



ENGINE 3.1

Training Programs

Catalog of Course Descriptions



Catalog of Course Descriptions

INTRODUCTION.....	5
ACCESS NETWORKS, AN OVERVIEW (WBL).....	6
APG 40 OPERATION & MAINTENANCE	8
APG 40 INSTALLATION & CONFIGURATION.....	10
APG40 RECOVERY PROCEDURES	11
APZ 212 30/33 DELTA	13
APZ 212 40 DELTA	14
APZ 212 40 OPERATION & MAINTENANCE, DELTA	16
ATM & IP OVER ATM.....	18
AUTOMATED O&M USING OPERATIONS PROCEDURE SUPPORT	22
AXD 301/305 7.1 CONFIGURATION & VERIFICATION.....	24
AXD 301/305 6.0 TO 7.1 CONFIGURATION DELTA.....	26
AXD 301/305 7.1 MAINTENANCE	28
AXE 810 DATA TRANSCRIPT	30
AXE810 CONFIGURATION DELTA.....	34
AXE ENABLER 1.0 DELTA.....	36



AXE FOR THE 21ST CENTURY (MBL)	38
AXE HARDWARE MAINTENANCE	40
AXE OPERATION AND CONFIGURATION	43
AXE SURVEY	46
CORE NETWORKS, AN OVERVIEW (WBL)	47
DATACOM NETWORKING	49
ENGINE CORE INTRODUCTION	50
ENGINE INTEGRAL 1.0/2.0 TO 3.0/3.1 DELTA	52
ENGINE INTEGRAL 3.1 FAULT FINDING	53
ENGINE INTEGRAL 3.1 INTEGRATION & VERIFICATION	55
ENGINE INTEGRAL 2.0 TO 3.1 INTEGRATION & VERIFICATION DELTA	58
ENGINE SIGNALING IN THE CORE NETWORK	60
IP NETWORKING	62
IP NETWORK PLANNING	65
IP NETWORKING AND INTERNETWORKING (WBL)	68
IP NETWORKING AND INTERNETWORKING (WBL)	70
IPV6 AND TRANSITION FROM IPV4 TO IPV6	72
IPV6 AND TRANSITION FROM IPV4 TO IPV6, HANDS-ON	74
IPV6 ROUTING PROTOCOLS	77














MN-OSS R5 TO R6 DELTA.....	81
MN-OSS OPERATION TELEPHONY OVER PACKET	83
MN-OSS OPERATION, AXE	85
MN-OSS TOP, AXD EM ONLY.....	88
MN-OSS SYSTEM ADMINISTRATION	91
NETWORKING AND ETHERNET STANDARDS (WBL)	94
NETWORKING BASICS, AN OVERVIEW (WBL).....	96
TELECOMS 2000: AN OVERVIEW (MBL).....	98
TELECOMS 2000 FUNDAMENTALS (MBL)	99
TELECOMMUNICATION ABC	101
USING THE FMX TOOL	102
VPN & IP SECURITY	104



Introduction

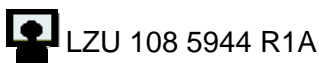
Ericsson has developed a comprehensive Training Programs service to satisfy the competence needs of our customers, from exploring new business opportunities to expertise required for operating a network. The Training Programs service is delineated into packages that have been developed to offer clearly 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:

Icon	Delivery Method
	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)
	Delivery Enablers
	Remote Training Lab (RTL)
	Web Portal (WP)
	Ericsson Education E-Learning
	EEOnline @ http://learning.ericsson.net/eeonline/



Access Networks, An Overview (WBL)



Description

This course provides a comprehensive introduction to the basic concepts and technologies in both fixed and mobile access networks.

Learning objectives

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

- 1 Understand fixed network connections: access networks
- 2 Outline basic concepts, bandwidth and technologies in access networks
- 3 Describe access based on telephone networks (analogue and digital)
- 4 Outline other access network technologies, such as, cable TV, fiber optics and microwave
- 5 Understand the basic concepts of mobile access
- 6 Outline different mobile access (GSM, GPRS and UMTS)
- 7 Explain GSM architecture and outline a basic traffic case
- 8 Explain GPRS architecture and outline a basic traffic case
- 9 Explain UMTS architecture and outline a basic traffic case
- 10 Define mobile IP for IPv4 and IPv6

Target audience

The target audience for this course is anybody wishing to gain a basic understanding of modern access network technologies.

The course focuses on modern standard technologies and does not contain any Ericsson specific product material.

Prerequisites

There are no prerequisites for this course.

Duration

The length of the course is 2 hours 30 mins.



Learning situation

The course is a web based learning product.

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	Fixed Network Connections: Access Networks	1 hour
1	Connecting While Travelling: Mobile Access	1 hour 30 min

APG 40 Operation & Maintenance



LZU 1085870 R2A

Description

This course will introduce students to operational as well as maintenance issues on the APG40 platform. After attending the course the students will be able to work practically with common APG40 handling tasks.

Learning objectives

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

- 1 Describe the APG40 Hardware and Software on an overview level
- 2 Know the characteristics of all hardware boards and connections
- 3 Understand how the APG40 is built up
- 4 Be able to use different interfaces to connect to the APG40 platform
- 5 Connect to the APG40 using Telnet, WinFiol or pcANYWHERE
- 6 Describe the Alarm System on an overview level
- 7 Understand how the AEH, ALH, and PRC co-operates to raise alarms
- 8 Use the GOH to send data
- 9 Use the CDH, AFP and DBO for transfer of data to remote systems
- 10 Collect statistics using STS
- 11 Configure the STS on AP to request counter data from the CP
- 12 Have a basic understanding of the concept AD-devices
- 13 Be able to use AD-devices for command input and for routing of printouts
- 14 Load the CP from the APG40
- 15 Use CPT to perform an initial load of the AXE-CP
- 16 Perform backup and restore of the APG40 platform
- 17 Use burbackup and burrestore commands according to OPIs
- 18 Upgrade the APG40 system
- 19 Use Hard Function Change and Soft Function Change to install new software and/or update parameters

Target audience

The target audience for this course is personnel working with Network Maintenance, Network Operation, Network Development and System Administration.

Prerequisites

The participants should be familiar with Windows NT and have AXE knowledge equal to the following course: *LZU 108775 AXE Survey*

Duration and class size

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



Learning situation

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

APG 40 Installation & Configuration



LZU 108 5871 R2A

Description

This course will prepare participants for installation and configurational tasks on the APG40. After the course the students will be able to install and put an APG40 into operation

Learning objectives

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

- 1 Start up and Test the APG40
- 2 Follow the Test Instruction, Start up and Test of APG40 to install and configure the APG40 for operation
- 3 Change the site parameters
- 4 Understand the domain concept and know how a MUD can be set up and used
- 5 Use the User manager for domains to Add trusts between domains
- 6 Add user accounts to the system
- 7 Add users with different access rights to the APG40 and to the CP
- 8 Know about the different restore procedures
- 9 Understand when to use single node restore, cluster restore or Disaster Recovery and how a Node Change can be performed
- 10 Migrate to APG40 from IOG20
- 11 Undefine the IOG20 and move all operations to APG40
- 12 Configure the Antivirus for APG40
- 13 Shedule Virus scans and update the virus definitions

Target audience

The target audience for this course is personnel working with Network Maintenance, Network Operation, Network Development and System Administration.

Prerequisites

The participants should be familiar with Windows NT and have AXE knowledge equal to the following course: *LZU 108775 AXE Survey*

Duration and class size

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

Learning situation

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

APG40 Recovery Procedures



LZU 108 6326 R1A

Description

This course will introduce students to different recovery procedures on the APG40. These procedures will be described and practically performed on APG40 hardware.

After attending this course the students will know how to make a proper backup of the APG40 System and be able to restore the system using the recovery procedures described.

Learning objectives

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

- 1 Perform a Health Check of an APG40 System
 - 1.1 Use an audit script to check the status of a fault suspected APG40
- 2 Decide which Recovery Procedure to use
 - 2.1 Select between the existing OPI's for restoring a system
- 3 Create a Trouble Report
 - 3.1 Use the correct TR tools and documents at the right time
- 4 Make a proper backup of the APG40 System
 - 4.1 Understand how and what and when to backup an APG40
- 5 Perform Restore on the APG40 system
 - 5.1 Perform both single node and cluster node restore
- 6 Perform the AP, System Disaster Recovery OPI to restore an APG40 System
 - 6.1 Restore a single or both system disks on the APG40 from a LCT
- 7 Do a Quorum Restore on the APG40 System
 - 7.1 Restore the cluster quorum
- 8 Initiate a data disk restore on the APG40 System
 - 8.1 Repair failed disks and get them up in an optimal state

Target audience

The target audience for this course is staff working both for Ericsson and for External Companies with maintenance and support of APG40 Systems

Prerequisites

Successful completion of the following courses or equivalent knowledge:

- LZU1085870, APG40 Operation and Maintenance

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 run only as instructor-led training (ILT).

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).

Day	Topics in the course	Estimated time
1	Health Check Decide what action to take Trouble Report Burbackup procedure	1 day
2	Burrestore procedure Quorum Restore Data Disk Restore Node Change Other recovery methods	1 day
3	AP, System Disaster Recovery	1 day



APZ 212 30/33 Delta



LZU 108 1446

Description

This course describes the differences between the APZ 212 20 and the APZ 212 30/33, both in hardware and in functionality.

Learning Objectives

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

- 1 Describe the hardware structure of APZ 212 30/33
- 2 Describe the new functions of APZ 212 30/33
- 3 Name and explain the new commands

Target Audience

The course is intended for all staff working with installing, replacement or trouble shooting on APZ 212 30/33.

Prerequisites

The participant should be familiar with handling of older APZ 212 versions.

Duration and class size

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

Learning situation

This learning product is recommended for:

Instructor-led lessons

Other forms of education could be used.

APZ 212 40 Delta



LZU 108 5646 R3A

Description

This course will theoretically introduce participants to the key features of the APZ 212 40. It compares the APZ 212 40 to the earlier APZ versions. The main focus is on the differences that exist in terms of Hardware, Software and Error Handling. Participants will have a good understanding of how the APZ 212 40 works and where and how it behaves differently to the older APZs.

Learning objectives

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

- 1 Describe the evolution of APZ 212 40.
- 2 Outline the key features of the APZ 212 40 – New CPU, Capacity, Warm standby concept and the I/O systems required.
- 3 Illustrate the APZ 212 33 and APZ 212 40 Hardware Cabinets.
- 4 Detail the CPU and RPH magazines in both the classic APZ and the APZ 212 40.
- 5 Explain the Inter Platform Network switch.
- 6 Describe the differences in the Control Display Unit in the APZ 212 40.
- 7 Describe the APZ 212 40 software structure.
- 8 Explain PlexEngine, the APZ VM, the ASA compiler, and the commercial Operating System for the APZ 212 40.
- 9 Explain the new Record Orientated architecture of the Data Store as opposed to the original Dats store format of previous APZs.
- 10 Describe the functionality of HAL and OS API.
- 11 describe how to perform changes in APZ Hardware and Software
- 12 Describe the Reloading and Dumping in APZ 212 40
- 13 Describe the Ethernet RP bus and
- 14 Describe the RPB-E interface board in GEM

Target audience

The primary target audience for this course consists of all kind of personnel that need basic understanding of APZ 212 40.

Prerequisites

A knowledge of previous APZs is recommended.

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.

Terminology

CPU	Central Processor Unit.
RPH	Regional Processor Handler
APZ VM	APZ Virtual Machine
HAL	Hardware Abstraction Layer
OS API	Operating system Application Interface
GEM	Generic Ericsson Magazine
RPB	Regional Processor Bus
CDU	Control Display Unit
APG	Adjunct Processor Unit

APZ 212 40 Operation & Maintenance, Delta



LZU 108 6320 R1A

Description

This course enables the students to operate and maintain the APZ 212 40. The course will provide knowledge on basic concepts and APZ functions related to the operation tasks. Through practical exercises will skill the participants in handling hardware faults and extracting of system logs.

