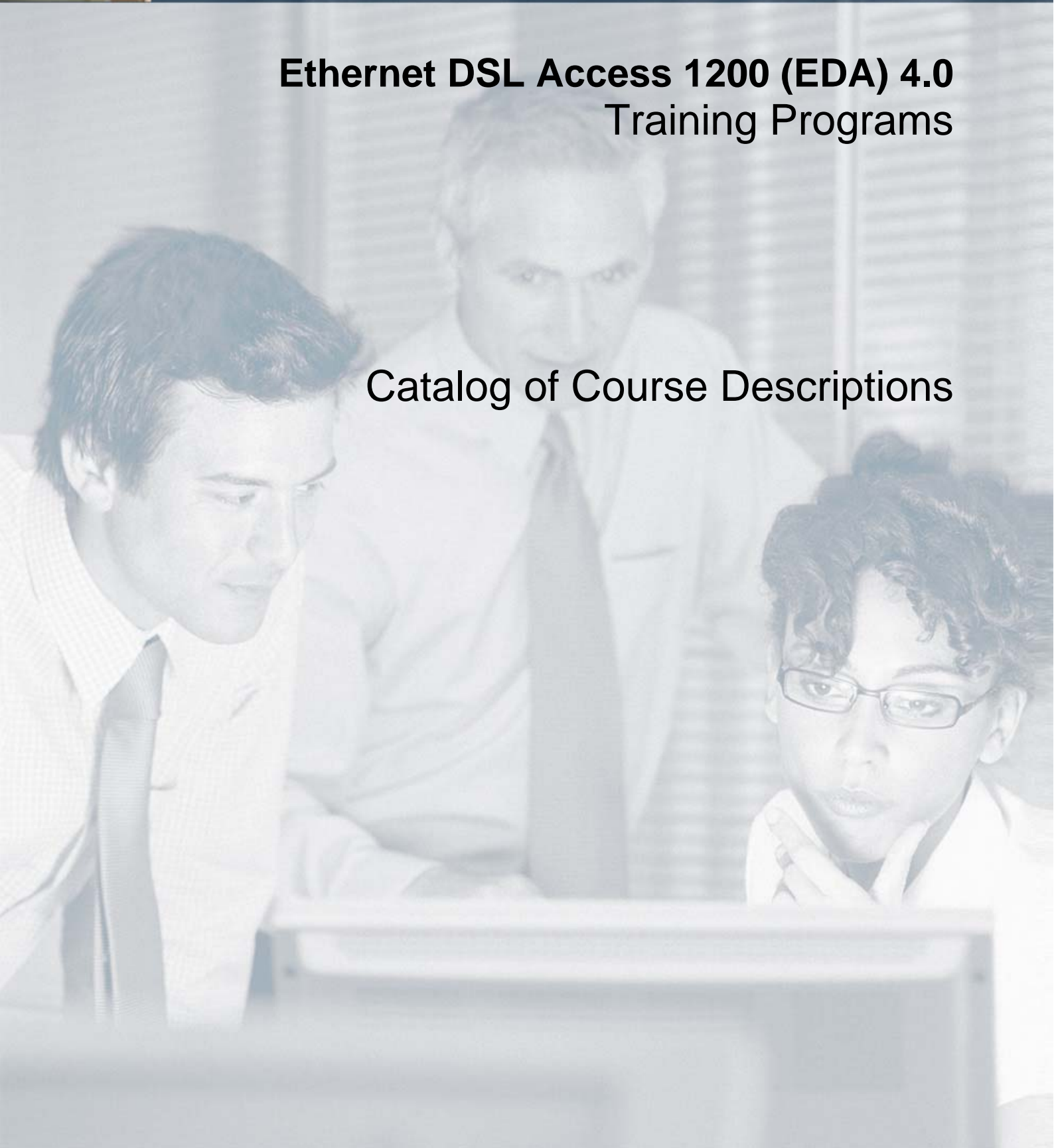




# Ethernet DSL Access 1200 (EDA) 4.0 Training Programs

## Catalog of Course Descriptions

















# Catalog of Course Descriptions

<b>INTRODUCTION.....</b>	<b>3</b>
<b>IP NETWORKING .....</b>	<b>4</b>
<b>NETWORKING BASICS, AN OVERVIEW .....</b>	<b>8</b>
<b>NETWORKING AND ETHERNET STANDARDS .....</b>	<b>10</b>
<b>IP NETWORKING AND INTERNETWORKING.....</b>	<b>12</b>
<b>IP NETWORK APPLICATIONS.....</b>	<b>14</b>
<b>ACCESS NETWORKS, AN OVERVIEW .....</b>	<b>16</b>
<b>CORE NETWORKS, AN OVERVIEW.....</b>	<b>18</b>
<b>IP ADVANCED.....</b>	<b>20</b>
<b>EDA 1200 OVERVIEW .....</b>	<b>24</b>
<b>EDA 1200 INSTALLATION AND NETWORK CONFIGURATION .....</b>	<b>26</b>
<b>EDA 1200 SERVICE AND END-USER CONFIGURATION .....</b>	<b>29</b>
<b>EDA 1200 TROUBLESHOOTING .....</b>	<b>31</b>
<b>EDA 1200 4.0 DELTA .....</b>	<b>33</b>
<b>EFN324 INSTALLATION AND CONFIGURATION .....</b>	<b>35</b>

