



Router 6000 R17 Training Programs

Catalog of Course Descriptions





Catalog of Course Descriptions

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Introduction

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

Service delivery is supported using various delivery methods including:

Icon



Delivery Method

Instructor Led Training (ILT)

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IP Networking



LZU102397 R6A

Description

This course will provide participants with an insight into and an understanding of the TCP / IP protocol stack from the physical layer to the application layer. Participants will learn the operation of different protocols and applications within the TCP / IP suite such as DHCP, DNS, NFS, NIS, NTP, HTTP, SNMP, SMTP, Telnet, FTP, TFTP and RTP. Participants will learn about IP addressing, both classful and classless (CIDR) and how subnetting / aggregation and VLSM operates. Participants will learn about different network devices and will develop a detailed understanding of LAN Switching, Routing and Routing protocols like (RIP, OSPF, and BGP & ISIS). Hands-on exercises using protocol analyzers are used to facilitate the understanding of theory sessions.

Learning objectives

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

- 1 Networking Devices
 - 1.1 Networking Devices. (Hub, Switches & Routers Function) Explain ARP, CSMA/CD, and Transmission Types
 - 1.2 OSI MODEL. Vs. TCP/IP Suite
 - 1.3 IP Addressing
 - 1.4 Explain ICMP, Ping, Trace route
 - 1.5 Subnetting, VLSM, CIDR
 - 1.6 Perform Exercises on IPv4 Subnetting, VLSM & CIDR
 - 1.7 Describe IPv6 Addressing
- 2 Transport & application protocol
 - 2.1 Explain TCP, UDP and SCTP protocol structures, headers and functionality
 - 2.2 List and explain the operation of different protocols / applications such as DHCP, DNS, NFS, NIS, NTP, HTTP, SNMP, SMTP, Telnet, FTP, TFTP and RTP
- 3 Basic Router Configuration
 - 3.1 Explain Router Internal & external components
 - 3.2 Explain the booting process of the router
 - 3.3 Explain the router modes for the configuration of the router
 - 3.4 Explain the basic commands of the router
 - 3.5 Perform exercises for the basic commands on the router
- 4 Describe Routing Protocols and IP Switching and perform exercises
 - 4.1 Explain Basic Routing Concepts & Types of routing (Dynamic & Static)





- 4.2 Perform Exercises for Static Routing
- 4.3 Explain the Concept of dynamic routing protocol
- 4.4 Explain RIP
- 4.5 Explain OSPF
- 4.6 Explain BGP
- 4.7 Perform Exercises for RIP, OSPF, BGP
- 4.8 Explain ISIS
- 4.9 Perform Exercises on ISIS Routing protocol
- 4.10 Review Function of Switches, ARP & Explain VLANs, Types of Ports, Frame Tagging Types
- 4.11 Explain STP Functions on LAN Switches, different types of port of STP & States of STP
- 4.12 Perform Exercises on STP, STP Ports & STP States

Target audience

The target audience for this course is:

Network Design Engineer, Network Deployment Engineer, System Technician, Service Technician, System Engineer, Service Planning Engineer, Service Design Engineer

Prerequisites

Successful completion of the following courses:

There are no pre-requisites.

Duration and class size

The length of the course is 5 days and the maximum number of participants is **Error! Unknown document property name..**

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	Topics in the course	Estimated Time (Hours)
1	Networking Devices. (Hub, Switches & Routers Function) Explain ARP, CSMA/CD, and Transmission Types	1.5
	OSI Model Vs. TCP/IP Suite	1
	IP Addressing IPv4	1
	Explain ICMP, Ping, Trace route	0.5
	Explain Subnetting, VLSM, CIDR	1
	Perform Exercises on IPv4 Subnetting, VLSM & CIDR	0.5
	Describe IPv6 Addressing	0.5
2	Explain TCP, UDP and SCTP protocol structures, headers and functionality	2.0
	List and explain the operation of different protocols / applications such as DHCP, DNS, NFS, NIS, NTP, HTTP, SNMP, SMTP, Telnet, FTP, TFTP and RTP	2.0
	Explain and perform exercises about ARP	2.0
3	Explain Router Internal & external components	0.5
	Explain the booting process of the router	0.5
	Explain the router modes for the configuration of the router	0.5
	Explain the basic commands of the router	1
	Perform exercises for the basic commands on the router	2
	Explain Basic Routing Concepts & Types of routing (Dynamic & Static)	1
	Perform Exercises for Static Routing	0.5