Learning objectives

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

- 1 Describe the evolution of APZ 212 40.
- 2 Outline the key features of the APZ 212 40 – New CPU, Capacity, Warm standby concept and the I/O systems required.
- 3 Illustrate the APZ 212 33 and APZ 212 40 Hardware Cabinets.
- 4 Detail the CPU and RPH magazines in both the classic APZ and the APZ 212 40.
- 5 Explain the Inter Platform Network switch.
- 6 Describe the differences in the Control Display Unit in the APZ 212 40.
- 7 Describe the APZ 212 40 software structure.
- 8 Explain PlexEngine, the APZ VM, the ASA compiler, and the commercial Operating System for the APZ 212 40.
- 9 Explain the new Record Orientated architecture of the Data Store as opposed to the original Dats store format of previous APZs.
- 10 Describe the functionality of HAL and OS API.
- 11 Handle changes in APZ Hardware and Software
- 12 Reload, maintain and Dump the APZ 212 40
- 13 Handle faults in CP Hardware, CDU, FANS and RPHM
- 14 They will also be able to:
- 15 Extract restart information in case of CP Software faults.
- 16 Extract error log files from CP / APG and send it for further analysis and troubleshooting.
- 17 Perform a CP stoppage and retrieval of restart data.
- 18 Work with the Ethernet RP bus and connect GEMs to RPB-E :



Target audience

The primary target audience for this course consists of all kind of personnel that need to operate the APZ 212 40.

Prerequisites

Knowledge of previous APZs is recommended.

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 APZ 212 40 equipment and tools (WinFiol, ALEX).

Terminology

CPU	Central Processor Unit.
RPH	Regional Processor Handler
APZ VM	APZ Virtual Machine
HAL	Hardware Abstraction Layer
OS API	Operating system Application Interface
GEM	Generic Ericsson Magazine
RPB	Regional Processor Bus
CDU	Control Display Unit
APG	Adjunct Processor Unit



ATM & IP over ATM



LZU 108 6129 R1A (Instructor Led Training)



LZU 108 6129/9 R1A (Virtual Classroom Training)

Description

This course covers the purpose and principles of Asynchronous Transfer Mode (ATM). From cell format over circuits and connections to ATM network traffic and ATM internetworking, this course explores the evolution and trends of ATM networking. It contrasts alternative technologies including IP and Frame Relay and discusses multi-service traffic types and quality of service (QoS). The latter part of the course focuses on IP over ATM.

Learning objectives

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

- 1 Describe basic ATM concepts
Understand the basic ATM concepts
List some reasons for implementing an ATM service
- 2 Describe the general format of the ATM cell structure
- 3 Understand the basic concept of virtual circuits
- 4 Describe ATM's handling of different traffic types
- 5 Describe ATM Standardisation
- 6 List the ATM standards bodies
- 7 Outline the responsibilities of the ATM forum
- 8 Describe briefly the history of ATM
- 9 Outline the major ATM standards
- 10 Describe the ATM protocol layers
- 11 Describe the physical layer
- 12 Define the physical layer
- 13 Explain how the physical layer interacts with other layers
- 14 Describe Synchronous Digital Hierarchy (SDH) and Synchronous Optical Network (SONET)
- 15 Understand Dense Wavelength Division Multiplexing (DWDM)
- 16 Describe the ATM layer
- 17 Understand the ATM header information and how it is used
- 18 Outline the UNI and NNI cell headers
- 19 Describe the functions of the ATM layer
- 20 Describe the ATM Adaptation Layers (AAL 1, 2 and 5)
- 21 Describe the ATM Adaptation Layer
- 22 Describe quality of service (QoS) categories
- 23 Outline the function of the different AAL types and sublayers
- 24 Describe circuit emulation
- 25 Understand ATM Traffic Descriptors
- 26 Understand ATM Traffic Descriptors
- 27 Outline which Traffic Descriptors are required for each Service Category
- 28 Describe quality of Service parameters



- 29 Define the quality of service (QoS) parameters used in ATM
 - 30 Distinguish between negotiable and non-negotiable QoS parameters
 - 31 Describe traffic control
 - 32 Describe what is meant by connection admission control
 - 33 Define virtual bandwidth
 - 34 Define traffic shaping
 - 35 Define traffic policing
 - 36 Understand the ATM switch architecture
 - 37 Outline the basic structure of a switching node
 - 38 Outline different fabric types
 - 39 Outline the function of the switch map, or routing table
 - 40 Define Input and output buffers
 - 41 Define Blocking
 - 42 Understand ATM networks
 - 43 Outline how networks are created
 - 44 Describe how different network types interwork
 - 45 Define Public and private networks
 - 46 Outline the location of UNI and PNNI
 - 47 Describe IP over ATM fundamentals
 - 48 Describe why ATM is widely used to carry IP traffic
 - 49 List some of the issues encountered when internetworking IP and ATM
 - 50 List the standards bodies involved in the development of the IP over ATM specifications
 - 51 Describe Multiprotocol Encapsulation over AAL 5
 - 52 Define RFC 2684
 - 53 Describe logical link control (LLC) encapsulation
 - 54 Describe VC multiplexing
 - 55 State when both methods are used
 - 56 Describe Classical IP over ATM
 - 57 Describe Classical IP over ATM (CLIP)
 - 58 Describe the function of an ATMARP server
 - 59 Define a logical IP subnet (LIS)
 - 60 Describe the format of an ATMARP packet
 - 61 Describe Multiprotocol Label Switching (MPLS)
 - 62 Describe the concept of MPLS
 - 63 List some advantages of MPLS
 - 64 Describe the structure of an MPLS network
 - 65 Describe how a Label Switched Path (LSP) is set up
- 1

Target audience

The target audience for this course is not limited and may be taken by anyone that has a need to learn about ATM and IP over ATM; for example, Network Operations, Network Development and System Administration staff.

Prerequisites



The participants should be familiar with data communications and telecommunications and should have successfully completed the Datacom Networking course (LZU 102 371) or the Introduction to IP Networks Web Based Learning course (FAB 102 1313), or have equivalent experience.

Duration and class size

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

Learning situation

LZU 1026129 is an instructor-led theory course delivered in a classroom. LZU 1026129/9 is the same course delivered via VCT (Virtual Classroom Training) over the Internet.



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	Topic	Estimated time
1	Welcome	0.25 hours
1	Chapter 1: Introduction	1.5 hours
1	Chapter 2: Standardisation	0.5 hours
1	Chapter 3: The Physical Layer	1 hour
1	Chapter 4: The ATM Layer	1.25 hours
1	Chapter 5: The ATM Adaptation Layer	1.5 hours
2	Chapter 6: Circuit Emulation	0.5 hours
2	Chapter 7: Signalling	0.5 hours
2	Chapter 8: UNI Signalling	1 hour
2	Chapter 9: PNNI Routing and Signalling	1 hour
2	Chapter 10: AAL 2, B-ICI, AINI, IISP	0.5 hours
2	Chapter 11: Network Management	0.5 hours
2	Chapter 12: ATM Traffic Descriptors	1 hour
2	Chapter 13: Quality of Service Parameters	1 hour
2	Chapter 14: Traffic Control	0.5 hours
3	Chapter 15: ATM Switch Architecture	0.5 hours
3	Chapter 16: Building ATM Networks	0.5 hours
3	Chapter 17: IP over ATM Fundamentals	0.5 hours
3	Chapter 18: Multiprotocol Encapsulation over AAL 5	0.5 hours
3	Chapter 19: Classical IP over ATM	1 hour
3	Chapter 20: MPLS	2.5 hours



Automated O&M using Operations Procedure Support



LZU 108 5149 R2A

Description

This course makes familiar with the Operations Procedure Support (OPS) scripting language necessary for Remote Function Change and Automatic Correction Deployment of an AXE. It introduces scripted solutions and works with the OPS Graphical User Interface.

Learning objectives

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

- 1 Work with the OPS Graphical User Interface
- 2 Explain the structure of the OPS script language including the structure of subroutines
- 3 Understand and write OPS scripts
- 4 Find and react on script errors

Target audience

The target audience for this course is Ericsson employees and Ericsson customers working in the technical operation area of the GSM/WCDMA network represented by network engineers.

Prerequisites

The participants should be familiar with AXE 10 (MML commands, ALEX) and UNIX.

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 lessons, demonstrations and hands-on exercises. The exercises are mainly case oriented where the participants are expected to investigate applications and find their own solutions rather than following step by step instructions.

The course could be conducted at an Ericsson training center or at a customer site. For security reasons only printout commands are sent to the network elements at a customer site. It's recommended that the exercises are reviewed by the customer before course conduction. For hands-on exercises, one computer is needed for every two participants.

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	OPS GUI / NUI	1,0h
1	OPS Scripting	2,0h
1	Exercises: - OPS GUI - OPS Script Language Basics - OPS Script Language	3,0h
2	OPS Subroutines	1,0h
2	Exercises: - OPS Script Language - OPS Tasks	5,0h

AXD 301/305 7.1 Configuration & Verification



LZU 102 709 R2A

Description

This course will teach participants about various components of the AXD 301/305 and its management system. Participants will look at the management interfaces and security management and work with batch.jobs and log files. Permanent and switched ATM connections will be configured and verified as well as IP interfaces like, MPLS, DiffServ, and BGP.

Learning objectives

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

- 1 Use the AXD management system (AMS).
- 2 Configure different users in security management.
- 3 Configure batch jobs and log files.
- 4 Create performance management reports.
- 5 Configure permanent ATM connections
- 6 Turn on and configure the charging administration service.
- 7 Show how the AXD 301 is used in networks
- 8 Describe and define the various ATM signaling protocols like UNI, PNNI and AINI.
- 9 Give an overview of the IP routing protocols, RIP V2, OSPF, IS-IS, BGP 4, and know how to define one of these interfaces on the AXD 301.
- 10 Describe and define the differentiated services on the AXD 301.
- 11 Describe and define MPLS protocol support and the MPLS features supported.
- 12 Give an overview of how the AXD deals with voice compression, AAL2 trunking, Circuit Emulation, Inverse Multiplexing and switch fabric management

Target audience

The target audience for this course is: System Engineers, Network Deployment Engineers. This audience is responsible for implementation, installation, testing, integration, operation and support tasks on the AXD 301/305.

Prerequisites

The participants should be familiar with ATM and IP or successful completion of the following courses:

AXD Maintenance ILT LZU 108 6130

IP Networking ILT LZU 102 397

Duration and class size

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



Learning situation

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

Time schedule

To be written.

Day	Topics in the course	Estimated time
1	Introduction	0.5 hours
1	Chapter 1 – Introduction to EIN 3.1	1 hour
1	Chapter 2 –Management and Security	1.5 hours
1	Chapter 3 – System Administration	1 hours
1	Chapter 4 – Permanent Connections	2 hours
2	Chapter 5 – Performance Management	0.5 hours
2	Chapter 6 – Charging Management	0.5 hours
2	Chapter 7 – Signalling Concepts, Addressing & Call Control	1.5 hours
2	Chapter 8 – Frame Relay	0.5 hour
2/3	Chapter 9 – UNI, IISIP, AINI	4 hours (3 hours)
3	Chapter 9 – UNI, IISIP, AINI (continuation)	4 hours (1 hours)
3	Chapter 10 – PNNI	1.5 hour
3	Chapter 11 – SPC	1.5 hour
3	Chapter 12 – Switch Fabric Management (to be inserted)	2 hours
4	Chapter 13 – Addressing Routing and Forwarding	2.5 hour
4	Chapter 14 – Routing Protocols	3.5 hours
5	Chapter 15 – MPLS	2 hour
5	Chapter 16 – RSVP	2 hours
5	Chapter 17 – IP/MPLS QoS	2 hours



AXD 301/305 6.0 to 7.1 Configuration Delta



LZU 108 6347 R1A

Description

This course will give customers and Ericsson employee's practical knowledge about the HW, SW, Configuration and Operation differences between AXD 301 6.0 and AXD 301 7.1.

Learning objectives

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

- 1 Describe the new HW and SW for the AXD 301 when it is used towards an IP core network instead of ATM.
- 2 Use the AMS (AXD Management System) to define and understand parameters for the new IPS (IP Subsystem) MFA (Managed Functional Area).
- 3 Know the new alarms that connected with IPS.
- 4 Give an overview of the IP routing protocols, RIP V2, OSPF, IS-IS, BGP 4, and define one of these interfaces on the AXD 301.
- 5 Describe and define the differentiated services (DiffServ) on the AXD 301.
- 6 Describe and define the MPLS protocol and interface.

Target audience

The target audience for this course is: System Engineers, Network Deployment Engineers. This audience is responsible for implementation, installation, testing, integration, operation and support tasks on the AXD 301/305.

Prerequisites

Good practical knowledge about AXD 301 4.0 or 6.0 equivalent to LZU 102 709 R1A.

Duration and class size

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

Learning situation

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



Time schedule

Day	Topics in the course	Estimated time
1	AXD 301 in EIN 3.1 and new HW and SW	1 hours
1	Addressing, Routing and Forwarding Hardware	2 hours
1	Routing Protocols	3 hours
2	MPLS	2 hours
2	RSVP	2 hours
2	IP/MPLS QoS and Resource Handling	2 hours



AXD 301/305 7.1 Maintenance



LZU 108 6130 R2A

Description

This course will teach students how to troubleshoot alarms, replace faulty hardware and perform system restarts on the AXD 301/305 7.1.

