108 6115 R1A

### Description

This course is a web-based course and explains on overview level data and speech traffic cases. It illustrates with signaling diagrams the call setup and mobility management procedures.

The web-based course presentation visualizes animated message flows and an information area where the explanatory text is shown. Different levels of details are presented.

After the course the improved knowledge of the student can be tested in a question and answer session.

The participant will explore each traffic case and follow on the screen the respective signaling flow. In the introduction to each case the concepts and terms are explained and the flow is visualized in detail.

The information window and the pop-up windows will provide additional information about the current message and explanation of what happens in the receiving party when the message is received.

### Learning objectives

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

#### **1 List and explain the signaling interfaces involved and the respective message flow on overview level for the following traffic cases:**

- 1.1 GSM MS Originated Speech Call
- 1.2 GSM MS Terminated Speech Call
- 1.3 GSM Intra and Inter MSC handover
- 1.4 GSM IMSI Attach
- 1.5 GSM IMSI Detach
- 1.6 GSM Location Update
- 1.7 GSM GPRS Attach
- 1.8 GSM GPRS Detach
- 1.9 GSM PDP Context Activation
- 1.10 GSM PDP Context Deactivation
- 1.11 GSM GPRS Location Update Procedures

#### **2 List and explain the signaling interfaces involved and the respective message flow on overview level for the following traffic cases:**

- 2.1 WCDMA Mobile Originated speech call
- 2.2 WCDMA Mobile Terminated speech call
- 2.3 WCDMA Mobile to Mobile speech call
- 2.4 WCDMA GPRS attach
- 2.5 WCDMA GPRS detach
- 2.6 RAB Re-establishment
- 2.7 Network Initiated RAB re-establishment
- 2.8 WCDMA PDP Context Activation

- 2.9 WCDMA PDP Context Deactivation
- 2.10 WCDMA MS originated/terminated Payload Traffic
- 2.11 WCDMA Intra and Inter SGSN Routing Area Update
- 3 Explain the signaling and payload paths in horizontal network architecture.**
- 4 Search and find information in the WBL about the main nodes involved in the traffic case.**

### **Target audience**

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

### **Prerequisites**

Successful completion of the following courses:

GSM/WCDMA Core Network Overview	LZU 108 5201
OSS-RC Overview	LZU 108 6231
GSM Radio Network Overview	LZU 108 6235

### **Duration and class size**

The length of the course is 4 hours.

### **Learning situation**

Web-based learning

## IPWorks 4.2 Overview



LZU 108 6126 R2A

### Description

Is IP network configuration and administration a new undertaking for your organisation or team members? Are you migrating to IPv6 technology? Does IMS feature in your organisations network strategic planning? Have you purchased an IPWorks solution and require training?

With the help of IPWorks overview training and the guidance of the instructors, the attendees can achieve a thorough understanding of the terminology and operation of both DNS and DHCP services. The course is targeted to those with minimal DNS and DHCP experience. The course will also give the participants an understanding of the requirements for DNS and DHCP in the GPRS / WCDMA and CDMA2000 environment and how to plan, dimension and deploy an IPWorks solution. The course will also focus on how IPWorks provides efficient, manageable and highly available DNS and DHCP services in these network domains.

### Learning objectives

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

- 1 Recognize the IPWorks solution and components**
  - 1.1 Express the concept of IPWorks 4.2 server
  - 1.2 Identify the main components of the IPWorks 4.2 system architecture
  - 1.3 Outline the new features of IPWorks 4.2.
- 2 Identify and describe the IP protocols supported by IPWorks 4.2**
  - 2.1 Describe the addressing details of IPv4
  - 2.2 Describe the addressing details of IPv6
  - 2.3 Differentiate between IPv4 and IPv6.
- 3 Introduce and explain Domain Name Services (DNS)**
  - 3.1 List and describe the three basic functions of DNS
  - 3.2 Explain subnet masks, Default router and DNS settings for normal operation
  - 3.3 Describe a typical DNS Query.
- 4 Introduce and explain the Dynamic Host Configuration Protocol (DHCP)**
  - 4.1 Underline the purpose of DHCP, why it is required
  - 4.2 List and explain three methods of Dynamic IP address allocation
  - 4.3 Relate the benefits of Dynamic IP address configuration.
- 5 List and describe the components of the IPWorks 4.2 architecture**
  - 5.1 List the main components of IPWorks 4.2
  - 5.2 Describe the elements of each component of IPWorks 4.2.
- 6 Follow and explain the DNS Configuration procedure within IPWorks 4.2**
  - 6.1 Explain the configuration of generic DNS (server – Linux or SUN)
  - 6.2 List the steps required for DNS setup within IPWorks 4.2
  - 6.3 Configure a sample DNS configuration for IPWorks 4.2
  - 6.4 Explain the use of DNS lookups and use forward, reverse lookup using ping, tracert
  - 6.5 Analyze the DNS protocol and record types.
- 7 Follow and explain the DHCP Configuration procedure within IPWorks 4.2**