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4	Explain the Concept of dynamic routing protocol	0.5
	Explain RIP	0.5
	Explain OSPF	1.5
	Explain BGP	1.5
	Perform Exercises for RIP, OSPF, BGP	2.0
5	Explain ISIS	1
	Perform Exercises on ISIS Routing protocol	0.5
	Review Function of Switches, ARP & Explain VLANS, Types of Ports, Frame Tagging Types	1
	Explain STP Functions on LAN Switches, different types of port of STP & States of STP	1.5
	Perform Exercises on STP, STP Ports & STP States	2



IP Overview & Fundamentals



LZU 108 8538 R1A

Description

This course contains of two parts: Overview and Fundamentals. Both ends with knowledge assessments.

The first part gives an introduction into IP. It gives a short historic perspective. It explains the business drivers behind IP, how the networks are evolving to "all-IP", and how IP packet networks are different from circuit based telephony networks.

The second part is made for people who want more technical detail. Fundamentals presents the main concepts behind the IP protocol.

Learning objectives

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

- 1 Learn about the business drivers for IP
- 2 Learn about the historical background
- 3 Learn about how the industry is going towards all-IP
- 4 Learn about packet switching versus circuit switching
- 5 Understand what is TCP/IP
- 6 Know the IPv4 Packet Structure
- 7 Know the IPv4 Address Schema
- 8 Know about classless IP addressing
- 9 Learn about the life of an IP Packet

Target audience

The target audience for this course is:

Fundamentals





Prerequisites

Successful completion of the following courses:

There are no prerequisites for this course

Duration and class size

The length of the course is 1.25 hours

Learning situation

This is a self-paced web-based course

Time schedule

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

Day	Topics in the course	Estimated Time (hours)
1	Business drivers for IP Historical background of IP How is the industry going towards all-IP? Packet switching versus circuit switching approach What is IP? What id TCP/IP? OSI Model IPv4 Package structure 32-bit address scheme of IPv4 IP addressing	

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IP Routing Overview & Fundamentals



LZU 108 8593 R1A

Description

This course consists of two modules, IP Routing Overview and IP Routing Fundamentals. The IP Routing Overview module describes what IP Routing is, why we use it and how it works. It describes the different types of routing available. It also describes the difference between switching and routing

The IP Routing Fundamentals module describes how IP packets are transmitted in an IP network. Provides information about how Routing Table is populated with route data. The purpose and main functionalities of Dynamic Routing protocols. It also presents techniques to reduce the size of Routing Tables

Learning objectives

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

- 1 Know the basics of IP routing
- 2 Describe how IP addresses and subnet masks used
- 3 Understand the differences between routing and switching
- 4 Know what routers and routing tables are
- 5 Compare static versus dynamic routing protocols
- 6 Understand the difference between interior and exterior routing protocols
- 7 Describe what IP routing is
- 8 Understand how IP packets are transmitted
- 9 Know the purpose and main characteristics of dynamic routing protocols
- 10 Compare Distance Vector and Link State Advertisement routing protocols
- 11 Understand the function of a Default Gateway router
- 12 Define what is Route summarization
- 13 Tell how does Administrative Distance influence route selection
- 14 Describe the importance of Convergence Time



**Target audience**

The target audience for this course is:
Fundamentals

Prerequisites

Successful completion of the following courses:

IP Overview & Fundamentals LZU 108 8538

Duration and class size

The length of the course is appr. 0.77 hour.