## 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)
	Structured Knowledge Transfer (SKT)
<b>Delivery Enablers</b>	
	Remote Training Lab (RTL)
	Web Portal (WP)
<b>Ericsson Education E-Learning</b>	
	EEOnline @ <a href="http://learning.ericsson.net/eeonline/">http://learning.ericsson.net/eeonline/</a>

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LZN 901 0288R4A

### 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 and applications within the TCP / IP suite such as ARP, BOOTP, DHCP, DNS, NIS, NTP, NFS, HTTP, FTP, SMTP, Telnet, FTP, TFTP. 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. The hands-on exercises and analysers are used to facilitate the understanding of theory sessions.

### Learning objectives

On completion of each module the participants will be able to:

- 1 List and explain IP Networking Protocols
  - 1.1 List the functions of the different bodies involved in IP standards / RFCs
  - 1.2 Analyze the OSI reference model and how it relates to the TCP / IP stack
  - 1.3 Explain Ethernet as Physical and Data Link Layer: MAC Address, CSMA/CD principles, Fast Ethernet, Gigabit Ethernet and speed negotiation
  - 1.4 Explain the operation of Hubs, Bridges, Switches and Routers
  - 1.5 Explain Wireless LANs
  - 1.6 Explain IP Protocol
  - 1.7 Explain IPv4 packet structure, protocol header and features
  - 1.8 Explain VLSM, CIDR, Subnetting, aggregation, NAT and NAPT
  - 1.9 Explain how to use ICPM utilities and traceroute command
  - 1.10 Perform exercises configuring IPv4 addresses, and check connectivity
  - 1.11 Demonstrate IPv6 packet structure, protocol header, features
  
- 2 List and explain IP Transport and Application Protocols
  - 2.1 Explain TCP, UDP and SCTP protocol structures, headers and functionality
  - 2.3 List and explain the operation of different protocols / applications such as ARP, BOOTP, DHCP, DNS, NIS, NTP, NFS, HTTP, FTP, SMTP, Telnet, FTP, TFTP
  
- 3 Explain and work with IP Routing
  - 3.1 List the purpose and operation of VLANs
  - 3.2 Explain and perform exercises of Spanning Tree Protocol (STP)
  - 3.3 Explain the operation of Static and Dynamic routing protocols
  - 3.4 Perform Static routing exercises
  - 3.5 Explain Autonomous System
  - 3.6 Explain Interior and Exterior Gateway Protocols
  - 3.7 List the differences between Vector Distance and Link State protocols.
  - 3.8 Explain and perform exercises of RIP routing protocol
  - 3.9 Explain and perform exercises of OSPF routing protocol
  - 3.10 Explain and perform exercises of BGP routing protocol

### **Target audience**

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

### **Prerequisites**

There are no pre-requisites

### **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 or simulation 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	• List the functions of the different Standard Bodies involved in IP / RFCs	0.5
	• Analyze the OSI Reference Model and how it relates to the TCP / IP stack	1
	• Explain Ethernet, Fast Ethernet, and Gigabit Ethernet	1
	• Explain the operation of Hubs, Bridges, Switches, Routers, Collision Domains and Broadcast Domains	1
	• Explain Wireless LANs	1.5
	• Explain IP Protocol	1.0
2	• Explain IPv4 (packet format, addressing and features)	1.0
	• Explain VLSM, CIDR, Subnetting, aggregation, NAT and NAPT	1.5
	• Explain ICMP protocol and traceroute	0.5
	• Perform exercises configuring IPv4 addresses, and check connectivity	2.5
	• Demonstrate IPv6 (packet format, addressing and features)	0.5
3	• Explain TCP, UDP and SCTP protocol structures, headers and functionality	2
	• List and explain the operation of different applications (ARP, BOOTP, DHCP, DNS, NIS, NTP, NFS, HTTP, FTP, SMTP, Telnet, FTP, TFTP)	3.0
	• List the purpose and operation of VLANs	1
4	• Explain and perform exercises of Spanning Tree Protocol (STP)	2.0
	• Explain the operation of Static and Dynamic routing protocols	1
	• Explain Autonomous System	
	• Explain Interior and Exterior Gateway Protocols	
	• List the differences between Vector Distance and Link State protocols.	
	• Perform Static routing exercises	1.0
	• Explain and perform exercises of RIP routing protocol	2

- |   |  |   |
|---|--|---|
| 5 | <ul style="list-style-type: none"><li>• Explain and perform exercises of OSPF routing protocol</li></ul> | 3 |
|   | <ul style="list-style-type: none"><li>• Explain and perform exercises of BGP routing protocol</li></ul>  | 3 |

## Networking Basics, An Overview



LZU 108 5940 R1B

### Description

When you finish this course, you will have acquired knowledge of the basic networking principles and be able to describe how a PC communicates with other devices and networks.