- 7.1 Define the steps required for DHCP setup
- 7.2 Configure a sample DHCP configuration for IPWorks 4.2.
- 8 Identify new features and benefits of IPWorks 4.2 features**
- 8.1 List the server requirements, management and security issues involved in planning & dimensioning an IPWorks 4.2 solution for a GPRS network
- 8.2 Explain the structure of the Ericsson IPWorks 4.2 solution and how to plan, dimension and integrate it within the GPRS network
- 8.3 Interpret the architecture of the IPWorks 4.2 solution
- 8.4 Describe the configuration and management features of the IPWorks 4.2 solution.
- 9 List and Explain IPWorks 4.2 Deployment Scenarios**
- 9.1 Identify DNS deployment in a generic IP network
- 9.2 Identify DHCP deployment in a generic IP network
- 9.3 Identify DNS deployment in a GPRS/WCDMA core network
- 9.4 Identify Smart Mobile DNS deployment in a core network
- 9.5 Identify DNS deployment in a GPRS/WCDMA Gi network
- 9.6 Identify DHCP deployment in a GPRS/WCDMA Gi network
- 9.7 Identify DNS deployment in a CDMA2000 network
- 9.8 Identify Active Select DNS in a CDMA2000 network
- 9.9 Identify DHCP deployment in a CDMA2000 network
- 9.10 Relate O&M functions and Infrastructure networks.

### Target audience

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

It is also a prerequisite for those that need to know about IPWorks for further study or who are going to attend the Operation & Configuration course.

This audience is responsible for configuration of the IP Works / DHCP server.

### Prerequisites

The participants should be familiar with IPv4 and IPv6 addressing, subnet masking, default gateways and general routing principles. Although IPv4 and IPv6 will be covered in brief, participants should be familiar with IP addressing and subnet masks. Successful completion of the following courses or equivalent is preferred:

IP Networking	LZU 102 397
GPRS System Survey	LZU 108 876

### 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 instructor-led theory conducted in a classroom environment. Alternatively it can be provided as web-based learning through Centra / VCT

### Time schedule



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

<b>Day</b>	<b>Short description of the topics in the course</b>	<b>Estimated time</b>
1	<ul style="list-style-type: none"><li>• Review of IPv4 and IPv6 addressing</li><li>• Overview of DHCP</li><li>• Example configuration of DHCP (server – Linux or SUN )</li><li>• Example of DHCP proxy and DHCP relay</li><li>• Analysis of the DHCP protocol</li><li>• Overview of DNS operation</li><li>• Example configuration of DNS (server – Linux or SUN)</li><li>• Using DNS – forward, reverse lookup (Use PC commands - ping, tracet, nslookup)</li><li>• Analysis of the DNS protocol and record types (a, ns, aaaa etc.)</li><li>• IPWorks DNS &amp; DHCP servers &amp; architecture</li><li>• IPWorks DNS (ActiveSelect DNS, Dynamic DNS updates,etc)</li></ul>	<p>1.0 Hours</p> <p>0.5 Hours</p> <p>0.5 Hours</p> <p>0.5 Hours</p> <p>0.5 Hours</p> <p>1.0 Hours</p> <p>0.5 Hours</p> <p>0.5 Hours</p> <p>1.0 Hours</p> <p>1.0 Hours</p> <p>1.0 Hours</p>

## IPWorks 4.2 Operation and Configuration



LZU 108 6127 R2A

### Description

Does maintaining, managing and administering IP operations in your network provide a challenge to you? Are members of your team in need of skills to perform the duties required when managing your IP solution efficiently? Have you upgraded your IP solutions or alternatively are you looking to do so? Do you support the IP Works solution

The IPWorks Operation and Configuration training is designed to familiarize students with the operation and configuration of IPWorks. Students will learn the skills necessary to deploy, configure, and manage DNS and DHCP service using IPWorks. An emphasis is made on developing an understanding of IPWorks as a management tool so students can develop their own procedures for supporting and using IPWorks.

### Learning objectives

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

- 1 Provide an introduction to the IPWorks solution and components**
  - 1.1 Define the concept of IPWorks server
  - 1.2 Outline the main components of the IPWorks 4.2 system architecture
  - 1.3 Outline the new features of IPWorks 4.2.
- 2 Introduce the Element Management System Control Panel**
  - 2.1 Introduce and define the configurable DNS and DHCP objects administered by IPWorks
  - 2.2 Explore the Control Panel Navigation and Menus
  - 2.3 Follow and execute the procedure to start and stop processes.
- 3 Introduce the Element Management System Web Interface**
  - 3.1 Use the IPWorks Web interface for management tasks such as address management and server configuration?
- 4 Navigate the Element Management System Command Line Interface (CLI)**
  - 4.1 Create a DHCP server, subnet, address pool and DHCP client using the CLI
  - 4.2 Perform management tasks for creating, listing, adding, deleting and exporting data via the command line interface.
- 5 Configure and verify IPWorks for DHCP operation**
  - 5.1 Create a DHCP server
  - 5.2 Configure a DHCP server and verify its operation
  - 5.3 Analyze how a DHCPv4 server assigns IP addresses
  - 5.4 Examine and explain client classes
  - 5.5 Examine address leasing
  - 5.6 Perform lease searching procedures
  - 5.7 Perform and verify a DHCP failover operation
  - 5.8 Perform and verify a DHCP Classing operation.
- 6 Examine the procedures for Domain Name Services (DNS) configuration**
  - 6.1 Create a DNS server
  - 6.2 Explain the concept of zones