Learning objectives

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

- 1 Perform starts and restarts of the AXD 301/305
- 2 Troubleshoot events and alarms on the system
- 3 Remove and replace faulty hardware
- 4 Perform a backup and software upgrade

Target audience

The target audience for this course is: System Technician, Field Engineer.

Prerequisites

Successful completion of the following courses:

ATM Fundamentals FAB 102 1315

IP Networking LZU 102 397

Duration and class size

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

Learning situation

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



Time schedule

Day	Topics in the course	Estimated time
1	Module 1 – Hardware Overview	2 hour
	Module 2 – Hardware Maintenance	1 hour
	Module 3 – Software Maintenance	1 hour
	Module 4 – Event & Alarm Management	1 hour
	Module 5 – System Starts & Restarts	1 hour

AXE 810 Data Transcript



LZU 1086134 R1A

Description

This course will develop the student's current knowledge and understanding of exchange data to a point where he/she will be able to interpret exchange requirements and write the data transcript for an AXE 810.

The student will have the opportunity for discussion about data transcript production, inputs, flow and ideas. Generally, theoretical lessons will be followed by practical work giving the student the opportunity to write data transcript from exchange requirements.

Learning objectives

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

- 1 Understand the general hardware structure of AXE 810
 - 1.1 Understand the AXE modular system architecture
 - 1.2 Understand APZ control system
 - 1.3 Understand the general hardware structure of AXE810
 - 1.4 Describe the main benefits of AXE 810
 - 1.5 Describe the difference compared with BYB501 1.3/1.4
 - 1.6 List the highlights of AXE 810
- 2 Understand the new feature of AXE 810
 - 2.1 Understand the basic structure of APZ 212 33
 - 2.2 Describe the function of IPN
 - 2.3 Describe the definition of IPN
 - 2.4 Understand the basic structure of APG40
- 3 Define the C3 file and other hardware of AXE 810
 - 3.1 Explain the inputs and outputs of the Data Transcript process.
 - 3.2 Use the Customer Product Information (Alex Document Browsers) in order to find appropriate commands, parameters and parameter values.
 - 3.3 Explain the process of converting a reference dump into a working dump.
- 4 Perform a Size Alteration
 - 4.1 Understand the concept of SAE
 - 4.2 Explain the difference between global SAE and local SAE
 - 4.3 Understand the manual and automatic SAE function
 - 4.4 List a simple DT example
- 5 Allocate RP and EM
 - 5.1 Describe the basic structure of various GDM
 - 5.2 List different RP types
 - 5.3 List the DT examples of allocation for RP and EM
- 6 Define the Group Switch and connect Devices
 - 6.1 Describe the GEM structure
 - 6.2 Describe the structure of GS890



- 6.3 Understand the different capacity configuration of GS890
- 6.4 List the new hardware equipment in GEM
- 6.5 Describe the connection of GDM to the GS890
- 6.6 Describe the definition of BL phone, M-AST and PDSPL2-E applications
- 6.7 describe the structure and different configuration of CL890
- 6.8 List the DT example to define GS, SNT, DIP, device, route and necessary deblocking device, etc.
- 7 Define pre A-number and A-number analysis
 - 7.1 Understand the basic principle of A-number analysis and A-number pre-analysis
 - 7.2 Understand the commands and the parameters in the A-number and A-number pre-analysis table
 - 7.3 List simple DT example for A-number and A-number pre-analysis table
- 8 Define Pre B-Number Analysis
- 9 Define B-Number Analysis
- 10 Define Route Data
- 11 Define Routing Case Analysis
 - 11.1 Understand the basic principle of routing case analysis
 - 11.2 Understand the commands and the parameters in routing case analysis table
 - 11.3 List simple DT example for routing case analysis
- 12 Define End-of-Selection Analysis
 - 12.1 Understand the basic principle of EOS analysis
 - 12.2 Understand the parameters and actions possible to initiate in EOS analysis table
 - 12.3 List simple DT example for EOS analysis
- 13 Define Equal Access
 - 13.1 Understand the basic function and structure of equal access carrier analysis
 - 13.2 Understand the commands and parameters in the equal access carrier analysis table
 - 13.3 List simple DT example for equal access carrier analysis
- 14 Define Charging Data
 - 14.1 Understand the overall charging analysis table
 - 14.2 Understand the charging data in the charging analysis table, including traffic activity analysis, charging program analysis, tariff class analysis, switching class analysis, tariff data analysis, etc.
 - 14.3 Understand the calendar function
 - 14.4 List DT example for tariff charging
- 15 Define Access-Barring Analysis and Time-Supervision Analysis
 - 15.1 Understand the basic concept of access barring analysis and time supervision
 - 15.2 Understand the commands for access barring analysis and time supervision
 - 15.3 List DT example of access barring analysis and time supervision analysis
- 16 Define Announcements
 - 16.1 Understand the phrase of announcements
 - 16.2 Understand the access to announcement and the route data
 - 16.3 List DT example of announcements

Target audience

The target audience for this course is personnel in the network planning or network configuration in the area of Data Transcript. The target audience is represented by:

- Core Network Engineer
- Core Network Specialists



- Core Network Planning Engineers

Prerequisites

Successful completion of the following courses:

For the WCDMA customer

- WCDMA MSC/VLR Operation & Configuration FAB 102 1320

And/or

- WCDMA User Database & Authentication Operation FAB 102 1321

For the GSM customer

- GSM MSC/VLR Configuration LZU 108 5448/2

Duration and class size

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

Learning situation

This course is based on theoretical and practical instructor-led lessons given in 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	Chapter 1 AXE 810 Overview	2 hours
	Chapter 2 CP and APG	2 hours
	Chapter 3 Introduction to Data Transcript	1 hours
	Chapter 4 Size Alteration Events	1 hour
2	Chapter 4 Size Alteration Events (continued)	1 hour
	Chapter 5 Allocation of RP and EM	2 hours
	Chapter 6 Group Switch and Connection of Device	3 hours
3	Chapter 6 Group Switch and Connection of Device (continued)	3 hours
	Chapter 7 A number Analysis	1 hour
	Chapter 8 B number Analysis	2 hours



4	Chapter 9 Routing Case Analysis	2 hours
	Chapter 10 End of Selection	2 hours
	Chapter 11 Equal Access	2 hours
5	Chapter 12 Tariff Charging	2 hours
	Chapter 13 Access Barring and Time Supervision	2 hours
	Chapter 14 Announcement	2 hours

AXE810 Configuration Delta



LZU 108 5412 R3A

Description

The focus of this course is how to configure the new hardware in AXE810 (BYB 501 1.5). It gives a theoretical survey of the main differences, on a high level, between BYB 501 1.4 and the new hardware.

Learning objectives

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

- 1 Describe the new AXE810 on a basic level
- 2 Understand the market and the drivers behind AXE810.
- 3 Account for differences in metrics such as floor space, power consumption and capacity.
- 4 Introduction to the new hardware parts.
- 5 Describe changes and improvements on APZ level
- 6 Explain the main changes within APZ 212 33/33C/40.
- 7 Find and use new OPIs and commands.
- 8 Describe changes and improvements on APT level
- 9 Account for the main changes in APT.
- 10 Definitions in GEM.
- 11 Connection of reused GDMs.
- 12 Describe new functionalities introduced with AXE810
- 13 Account for the main changes in Operation and Maintenance.
- 14 ISP, In-Service Performance.
- 15 NNRP, explain how extensions to existing BYB 501 1.4 nodes can be made.
- 16 Be able to configure the AXE810 hardware
- 17 Give examples of node layouts and explain capacity for a number of model exchanges based upon mobile and fixed lines applications.
- 18 Explain configuration of hardware.
- 19 Know how to use the new OPIs/CODs/PODs.

Target audience

The target audience for this course are all technical personnel working with earlier AXE hardware releases BYB 501 1.4. Examples are personnel working with Field Maintenance, Network Surveillance and Network Operation and Configuration.



Prerequisites

The participants should be familiar with operation and configuration of AXE BYB 501 1.4.

Successful completion of any of the following courses will achieve this:

LZU 108 6131, AXE Hardware Maintenance.

LZU 108 6145, AXE Operation and Configuration

For GSM: LZU 108 5024/2, GSM AXE Operation,

For WCDMA: LZU 108 5024/2, WCDMA AXE Operation,

Duration and class size

The length of the course is three days and the maximum number of participants is eight.

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. *(This paragraph is mandatory).*

Day	Short description of the topics in the course	Estimated time
1	Introduction APZ APT Functionalities	7 h
2-3	Configuration Exercises, configuration of AXE810	14 h

AXE Enabler 1.0 Delta



LZU 108 5933

Description

This course provides the participants with the knowledge about the functionality in AXE Enabler 1.0. The differences between Local 7.2/TL4.2/TG5.2 and AXE Enabler 1.0 modern/classic will be the main issues to describe but even the differences from earlier product lines will be mentioned.

Learning objectives

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

1. Describe the node types supported by the AXE Enabler 1.0.
2. Describe the main differences between L7.2/TL4.2/TrG 5.2 and AXE Enabler 1.0 Classic and Modern.
3. Describe the main hardware changes in HWM1.5 platform and the support of large switches.
4. Understand the main functions and features in APZs supporting Enabler 1.0.
5. Describe the IPN network solution.
6. Understand the handling of AS Parameters Using DBS Commands
7. Understand the Remote connection of Internet Access Server
8. Understand how comprehensive network signalling is realised via inclusion of ET155, SS7, PRA and V5.x signalling using signalling terminals on RPG3
9. Understand the Engine Access Ramp functions.
10. Describe the AXE Enabler 1.0 functions in an EIN 2.0 network and migration support towards EIN2.0.
11. Describe the ported products to AXE Enabler 1.0 GAS

Target audience

The target audience for this course for personnel working with Operation, Maintenance and support of local and translocal applications

The course can be given to Ericsson personnel and external customers

Prerequisites

The participants should be familiar with:

Local 7.2/ Translocal 4.2 application (or equivalent)



Duration and class size

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

Learning situation

The course is based on instructor-led lessons and practical exercises in the classroom and in a training exchange environment using the AXE Enabler 1.0 SW.

AXE for the 21st Century (MBL)



LZU 108 107/C

Description

AXE for the 21st Century constitutes a dynamic update to the existing AXE Survey course. This enhanced product offers a general, and yet comprehensive, view of the AXE system. AXE platforms such as switching, signalling, control system and operation & maintenance are examined. The applications that run on these platforms such as Business Communications, Intelligent Networks, Mobile Communications, PSTN/ISDN Networks and the Internet are described. A description of the AXE hardware, BYB 501, is also included. Designed primarily for those with a basic grounding in telecommunications who require a broad knowledge of the AXE system, the course provides an essential and invaluable contribution to the user's understanding of AXE.

Objectives

On completion of this course the students will have a broad knowledge of:

- 1 Trends in modern communications and how AXE has developed in response to them
- 2 Major characteristics and functional structure of AXE
- 3 Main platforms within AXE, such as switching and signalling
- 4 Applications that run on the AXE platform, such as Business Communications, Mobile Communications, Intelligent Networks, PSTN/ISDN and the Internet
- 5 Centralized and local operation, maintenance and management features of the AXE system including the TMOS and XMATE products
- 6 Major AXE product lines
- 7 Advanced AXE Hardware (BYB 501)

Target Audience

The target group for this product is:

Management staff of Network Operators and Service Providers

Technical staff of Network Operators and Service Providers

New recruits within Ericsson, both technical and non-technical

Experienced Ericsson staff that want to refresh or broaden their knowledge

Prerequisite

A good knowledge of Telecoms concepts

Duration

The length of the course is approximately 22 hours.



Learning situation

Multimedia-Based Learning (MBL)

Minimum Configuration

Intel 486 processor (66 MHz)

8 MB RAM

CD-ROM

256 color display

Windows 3.1

Recommended configuration

Pentium processor

16MB RAM

CD-ROM-4X

Sound card & speakers

Windows 95

AXE Hardware Maintenance



LZU 108 6131 R1A

Description

The course focuses on more advanced training for Maintenance staff. After the course the student will have a deeper understanding of the maintenance activities in an AXE exchange. The practical part must be performed in a real exchange with realistic exercises.