### Learning objectives

- 1 Explain the basics of networking
  - 1.1 Outline the input and output devices of a PC and how they are connected
  - 1.2 Describe the communication parameters necessary to understand connections
  - 1.3 Describe physical and logical network topologies
- 2 Describe how to connect a PC to a datacom network
  - 2.1 Identify and describe communication devices in a LAN (Hub, Switch and Router)
  - 2.2 Understand the different types of cables (UTP,STP and Fiber Optical)
  - 2.3 Explain how to connect computers to a LAN
  - 2.4 Explain the difference between Internet and Intranet
  - 2.5 Outline how to implement a Structured Cabling System (independent cabling system)

### Target audience

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

### Prerequisites

There are no prerequisites for this course. The course is open to anyone wishing to gain a basic understanding of modern datacom networking technologies.

### Duration and class size



The length of the course is 2 hours.

### **Learning situation**

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

### **Time schedule**

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

<b>Day</b>	<b>Topics in the course</b>	<b>Estimated time</b>
1	<ul style="list-style-type: none"><li>• Network Basics</li></ul>	1 hour
	<ul style="list-style-type: none"><li>• Your PC and the Datacom Network</li></ul>	1 hour

## Networking and Ethernet Standards



LZU 108 5941 R2A

### Description

Upon completion of this course, you will be able to explain the main principles of modern LAN and WAN technologies and concepts, from Ethernet to Wireless LAN.

### Learning objectives

- 1 Describe Local Area Networks (LAN) and the Ethernet Standard
  - 1.1 Define the building blocks in a LAN
  - 1.2 Outline the different types of Ethernet standard
  - 1.3 Explain data transmission in an Ethernet LAN - Ethernet frame
  - 1.4 Understand Ethernet basics (CSMA/CD)
  - 1.5 Outline the difference between a Hub and a Switch
  - 1.6 Describe how to connect communication devices and design a LAN
- 2 Describe Wireless Local Area Networks (WLAN)
  - 2.1 Describe two basic types of Wireless LAN (Ad Hoc and Infrastructure mode)
  - 2.2 Outline the IEEE 802.11 standard and its applications
  - 2.3 Outline the properties of Home RF
  - 2.4 Understand Bluetooth drivers and communication models

### Target audience

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

### Prerequisites

The participants should be familiar with Networking Basics, An Overview, LZU 108 5940.



### **Duration and class size**

The length of the course is 2.5 hours.

### **Learning situation**

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

### **Time schedule**

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

<b>Day</b>	<b>Topics in the course</b>	<b>Estimated time</b>
1	<ul style="list-style-type: none"><li>• Local Area Networks and the Ethernet Standard</li></ul>	1 hour 10 mins
	<ul style="list-style-type: none"><li>• Wireless Local Area Networks, WLANs</li></ul>	1 hour 20 mins

## IP Networking and Internetworking



LZU 108 5942 R2A

### Description

If you need to have an understanding of the principles of IP networking and internetworking, then this three hour course will provide you with the information you need. This course covers the basics of IP addresses, internet domains, how IP packets are sent using routers to details on routing protocols and utilities used to get information on the network.

### Learning objectives

- 1 Describe the basic concepts of IP networking
  - 1.1 Define virtual address and explain communication between networks
  - 1.2 Outline the difference between IPv4 and IPv6 addressing
  - 1.3 Outline how to configure the hosts in LAN (IP address, subnet mask, default gateway)
  - 1.4 Understand Internet domains and how the Domain Name System works
  - 1.5 Describe how to leave the local network using a Router
- 2 Describe the basic concepts of IP internetworking
  - 2.1 Describe the Internet (transit, regional and ISP networks)
  - 2.2 Understand routing domains and usage of two routing protocols (RIP and OSPF)
  - 2.3 Discover networks using two useful utilities PING and Traceroute

### Target audience

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

### Prerequisites

The participants should be familiar with Networking and Ethernet Standards, LZU 108 5941.

### Duration and class size



The length of the course is 3 hours.

### **Learning situation**

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

### **Time schedule**

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

<b>Day</b>	<b>Topics in the course</b>	<b>Estimated time</b>
1	<ul style="list-style-type: none"><li>• IP Networking</li></ul>	1 hour 30 mins
	<ul style="list-style-type: none"><li>• IP Internetworking</li></ul>	1 hour 30 mins

## IP Network Applications



LZU 108 5943 R2A

### Description

This course is recommended for anyone who needs a basic introduction to IP network applications and TCP/IP data communications.