- 6.3 Perform Master and Slave zone configuration
- 6.4 Follow the Create Resource Records procedure
- 6.5 Execute and verify a Zone Transfer procedure
- 6.6 Create access control lists
- 6.7 Use and implement Trusted Keys (TSIG Keys).
- 7 Introduce the procedures to deploy ActiveSelect DNS**
- 7.1 Explain the purpose of ActiveSelectDNS
- 7.2 Examine the ActiveSelect sites, policies and records
- 7.3 Follow the procedure to configure the ActiveSelect monitor, scripts and methods
- 7.4 Follow the procedure to configure and monitor a resource
- 7.5 Create a DNS contact.
- 8 Examine and analyze a Dynamic DNS configuration**
- 8.1 Define the purpose of Dynamic DNS (DDNS)
- 8.2 Enable a DDNS configuration
- 8.3 Enable a secure DDNS configuration.
- 9 Run system verification checks, do simple troubleshooting and capture relevant information for troubleshooting**
- 9.1 Troubleshoot common problems using shell commands
- 9.2 Follow troubleshooting steps for the protocol servers
- 9.3 Resolve problems using log files and configuration files.
- 9.4 Examine the transaction log files
- 9.5 Analyze the SNMP traps
- 9.6 Perform and verify a System Verification.
- 10 Follow the Installation and Un-installation procedures**
- 10.1 Perform an IPWorks 4.2 system un-installation
- 10.2 Perform an IPWorks 4.2 system installation
- 10.3 Troubleshoot common problems in the installation environment.

### Target audience

The target audience for this course is: Ericsson customers, in particular those that will support or use IPWorks. Sales, Technical Support, Provisioning and Operation & Configuration personnel from within customer's organizations. It is also a prerequisite for those that need to know about IPWorks for further study or who are going to attend the Operation & Configuration course.



### **Prerequisites**

The participants should be familiar with IPv4 and IPv6 addressing, subnet masking, default gateways and general routing principles. Working knowledge of DNS and DHCP are required. A working knowledge of Unix OS and SUN Solaris at administrator level is preferred.

Successful completion of the following courses or equivalent is preferred:

IP Networking	LZU 102 397
GPRS System Survey	LZU 108 876
Unix fundamentals	LZUBB 108 170
UNIX System Administration	LZUBB 108 356
IPWorks Overview	LZU 108 6126

### **Duration and class size**

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

### **Learning situation**

The course is based on instructor-led theory and practical instructor-led task oriented lessons given in both classroom and in a technical environment using equipment and tools.



## Time schedule

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

Day	Short description of the topics in the course	Estimated time
1	• Installation & System Configuration	1.0 Hours
	• IPWorks Command Line Interface	1.0 Hours
	• IPWorks Web Interface	1.0 Hours
	• DNS server configuration and verification	1.5 Hours
	• DHCP server configuration and verification	2.0 Hours
	• Active DNS	1.0 Hours
2	• Zone transfers	1.0 Hours
	• Dynamic DNS	1.0 Hours
	• DHCP failover	1.0 Hours
	• DHCP Classing	1.0 Hours
	• System Verification & Troubleshooting	0.5 Hours
	• Capturing Relevant Information for support	1.0 Hours
	• IPWorks System Configuration and management	2.0 Hours

## OSS RC Overview (WBL)



LZU 108 6231 R1A

### Description

Participants attending the OSS RC Introduction WBL course will be given a basic introduction to the Operation and Support System (OSS). The OSS is used for centralized Operation and Maintenance of mobile networks. OSS RC can manage Radio- (GSM) and Core Network (GSM and WCDMA) nodes.

### Learning objectives

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

- 1 **Detail the purpose of OSS and its architecture**
- 2 **Detail the process of alarm handling.**
- 3 **List the different applications used in Fault Management**
- 4 **List the different application used for configuration of Radio and Core Network elements.**
- 5 **Detail the function of SMO.**
- 6 **Detail briefly how Network Elements (NE) can be displayed using GNIP and GCC.**
- 7 **Explain the difference between long-term and short-term statistics.**
- 8 **Detail how statistics are fetched from the NE, stored and displayed in OSS.**
- 9 **List the applications used for Radio Network Optimization.**

### Target audience

The target audience for this course is: Service Planning Engineers, Service Design Engineers, Network Design Engineers, Network Deployment Engineers, Service Deployment Engineers, System Technicians, Service Technicians, System Engineers, Service Engineers, Field Technicians, System Administrators, Application Developers, Business Developers, Customer Care Administrators.

### Prerequisites

Successful completion of the following courses:

GSM/WCDMA Core Network Overview

LZU 108 5201

### Duration and class size

The length of the course is 3 hours.

### Learning situation

Web-based learning

## GSM Radio Network Overview (WBL)



LZU 108 6235 R1A

### Description

Participants attending the GSM Radio Network Overview WBL course will be given a basic introduction to the Radio Access part of GSM.

### Learning objectives

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

- 1 **Detail the Radio Network components, their functions, features and required specifications**
- 2 **Explain that the BSC controls the radio resources for the RBS**
- 3 **Outline the main working functions of a BSC, TRC and RBS**
- 4 **List the different versions of RBS's**
- 5 **Outline that an RBS contains a transmitter and a receiver and is the interface towards the MS**
- 6 **Explain the influence of EDGE to the Radio Network in terms of infrastructure requirements, Air Interface and end-user service enhancements.**
- 7 **Detail briefly the 3 different positioning methods available with Flexible Positioning Support CGI+TA, E-OTD and A-GPS positioning**

### Target audience

The target audience for this course is: Service Planning Engineers, Service Design Engineers, Network Design Engineers, Network Deployment Engineers, Service Deployment Engineers, System Technicians, Service Technicians, System Engineers, Service Engineers, Field Technicians, System Administrators, Application Developers, Business Developers, Customer Care Administrators

### Prerequisites

Successful completion of the following courses:

GSM/WCDMA Core Network Overview	LZU 108 5201
OSS-RC Overview	LZU 108 6231

### Duration and class size

The length of the course is 3 hours.