Learning situation

This is a self-paced web based course

Time schedule

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

Day	Topics in the course	Estimated Time (hours)
1	What is IP Routing IP addressing Routing and Switching Routers and Routing Tables Static versus Dynamic Routing Protocols Interior versus Exterior Routing Protocols Packet Transmission Routing Protocols Default Gateways Summarization Administrative Distance Convergence Time	

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Router 6000 R17 Product Overview



LZU1082487 R1A

Description

This course describes the Ericsson Router 6000 and its use cases, services, features and architecture. Course covers the logical and functional aspects of the hardware and software. It includes a brief overview of the hardware architecture.

Learning objectives

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

- 15 Explain Hardware Architecture
 - 15.1 Discuss Router 6000
- 16 Explain Ericsson IP Operating System Architecture
 - 16.1 Define Contexts
 - 16.2 Recall Interfaces
 - 16.3 Define Ports Functionality
 - 16.4 Describe Circuits Roles
- 17 Explain Use Cases
 - 17.1 Underline Layer 3 Solutions
 - 17.2 Underline Layer 2 Solutions
 - 17.3 Indicate Router 6000 in Other Ericsson Solutions and Products
 - 17.4 Discuss Mobile Backhaul Services
 - 17.5 Relate Converged Networking Solution
- 18 Demonstrate Features
 - 18.1 Relate Link Aggregation Groups with Router 6000
 - 18.2 Discuss Cross-Connections
 - 18.3 Explain Bridges
 - 18.4 Describe IP Routing Concepts
 - 18.5 Relate Routing Protocol Support
 - 18.6 Explain MPLS Networking
- 19 List User Interface
 - 19.1 Use the CLI

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Target audience

The target audience for this course is:

Service Planning Engineer, Service Design Engineer, Network Design Engineer, Network Deployment Engineer, Service Deployment Engineer, System Technician, Service Technician, System Engineer, Service Engineer

Prerequisites

Successful completion of the following courses:

IP Networking, LZU102397

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	Topics in the course	Estimated Time (hours)
1	Explain Hardware Architecture	1.0
	Explain Ericsson IP Operating System Architecture	1.0
	Explain Use Cases	1.5
	Demonstrate Features	1.5
	List User Interface	1.0

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Router 6000 R17 Operation and Maintenance



LZU1082486 R1A

Description

This course introduces the main tasks for system operation and maintenance of the Ericsson Router 6000 Family. It includes Router 6000 platform and the main available features. It shows how to identify hardware and software components, failures, alarms and how to perform software upgrades. Hands-on exercises allow participants to work with the Router 6000 CLI focusing on operations and maintenance related commands and tools.

This course module also describes administration and security functions on the Ericsson Router 6000 system. Several features related to system level administration and security are presented both in theory and using hands-on exercises.

Learning objectives

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

- 1 Router 6000 Fundamental Concepts
 - 1.1 Describe the Router 6000 Overview
 - 1.2 Explain the features and its function
 - 1.3 Describe the HW and SW Architecture Overview
 - 1.4 Describe the Use-Cases of Router 6000
- 2 Key Concepts in Router 6000 IPOS Environment
 - 2.1 Explain the terminologies such as context, interface and bindings architecture
 - 2.2 Discuss the IPOS Command Line Interface
 - 2.3 Configure contexts, move between contexts and recognize where you are in the CLI
 - 2.4 Work with interfaces, ports, circuits and bindings and verify their status
- 3 File and configuration management in Router 6000
 - 3.1 Describe the Managing Configuration file in Router 6000
 - 3.2 Discuss the File Storage Organization and Configuration Files
 - 3.3 Explain the active configuration and the transaction database
 - 3.4 Explain the Managing of Configuration Files
 - 3.5 Explain boot configuration and how to reset to default configuration
 - 3.6 Explain concept of auto-configuration
- 4 Ericsson IPOS Software structure, management and licensing
 - 4.1 Explain Ericsson IPOS structure
 - 4.2 Discuss Router 6000 software packages and licensing
 - 4.3 Explain the release upgrade procedure of Ericsson IPOS