Learning objectives

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

- 1 Have a general knowledge of the system to be able to perform maintenance activities.
- 2 Be able to describe the System structure.
- 3 Know how to use the AXE library and it's documents.
- 4 Know how to use WinFiol to manage the AXE.
- 5 Perform basic maintenance activities in AXE.
- 6 Describe what is meant by Maintenance activities in the AXE system.
- 7 Describe the labeling and cabling in AXE system.
- 8 Describe the main structure of power supply and distribution system.
- 9 Keep records of all serious problems, activities and routines in a logbook.
- 10 Issue a trouble report of a corrective action taken.
- 11 Handle alarms in a correct manner.
- 12 Be able to print and interpret the information found in the AXE alarm list.
- 13 Be able to find the correct OPI to handle the alarm.
- 14 Take appropriate actions according to the OPI.
- 15 Perform maintenance on IO.
- 16 Be able to perform repair sequences on IO (IOG 20 / APG 40) hardware elements.
- 17 Determine IO system status, using the visible indicators on IO hardware.
- 18 Be able to save a system backup copy on removable media.
- 19 Be able to test load a system backup copy.
- 20 Perform maintenance on APZ 212.
- 21 Identify the OPI required for each type of error.
- 22 Understand the supervision principles of APZ hardware and software.
- 23 Know how to identify and repair faults in APZ.
- 24 Be able to work with maintenance activities of APZ 212.
- 25 Perform repair sequences on GDM / GEM hardware elements (RPs, EMs).
- 26 Perform maintenance on group switch.
- 27 Identify the OPI required for each type of error.
- 28 Interpret and repair GS supervision alarms with help of the correct OPI.
- 29 Interpret and repair Network Synchronisation alarms.
- 30 Interpret and repair SNT and DIP alarms.
- 31 Perform maintenance on trunks.
- 32 Identify the OPI required for each type of error.
- 33 Interpret and repair trunk supervision alarms with help of the correct OPI.
- 34 Perform maintenance on Signaling system No. 7.
- 35 Describe the concept of signaling in general.
- 36 Describe the basic terms and concepts used in Signaling System Number 7.



- 37 Describe the ISUP implementation in AXE.
- 38 Be able to perform maintenance activities on the Signaling System No. 7.
- 39 Be able to check the system status.
- 40 Generate printouts of system status and hardware elements.

Target audience

The target audience for this course is mainly field maintenance staff. Other personnel interested in AXE maintenance activities can also attend the course.

Prerequisites

The participants should be familiar with the AXE structure and have a general understanding of the functionalities of the system.

Successful completion of the following course:

LZU 108 775, AXE Survey

Duration and class size

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

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.

Day	Short description of the topics in the course	Estimated time
1	Introduction MML and WinFIOL	6,5 h
2 – 3	I/O Systems – Fault and repair	8 h
3 – 6	I/O Systems - Backup APZ 212	24,5 h
7 – 8	Group Switch Clock and synchronization SNT & DIP	9 h
8	Signaling in AXE System Status Final Evaluation	4 h

AXE Operation and Configuration



LZU 108 6145 R1A

Description

This course will give more advanced theoretical and practical training for Operational staff as well as other personnel working with configuring the system. After the course the students will have a deeper understanding of operation and configuration activities in AXE exchanges.

The practical parts will be performed in a real exchange, on SEA environment or in a Remote Lab (RTL) with realistic exercises.

Learning objectives

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

- 1 Understand the AXE structure.
- 2 Know the different parts of AXE (APZ/APT/Subsystems).
- 3 Be able to use tools to handle the system.
- 4 Be able to use MML commands.
- 5 Be able to use WinFiol to handle the system.
- 6 Be able to use command files to configure the system.
- 7 Be able to use the AXE library as an aid (COD/POD/OPI/Application Information/etc.).
- 8 Know the different I/O systems delivered from Ericsson.
- 9 Have a basic understanding of the APG40 product.
- 10 Have a basic understanding of the IOG20 product.
- 11 Be able to handle the APZ 212 on a basic level.
- 12 Be able to operate the APZ 212.
- 13 Be able to handle System Backup functions.
- 14 Be able to configure the boards in the RPHM.
- 15 Be able to handle the RPs.
- 16 Know how to configure the RPs.
- 17 Be able to use database commands to change database tables RPSRPBSPOS and RPSDEFOSRSUS.
- 18 Be able to handle the group switch.
- 19 Be able to configure the different parts of the group switch.
- 20 Be able to configure synchronization.
- 21 Be able to configure SNTs and DIPs.
- 22 Be able to configure trunks and signaling.
- 23 Define trunks (ETC5 and ET155).
- 24 Define signaling system no. 7.
- 25 Be able to handle the basic exchange data.
- 26 Define and change data in the (Pre) B-Number Analysis table and check the result.
- 27 Define or change data in the Route Analysis table and check the result.
- 28 Define or change data in the End-of-Selection Analysis table using command files
- 29 Define or change data in Charging Analysis



- 30 Be able to retrieve statistics data from OMS
- 31 Be able to Troubleshoot an APT / APZ alarm
- 2

Target audience

The target audience for this course is operator's personnel working with operation and configuration activities and others needing a thorough practical knowledge of the AXE system.

Prerequisites

The participants should be familiar with the AXE structure and have a general understanding of the functionalities of the system.

Successful completion of the following course:

LZU 108 775, AXE Survey

Duration and class size

The length of the course is 10 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.

Day	Short description of the topics in the course	Estimated time
1	Introduction MML and WinFIOL	6,5 h
2	I/O System	6,5 h
3 – 4	APZ 212	10 h
4 – 5	Group Switch Clock and synchronization SNT & DIP	3,5 h 3 h 3 h
6 - 7	Route and Device Data Signaling in AXE	4 h 4 h
7 – 9	Analysis in AXE	18 h
10	Traffic Measurements Final Evaluation	6,5 h

AXE Survey



LZU 108 775 R2A

Description

This course gives the participants an overview of the functions and services provided by AXE.

Learning Objectives

At the end of this course the participant will be able to:

- 1 Describe the trends in current telecommunications;
- 2 Describe the main characteristics of AXE
- 3 Describe the structure of AXE
- 4 Describe the Control system in AXE
- 5 Describe the APT 1.5
- 6 Describe how the different HW versions cooperate with each other
- 7 Describe the major product lines in AXE
- 8 Illustrate traffic handling in AXE
- 9 Describe how Operation and Maintenance is performed in AXE
- 10 Describe briefly the procedures involved in marketing and design of AXE
- 11 Explain the Internet related application using the AXE

Target Audience

The course is intended for all staff associated in any way with AXE. Marketing people can use this material to get a general knowledge about AXE. People working with operation, maintenance and testing can use the material in this course, to understand the basic AXE concepts.

Prerequisites

The participants should have equivalent knowledge to the course

"Telecom ABC", LZU 107 12 or

"Understanding the New Telecom", LZU 107 106.

Duration and class size

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

Learning situation

This product is an instructor-led course with theoretical lessons/exercises and practical study cases.

Core Networks, An Overview (WBL)



LZU 108 5945 R1A

Description

This course provides a comprehensive introduction to the technologies in the core networks, core network architecture and network operation and maintenance.

Learning objectives

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

- 1 Describe the technologies in the core network
- 2 Explain how a physical network is built
- 3 Outline different types of multiplexing (FDM, TDM and WDM)
- 4 Describe transmission technologies such as SDH and SONET
- 5 Describe optical ring architecture and the basics of ATM and MPLS
- 6 Define core network architectures
- 7 Understand traffic trends and outline multiservice backbone requirements
- 8 Explain resource allocation and quality of service
- 9 Understand performance optimization
- 10 Define IPsec and VPN technology
- 11 Understand network operation and maintenance
- 12 Outline steps in network operation
- 13 Understand network traffic and outline some network traffic situations
- 14 Explain monitoring using SNMP and PING
- 15 Define steps and routines for error handling

Target audience

The target audience for this course is anybody wishing to gain a basic understanding of the technologies used in core networks, core network architecture and network operation and maintenance.

The course focuses on modern standard **technologies and does not contain any Ericsson** specific product material.

Prerequisites

There are no prerequisites for this course.

Duration

The length of the course is 3 hours.



Learning situation

The course is a web based learning product.

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	Technologies in the Core Network	1 hour 15 min
1	Core Network Architectures	1 hour
1	Network Operation and Maintenance	45 min



Datacom Networking



LZU 102 371 R1A

Description

Expert communication knowledge requires a solid foundation in data communications. From standards, physical media and network devices to transmission technologies, protocols, implementation and management this course guides novices effortlessly through modern data communication terminology and technologies and gives a comprehensive overview of underlying networking concepts.

Learning Objectives

General interest in communications technologies and computer literacy is recommended. Having successfully completed this course, students will be able to describe:

- 1 Network Standards
- 2 Physical Media
- 3 LAN and WAN concepts
- 4 Transmission Technologies
- 5 Internet Protocol Suite
- 6 Internetworking

Target Audience

Datacom Networking has been designed for seeking to acquire, refresh or improve knowledge of data technologies. The course is the entry point to Ericsson's datacom classes. This course prepares students for any advanced technology courses and basic product training.

Prerequisites

General interest in communications technologies and computer literacy is recommended.

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 with study cases given in a classroom environment.



ENGINE Core Introduction



LZU 108 1476 R5A

Description

This course is an introduction to the ENGINE concept. The ENGINE Softswitch solution will be described including the ENGINE Integral Network (EIN) and the ENGINE MultiMedia Network (EMM). The Packet Backbone Network technologies of the connectivity layer (IP, ATM and MPLS) are described together with how the new BBA (Broad Band Access) products are connected to the ENGINE Softswitch solutions.

Learning objectives

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

- 1 Explain why an operator would choose ENGINE.
- 2 Outline the basic functions and network elements of the ENGINE Softswitch solutions: ENGINE Integral Network and ENGINE MultiMedia Network.
- 3 Describe how IP, ATM, and MPLS are used in the connectivity layer.
- 4 Outline the basic functions and network elements of the Packet Backbone Network used for the ENGINE networks.
- 5 Explain the basics of the management system MN-OSS
- 6 Explain how the BBA (Broad Band Access) products connect to the Engine Softswitch solution.

Target audience

The target audience for this course is Ericsson customers and employees wishing to be introduced to the ENGINE concept and the various core network solutions within this concept.

The target audience for this course is: Fundamedals.

Prerequisites

The participants should be familiar with telecommunication solutions in general or have successfully completed the following courses:

- Telecommunication ABC, LZU 107 12, (3 days ILT)
- or
- Telecoms 2000: Fundamentals LZU 108 993 (5 hours MBL)

Duration and class size

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



Learning situation

This is an Instructor led training course (ILT).

Time schedule

Day	Topics in the course	Estimated time
1	Introduction	0,5
	Engine Softswitch Solutions	3
	Technologies in the Connectivity Network	1,5
	MN-OSS	1



ENGINE Integral 1.0/2.0 to 3.0/3.1 Delta



LZU 108 6132 R1A

Description

The purpose of this seminar is to primarily support Ericsson employees with knowledge of the differences between EIN 1.0/2.0 and EIN 3.0. On request it can also be given to customers.

The seminar consists of theory only and describes the new main technical features of the EIN 3.0 compared to EIN 1.0/2.0.

Learning objectives

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

- 1 Explain the differences in network implementation between EIN 1.0/2.0 and EIN 3.0.
- 2 Know what different access types that are supported by EIN 3.0.
- 3 Explain the differences in hardware and software compared to the earlier releases
- 4 Know the implementation of the EIN 3.0 communication protocols
- 5 Explain the traffic cases supported in EIN 3.0 and the use of the H.248, BICC and IP-Core protocols in the call set-up sequence.
- 6 Know the basics about the migration from EIN 1.0/2.0 to EIN 3.0.

Target audience

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

Prerequisites

For contentment the participants of the seminar should have knowledge of EIN 2.0/EIN 1.0 equivalent to EIN Integration & Verification, LZU 108 5860.

Duration and class size

The duration for this learning product is 1/2 day (~ 3 hours). The seminar is to be held for a large number of students, and the number will depend on the size of the lecture hall.

Learning situation

The seminar is a speaker presentation.

Terminology

EIN	Engine Integral Network
BICC	Bearer Independent Call Control
H.248	The Gateway Control Protocol (ITU-T)

ENGINE Integral 3.1 Fault Finding



LZU 108 5932 R2A

Description

This course will provide the participants with the competence needed to locate and solve faults in an ENGINE Integral Network (EIN).

Recovery processes and how to define the Integral Network with maximum redundancy will be covered. The course consists of theory and task oriented exercises where the participants should find and solve faults in the network using the trace tools available in the network nodes (AXE and AXD 301).

Learning objectives

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

- 1 Locate and solve faults in the EIN by analyzing alarms and events in the different network elements.
- 2 Understand how a fully redundant EIN is designed
- 3 Describe the recovery principles for EIN
- 4 Be able to trace calls and signaling connections through the network, using the built-in tools for CCF, ML and MGW.

Target audience

The target audience for this course is: System Engineer and as well Ericsson employees working with support and operations tasks on the EIN.