### Learning situation

Web-based learning

## Ericsson Wireless LAN Authentication Server (EWAS) 2.0 Operation



LZU 108 6351 R2A

### Description

This course is designed to provide participants with the skills and knowledge to operate and manage the EWAS node. The course covers all aspects of EWAS management including handling faults, configuration and performance management activities on the EWAS node. Participants will also be able to perform operation and maintenance tasks through the different interfaces.

### Learning objectives

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

- 1 Describe the architecture and functionality of the EWAS node**
  - 1.1 Explain the features of the EWAS node and describe the concepts of WLAN SIM Based Authentication, WLAN USIM based authentication, WLAN end user identification and automatic user provisioning
  - 1.2 List the interfaces supported by EWAS
  - 1.3 Describe the EWAS architecture
- 2 Explain the different types of authentication in the EWAS node**
  - 2.1 Describe EAP SIM Based Authentication
  - 2.2 Describe EAP AKA Based Authentication
- 3 Perform EWAS Configuration Management**
  - 3.1 Describe Configuration Management on the EWAS including - the EWAS Application, RADIUS stack, MAP stack
  - 3.2 Detail System Backup, Restore and System Upgrade
  - 3.3 Perform System Backup
- 4 Explain the function of Performance Management on the EWAS**
  - 4.1 Explain the Performance Management of the EWAS
  - 4.2 List the EWAS Platform Measurements
  - 4.3 Describe the use of XML files
  - 4.4 Import and analyze Performance Management data via the Node Management interfaces - alarm Interfaces and LDAP Browser
- 5 Analyze EWAS Fault Management**
  - 5.1 List the different types of alarms for the EWAS
  - 5.2 Explain the EWAS logs
  - 5.3 Use the user interface for receiving alarms and notifications
  - 5.4 Find the relevant alarm information in the on-line documentation
- 6 Perform EWAS Provisioning**
  - 6.1 Use the interface for the administration of user data
  - 6.2 Understand auto provisioning of users

**Target audience**

The target audience for this course is: Network Design Engineers, Network Deployment Engineers, Service Deployment Engineers, System Technicians, Service Technicians, System Engineers, Service Engineers, Field Technicians, System Administrators, Business Developers, Customer Care Administrators.

**Prerequisites**

Successful completion of the following courses, or have equivalent experience:

TSP System Overview	LZU 1086441
UNIX Basics	LZU 108170
UNIX Fundamentals	LZUBB 108356

Optional:

The Server Platform (TSP) 5 Operation & Maintenance	LZU 108 6443
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Knowledge on IP and SS7 routing would be helpful

**Duration and class size**

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

**Learning situation**

The course is based on instructor-led lessons and practical exercises on the EWAS node.

Remote access to this equipment is available to both the Ericsson and to the operator's organizations.



## Time schedule

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

Day	Topics in the course	Estimated time
1	<ul style="list-style-type: none"><li>• Describe the architecture and functionality of the EWAS node.</li><li>• Describe the architecture and functionality of the EWAS node.</li><li>• Explain the different types of authentication in the EWAS node</li><li>• Perform EWAS Configuration Management</li><li>• Exercise</li><li>• Explain the function of Performance Management on the EWAS</li><li>• Exercise</li><li>• Perform EWAS Fault Management.</li><li>• Exercise</li><li>• Perform EWAS Provisioning</li><li>• Exercise</li></ul>	<p>1 hour</p> <p>0,5 hours</p> <p>0,5 hours</p> <p>1 hour</p> <p>1 hour</p> <p>1 hour</p> <p>1 hour</p> <p>1 hour</p>

## Telecom Server Platform (TSP) 5 Overview



LZU 108 6441 R1B

### Description

This course serves as a general introduction to Ericsson Telecom Server Platform (TSP) and its applications.

### Learning objectives

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

#### 1 Explain when TSP is a good platform choice and why

- 1.1 List the principles of layered networks
- 1.2 Identify the main characteristics of TSP and how they are achieved
- 1.3 Interpret the terms scalability, high system availability and reliability, Telecom Grade software and hardware network redundancy

#### 2 Identify the applications available on TSP

- HLR/AC
- VPN
- NRG
- USIS
- CCN
- CSCF/MRFC/HSS
- INS
- EWAS
- SCP
- TAS
- EAS
- PGM

#### 3 Recognize the software architecture (Linux, Dicos, TelORB, Database)

#### 4 Illustrate the hardware architecture

- 4.1 Discuss GEM
- 4.2 Explain the different types of processor modules
- 4.3 Outline the different hardware types (NSP 4.0, NSP 4.1, NSP 5.0)
- 4.4 Recognize the standard configurations (Pico, Micro, Mini, Midi, Opti, Macro)

#### 5 Analyze on an overview level how TSP executes jobs

- 5.1 Describe processes and process types
- 5.2 Identify database objects, POTs, DUs
- 5.3 Explain distribution principles
- 5.4 Explain replication principles
- 5.5 Discuss data security

#### 6 Explain what external interfaces are supported by TSP:

- VIP
- SS7
- CORBA

**7 Describe how high availability is achieved:**

- 7.1 Outline how the configuration manager handles faults
- 7.2 Discuss how system upgrades are performed

**8 Examine on a basic level how node management is performed****Target audience**

The target audience for this course is: Service Planning Engineers, Service Design Engineers, Network Design Engineers, Network Deployment Engineers, Service Deployment Engineers, System Technicians, Service Technicians, System Engineers, Service Engineers, Field Technicians, System Administrators, Application Developers, Business Developers.