### Learning objectives

- 1 Describe network fundamentals and describe IP network applications
  - 1.1 Explain how Internet applications are addressed in a data packet
  - 1.2 Understand application models (Client/Server and Peer-to-Peer)
  - 1.3 Describe how a Web browser works
  - 1.4 Explain Web architecture and connecting to a Web server
  - 1.5 Explain how to send and receive Internet E-mail and outline the protocols used
  - 1.6 Outline IP telephony architecture
- 2 Explain the TCP/IP data communications architecture
  - 2.1 Describe TCP/IP layered approach to networking
  - 2.2 List the layers in the TCP/IP protocol stack
  - 2.3 List the Internet organizations (ISOC, IETF and ICANN)
  - 2.4 Explain IP addressing and routing and some important fields in an IP packet
  - 2.5 Outline how the Transmission Control Protocol (TCP) works
- 3 Explain the TCP/IP data communications architecture
  - 3.1 Describe TCP/IP layered approach to networking
  - 3.2 List the layers in the TCP/IP protocol stack
  - 3.3 List the Internet organizations (ISOC, IETF and ICANN)
  - 3.4 Explain IP addressing and routing and some important fields in an IP packet
  - 3.5 Outline how the Transmission Control Protocol (TCP) works

### Target audience



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

### Prerequisites

The participants should be familiar with IP Networking and Internetworking WBL, LZU 108 5942.

### Duration and class size

The length of the course is 3 hours.

### Learning situation

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

### Time schedule

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

Day	Topics in the course	Estimated time
1	<ul style="list-style-type: none"><li>Using the Network: IP Network Applications</li></ul>	1 hour 30 mins
	<ul style="list-style-type: none"><li>TCP/IP Data Communications Architecture</li></ul>	1 hour 30 mins

## Access Networks, An Overview



LZU 108 5944 R2A

### Description

When you complete this course you will be able to describe the basic concepts and technologies in both fixed and mobile access networks. These concepts are all presented in such a way to give you a solid foundation to build upon.

### Learning objectives

- 4 Describe fixed network connections in access networks as described in Customer Product Information documents.
  - 4.1 Outline basic concepts such as bandwidth and technologies in access networks
  - 4.2 Describe access based on telephone networks (analogue and digital).
  - 4.3 Outline other access network technologies, such as fiber optics and microwave.
- 5 Describe the basic concepts of mobile access for GSM, GPRS and UMTS.
  - 5.1 Explain GSM architecture and outline how traffic flows in GSM.
  - 5.2 Explain GPRS architecture and outline traffic flow in a GPRS network.
  - 5.3 Explain UMTS architecture and outline traffic flow in a UMTS network.
  - 5.4 Describe Mobile IP.

### Target audience

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

### Prerequisites

The participants should be familiar with IP Network Applications WBL, LZU 108 5943.

### Duration and class size

The length of the course is 2 hours 30 minutes.



### Learning situation

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

### Time schedule

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

Day	Topics in the course	Estimated time
1	<ul style="list-style-type: none"><li>• Fixed Network Connection: Access Networks</li><li>• Connecting While Travelling: Mobile Access</li></ul>	1 hour 1 hour 30 mins

## Core Networks, An Overview



LZU 108 5945 R2A

### Description

Upon completion of this course, you will have acquired the knowledge to describe the technologies in the core networks, core network architecture and network operation and maintenance.

### Learning objectives

- 1 Describe the technologies in the core network as found in the system release documentation
  - 1.1 Explain how a physical network is built
  - 1.2 Outline different types of multiplexing (TDM and WDM)
  - 1.3 Describe transmission technologies such as SDH and SONET
  - 1.4 Describe optical ring architecture and the basics of ATM and MPLS
- 2 Define core network architectures
  - 2.1 Understand traffic trends and outline multiservice backbone requirements
  - 2.2 Explain resource allocation and quality of service
  - 2.3 Outline performance optimization
  - 2.4 Define IPSec and VPN technology
- 3 Outline the main principles of network operation and maintenance
  - 3.1 Outline the steps involved in network operation
  - 3.2 Explain network traffic and outline some network traffic situations
  - 3.3 Explain monitoring using SNMP and PING
  - 3.4 Define steps and routines for error handling

### Target audience

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

### Prerequisites

The participants should be familiar with IP Network Applications WBL, LZU 108 5943.

### Duration and class size



The length of the course is 3 hours.