Prerequisites

Successful completion of the following courses:

- ENGINE Integral 3.1 Integration & Verification, LZU108 5860 or equivalent knowledge.

Duration and class size

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

Learning situation

The course is instructor-led using task oriented practical exercises, based on the EIN 3.1 configuration available in the training network.



Time schedule

To be written

Day	Topics in the course	Estimated time
1		



ENGINE Integral 3.1 Integration & Verification



LZU 108 5860 R2A

Description

This course provides Ericsson customers with the competence needed to perform Integration and Verification of an ENGINE Integral Network 3.1.

The course consists of theory and case based exercises on how to integrate and verify EIN 3.1 on the AXE and AXD 301 platforms. All traffic and signaling interfaces in EIN will be covered and also the alarms related to the interfaces. The course will only describe EIN 3.1 connected towards an IP core network.

Learning objectives

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

- 1 Describe the HW and SW implementation of EIN 3.1.
- 2 Establish CP communication between the Call Control Function (CCF, AXE) and the Mediation Logic (ML) and know the alarms connected to the interface.
- 3 Configure the interconnect interface (IC) between the CCF and the ML and know the alarms connected to the interface.
- 4 Configure the MGW control interfaces between the TeS and the MGWs using H.248 and know the alarms connected to the interface.
- 5 Configure and verify the shared risk groups used for narrowband signaling and know the alarms connected to the interface.
- 6 Configure and verify the SIP-T / BICC interface between two TeSs and know the alarms connected to the interface.
- 7 Configure and verify SIP or H323 towards an external VoIP network.
- 8 Configure at least two of the ETSI-ISUP, ANSI-ISUP, V5.2, ETSI- PRA, EAR and RSS accesses and know the alarms connected to the interfaces.
- 9 Verify the configuration by making test calls using the different accesses configured.
- 10 Make call-path tracings in CCF, ML and MGWs.

Target audience

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

This audience is working with implementation, installation, testing, integration, operation and support tasks on the EIN.

Prerequisites

Successful completion of the following courses:

- AXD 301/305 7.1 Operation & Configuration (FAB 102 1343) (or equivalent knowledge).
- AXE Network Operation & Configuration (FAB 102 1344) (or equivalent knowledge).
- ENGINE Core Fundamentals (FAB 102 1337) (or equivalent knowledge).

Duration and class size

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



Learning situation

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

Time schedule

Day	Short description of the topics in the course	Estimated time
1	Introduction	45 min
1	EIN 3.1 HW & SW implementation	70 min
1	Traffic handling	45 min
1	CCF – ML Communication	45 min
1	Exercise 1, Establish CCF – ML communication	60 min
2	Repetition	15 min
2	Basic IP Configuration	45 min
2	ML & MGW configuration	45 min
2	IC interface configuration	30 min
2	Exercise 2, Basic IP configuration	45 min
2	Exercise 3, ML & MGW configuration	60 min
2	Exercise 4, IC interface configuration	30 min
3	Repetition	15 min
3	BICC configuration	60 min
3	ISUP access configuration	30 min
3	Call path tracing	30 min
3	Exercise 5, BICC configuration & call path tracing	75 min
3	Exercise 6 ISUP access configuration	60 min



4	Repetition	15 min
4	EAR & RSS access configuration	60 min
4	PRA access configuration	30 min
4	V5.2 access configuration	30 min
4	Exercise 7, EAR configuration	70 min
4	Exercise 8, PRA Configuration	65 min
5	Repetition	15 min
5	SIP and SIP-T Configuration	70 min
5	H.323 Configuration	50 min
5	Exercise 9, SIP & SIP-T Configuration	80 min
5	Exercise 10, H.323 Configuration	55 min



ENGINE Integral 2.0 to 3.1 Integration & Verification Delta



LZU 108 6346 R1A

Description

This course will give the participant practical knowledge about the integration and configuration differences between EIN 2.0 and EIN 3.1.

Learning objectives

On completion of this course the participants will be able to

- 1 Explain the HW and SW implementation in EIN 3.1.
- 2 Define MGW's and ML for an IP backbone network
- 3 Configure and verify the H.248 control links over IP and know the alarms connected to the interface.
- 4 Configure and verify the shared risk groups used for narrowband signaling and know the alarms connected to the interface
- 5 Configure and verify the SIP-T / BICC interface between two TeSs and know the alarms connected to the interface.
- 6 Configure and verify at least one narrowband access towards a MGW.
- 7 Configure and verify SIP or H323 towards an external VoIP network.
- 8 Verify the configuration by making test calls using the different accesses configured.
- 9 Make call-path tracings in CCF, ML and MGWs.

Target audience

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

This audience is working with implementation, installation, testing, integration, operation and support tasks on the EIN 3.1.

Prerequisites

The participants should have good practical experience of EIN 2.0 or EIN 1.0 equivalent to LZU 108 5860 R1A

Duration and class size

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

Learning situation

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



Time schedule

Day	Short description of the topics in the course	Estimated time
1	Introduction	30 min
1	EIN 3.1 HW & SW implementation	60 min
1	Traffic handling	45 min
1	Basic IP Configuration	45 min
1	ML & MGW configuration	45 min
1	Exercise 2, Basic IP configurations	45 min
2	Repetition	30 min
2	Exercise 3, ML & MGW configuration	60 min
2	BICC configuration	60 min
2	Call path tracing	45 min
2	Exercise 5, BICC configuration & call path tracing	75 min
3	Repetition	15 min
3	SIP and SIP-T Configuration	70 min
3	H.323 Configuration	50 min
3	Exercise 9, SIP & SIP-T Configuration	80 min
3	Exercise 10, H.323 Configuration	55 min



ENGINE Signaling in the Core Network



LZU 108 897/5 R7A

Description

This course is designed to give the participant an overview of signaling technologies and protocols used to manage and control voice calls in the ENGINE Integral Network (EIN).

Learning objectives

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

- 1 Explain the structure of the Signaling System No. 7
- 2 Describe three different signaling transport alternatives (MTP, SAAL and SIGTRAN) and list the differences
- 3 Describe the user plane protocol stacks
- 4 Describe ISUP signaling briefly
- 5 Explain H.248 and BICC signaling on high level
- 6 Explain the bearer control signaling of PNN1 and IPBCP
- 7 Explain SIP/SIP-T signaling in EIN
- 8 Describe H.323 signaling in EIN briefly

Target audience

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

Prerequisites

Successful completion of the following courses:

ENGINE Core Introduction LZU 108 1476

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 (effective time is stated, excluding breaks and 1 hour lunch).



The intention is that chapters marked "brief" is covered shortly since most students know this allready. In specific cases, when this assumption is not true, the course can be extended to 5 full days by covering the shortened chapters more thoroughly (on request when ordering the course).

Day	Topics in the course	Estimated time
1	EIN Core Network introduction	1,5 h
1	SS7 Intro	0,5 h
1	MTP (brief)	1 h
1	SAAL	2 h
2	SIGTRAN	1,5 h
2	ISUP (brief)	1 h
2	BICC	2,5 h
3	PNNI	1,5 h
3	H.248	2,5 h
3	traffic case Interworking, (BICC, H.248, PNNI)	0,25 h
3	IPBCP	0,75 h
4	SIP, SIP-T	3 h
4	H.323	1 h
4	SCCP (brief)	0,5 h
4	TCAP (brief)	0,25 h
4	IN signaling (brief)	0,25 h

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 as 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 Describe IPv4 and IPv6 protocol, addressing and subnetting / aggregation
- 2 Describe the functions of the different bodies involved in IP standards / RFCs
- 3 Describe IPv4 packet structure, protocol header and features
- 4 Describe and perform exercises on IPv4 addresses, CIDR, subnetting and aggregation
- 5 Describe IPv6 packet structure, protocol header, features and the different types of IPv6 addresses
- 6 Describe the purpose and operation of different protocols such as TCP, UDP, ICMP, HTTP, FTP, TFTP, SMTP, POP3, IMAP, ARP, DNS and DHCP
- 7 Describe the OSI reference model and how it relates to the TCP / IP stack
- 8 Describe the TCP and UDP protocol structures, headers and functionality
- 9 Describe and perform exercises and analysis on the operation of different protocols / applications (ARP, DHCP, DNS, HTTP, FTP, TFTP, SMTP, POP3, IMAP, etc.)
- 10 Describe the purpose and operation of different network devices and routing protocols used in IP networking
- 11 Describe the operation of Hubs, Bridges and Switches
- 12 Describe and perform exercises and analysis on the operation of Spanning Tree Protocol (STP)
- 13 Describe and perform exercises and analysis on the operation of Static and Dynamic routing protocols
- 14 Describe and perform exercises and analysis on RIP routing protocol
- 15 Describe and perform exercises and analysis on OSPF routing protocol

Target audience

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



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 – 4 days ILT

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.

Day	Short description of the topics in the course	Estimated time
1	Describe the functions of the different bodies involved in IP standards / RFCs	1.0
	Describe IPv4 packet structure, protocol header and features	1.0
	Describe IPv4 addresses, CIDR and subnetting and aggregation	1.5
	Describe IPv6 packet structure, protocol header, features, different types of IPv6 addresses	1.5
	Perform exercise on IP addressing and subnetting	1.5
2	Describe the OSI reference model and how it relates to the TCP / IP stack	0.5
	Describe the TCP and UDP protocol structures, headers and functionality	1.0
	Describe the operation of different applications (ARP, DHCP, DNS, HTTP, FTP, SMTP, POP3, IMAP, etc.)	2.0
	Perform exercises and analysis on ARP, DHCP, DNS, HTTP, FTP, TFTP, Telnet, SMTP, POP3, IMAP, etc.	3.0
3	Describe the operation of Hubs, Bridges, Switches, Collision Domains and Broadcast Domains	1.0
	Describe the operation of Spanning Tree Protocol (STP)	1.0
	Describe the operation of Static and Dynamic routing protocols	1.0
	Describe RIP routing protocol	1.5
	Perform exercises and analysis of protocols on Bridges, STP and Static routing	2.0
4	Describe OSPF routing protocol	1.5
	Perform exercises and analysis of RIP protocol	1.5
	Perform exercises and analysis of OSPF protocol (areas, aggregation, authentication)	3.5

IP Network Planning



LZU 108 297 R1A

Description

This course will give the students an insight and understanding of the methodology in the planning / design of IP core networks. Students will learn the skills necessary to plan and design IP networks. Different protocols and technologies, configuration of IP addresses and providing support for different applications are examined from a network throughput and performance point of view. An emphasis is made on developing an understanding of how Quality of Service and Security may be implemented in networks and how it affects on performance.

Learning objectives

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

- 1 Describe IP addresses, IP Applications and Services
 - 2 Describe IPv4 and IPv6 addressing, Subnet masks and NAT / PAT
 - 3 Analyse the protocols used for Web, Email, FTP, TFTP, Telnet, Secure Shell
 - 4 Describe Security (Tunnel mode) for IP Sec AH and IP Sec ESP and how it affects router performance and throughput
 - 5 Diagnose router statistics to obtain packet rate / throughput for different applications / routing protocols
 - 6 Describe network design process, perform exercises related to real solutions and describe steps in network performance analysis for IP networks
 - 7 Describe the steps involved in the design / planning process of an IP network
 - 8 Describe router requirements in relation to throughput, interfaces, routing protocols, security, management, redundancy, load sharing, backup
 - 9 Design a network consisting of different WAN technologies (ATM, Frame Relay, POS) and define quantity of routers, and interfaces required
 - 10 Define the IP addresses /subnet-mask required for different size networks and links
 - 11 Describe Network performance and Identify the tools used to measure / troubleshoot QoS / GoS
- 3
4

Target audience

The target audience for this course are Ericsson internal personnel and Ericsson customers who are involved in the planning and design of IP Core networks.

Prerequisites

The participants should be familiar with.

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.

Successful completion of the following courses or equivalent is preferred:



- Datacom Networking - LZU 102 371 – 4 days ILT
- IP Networking – LZU 102 397 – 4 days ILT

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.

PCs with Ethernet analyzers and routers are required for practical exercises in the classroom.

Access to Internet for vendor material is an advantage in order to obtain router specifications, etc.