- 4.4 Ericsson IPOS roll-back procedure
- 4.5 Restore System to Previous Image
- 5 Router 6000 system level operation concepts
 - 5.1 Describe router 6000 hardware components
 - 5.2 Verify router 6000 hardware components status
 - 5.3 Verify hardware diagnostics
 - 5.4 Describe IPOS software structure and processes
 - 5.5 Manipulate processes and use Core Dumps
- 6 Router 6000 system security concepts
 - 6.1 Explain administrative access
 - 6.2 Describe the Privilege Levels
 - 6.3 Explain the concept of Services
 - 6.4 Describe the concept and types of ACLs
 - 6.5 Describe administrator local and remote AAA using TACACS+/RADIUS
 - 6.6 Understand password recovery
 - 6.7 Discuss the Reset of Administrator Password
- 7 Router 6000 system troubleshooting
 - 7.1 Describe CLI troubleshooting tools (GREG, EMACS, reg-exp, alias, macro)
 - 7.2 Understand the Router 6000 system debug structure
 - 7.3 Identify the Router 6000 debug process
 - 7.4 Explain system logs and syslog
 - 7.5 Describe connectivity and traffic troubleshooting (port, interface and binding states, traffic statistics, errors, debug)
 - 7.6 Explain traffic mirroring

Target audience

The target audience for this course is:

Service Planning Engineer, Service Design Engineer, Network Design Engineer, Network Deployment Engineer, Service Deployment Engineer, System Technician, Service Technician, System Engineer, Service Engineer

Prerequisites

Successful completion of the following courses:

Router 6000 R17 Product Overview, LZU1082487
IP Overview, LZU1088083
IP Fundamentals, LZU1088094

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**Duration and class size**

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

Learning situation

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

Time schedule

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

Day	Topics in the course	Estimated Time (hours)
1	Router 6000 Fundamental Concepts <ul style="list-style-type: none"> Router 6000 Overview Router 6000 features and its function Hardware and Software Architecture Overview Use-Cases of Router 6000 	1
	Key Concepts in Router 6000 IPOS Environment <ul style="list-style-type: none"> Terminologies: context, interface and bindings architecture IPOS Command Line Interface 	1.5
	Exercise: Configure contexts, move between contexts and recognize where you are in the CLI	1
	Exercise: Work with interfaces, ports, circuits and bindings and verify their status	1
	Configuration file management in Router 6000	0.5
	Active configuration and the transaction database	0.5
	Boot configuration and how to reset to default configuration	0.5
2	Concept of auto-configuration	0.5
	Exercise: Configuration file management	1

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2	Ericsson IPOS Software structure, management and licensing	-
	Ericsson IPOS structure	0.5
	Router 6000 software packages and licensing	0.5
	Release upgrade procedure of Ericsson IPOS	0.5
	IPOS roll-back procedure	0.5
	Exercise: Software upgrade	1
	Router 6000 system level operation concepts	-
	Router 6000 hardware components <ul style="list-style-type: none"> • Hardware status • Hardware diagnostics 	0.5
	Exercise: Router 6000 hardware	0.5
	IPOS software structure and processes <ul style="list-style-type: none"> • Manipulate processes and use Core Dumps 	0.5
	Exercise: processes	0.5
3	Router 6000 system security concepts	-
	Administrative access	0.5
	Privilege Levels Command privileges	0.5
	Exercises: administrative access and privileges	0.5
	The concept of Services	0.5
	Exercises: services	0.5
	The concept and types of ACLs	0.5
	Exercises: Admin ACLs	0.5
	Administrator local and remote AAA using TACACS+/RADIUS	0.5
	Exercises: Admin AAA using TACACS+	0.5

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3	Password recovery	0.25
	Exercises: password recovery and system default	0.25
4	Router 6000 system troubleshooting	-
	CLI troubleshooting tools (GREP, EMACS, reg-exp, alias, macro)	0.5
	Exercises: CLI troubleshooting tools	1
	Router 6000 debug process	0.5
	Exercises: Debug	0.5
	System logs and syslog	0.5
	Exercises: System logs and syslog	0.5
	Connectivity and traffic troubleshooting	0.5
	Exercises: Connectivity and traffic troubleshooting	0.5
	Traffic mirroring	0.5
	Exercise: port mirroring	0.5

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Exercises for IP Routing and MPLS VPN on Router 6000



LZU1082337 R2A

Description

This course covers hands-on configuration for IP Routing and MPLS VPN on Router 6000. It provides multiple configuration tasks as well as verification and troubleshooting commands.