### **Learning situation**

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

### **Time schedule**

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

<b>Day</b>	<b>Topics in the course</b>	<b>Estimated time</b>
1	<ul style="list-style-type: none"><li>• Technologies in the Core Network</li></ul>	1 hour
	<ul style="list-style-type: none"><li>• Core Network Architecture</li></ul>	1 hour
	<ul style="list-style-type: none"><li>• Network Operation and Maintenance</li></ul>	1 hour

## IP Advanced



LZU 108 6748 R1A

### Description

This course will give the students an insight and understanding of QoS, security issues and management of IP networks. The students will learn the operation of QoS supporting IP Protocols, VoIP protocols, Security topics such as authentication, confidentiality, and integrity and Simple Network Management Protocol. The hands-on exercises are used to facilitate the understanding of theory sessions.

### Learning objectives

On completion of each module the participants will be able to:

- 1 Quality of Service (QoS)
  - 1.1 Analyze the enhancement of the IP networks to support transmission of Real Time data
  - 1.2 Describe QoS Basic Concepts
  - 1.3 Describe QoS Architectures
  - 1.4 Describe QoS Mechanisms
  - 1.5 Explain Resource Reservation Protocol (RSVP) – RFC 2205
  - 1.6 Explain Multi Protocol Label Switching (MPLS) – RFC 3031
  - 1.7 Explain Label Distribution Systems (LDP, RSVP-TE, BGP)
  - 1.8 Perform practical exercises covering Class Based Marking (CBM) using IP Precedence, DSCP and MPLS
- 2 Voice over IP (VoIP)
  - 2.1 Comment some VoIP Protocols: H.323, Media Gateway Control Protocol (MGCP) – RFC 2705
  - 2.2 Explain H.248 (MEGACO)
  - 2.3 Explain Session Initiation Protocol (SIP) – RFC 3261
  - 2.4 Explain Real-Time Transport Protocol (RTP) and RTP Control Protocol (RTCP) – RFC 3550 and RFC 3611
  - 2.5 Perform practical exercises covering SIP messages
- 3 IP Security (IP Sec)
  - 3.1 Analyze the existing security threats types
  - 3.2 Explain Access control lists (ACL)
  - 3.3 Explain the purpose and use of Firewalls
  - 3.4 Explain Data Integrity, Authenticity and Confidentiality
  - 3.5 Identify different Security Services (SSL, TLS, SSH, etc) – RFC 4366
  - 3.6 Explain how virtual Private Networks (VPN) operate
  - 3.7 Explain IP Security (IPSec) – RFC 4301
  - 3.8 Explain Authentication Header (AH) – RFC 4302
  - 3.9 Explain Encapsulating Security Payload (ESP) – RFC 4303
  - 3.10 Explain Internet Key Exchange (IKE) – RFC 2409 v1/RFC 4306 v2



- 3.11 Perform practical exercises covering the configuration of an IPSec VPN tunnel (Phase I and Phase II negotiation)
  
- 4 IP Network Management
  - 4.1 Explain ISO management areas (FM, CM, AM, PM and SM)
  - 4.2 Describe the architecture of the SNMP
  - 4.3 Describe functionalities available on SNMPv1, SNMPv2 and SNMPv3
  - 4.4 Explain Manager-Agent communication
  - 4.5 Explain SNMP operations (Get Request, GetNextRequest, GetResponse, SetRequest, Trap)
  - 4.6 Perform practical exercises covering analysis of SNMP messages exchanged between Manager and Agent

### **Target audience**

The target audience for this course is the staff involved in IP networking and require more knowledge on IP networks to guarantee quality of service, security, and management of real-time traffic.

### **Prerequisites**

IP Networking 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 or simulation 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	• Analyze the enhance of the internet to support transmission of real time data	0.5
	• Describe QoS Basic Concepts	0.5
	• Describe QoS Architectures	0.5
	• Describe QoS Mechanisms	0.5
	• Explain Resource Reservation Protocol (RSVP)	1.5
	• Explain Multi Protocol Label Switching (MPLS)	1.0
	• Explain Label Distribution Systems (LDP, RSVP-TE, BGP)	0.5
	• Perform practical exercises covering Class Based Marking (CBM) using IP Precedence, DSCP and MPLS	1.0
2	• Comment some VoIP Protocols: H.323 and Media Gateway Control Protocol (MGCP)	1.0
	• Explain H.248 (MEGACO)	1.5
	• Explain Session Initiation Protocol (SIP)	1.5
	• Explain Real-Time Transport Protocol (RTP) and RTP Control Protocol (RTCP) – RFC 3550	1.0
	• Perform practical exercises covering SIP messages	1.0
3	• Analyze existing security threats types	1.5
	• Explain Access control lists (ACL)	0.5
	• Explain the purpose and use of Firewalls	1.0
	• Explain Data Integrity, Authenticity and Confidentiality	2.0
	• Identify different Security Services (SSL, TLS, SSH, etc)	1.0
4	• Explain how virtual Private Networks (VPN) operate	1.0
	• Explain IP Security (IPSec)	1.0
	• Explain Authentication Header (AH)	1.0
	• Explain Encapsulating Security Payload (ESP)	1.0