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 IPv4 and IPv6 addressing, subnet masks, NAT / PAT	2.0
	Analyse requirements for applications such as Web, Email, FTP, TFTP, Telnet, Secure Shell	1.0
	Describe Security (Tunnel mode) for IP Sec AH (authentication) and IP Sec ESP (encryption security payload) and how it affects router performance and throughput	1.0
	Describe static routing, RIP, OSPF, IS-IS and BGP	2.0
	Diagnose router statistics to obtain packet rate / throughput for different applications and routing protocols	1.5
2	Describe the steps involved in the design / planning process of an IP network	1.0
	Describe router characteristics in relation to throughput, interfaces, routing protocols, security, management, redundancy, load sharing, backup	1.0
	Design networks consisting of different WAN technologies (ATM, Frame Relay, POS) and define quantity of routers, and interfaces required. These are paper exercises based on realistic solutions	2.0
	Define the IP addresses /subnet-mask required for different size networks and links. These are paper exercises based on realistic solutions	2.5
	Describe Network performance and identify the tools used to measure / troubleshoot QoS / GoS	1.0



IP Networking and Internetworking (WBL)



LZU 108 5942 R1A

Description

This course provides an introduction to the principles of IP networking and internetworking.

Learning objectives

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

- 1 Describe the basic concepts of IP networking
- 2 Define virtual address and explain how to communicate between networks
- 3 Outline the difference between IPv4 and IPv6 addressing
- 4 Outline how to configure the hosts in LAN (IP address, subnet mask, default gateway)
- 5 Understand Internet domains and how the Domain Name System works
- 6 Describe how to leave the local network using a Router
- 7 Describe the basic concepts of IP internetworking
- 8 Describe the Internet (transit, regional and ISP networks)
- 9 Understand routing domains and usage of two routing protocols (RIP and OSPF)
- 10 Discover networks using two useful utilities PING and Traceroute

Target audience

The target audience for this course is anybody wishing to gain a basic understanding of modern datacom networking technologies.

The course focuses on modern standard technologies and does not contain any Ericsson specific product material.

Prerequisites

There are no prerequisites for this course.

Duration

The length of the course is 3 hours.



Learning situation

The course is a web based learning product.

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	IP Networking	2 hours
1	IP Internetworking	1 hour



IP Networking and Internetworking (WBL)



LZU 108 5942 R1A

Description

This course provides an introduction to the principles of IP networking and internetworking.

Learning objectives

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

- 1 Describe the basic concepts of IP networking
- 2 Define virtual address and explain how to communicate between networks
- 3 Outline the difference between IPv4 and IPv6 addressing
- 4 Outline how to configure the hosts in LAN (IP address, subnet mask, default gateway)
- 5 Understand Internet domains and how the Domain Name System works
- 6 Describe how to leave the local network using a Router
- 7 Describe the basic concepts of IP internetworking
- 8 Describe the Internet (transit, regional and ISP networks)
- 9 Understand routing domains and usage of two routing protocols (RIP and OSPF)
- 10 Discover networks using two useful utilities PING and Traceroute

Target audience

The target audience for this course is anybody wishing to gain a basic understanding of modern datacom networking technologies.

The course focuses on modern standard technologies and does not contain any Ericsson specific product material.

Prerequisites

There are no prerequisites for this course.

Duration

The length of the course is 3 hours.



Learning situation

The course is a web based learning product.

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	IP Networking	2 hours
1	IP Internetworking	1 hour



IPv6 and Transition from IPv4 to IPv6



LZU 102 801 R1A

Description

This course gives a profound technical presentation of the Internet protocol IPv6. The course will also discuss different IPv4-IPv6 transition mechanisms.

After this course it will be clear how IPv6 will function in a network and how IPv6 can co-exist with IPv4.

Learning objectives

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

- 1 Describe the protocol IPv6 on an advanced level.
- 2 Describe some of the important Transition Mechanisms between IPv4 and IPv6.
- 3 Get an overview of how the Transition Mechanisms work when setting up an IPv6 network.

Target audience

The target audience for this course is anyone who needs technical knowledge within this area, such as Technicians and Designers.

Prerequisites

Successful completion of the following courses:

The flow IP Fundamentals, FAB 102 1314, ending with the course

VPN & IP Security, LZU 102 323

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.

Day	Short description of the topics in the course	Estimated time
1	Introduction Welcome Presentation Training Schedule Course outline	1 h
	IPv6 IPv6 Header Address Architecture Unicast, Multicast and Anycast Auto-configuration Neighbor Discovery ICMPv6 Making an IPv6 Network Connecting IPv6 islands Dual Stack Model DNS	3 h
	DHCP Transition Mechanisms Configured tunnels IPv6 to IPv4 (6to 4) ISATAP Teredo SIIT NAT-PT Other Transition Mechanisms	2 h



IPv6 and Transition from IPv4 to IPv6, Hands-on



LZU 102 798 R1A

Description

This course gives a profound technical presentation of the Internet protocol IPv6 and of IPv4-IPv6 Transition Mechanisms. The change from IPv4 to IPv6 will not happen overnight.

The course gives a clear view of how the Transition Mechanisms function and how they are used to establish IPv6 networks in a world of IPv4 networks and to ensure connectivity between different IPv6 networks and between IPv6 and IPv4 networks.

Different challenges, problems and solutions concerning the transition from IPv4 to IPv6 networks will be discussed. The transition mechanisms will be configured in a network.

Learning objectives

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

- 1 Describe the protocol IPv6 on an advanced level.
- 2 Describe and configure the Transition Mechanisms between IPv4 and IPv6.
- 3 Describe how The Transition Mechanisms work when setting up an IPv6 network.
- 4 Set up an IPv6 network configuring routers and hosts.

Target audience

The target audience for this course is anyone who needs technical knowledge within this area, such as Technicians and Designers.

Prerequisites

Successful completion of the following courses:

The flow IP Fundamentals, FAB 102 1314, ending with the course

VPN & IP Security, LZU 102 323

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.

Time schedule

The time required always depends on the knowledge of the attending participants and the hours stated below can be used as estimate. Included in the topics are practical exercises.

Day	Short description of the topics in the course	Estimated time
1	Introduction Welcome Presentation Training Schedule IPv6 and Mobile Internet Increased Address Space Built in Security Quality of Service (QoS) for Real Time Services Simple Routing for Scalability	1 h 1 h
	IPv6 IPv6 Header Address Architecture Unicast, Multicast and Anycast Auto-configuration Neighbor Discovery ICMPv6Dual Stack Model DNS DHCP	5 h
2	Tunneling Introduction Connecting IPv6 islands Configured tunnels IPv6 to IPv4 (6to 4) ISATAP Teredo Other Tunnel Mechanisms Automatic Tunnels Tunnel Broker IPv6 over IPv4 (6over4) Routing IPv6 on the internet	3 h



Translation	2 h
Introduction	
DSTM	
Header Translation	
NAT-PT	
FTP-ALG	
DNS-ALG	
SIIT	
BIS	
Socks64	
TCP/UDP Relay	

IPv6 Routing Protocols



LZU 102 796 R1A

Description

This course is a profound technical presentation of the routing protocols RIPng, OSPFv3, ISIS and BGP4+. The protocols and their different functions in the Internet will be discussed.

Learning objectives

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

- 1 Know how the Routing Protocols are used in IPv6
- 2 Know how they are working on a router and the hosts of an IPv6 network

Target audience

The target audience for this course is anyone who needs technical knowledge within this area, such as Technicians and Designers.

Prerequisites

Successful completion of the following courses:

- The flow IP Fundamentals, FAB 102 1314, ending with the course VPN & IP Security, LZU 102 323
 - IPv6 and Transition from IPv4 to IPv6, Hands-on, LZU 102 798
- or
- IPv6 and Transition from IPv4 to IPv6, LZU 102 801

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.



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	Introduction Welcome Presentation Training Schedule	1 h
	RIPng The RIPng Header Distance Vector Algorithm Hop Counts Flooding Counting to Infinity Reverse Poisoning Split Horizon	3 h



	OSPFv3	5 h
	The OSPFng Header	
	Link State Advertisements (LSAs)	
	The Link-State Database	
	Hello Packets	
	Database Synchronization	
	Flooding	
	Routing Calculations	
	SPF Algorithm	
	External Routing Information	
	OSPF Areas	
	OSPF Range	
	Stub Areas	
	History	
	Support on data link layer	
	Hello packets	
	Link State packets	
	Sequence number packets	
	Options	
	Level 1 and Level 2 routers	
	Designated router election	
	Area reconfiguration	
	Overload state	
	Comparison with OSPFv3	
2	ISIS	1 h
	History	
	Support on data link layer	
	Hello packets	
	Link State packets	
	Sequence number packets	
	Options	
	Level 1 and Level 2 routers	
	Designated router election	
	Area reconfiguration	
	Overload state	
	Comparison with OSPFv3	



BGP4+	2 h
The BGP Header	
BGP Sessions	
Attributes	
Keep-Alive Features	
Internal-External BGP	
Best Path Calculation	
Synchronizing with OSPFng	
Policy Routing – Multi-homing	
Explosion of routing tables	

MN-OSS R5 to R6 Delta



LZU 108 6348 R1A

Description

This course provides the competence needed for using the new and upgraded tools in the Telephony over Packet support functions of MN-OSS system release 6.0. After the course the students will be able to handle all the standard applications in order to operate the system.

Learning objectives

At the end of this course, the students will be able to:

- 1 Describe the functionality of the standard tools and optional tools included in the MN-OSS system release 6.0.
 - 1.1 Understand the basic terminology of MN-OSS
 - 1.2 Describe the differences between MN-OSS R5.1 and MN-OSS R6.0. (Which tools have been upgraded, which tools have been removed, which tools are new)
 - 1.3 Describe the MN-OSS Base Package, the AXE additions, the AXD additions, and the Telephony over Packet additions
 - 1.4 Describe the optional tools that are not included in the packages
- 2 Describe the structure and content of the MN-OSS library in Alex.
 - 2.1 Use the library to search for specific documents.
- 3 Use the OSS Network Explorer (ONE) GUI to access the available support activities for O&M in the network.
 - 3.1 Find network objects and view object properties.
 - 3.2 Create and edit a network browser view.
 - 3.3 Launch applications.
- 4 Use the Software Management Organizer (SMO) to handle network element details.
 - 4.1 View network element details.
 - 4.2 Monitor jobs.
 - 4.3 Handle software packages and files.
- 5 Describe and use BASE.
 - 5.1 Know the relation between the software components of BASE and the AOS applications.
 - 5.2 Use the Topology Manager for centralized management of topology information.
 - 5.3 Use the Audit Trail Browser to track network management actions.
- 6 Use AXD Configuration Tool (ACT) to perform the most common configuration, software management and user management tasks for multiple AXD network elements.
 - 6.1 Understand the role and basics of ACT
 - 6.2 Initiate backup operations
 - 6.3 Perform BGP and bulk configuration
 - 6.4 Manage AMS and SNMPv3 user configuration
 - 6.5 Understand restore backup, patch operations and cloning configuration
- 7 Gather and present statistical information from the AXD based network elements using Performance Monitor (PMR).
 - 7.1 Set up a measurement job in an AXD
 - 7.2 Retrieve measurement data from the PMR Database and present it in tables and graphs.
 - 7.3 Transfer the measurement data into an external spreadsheet program
- 8 Use Test Manager AXD (TMG) to detect & localize faults in AXD sub-networks.



- 8.1 Troubleshoot PVCs
- 8.2 Perform path tracing and ATM, IP reachability tests.

Target audience

The target audience for this course is: System Technician.

Prerequisites

The student should have attended the course MN-OSS Operations ToATM course LZU 108 5948 R3A, or have equivalent knowledge & experience of MN-OSS R5.1.

Duration and class size

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

Learning situation

This is based on theoretical lessons given in the classroom and practical instructor-led sessions using remote access to an MN-OSS system (Training system or a customer's system).

Time schedule

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

Day	Short description of the topics in the course	Hours
1	Introduction	0,5
	MN-OSS Library	0,5
	ONE	1,5
	SMO	2
	BASE	1,5
2	ACT	2
	PMR	2
	TMG	2



MN-OSS Operation Telephony over Packet



LZU 108 6099 R1A

Description

This course provides the competence needed for configuring and using the Telephony over Packet support functions of MN-OSS system release 6.0 in order to manage and supervise the EIN 3.0 and 3.1 networks.

The course consists of theory and case based practical exercises. It covers all mandatory applications used for handling AXE/AXD based network elements. The students solve tasks on the training system, using the on-line documentation.

The focus of the course is communication, bulk configuration and fault management of AXE/AXD based network elements. It also covers performance management of the AXDs.

After the course the students should have the knowledge required to work as system operators, i.e. to perform the most common tasks required when operating and supervising AXE/AXD based network elements.