**Prerequisites**

The participants should be familiar with basic knowledge about telecommunications and data communications.

**Duration and class size**

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

**Learning situation**

Instructor Led Training, theoretical course.



### Time schedule

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

<b>Day</b>	<b>Topics in the course</b>	<b>Estimated time</b>
1	<ul style="list-style-type: none"><li>• Introduction</li><li>• Applications on TSP</li><li>• Software Architecture</li><li>• TSP Hardware</li><li>• Software execution and the database</li><li>• Communication</li><li>• High availability</li><li>• Node Management</li></ul>	<p>1.0 hours</p> <p>1.0 hour</p> <p>0.5 hour</p> <p>1.0 hour</p> <p>1.0 hour</p> <p>0.5 hour</p> <p>0.5 hour</p> <p>0.5 hour</p>

## Mobile@Home Technical Solution



LZU 108 6642 R3A

### Description

This course provides the participants with a detailed technical description of the Mobile@Home solution. The course covers items such as Mobile@Home solution overview, network elements, traffic cases, security and QoS as well as an overview of the management of Mobile@Home.

### Learning objectives

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

- 1 Describe the Mobile@Home solution**
  - 1.1 Describe the Mobile@Home concept
  - 1.2 Describe the GAN concept
  - 1.3 Describe the use of WLAN and Bluetooth in Mobile@Home

8
- 2 Describe the Mobile@Home components**
  - 2.1 Explain the main functionality of each network component
  - 2.2 List the main specifications of each network component

9
- 3 Describe the Mobile@Home traffic cases**
  - 3.1 Describe Bluetooth and WLAN link establishment procedures
  - 3.2 Explain the discovery and registration procedures
  - 3.3 Explain the Multiple Cell concept
  - 3.4 Explain the roving and handover procedures
  - 3.5 Explain GSM and GPRS call and data scenarios

10
- 4 Describe security and quality of service issues in the Mobile@Home solution**
  - 4.1 Describe the Bluetooth and WLAN security issues
  - 4.2 Explain the Up interface security and the use of IKEv2 and IPsec tunneling
  - 4.3 Explain the use of the security gateway
  - 4.4 Explain the use of the HSS authentication server
  - 4.5 Describe the Up interface quality of service issues

11
- 5 Describe the HSN functionality**
  - 5.1 Describe the role of the HSN in a Mobile@Home network
  - 5.2 Describe the HSN features
  - 5.3 Explain the HSN traffic cases

12
- 6 Describe the Mobile@Home management**
  - 6.1 Describe the HSS management issues
  - 6.2 Describe the IPWorks management issues
  - 6.3 Describe the HSN management issues
  - 6.4 Describe the SEGW management issues
  - 6.5 Describe the HBSC management issues



### **Target audience**

The course is intended for customers who need a technical overview of the Mobile@Home solution.

Typical target audience would be managers, marketing, installation, operating and maintenance personnel. The target audience is represented by :

- Service Planning Engineers
- Service Design Engineers
- Network Design Engineers
- Network Deployment Engineers
- Service Deployment Engineers
- System Technicians
- Service Technicians
- System Engineers
- Service Engineers
- Field Technicians
- System Administrators
- Application Developers
- Business Developers

### **Prerequisites**

Successful completion of the following courses, or equivalent qualifications:

IP Networking	LZU 102 397
GSM System Survey	LZU 108 852
GPRS System Survey	LZU 108 876

### **Duration and class size**

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

### **Learning situation**

The 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.

<b>Day</b>	<b>Topics in the course</b>	<b>Estimated time</b>
1	System Overview	3.0 hours
	Components	1.0 hour
	Traffic Cases	2.0 hours
2	Traffic Cases (continued)	1.0 hour
	Security and QoS	3.0 hours
	HSN Functionality	1.0 hour
	Management	1.0 hour

## Mobile@Home Basic Configuration



LZU 108 6781 R3A

### Description

This course is designed to provide the participants with the skills and knowledge needed to perform basic operation of a Mobile@Home network solution. This is achieved by practicing exercises on the GANC components of the Mobile@Home solution, the HBSC, the HSN and the SEGW. The exercises focus on analyzing traffic cases, handling of logs and statistical meters, alarm handling and fundamental configuration.

### Learning objectives

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

- 1 Create, modify and verify Mobile@Home specific element data in the HBSC**
  - 1.1 Enable and verify input and output logging in the element manager
  - 1.2 Create and verify cell data in the HBSC, such as GAN cell and GAN-CGI configuration
  - 1.3 Print out specific IP settings in the HBSC
  - 1.4 Create and verify UNC discovery data
  - 1.5 Activate and monitor statistical meters in the HBSC
- 2 Create, modify and verify Mobile@Home specific data in the SEGW**
  - 2.1 Import and modify a script file and bring it into operation
  - 2.2 Perform certificate request and activation
  - 2.3 Analyze and debug a rove in to GAN message flow using the SEGW Remote Console
  - 2.4 Monitor selected traffic loads using the SEGW Real-Time Monitor
  - 2.5 Configure and verify log receivers by means of the SEGW Log Analyzer
  - 2.6 Analyze traffic scenarios with the Ethereal Protocol Analyzer
- 3 Create, modify and verify Mobile@Home specific data in the HSN**
  - 3.1 Activate the HBSC for extended registration
  - 3.2 Enable logging and performance measurements
  - 3.3 Perform blacklisting and verify with Ethereal network protocol analyzer
  - 3.4 Enable the scrubbing process and verify with Ethereal network protocol analyzer
  - 3.5 Define and verify AP groups with separate charging indices

### Target audience

The course is intended for Ericsson and customer personnel who need to manage and operate a Mobile@Home network solution.