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|---|---|
| 5 | <ul style="list-style-type: none"><li>• Explain Internet Key Exchange (IKE) 1.0</li><li>• Perform practical exercises covering the configuration of an IPSec VPN tunnel (Phase I and Phase II negotiation) 1.0</li><li>• Explain ISO management areas (FM, CM, AM, PM and SM) 0.5</li><li>• Describe the architecture of the SNMP 1.0</li><li>• Describe functionalities available on SNMPv1, SNMPv2 and SNMPv3 1.5</li><li>• Explain Manager-Agent communication 1.0</li><li>• Explain SNMP operations (Get Request, GetNextRequest, GetResponse, SetRequest, Trap) 1.0</li><li>• Perform practical exercises covering analysis of SNMP messages exchanged between Manager and Agent 1.0</li></ul> |
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## EDA 1200 Overview



LZU 108 6789 R1A

### Description

This course provides the participants with an overview of the ADSL, VDSL and fiber solution, including topologies like metro ring, star topologies and flexible topologies, its components and its support for services. The course also describes line bonding, line testing, PSD shaping, VDSL profiling, quality of service, and security measures.

Furthermore, the course gives an introduction to the GUI based local craft tools and the HP OpenView based Public Ethernet Manager (PEM) running on Windows and Solaris platforms.

### Learning objectives

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

- 1 Describe fundamental principles of the EDA 1200 solution
  - 1.1 Describe ADSL, VDSL and fiber network solutions
  - 1.2 Describe the main features of the ADSL, VDSL and fiber solution
  - 1.3 Describe data, video and telephony implementation scenarios
  
- 2 Describe the EDA 1200 components
  - 2.1 List the network components
  - 2.2 Describe the main function of each network component
  
- 3 Describe quality of service and security measures
  - 3.1 Describe ATM based QoS
  - 3.2 Describe PTM based QoS
  - 3.3 Describe access methods
  - 3.4 Describe end-user and network security measures
  
- 4 Describe the PEM management system
  - 4.1 Describe the main characteristics of the management system
  - 4.2 Describe the applications in the management system
  - 4.3 Describe the local craft tools and line testing methods

### Target audience

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

### Prerequisites

Successful completion of the following course:



IP Networking, LZU 102 397, or equivalent qualifications.

### **Duration and class size**

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

### **Learning situation**

The course is based on theoretical instructor-led lessons given in a classroom environment.

### **Time schedule**

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

<b>Day</b>	<b>Short description of the topics in the course</b>	<b>Estimated time</b>
1	System overview	2 hours
	Components	1 hour
	Services and security	2 hours
	Management overview	1 hour

## EDA 1200 Installation and Network Configuration



LZU 108 6790 R1A

### Description

This course provides the participants with skills necessary to create access networks and to install EDA 1200 access nodes comprising controllers, switches, ADSL and VDSL IP DSLAMs, and FE-E1/T1 converters.

The course also enables the participants to perform security management, fault management, performance management, and system maintenance tasks.

Local craft tools and the node controller web interface are used for installation and installation verification tasks. The PEM management system is used for creating access networks and for configuring network elements.

### Learning objectives

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

- 1 Install network elements
  - 1.1 Install network elements comprising controllers, switches, ADSL and VDSL IP DSLAMs, FE-E1/T1 converters, and fiber nodes
  - 1.2 Verify installation using CLI and node controller web interface
  
- 2 Create the access network
  - 2.1 Create regions and line terminations
  - 2.2 Create domain subnet servers
  - 2.3 Create IP networks and domain subnets
  - 2.4 Discover and create access nodes
  
- 3 Configure network elements
  - 3.1 Configure properties of network elements
  - 3.2 Verify configuration and status of network elements
  
- 4 Perform security management
  - 4.1 Create PEM user accounts
  
- 5 Perform fault and performance management
  - 5.1 Handle alarms using the Fault Manager
  - 5.2 Monitor node performance
  
- 6 Perform system maintenance
  - 6.1 Perform maintenance tasks
  - 6.2 Upgrade software in network elements
  - 6.3 Backup the PEM database, the management server, and the domain server
  - 6.4 Configure SNMPv3



### **Target audience**

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

### **Prerequisites**

Successful completion of the following courses:

- 1 IP Networking, LZU 102 397, or equivalent qualifications
- 2 EDA 1200 Overview, LZU 108 6789

### **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 theoretical and practical instructor-led lessons given in both a classroom and in a technical environment using equipment and tools.