Learning objectives

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

- 1 Describe the functionality of the standard tools and optional tools included in MN-OSS system 6.0.
 - 1.1 Describe the MN-OSS Base Package, the AXE additions, the AXD additions, and the Telephony over Packet additions
 - 1.2 Describe the optional tools that are not included in the packages
 - 1.3 Describe the differences between MN-OSS 5.1 and MN-OSS 6.0. (Which tools have been upgraded, which tools have been removed, which tools are new)
- 2 Describe the structure and contents of the MN-OSS library in Alex.
 - 2.1 Use the library to search for specific documents.
- 3 Use the OSS Network Explorer (ONE) GUI to access the available support activities for O&M in the network.
 - 3.1 Find network objects and view object properties.
 - 3.2 Create and edit a network browser view.
 - 3.3 Launch applications.
- 4 Perform Element Management by communicating with, and configuring AXE network elements
 - 4.1 Use WinFiol to communicate with, and manage AXEs.
 - 4.2 Use Command Log Search (CLS) to search in the External Access Manager's (EAM) Command and Response Log.
 - 4.3 Set up time activation of command files/scripts with the Element Management Activity Manager (EMAM).
 - 4.4 Set up subscriptions of spontaneous reports with the Spontaneous Reports Manager (SRM)
- 5 Transfer files between MN-OSS and AXE network elements using File Handling Application (FHA).
 - 5.1 Describe how file transfers may be initiated to and from AXE
 - 5.2 Set up and perform a file transfer between MN-OSS and an AXE
 - 5.3 Understand the file subscription to other external systems
 - 5.4 Describe how to set up post-processing of files



- 6 Use the Software Management Organizer, SMO, to handle network element details.
 - 6.1 View network element details.
 - 6.2 Monitor jobs.
 - 6.3 Handle software packages and files.
- 7 Describe and use Operation Procedure Support (OPS) both as a development tool and part of an expert system.
 - 7.1 Run Command Files using OPS
 - 7.2 Edit existing Command Files
 - 7.3 Create and debug simple Command Files
 - 7.4 Set up properties for the user interface in OPS
- 8 Describe and use BASE.
 - 8.1 Know the relation between the software components of BASE and the AOS applications.
 - 8.2 Use the Topology Manager for centralized management of topology information.
 - 8.3 Use the Audit Trail Browser to track network management actions.
- 9 Use AXD Configuration Tool (ACT) to perform the most common configuration, software management and user management tasks for multiple AXD network elements.
 - 9.1 Understand the role and basics of ACT
 - 9.2 Initiate backup operations
 - 9.3 Perform BGP and bulk configuration
 - 9.4 Understand restore backup, patch operations and cloning configuration
- 10 Use Fault Manager (FM) tools to manage alarms and configure the way they are presented.
 - 10.1 Use the Graphical and logical Network Information Presentation (GNIP) and the alarm lists to interpret the different object symbols and alarm symbols and take appropriate action
 - 10.2 Set up and use different alarm presentation possibilities, using the Alarm Status Matrix (ASM) and the Alarm List viewer (ALV).
 - 10.3 Retrieve and analyze alarms from the alarm log with the Alarm Log Browser (ALB)
- 11 Gather and present statistical information from the AXD based network elements using Performance Monitor (PMR).
 - 11.1 Set up a measurement job in an AXD
 - 11.2 Retrieve measurement data from the PMR Database and present it in tables and graphs.
 - 11.3 Transfer the measurement data into an external spreadsheet program
- 12 Use Test Manager AXD (TMG) to detect & localize faults in AXD sub-networks.
 - 12.1 Trouble-shoot PVCs
 - 12.2 Perform path tracing and ATM, IP reachability tests.

Target audience

The target audience for this course is: System Technician.

Prerequisites

The participants should be familiar with AXE O&C – LZU 108 6145 or equivalent knowledge, AXD301 C&V – LZU 102 709 or equivalent knowledge, and have Basic UNIX knowledge

Duration and class size

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

Learning situation



This is based on theoretical lessons given in the classroom and practical instructor-led sessions using remote access to an MN-OSS system (Training system or a customer's system).

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	Hours
1	Introduction	1
	MN-OSS Library	1
	ONE	2
	Element Management Tools	2
2	Element Management Tools	2
	FHA	2
	SMO	2
3	OPS	2
	BASE	2
	ACT	2
4	Ericsson Fault Manager Tools	6
5	PMR	3
	TMG	3



MN-OSS Operation, AXE



LZU 108 6099/3 R1A

Description

This course will give the student knowledge about how to use the AXE support functions of the MN-OSS system release 6.0. After the course the students will be able to handle all the mandatory applications in order to operate the system.



The focus of the course is communication, bulk configuration and fault management of AXE based network element.

The course consists of modules with mostly practical sessions (task-oriented) but there will also be theoretical parts. The students solve the tasks on the training system, using the on-line documentation.

After the course the students should have the knowledge required to work as system operators, i.e. to perform the most common tasks required to operate and supervise AXE network elements.

Learning objectives

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

- 1 Describe the functionality of the standard tools and optional tools included in the MN-OSS system release 6.0.
 - 1.1 Understand the basic terminology of MN-OSS
 - 1.2 Describe the MN-OSS Base Package, the AXE additions, the AXD additions, and the Telephony over Packet additions
 - 1.3 Describe the optional tools that are not included in the packages
 - 1.4 Describe the differences between MN-OSS R5.1 and MN-OSS R6.0. (Which tools have been upgraded, which tools have been removed, which tools are new)
- 2 Describe the structure and contents of the MN-OSS library in Alex.
 - 2.1 Use the library to search for specific documents.
- 3 Use the OSS Network Explorer (ONE) GUI to access the available support activities for O&M in the network.
 - 3.1 Find network objects and view object properties.
 - 3.2 Create and edit a network browser view.
 - 3.3 Launch applications.
- 4 Perform Element Management by communicating with, and configuring AXE network elements
 - 4.1 Use WinFiol to communicate with, and manage AXEs.
 - 4.2 Use Command Log Search (CLS) to search in the External Access Manager's (EAM) Command and Response Log.
 - 4.3 Set up time activation of command files/scripts with the Element Management Activity Manager (EMAM).
 - 4.4 Set up subscriptions of spontaneous reports with the Spontaneous Reports Manager (SRM)
- 5 Transfer files between MN-OSS and AXE network elements using File Handling Application (FHA).
 - 5.1 Describe how file transfers may be initiated to and from AXE
 - 5.2 Set up and perform a file transfer between MN-OSS and an AXE
 - 5.3 Describe the organization of the AXE and MN-OSS file stores and be able to use them
 - 5.4 Understand the file subscription to other external systems
 - 5.5 Describe how to set up post-processing of files
- 6 Use the Software Management Organizer, SMO, to handle network element details.
 - 6.1 View network element details.
 - 6.2 Monitor jobs.
 - 6.3 Handle software packages and files.
- 7 Describe and use Operation Procedure Support (OPS) both as a development tool and part of an expert system.
 - 7.1 Run Command Files using OPS
 - 7.2 Edit existing Command Files
 - 7.3 Create and debug simple Command Files



- 7.4 Set up properties for the user interface in OPS
- 8 Use Fault Manager (FM) tools to manage alarms and configure the way they are presented.
- 8.1 Use the Graphical and logical Network Information Presentation (GNIP) and the alarm lists to interpret the different object symbols and alarm symbols and take appropriate action
- 8.2 Set up and use different alarm presentation possibilities, using the Alarm Status Matrix (ASM) and the Alarm List viewer (ALV).
- 8.3 Retrieve and analyze alarms from the alarm log with the Alarm Log Browser (ALB).

Target audience

The target audience for this course is: System Technician

Prerequisites

The participants should be familiar with AXE O&C – LZU 108 6145 or have equivalent knowledge, and have basic UNIX knowledge.

Duration and class size

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

Learning situation

This is based on theoretical lessons given in the classroom and practical instructor-led sessions using remote access to an MN-OSS system (Training system or a customer's system).

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	Hours
1	Introduction	1
	MN-OSS Library	1
	ONE	2
	Element Management Tools	2
2	Element Management Tools	2
	FHA	2
	SMO	2
3	Ericsson Fault Manager Tools	6

MN-OSS ToP, AXD EM only



LZU 108 6099/2 R1A

Description

This course will give the student knowledge about how to use the AXD Element Management functions of the MN-OSS system release 6.0. After the course the students will be able to handle all the AXD management applications in order to operate the system.

The focus of the course is communication, bulk configuration, performance management and fault management of AXD based network element.

The course consists of modules with mostly practical sessions (task-oriented) but there will also be theoretical parts. The students solve the tasks on the training system, using the on-line documentation.

After the course the students should have the knowledge required to work as system operators, i.e. to perform the most common tasks required to operate and supervise AXD **network elements**.

Learning objectives

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

- 1 Describe the functionality of the standard tools and optional tools included in the MN-OSS system release 6.0.
 - 1.1 Understand the basic terminology of MN-OSS
 - 1.2 Describe the MN-OSS Base Package, the AXE additions, the AXD additions, and the Telephony over Packet additions
 - 1.3 Describe the optional tools that are not included in the packages
 - 1.4 Describe the differences between MN-OSS R5.1 and MN-OSS R6.0. (Which tools have been upgraded, which tools have been removed, which tools are new)
- 2 Describe the structure and contents of the MN-OSS library in Alex.
 - 2.1 Use the library to search for specific documents.
- 3 Use the OSS Network Explorer (ONE) GUI to access the available support activities for O&M in the network.
 - 3.1 Find network objects and view object properties.
 - 3.2 Create and edit a network browser view.
 - 3.3 Launch applications.
- 4 Describe and use BASE.
 - 4.1 Know the relation between the software components of BASE and the AOS applications.
 - 4.2 Use the Topology Manager for centralized management of topology information.
 - 4.3 Use the Audit Trail Browser to track network management actions.
- 5 Use AXD Configuration Tool (ACT) to perform the most common configuration, software management and user management tasks for multiple AXD network elements.
 - 5.1 Understand the role and basics of ACT
 - 5.2 Initiate backup operations
 - 5.3 Perform BGP and bulk configuration
 - 5.4 Manage the AMS and SNMPv3 user configuration
 - 5.5 Understand restore backup, patch operations and cloning configuration
- 6 Use Fault Manager (FM) tools to manage alarms and configure the way they are presented.



- 6.1 Use the Graphical and logical Network Information Presentation (GNIP) and the alarm lists to interpret the different object symbols and alarm symbols and take appropriate action
- 6.2 Set up and use different alarm presentation possibilities, using the Alarm Status Matrix (ASM) and the Alarm List viewer (ALV).
- 6.3 Retrieve and analyze alarms from the alarm log with the Alarm Log Browser (ALB)
- 7 Gather and present statistical information from the AXD based network elements using Performance Monitor (PMR).
 - 7.1 Set up a measurement job in an AXD
 - 7.2 Retrieve measurement data from the PMR Database and present it in tables and graphs.
 - 7.3 Transfer the measurement data into an external spreadsheet program
- 8 Use Test Manager AXD (TMG) to detect & localize faults in AXD sub-networks.
 - 8.1 Trouble-shoot PVCs
 - 8.2 Perform path tracing and ATM, IP reachability tests.

Target audience

The target audience for this course is: System Technician.

Prerequisites

Successful completion of the following courses:

AXD301 C&V training LZU 102 709 (or equivalent knowledge)

Basic UNIX knowledge

Duration and class size

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



Learning situation

This is based on theoretical lessons given in the classroom and practical instructor-led sessions using remote access to an MN-OSS system (Training system or a customer's system).

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).

Day	Topics in the course	Hours
1	Introduction	1
	MN-OSS Library	1
	ONE	2
	BASE	2
2	ACT	2
	Fault Management Tools	4
3	PMR	3
	TMG	3

MN-OSS System Administration



LZU 108 5948 R4A

Description

This course will give the student knowledge about administration of the MN-OSS R6 system. After the course the students will be able to handle the standard maintenance of an up-and-running system.

The focus in the course is on the MN-OSS UNIX platform and the student will gain thorough knowledge about how to handle processes, errors and authority in the MN-OSS system. The course also covers fault management and network element connections.