Typical target audience would be operating and maintenance personnel. The target audience is represented by :

System Technicians  
 Service Technicians  
 System Engineers  
 Service Engineers

**Prerequisites**

The participants should have a basic knowledge of the components in the Mobile@Home solution and successfully completed the following course, or equivalent qualifications:

Mobile@Home Technical Solution LZU 108 6642.

**Duration and class size**

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

**Learning situation**

The course is based on theoretical and practical instructor-led lessons given in both a classroom and in a technical environment using equipment and tools.

**Time schedule**

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

<b>Day</b>	<b>Topics in the course</b>	<b>Estimated time</b>
1	General Introduction	1.0 hour
	HBSC Introduction	1.0 hour
	HBSC exercises	3.0 hours
	SEGW introduction	1.0 hour
2	SEGW exercises	2.5 hour
	Introduction to HSN	1.0 hour
	HSN exercises	2.5 hour

## GSM System Survey



LZU 108 852 R6A

### Description

Are you lost when discussing GSM network basic concepts? If you are starting working in different areas of GSM system and need a general concept this is the course you were looking for. It will provide you with knowledge about Ericsson's GSM based systems and GSM 800/900/1800/1900. It will focus on GSM terminology, wireless concepts, functions of network nodes, and the Ericsson implementation of those network nodes. Completing this training you will have all the initial knowledge you need to proceed in competence development in other areas.

### Learning objectives

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

- 1 Understand how mobile systems have evolved over the time and tell the history of GSM development**
  - 1.1 List benefits of having a standard;
  - 1.2 Detail the GSM geographical network structure and node functions;
  - 1.3 Understand the GSM frequency bands;
  - 1.4 List subscriber services provided in the GSM network.
  
- 2 List Ericsson's GSM System divisions and components and perceive how Ericsson has been involved in GSM since its inception and took an active part in the GSM specification process.**
  - 2.1 List network components and Detail their functions;
  - 2.2 Briefly Detail optional additional network entities functions.
  - 2.3
  - 2.4 Know basic concepts of wireless communications and its importance to provide a good knowledge of how GSM Systems works
  - 2.5 Understand Time Division Multiple Access technique (TDMA);
  - 2.6 List the transmission problems and their solutions;
  - 2.7 Understand how Adaptive Multi-Rate (AMR) can increase capacity.
  
- 3 List and identify GSM System mandatory concepts of air interface, their functions and required specifications.**
  - 3.1 Understand the concepts of physical channel and a logical channel;
  - 3.2 List one important piece of information sent on each of 3 different logical channels;
  - 3.3 Briefly explain the idea of mapping.
  
- 4 Differentiate the platforms that provides the networks nodes and functionalities that are basis to provide Circuit and Packet switching, including AXE and CPP platform principles, list the main components and outlines the main features.**
  - 4.1 Understand the function of APT and APZ;
  - 4.2 Differentiate functions that can be implemented using AXE platform modularity;
  - 4.3 Explain how the group switch switches calls;

- 4.4 Discriminate the AXE 810 hardware structure;
- 4.5 Discriminate the CPP Hardware Platform.
- 5 Explain how Ericsson implements the functions and nodes of the GSM switching system.**
- 5.1 Name 3 nodes in the Switching System;
- 5.2 List which 2 nodes are contracted for the security procedure in the GSM system;
- 5.3 Briefly explain the purpose of Authentication, Ciphering and Equipment Check;
- 5.4 Know Ericsson Mobile Softswitch Solution.
- 6 List and identify Radio Access Network system nodes, its functions and required specifications**
- 6.1 Outline the main functions of a BSC, TRC and RBS;
- 6.2 List the Ericsson's RBS 2000 configurations;
- 6.3 Explain the RBS architecture and functional blocks.
- 7 Recognize different mobile stations types, including their components, functions, features and required specifications**
- 7.1 Outline the information stored on the SIM-card;
- 7.2 Explain the advantage of having a separation between mobile equipment (ME) and subscription (SIM-card);
- 7.3 List the product categories of Mobile Stations (MS).
- 8 Understand the GSM traffic cases to consolidate all the GSM Network concepts using basic traffic cases examples.**
- 8.1 Explain the purpose of GSM ID-number (MSISDN, IMSI, TMSI, MSRN and LAI);
- 8.2 Understand the handover, locating and location updating concepts;
- 8.3 Briefly Detail how a traffic case works.
- 9 Explain the basic concepts and difficulties of planning a cellular network based on text examples and explanations.**
- 9.1 Detail 3 stages in the cell planning process;
- 9.2 Explain the terms Grade of Service (GOS) and 'Erlang';
- 9.3 Name 2 types of Interference;
- 9.4 Detail briefly the feature 'Re-Use of Frequencies within a Cell';
- 9.5 Understand what is meant by the term 'Hierarchical Cell Structure';
- 9.6 Detail briefly the feature 'BCCH in Overlaid Sub cell'.
- 10 Recognize Ericsson's Operation and Support System – OSS as an important tool for operation and maintenance in GSM network describing its features and functions**
- 10.1 Explain the functions of the Operations and Support System;
- 10.2 Detail the architecture of the Operations and Support System;
- 10.3 Outline the implementation of the Multi Mediation;
- 10.4 Understand the implementation of the Ericsson Multi Activation.
- 11 List the most common and main subscriber services, explaining their functions, features, and specifications.**
- 11.1 List the different types of services available in the network;