### Time schedule

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

<b>Day</b>	<b>Short description of the topics in the course</b>	<b>Estimated time</b>
1	Installing network elements	4 hours
	Creating the access network	2 hours
2	Creating the access network (cont'd)	2 hours
	Configuring network elements	4 hours
3	Security management	1 hour
	Fault and performance management	2 hours
	System maintenance	3 hours

## EDA 1200 Service and End-user Configuration



LZU 108 6791 R1A

### Description

This course provides the participants with skills necessary to create line configurations, alarm configurations, ADSL and VDSL service configurations, and end-user profiles.

### Learning objectives

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

- 1 Configure line and alarm parameters
  - 1.1 Describe key ADSL and VDSL configuration parameters
  - 1.2 Create line configurations
  - 1.3 Create alarm configurations
  
- 2 Create service and traffic configurations
  - 2.1 Describe key ATM and PTM configuration parameters
  - 2.2 Create configurations for ATM based QoS
  - 2.3 Create configurations for PTM based QoS
  - 2.4 Create traffic configurations
  
- 3 Create profiles and end-users
  - 3.1 Create and modify end-user profiles
  - 3.2 Create, modify, and delete end-users
  - 3.3 Perform bulk configurations
  - 3.4 Inspect subscriber lines

### Target audience

The target audience for this course is: System Technicians, Service Technicians, System Engineers, Service Engineers, Field Technicians, Customer Care Administrators.

### Prerequisites

Successful completion of the following courses:

- 4 IP Networking, LZU 102 397, or equivalent qualifications
- 5 EDA 1200 Overview, LZU 108 6789
- 6 EDA 1200 Installation and Network Configuration, LZU 108 6790

### Duration and class size

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

### Learning situation



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

### Time schedule

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

<b>Day</b>	<b>Short description of the topics in the course</b>	<b>Estimated time</b>
1	Line and alarm configurations	2 hours
	Service and traffic configurations	2 hours
	End-user configurations	2 hours

## EDA 1200 Troubleshooting



LZU 108 7069 R1A

### Description

This course provides the participants with the knowledge and skills needed to troubleshoot an EDA system comprising PEM, ECN330 and EDN312 or a system comprising PEM, ECN330, ESN212, EDN612 and an optional ESN410. To systematically trace faults, the course focuses on defining whether faults relate to PEM, the access network or customer equipment. Services like Internet surfing, IPTV and IP telephony will be configured for the network used during the course.

Ethernet as well as log and property files will be used to trace, analyze and isolate faults.

Furthermore, the course also enables the participants to analyze alarms and to take appropriate actions.

This course is valid for EDA 1200 release 2.2 or newer.

### Learning objectives

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

- 1 Describe EDA signaling
  - 1.1 Describe the signaling between PEM, ECN330 and IP DSLAM
- 2 Troubleshoot node hardware related faults
  - 2.1 Analyze alarms and logs using web interface, CLI and PEM
  - 2.2 Check hardware revisions and inventory using web interface and CLI
- 3 Troubleshoot node software related faults
  - 3.1 Analyze alarms and logs using web interface, CLI and PEM
  - 3.2 Check boot and application software using web interface, CLI and PEM
  - 3.3 Use the root account
  - 3.4 Tracing SNMP packets using private MIBS
- 4 Troubleshoot PEM related faults
  - 4.1 Identify and analyze alarms
  - 4.2 Analyze log and property files
  - 4.3 Check and remove locks
  - 4.4 Check PEM client, server and database versions
  - 4.5 Administrate system resources
  - 4.6 Create trouble reports
- 5 Troubleshoot end-user traffic
  - 5.1 Analyze line parameters using customer care
  - 5.2 Use tunneling and mirroring
  - 5.3 Trace and analyze voice, video, DHCP and PPP services

**Target audience**

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

**Prerequisites**

Successful completion of the following courses, or equivalent qualifications:

- 3 EDA 1200 Overview, LZU 108 6789
- 4 EDA 1200 Installation and Network Configuration, LZU 108 6790
- 5 EDA 1200 Service and End-user Configuration, LZU 108 6791

**Duration and class size**

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

**Learning situation**

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

**Time schedule**

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

<b>Day</b>	<b>Topics in the course</b>	<b>Estimated time</b>
1	EDA signaling	1 hour
	Troubleshoot node hardware related faults	2 hours
	Troubleshoot node software related faults	3 hours
2	Troubleshoot PEM related faults	3 hours
	Troubleshoot end-user traffic	3 hours

## EDA 1200 4.0 Delta



LZU108 7070 R1A

### Description

This course describes features introduced in EDA 4.0 since EDA 2.2. The main focus is on VDSL2 features, the IP DSLAM EDN612, the Gigabit Ethernet switch ESN212, and the power distribution node EPN210.

Furthermore, the course describes and practices how to configure node properties and make VDSL2 service provisioning using the ECN330 web interface, the CLI interface and PEM.