Learning objectives

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

- 1 Describe the overall structure of an OSS system.
 - 1.1 Describe the role that OSS plays in supporting a telecommunications network
 - 1.2 Describe the OSS architecture
 - 1.3 Describe how the OSS is located in the different types of networks
 - 1.4 Use the online documentation to find out how to perform system administrator tasks
- 2 Handle Authority Administration in the OSS system
 - 2.1 Add new users to the OSS system
 - 2.2 Describe the structure of the Administrative Model
 - 2.3 Use TSS Authority Administration GUI and CLI to administer users, targets and activities
 - 2.4 Use TSS Password Administration CLI
 - 2.5 Use BASE Security
- 3 Manage the OSS processes and error logs
 - 3.1 Describe the structure of CIF and the services it provides
 - 3.2 Describe the Managed Component (MC) Concept
 - 3.3 Use the CIF Management Console to manage MCs
 - 3.4 View CIF error log messages
 - 3.5 Use CIF's command line interface
- 4 Use and describe the main components in the fault management system
 - 4.1 Describe the flow of alarms from network elements to the alarm viewer applications
 - 4.2 Configure the alarm viewer applications
- 5 Manage Network Element Connections
 - 5.1 Add Network Element:
 - 5.2 Use Add Remove Network Element (ARNE)
 - 5.3 Describe the parts of the system modified by changes in ARNE
 - 5.4 Establish connection to an AXE/IOG or AXE/APG40 type network element
 - 5.5 Establish a connection to an AXD type network element
- 6 Perform standard maintenance in the OSS system



- 6.1 Perform platform maintenance
- 6.2 Handle the scripts scheduled in the crontab
- 6.3 Understand OSS backup and restore procedures
- 6.4 Know the location of all vital log files

Target audience

The target audience for this course is: System Administrators and System Engineers administrators-to-be who need to know the MN-OSS system and how to perform standard and corrective maintenance in the system.

Prerequisites

Successful completion of the following courses:

MN-OSS Operation, AXE	LZU 108 6099/3
MN-OSS Operation, AXD	LZU 108 6099

The student should be familiar with MN-OSS application systems handling

The participant would benefit from equivalent knowledge to the following external courses:

Sybase: Fast track to Adaptive Server Enterprise

Sun: Solaris System Administration I and II

The participants would also benefit from being familiar with Veritas Volume Management and have general knowledge of TCP/IP, X25 and SNMP.

Duration and class size

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



Learning situation

The course consists practical sessions (task-oriented) but there will also be theoretical parts. The students will solve the tasks on a training system, using the on-line documentation. The tasks are always concluded by an instructor lead discussion.

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	System administration introduction	3.5h
1-2	User Administration	4h
2-3	Process management	7h
3-4	Handling Network Element	8h
5	Regular Maintenance & Backup and Restore	6h



Networking and Ethernet Standards (WBL)



LZU 108 5941 R1A

Description

This course provides a basic introduction to modern LAN and WAN technologies and concepts.

Learning objectives

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

- 1 Describe Local Area Networks (LAN) and the Ethernet Standard
- 2 Define the building blocks in a LAN
- 3 Outline the different types of Ethernet standard
- 4 Explain data transmission in an Ethernet LAN – Ethernet frame
- 5 Understand Ethernet basics (CSMA/CD)
- 6 Outline the difference between a Hub and a Switch
- 7 Describe how to connect communication devices and design a LAN
- 8 Describe Wireless Local Area Networks (WLAN)
- 9 Describe two basic types of Wireless LAN (Ad Hoc and Infrastructure mode)
- 10 Outline the IEEE 802.11 standard and its applications
- 11 Outline the HIPERLAN/2 standard and its applications and compare to IEEE 802.11
- 12 Outline the properties of Home RF
- 13 Understand Bluetooth drivers and communication models

Target audience

The target audience for this course is anybody wishing to gain a basic understanding of modern datacom networking technologies.

The course focuses on modern standard technologies and does not contain any Ericsson specific product material.

Prerequisites

There are no prerequisites for this course.

Duration

The length of the course is 2.5 hours.



Learning situation

The course is a web based learning product.

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	Local Area Networks and the Ethernet Standard	1 hour 15 mins
1	Wireless Local Area Networks, WLAN	1 hour 15 mins



Networking Basics, An Overview (WBL)



LZU 108 5940 R1A

Description

This course provides information on basic networking principles and describes how a PC communicates with other devices and networks.

Learning objectives

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

- 1 Explain the basics of networking
- 2 Outline the input and output devices of a PC and how they are connected
- 3 Describe the communication parameters necessary to understand connections
- 4 Describe physical and logical network topologies
- 5 Describe how to connect a PC to a datacom network
- 6 Identify and describe communication devices in a LAN (Hub, Switch and Router)
- 7 Understand the different types of cables (UTP,STP and Fiber Optical)
- 8 Explain how to connect computers to a LAN
- 9 Explain the difference between Internet and Intranet
- 10 Outline how to implement a Structured Cabling System (independent cabling system)

Target audience

The target audience for this course is anybody wishing to gain a basic understanding of modern datacom networking technologies.

The course focuses on modern standard technologies and does not contain any **Ericsson specific** product material.

Prerequisites

There are no prerequisites for this course.

Duration

The length of the course is 2 hours.



Learning situation

The course is a web based learning product.

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	Networking Basics	1 hour
1	Your PC and the Datacom Network	1 hour



Telecoms 2000: An Overview (MBL)



LZU 108 989/C

Description

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

- 1 Describe the concepts and terminology associated with telecommunications
- 2 Describe how calls are handled in the PSTN
- 3 Explain how data is transferred between computers in various networks
- 4 Describe how a cellular mobile telephone is built, and how it works
- 5 Describe evolution of demand for ISDN and broadband services, and the technologies used to provide them
- 6 Outline the criteria and strategies used in planning and managing networks
- 7 Describe the various regulatory bodies and their associated standards

Learning Objectives

- 1 Telecommunications overview
- 2 Mobile Communications
- 3 ISDN and Broadband Communications
- 4 Telecommunications (Management and Planning)
- 5 The Public Switched Telephone Network (PSTN)
- 6 Data Communications
- 7 Telecommunications Standards "

Target Audience

Technical staff that have little of no telecommunications expertise

Telecommunications marketing and sales staff

Management and non-technical personnel who are starting work in a technical environment

Prerequisites

There are no prerequisites for this course

Duration

The length of the course is 1 day.

Learning situation

Theoretical lessons/exercises and practical study cases



Telecoms 2000 Fundamentals (MBL)



LZU 108 993

Description

Do you need a grounding in the basic concepts of telecommunications? Do you understand the difference between circuit and packet switching? Do you need an overview of how SS No.7 operates? Do you want a quick induction course in the basic concepts behind transmission, signalling and switching for your new technical or management recruits?

The course consists of five modules - each one lasting approximately one hour - and uses advanced multimedia learning techniques, including animated graphics and sound.

Course Objectives

Telecoms 2000: Fundamentals consists of five training modules, each approximately one hour long:

- 1 Basic Concepts
- 2 Transmission
- 3 Signalling
- 4 Switching
- 5 Case Studies

Target Audience

This course is intended for:

Technical staff that have little or no telecommunication expertise

Telecommunications sales and marketing staff

Management and non-technical personnel who are starting work a technical environment

Prerequisites

None

Duration

The length of the course is 5 hours.



Learning situation

This is CD-ROM based training that is installed on the local machine or network

Hardware Requirements:

IBM-compatible PC (80486 processor) or higher with at least 8MB of RAM, 16MB recommended

VGA graphics adaptor (minimum 256 colours, 32,000 colours recommended)

High speed CD-ROM drive

Mouse

High-capacity hard disk or network drive

Windows 3.1

Sound Card (e.g. Soundblaster) and speakers or headphones (optional)

Telecommunication ABC



Description

The course consists of general descriptions of telecommunications networks, transmission media, the AXE exchange, mobile telephony, ISDN, the SDH transport network and data communication, including the Internet and ATM. Ericsson's organization and products are treated briefly.

Learning objectives

After completed training the trainees will be able to:

- 1 Describe the organization of Ericsson and state the most important products made by the company
- 2 Describe Ericsson's role in the world of telecommunications
- 3 Describe the main architecture of the telecommunications network
- 4 State the most important transmission media
- 5 Describe how analogue signals are converted and sent through the network
- 6 Describe the main parts of an AXE exchange
- 7 Describe the main parts of a mobile telephone network
- 8 Describe the fundamentals of ATM, Internet and ISDN.

Target audience

Staff who have a background other than technical and need some technical orientation in telecommunications and Ericsson products.

Prerequisites

None

Duration and class size

The length of the course is 3 days and the maximum number of participants is 20.

Learning situation

Lessons, demonstrations and short exercises.

Using the FMX tool



LZU 108 5148 R1A

The name of the course is "Using the FMX Tool", and it is based upon the release of FM 4.x with FMX. The student will gain knowledge about the purpose of FMX regarding the contents, functionality and the connection to other applications in the management system.

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

In a safe training environment the students are guided through structured exercises, where mistakes are turned into a learning situation instead of network problems. The course can also be delivered On-Site.

Learning objectives

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

- 1 Describe what FMX is
- 2 Describe where and how FMX is used in the management system and understand the purpose of FMX
- 3 Describe the general flow of an alarm record when FMX is used
- 4 Describe the concepts of module, event discriminator and rule
- 5 Use the FMX user interfaces and tasks
- 6 Create and maintain FMX modules
- 7 Create rules in the FMX Rule editor
- 8 Test FMX modules and their contents
- 9 Work according to a workflow
- 10 Use tools for rule design
- 11 Use and configure the different building blocks in the Rule Editor
- 12 Design and create own FMX alarms
- 13 Describe the concept of object and attributes used in FMX
- 14 Use more advanced features and rule implementation
- 15 Create more advanced FMX rules and modules
- 16 Use advanced scripts to execute actions and retrieve results between FMX and a network element
- 17 Use FMX for interaction with the UNIX environment

Target audience

The target audience for this course is intended for future FMX developers, who need to know the FMX concept and how to develop and maintain FMX modules. However, anyone who will come in contact with FMX can also benefit from this course. FMX administrators and FM users in a system with FMX installed and running.



Prerequisites

The student should have:

Attended Telecom ABC LZU 107 12

Completed OSS Operation course or equivalent knowledge in the Fault Management area

Experience in object oriented programming

Duration and class size

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

Learning situation

This learning product is delivered by an instructor. The instructor works with the student to implement knowledge. The role of the instructor is to assist and guide the personnel to solve their own problems, using existing methods, tools, and routines.

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	What is FMX?	1 h
	Working with FMX	3 h
	Tools for Rule Design	2 h
2	FMX Rule Design	6 h
3	FMX Rule Design	6 h
4	Features and Rule Implementation	6 h

VPN & IP Security



LZU 102 323 R2A

Description

This course will give the students an insight and understanding of the security issues in IP networks. The students will learn about the threats and weaknesses in the TCP / IP suite and how to enable security within an IP network. The course covers such topics as encryption, cryptography, digital signatures and certificates. The course will also give the students an understanding of different VPN technologies and how different VPNs are implemented within the IP network. 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 Describe the threats and security issues in the IP networks
- 2 Describe the different security threats and weaknesses in TCP / IP suite
- 3 Describe how to develop a security policy, how to respond to incidents and the different bodies involved in IP security
- 4 Describe the devices and services in building a secure network
- 5 Describe and perform exercises and analysis on the operation of NAT and router filters / access lists and how they are implemented
- 6 Describe firewall solutions, and how to implement firewall security in a network
- 7 Describe the operation of secure DNS, HTTPS, S/MIME and SSH
- 8 Describe Encryption technologies, security services and certificates
- 9 Describe encryption, cryptography, and symmetric and asymmetric algorithms
- 10 Describe the operation of message digest and digital signatures
- 11 Describe operation of Certificate Authorities and how certificate are exchanged
- 12 Describe the operation of other security devices such as Smart Cards
- 13 Describe the purpose and operation of IPSec VPNs
- 14 Describe and perform exercises and analysis on the operation of L2TP
- 15 Describe and perform exercises and analysis on the operation of IPSec Authentication tunnels
- 16 Describe and perform exercises and analysis on the operation of IPSec ESP tunnels

Target audience

The target audience for this course personnel who are involved in IP networking and who need to know how to implement security in IP networks.

Prerequisites

The participants should be familiar with IP networking, IP routing and different IP services and applications or successful completion of the following courses:

Datacom Networking - LZU 102 371 – 4 days ILT

IP Networking - LZU 102 397 – 4 day ILT course



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.



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 different security threats and weaknesses in TCP / IP suite	1.0
	Describe how to develop a security policy, how to respond to incidents and the different bodies involved in IP security	1.0
	Describe and perform exercises and analysis on the operation of NAT and router filters / access lists, and how they are implemented	2.0
	Describe firewall solutions, and how to implement firewall security in a network	1.0
	Describe the operation of secure DNS, HTTPS, S/MIME and SSH	0.5
	Describe encryption, cryptography, and symmetric and asymmetric algorithms	1.0
2	Describe the operation of message digest and digital signatures	1.0
	Describe the operation of Certificate Authorities and how certificate are exchanged	1.0
	Describe the operation of other security devices such as Smart Cards	0.5
	Describe and perform exercises and analysis on the operation of L2TP and how it is implemented	1.0
	Describe and perform exercises and analysis on the operation of IPSec Authentication tunnels	1.0
	Describe and perform exercises and analysis on the operation of IPSec ESP tunnels	2.0