- 11.2 Identify one of each of the following service types in the network: teleservices, bearer services and supplementary services;
  - 11.3 Identify one of the Ericsson innovative services in the network;
  - 11.4 Briefly Detail the mobile intelligent network services available with Ericsson GSM systems ;
  - 11.5 Understand the need and advantages of the CAMEL system.
- 12 Understand charging and accounting concepts, their functions, features and required specifications, drawing attention to the fact that the charging concept is changing due to the introduction of new technologies such as GPRS, UMTS.**
- 12.1 Understand the charging concepts;
  - 12.2 List three call components;
  - 12.3 Explain the future of billing.
- 13 Discriminate how data calls are initiated in the GSM network and cite examples of how a data call is handled in a GSM network through a traffic case analysis.**
- 13.1 Explain the data transmission services which GSM offers;
  - 13.2 Detail a GSM data traffic case;
  - 13.3 List the data transmission services which GPRS offers;
  - 13.4 List the things that can lead to improved GPRS end-user performance;
  - 13.5 Detail a GPRS data traffic case.
- 14 Have an overview of the possible future functionality of GSM-based systems.**
- 14.1 Detail the evolution of GSM to WCDMA systems;
  - 14.2 List the technologies that will bridge these two systems including HSCSD, EDGE , GPRS , UMTS and HSPDA;
  - 14.3 Explain the 3G system and feature Adaptive Traffic Control.

### **Target audience**

The target audience for this course is: Service Planning Engineers, Service Design Engineers, Network Design Engineers, Network Deployment Engineers, Service Deployment Engineers, System Technicians, Service Technicians, System Engineers, Service Engineers, Field Technicians, System Administrators, Application Developers, Business Developers, Customer Care Administrators.

### **Prerequisites**

The participants should be familiar with telecommunication basics.

### **Duration and class size**

The length of the course is 4 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.

1	Course Introduction & pre-course test	1,0 h
	Introduction to Mobile Telecommunications and GSM	1,5 h
	Overview of Ericsson's GSM Systems	0,5 h
	Introduction to AXE and CPP	1,5 h
	Switching System	1,5 h
2	Radio Access Network	1,5 h
	Mobile Station	0,5 h
	Wireless Concepts	2,0 h
	Channel Concepts	2,0 h
3	Traffic Cases	2,5 h
	Cell Planning	1,5 h
	Operation and Maintenance tools	1,0 h
	Mobile IN and Subscriber Services	1,0 h
4	Charging and accounting	0,5 h
	Data Services	2,0 h
	The future of GSM	2,0 h
	Optional Components (Appendix A-B)	1,0 h
	Post-course Test	0,5 h

## GPRS System Survey



LZU 108 876 R4A

### Description

This course procures a basic introduction to the GPRS technology, the air interfaces for GSM (including EDGE) and WCDMA. The course includes traffic cases and Ericsson products within this field are presented.

The focus is on general principles rather than specific technical details.

### 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 Explain the differences between Circuit switching and Packet switching principles
  - 1.2 Describe some of the GPRS Applications
  - 1.3 List GPRS terminal features
  - 1.4 Describe the general GSM/GPRS/WCDMA network Architecture
  - 1.5 Illustrate how a terminal (Laptop or Smart Phone) uses the GPRS to access other networks such as corporate LAN or the internet
  - 1.6 List and explain GPRS architecture
  
- 2 Explain on overview level the air interface in GPRS covering the GSM, including EDGE and/or WCDMA Systems**
  - 2.1 Explain GPRS Radio resource management including:
    - Dedicated or on-demand PDCH's
    - UL/DL resource allocation
    - Multi slot allocation
    - Radio resource management for UL/DL packet transfer
  - 2.2 Understand GPRS throughput announcement, Coding schemes, Number of timeslots allocated, Protocol headers added to payload and Cell changing in GPRS
  - 2.3 Describe the User plane bearers for WCDMA
  
- 3 Describe the traffic cases in GSM/WCDMA Networks for:**
  - Location Update
  - Combined LA/RA update
  - Cell update
  - Paging
  - PDP context Activation
  
- 4 Describe the functions and hardware for the WPP based SGSN for both GSM and WCDMA as well as GGSN based on J20**
  - CGSN
  - SGSN
  - GGSN J20

- 5 List the Software and Hardware required for GPRS in GSM / WCDMA
- 6 Understand the protocol stacks associated with GSM Systems and WCDMA

### 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 or  
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.

Day	Short description of the topics in the course	Estimated time
1	• GSM/WCDMA Network Overview for GPRS	2 h
	• GSM Air Interface for GPRS, including EDGE	2 h
	• WCDMA Air Interface	2 h
2	• Transport and Traffic Management	2 h
	• SGSN and GGSN Hardware	2 h
	• BSS Architecture for GPRS	1 h
	• RAN Architecture for GPRS	1 h

## GSM Signaling in the Core Network



LZU 108 897/2 R7B

### Description

The complexity of the Core Network and the call control signaling has increased with the introduction of Softswitch Solutions, Bearer Independent Call Control and options for IP-based transmission. This course is designed to give the participant an overview of signaling technologies and protocols used to manage and control voice calls in the Core Networks for GSM up to release MSS R4.1. The theoretical background will provide a better understanding for the Core Network in general and signaling in specific.