### Learning objectives

On completion of this course the participants will be able to describe the main features of EDA 4.0 compared to the features known in EDA 2.2, the main characteristics of the EDN612, ESN212, and the EPN210.

Furthermore the participants will be able to make service provisioning on an EDA node comprising ESN410, ECN330, EDN612, ESN212 using the ECN330 web interface, the CLI interface and PEM.

- 1 Describe the EDA 1200 4.0 system
  - 1.1 Describe the new feature in EDA 4.0
  - 1.2 Describe the structure of the VDSL2 band plans, profiles and PSD masks
  - 1.3 Describe advantages of packet transfer mode (PTM)
  - 1.4 Describe typical node topologies, including flexible topologies
- 2 Describe the VDSL2 components
  - 2.1 List EDN612 main characteristics and describe its user interface
  - 2.2 List ESN212 main characteristics and describe its user interfaces including switch ID settings
  - 2.3 List EPN210 main characteristics and describe its support for EDN312x and EDN612
- 3 Configure ESN410 / ECN330 based nodes
  - 3.1 Create ESN410 / ECN330 topologies to support EDN612 and ESN212
  - 3.2 Load software into ECN330, ESN410, EDN612 and ESN212
  - 3.3 Create VDSL end-users using the ECN330 web interface
  - 3.4 Backup and restore node configurations on a FTP server
- 4 Perform service provisioning using PEM
  - 4.1 Create line and alarm configurations
  - 4.2 Create xDSL services and end-users
  - 4.3 Customize VDSL profiles
- 5 Upgrade node software using PEM
  - 5.1 Create software upgrade job
  - 5.2 Upgrade EDA nodes

**Target audience**

The target audience for this course is System Engineers, System Technicians, Service Engineers, Service Technicians, and Field technicians.

**Prerequisites**

Successful completion of the following courses, or equivalent qualifications:

- 6 EDA 1200 Overview, LZU 108 6613
- 7 EDA 1200 Installation and Network Configuration, LZU 108 6614
- 8 EDA 1200 Service and End-user Configuration, LZU 108 6615

**Duration and class size**

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

**Learning situation**

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

**Time schedule**

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

<b>Day</b>	<b>Topics in the course</b>	<b>Estimated time</b>
1	EDA 1200 4.0 system overview	2 hours
	VDSL2 components	1 hour
	ESN410 / ECN330 node configuration	3 hours
2	ESN410 / ECN330 node configuration (Contd)	1 hour
	Service provisioning using PEM	3 hours
	Software upgrade of nodes using PEM	2 hours

## EFN324 Installation and Configuration



LZU 108 7071 R1A

### Description

This course describes the main system characteristics of an EFN324 fiber/cat5 access node, gives a detailed description of QoS handling including traffic classification, scheduling, and policing mechanism.

This also course provides the participants with the knowledge and skills required to install and configure an EFN324 access node using CLI and PEM. Service provisioning will be done using CLI and PEM.

Furthermore, the course enables the participants to read and interpret log files, read statistical parameters, use debugging and diagnostic functions.

Approximately 50% of the course is allocated to hands-on exercises.

### Learning objectives

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

- 1 Describe EFN324 based solutions
  - 1.1 Describe typical EFN324 based access nodes
  - 1.2 Describe services supported by the EFN324
  - 1.3 Describe the main function of the EFN324
  - 1.4 Describe network functions
  
- 2 Describe EFN324 characteristics
  - 2.1 Describe the switching functions
  - 2.2 Describe the security functions
  - 2.3 Describe the system function
  
- 3 Explain QoS mechanisms
  - 3.1 Explain traffic classification
  - 3.2 Explain scheduling
  - 3.3 Explain policing
  
- 4 Install the EFN324
  - 4.1 Perform initial configuration of the EFN324 using CLI
  - 4.2 Verify the installation
  - 4.3 Create services using CLI
  - 4.4 Back up and restore configurations
  
- 5 Create the access network
  - 5.1 Create regions and line terminations
  - 5.2 Create domain subnet servers
  - 5.3 Create IP networks
  
- 6 Create services and end-users in PEM

- 6.1 Create and modify service configurations
- 6.2 Create and modify end-user profiles
- 6.3 Create, modify, and delete end-users
- 6.4 Read customer care information
  
- 7 Perform debugging and diagnostics
  - 7.1 Describe packet logger and trace logger applications
  - 7.2 Use the packet logger

### Target audience

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

### Prerequisites

The participants should be familiar with basic EDA 1200 and PEM configuration and operation.

### 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 a classroom and in a technical environment using equipment and tools.

### Time schedule

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

Day	Topics in the course	Estimated time
1	EFN324 solutions	1 hour
	EFN324 characteristics	1 hour
	QoS mechanisms	1 hour
	Installing the EFN324	3 hours
2	Creating the access network	1 hour
	Creating services and end-users in PEM	3 hours
	Debugging and diagnostics	2 hours