Theory to hands-on ratio of this course is 20/80

Learning objectives

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

- 1 Demonstrate IP connectivity and IP routing in Router 6000 platform
 - 1.1 Build an IP topology
 - 1.2 Configure and verify routes
 - 1.3 Configure and verify IP routing (OSPF / IS-IS)
 - 1.4 Display and explain IP routing tables
- 2 Explain IP/MPLS operation in Router 6000 platform
 - 2.1 Build a topology for MPLS exercises
 - 2.2 Configure and verify MPLS and LDP (Outer Label)
 - 2.3 Perform End to End Packet Flow Walk Through Verification
 - 2.4 Configure Label Distribution – LDP and LSP setup
 - 2.5 Configure IBGP for VPN signaling
 - 2.6 Configure and verify VPN
 - 2.7 Configure and verify CE
 - 2.8 Demonstrate end to end packet flow walk through
- 3 Discuss L3VPN, L2VPN and RSVP concept and configuration in Router 6000
 - 3.1 Describe L2VPN
 - 3.2 Configure and verify L2VPN VPWS in Router 6000
 - 3.3 Describe RSVP
 - 3.4 Configure and verify RSVP in Router 6000

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Target audience

The target audience for this course is:

Network Design Engineer, Network Deployment Engineer, System Engineer, Service Engineer

Prerequisites

Successful completion of the following courses:

IP Networking, LZU102397

Router 6000 R16 Product Overview, LZU1082340

Router 6000 R16 Operation and Maintenance, LZU1082339

MPLS Fundamentals

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 technical environment using equipment and tools.

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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 (hours)
1	MPLS L3VPN Fundamentals	1
	MPLS L3VPN operations in Router 6000	0.5
	Building IP topology for MPLS	0.5
	Configure and verify IGP	0.5
	Configure and verify MPLS and LDP	0.5
	Configure and verify I-BGP for L3VPN signaling	0.5
	Configure and verify L3VPN	0.5
	Configure and verify CE	1.0
	End to End packet walk through	1.0
2	Configure and verify second L3VPN	1.5
	Configure and verify Multi-site corporate L3VPN network	1.5
	Concepts of L2VPN	0.5
	Configuring and verify L2VPN in Router 6000	1.0
	Concepts of RSVP	0.5
	Configuring and verify RSVP on Router 6000	0.5

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Exercises for QoS on Router 6000



LZU1082485 R1A

Description

This course module covers fundamentals of Quality of Service on Ericsson Router 6000 product family. It provides multiple configuration tasks based on Ericsson IPOS, as well as verification and troubleshooting.

Learning objectives

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

- 1 Discuss QoS handling in the system
 - 1.1 Describe QoS overview
 - 1.2 Explain the QoS blocks
 - 1.3 Identify the QoS packet flow
 - 1.4 Identify QoS deployment for Router 6000
- 2 Describe QoS propagation
 - 2.1 Explain QoS indicators
 - 2.2 Identify different types of propagation
 - 2.3 Configure and verify IP QoS propagation
- 3 Discuss QoS Classification and Marking
 - 3.1 Configure and verify classification using ACLs
 - 3.2 Configure and verify internal QoS marking
- 4 Explain Rate limiting
 - 4.1 Describe Token Bucket concept
 - 4.2 Configure and verify QoS policy policing/metering with classes
- 5 Explain the concept of queuing
 - 5.1 Configure and verify QoS Queue-map
- 6 Discuss QoS Scheduling
 - 6.1 Configure and verify scheduling, Priority Weighted Fair Queuing (PWFQ)
- 7 Describe Congestion Management
 - 7.1 Configure and verify congestion avoidance – Weighted Random Early Discard (WRED)
- 8 Identify concept of Hierarchical QoS
 - 8.1 Compare H-QoS and flat QoS
 - 8.2 Configure and verify H-QoS