### Learning objectives

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

- 1 Explain the basic structure and terminology of the Signaling System No. 7.
- 2 Explain three different signaling transport alternatives used in the Core Network (MTP, SAAL and SIGTRAN) and list the main differences between them.
- 3 List the user plane protocol stacks in the Core Network.
- 4 Explain ISUP signaling capabilities briefly, and list the messages of a typical call setup.
- 5 Explain BICC & GCP signaling principles and concepts.
- 6 Explain the signaling between MSCs (also MSC server to MGW) for setting up and releasing calls in the Mobile Softswitch Solution.
- 7 Explain Q2630 & IPBCP signaling principles and concepts.
- 8 Explain the signaling between MGWs for setting up and releasing bearers in ATM and IP backbone networks.
- 9 Explain SCCP services and routing alternatives used by BSSAP and MAP.
- 10 Explain TCAP and MAP signaling principles on high level.
- 11 Explain BSSAP signaling for a call setup and list important BSSAP functions.
- 12 Explain the steps in a typical call set up and explain how the involved signaling protocols interact.

### Target audience

The target audience for this course is:

Core Network Engineer

Core Network Specialist

ATM Transport Network Specialist

This audience benefits from a deep insight about protocols and signaling techniques in the Mobile Core Network.



### **Prerequisites**

Successful completion of the following courses:

- GSM System Survey LZU 108 852 or LZU 108 4513
- GSM Traffic Cases LZU 108 5492
- GSM Network Surveillance LZU 108 5471/2
- GSM Operation Handling in MSC/BSC LZU 108 5024/2
- GSM MSC/VLR Operation LZU 108 5448/2

or equivalent knowledge. Experience of Ericsson's GSM system is recommended.

### **Duration and class size**

The length of the course is 5 days and the maximum number of participants is 16.

### **Learning situation**

Instructor Led Training (ILT). This course is based on theoretical instructor-led lessons and theoretical exercises.

## Time schedule

The time required always depends on the knowledge of the attending participants and the hours stated below can be used as estimate (effective time is stated, excluding brakes and 1 hour lunch).

Day	Topics in the course	Estimated time
1	• Core Network signaling introduction	1,5 h
1	• SS7 Intro	0,5 h
1	• MTP	2 h
1/2	• SAAL	2 h
2	• SIGTRAN	2,5 h
2	• ISUP	1,5 h
2/3	• BICC	2,5 h
3	• Q2630	2 h
3/4	• GCP	3,5 h
4	• traffic case Interworking, (BICC, GCP, Q2630)	0,5 h
4	• IPBCP	1 h
4	• SCCP	2,5 h
5	• RAN signaling, BSSAP	1,5 h
5	• TCAP	0,5 h
5	• MAP	2 h
5	• Signaling for IN	0,5 h
5	• GTP, PS domain signaling (brief)	0,5 h

## UNIX Fundamentals



LZUBB 108 170 R1B

### Description

This course provides an overview of the fundamentals of the UNIX operating system. The course provides an introduction to the structure and operation of UNIX using the wide range of fundamental commands and utility programs. Tutorials on the 3 shells (Bourne, Korn and C) are given, allowing to the students to experiment with useful shell scripts. Students are encouraged to use the fundamental commands and utility programs throughout the duration of the course.

### Learning objectives

On completion of this course the participants will be able to

- 1 Describe the history of UNIX
- 2 Describe the UNIX operating system
- 3 Describe the UNIX file system
- 4 Use fundamental UNIX commands
- 5 Overview of the vi editor
- 6 Work within a shell environment
- 7 Use network utility programs
- 8 Write basic shell scripts
- 9 Use the on-line documentation
- 10 Set up file permissions
- 11 Describe the role of the System Administrator
- 12 Describe the role of a UNIX System Administrator

### Target audience

The target audience for this course primarily personnel working with UNIX administration and needing to get familiar with UNIX and shell scripting.

### Prerequisites

Successful completion of the following courses:

- UNIX Basics (LZU 108 5134)

### 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.

## UNIX System Administration



LZUBB 108 356 R1B

### Description

This course Unix System Administration Level 1 is a practical course, which will enable the students to perform the basic system administration tasks for a Solaris based Unix platform which include installation, file system management, backup procedures, process control, user administration and device management.

### Learning objectives

On completion of this course the participants will be able to

- 1 **Describe the role of a UNIX System Administrator**
- 2 **Access system documentation and reference sources for performing administration tasks and troubleshooting**
- 3 **Perform an installation of the UNIX Operating System**
- 4 **Add and remove software packages**
- 5 **Add and configure new devices**
- 6 **Perform booting and shutdown procedures**
- 7 **Manage User and Group accounts**
- 8 **Manage the File System and Disk devices**
- 9 **Monitor system performance (Memory, File System, Processes, CPU)**
- 10 **Understand how to implement UNIX security features**
- 11 **Perform backup and restore**
- 12 **Implement System Administrator Tools and Utilities**

### Target audience

The target audience for this course primarily personnel new to UNIX administration and who will be involved in supporting UNIX based nodes and applications.

### Prerequisites

Successful completion of the following courses:

- UNIX Fundamentals LZU 108 170
- UNIX Basics LZU 108 5134

### 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.