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Target audience

The target audience for this course is:

Service Planning Engineer, Service Design Engineer, Network Design Engineer, Network Deployment Engineer, Service Deployment Engineer, System Technician, Service Technician, System Engineer, Service Engineer

Prerequisites

Successful completion of the following courses:

Router 6000 R17 Product Overview - LZU1082487

Router 6000 R17 Operation and Maintenance - LZU1082486

IP-QoS Overview & Fundamentals, LZU1088528

Duration and class size

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

Learning situation

Service Planning Engineer, Service Design Engineer, Network Design Engineer, Network Deployment Engineer, Service Deployment Engineer, System Technician, Service Engineer

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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 (hours)
1	QoS overview	0.5
	Introducing QoS on platform	0.5
	LAB environment and QoS topology	1.0
	QoS propagation introduction	0.5
	Configure and verify IP QoS propagation	1.0
	QoS classification and marking introduction	0.5
	Configure and verify classification and marking	1.0
	QoS Rate limiting	0.5
	Configure and verify rate limiting	1.0
2	Introduction to Queuing and Queue-mapping	0.5
	Configure and verify queue-mapping	0.5
	Introduction to scheduling and Priority Weighted Fair Queuing (PWFQ)	0.5
	Configure and verify PWFQ	1.0
	Introduction to congestion avoidance – Weighted Random Early Discard (WRED) Configure and verify RED	0.5
	Hierarchical Scheduling	2.0
	Configure and verify PWFQ - Hierarchical Scheduling	1.0

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Exercises for Sync on Router 6000



LZU1082338 R2A

Description

This course covers timing and synchronization features of the Ericsson Router 6000 Family. It includes Synchronous Ethernet and IEEE 1588 concepts. The participants will perform multiple hands-on configuration and verification exercises for these features.

Learning objectives

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

- 1 Identify overview of timing and synchronization
 - 1.1 Explain timing and synchronization general concepts and protocols
 - 1.2 Describe timing features in Router 6000
- 2 Explain Synchronous Ethernet on Router 6000
 - 2.1 Describe Synchronous Ethernet concept and support on Router 6000
 - 2.2 Configure and verify SyncE on Router 6000
- 3 Explain IEEE 1588 PTP on Router 6000
 - 3.1 Describe the purpose and concept of IEEE 1588
 - 3.2 Configure and verify PTP on Router 6000

Target audience

The target audience for this course is:

Service Planning Engineer, Service Design Engineer, Network Design Engineer, Network Deployment Engineer, Service Deployment Engineer, System Technician, Service Engineer

Prerequisites

Successful completion of the following courses:

Router 6000 R17 Product Overview, LZU1082487

Router 6000 R17 Operation and Maintenance, LZU1082486





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 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 (hours)
1	Timing and Synchronization general concepts	1
	Synchronization on Router 6000	0.5
	Synchronous Ethernet – SyncE	0.5
	SyncE on Router 6672	0.5
	Exercise: SyncE	2.5
2	Precision Time Protocol (PTP) – IEEE 1588	0.5
	Exercise: PTP G8265.1	2
	PTP G.8275.1 Profile	0.5
	Exercise: PTP G8275.1, Part1: Single clock source	1.5
	Exercise: PTP G8275.1, Part 2: Multiple clock sources	1.5
	Exercise: PTP 1588v2 default profile	0.5

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Exercises for IP Multicast on Router 6000



LZU1082483 R1A

Description

This course module covers Fundamentals as well as hands-on configuration for IPv4 Multicast on Router 6000. It provides multiple configuration tasks as well as verification and troubleshooting commands.

Theory to hands-on ratio of this course is 30/70

Learning objectives

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

- 1 Define IP Multicast fundamentals
 - 1.1 Explain IP Multicast
 - 1.2 Explain IGMP
 - 1.3 Explain PIM
 - 1.4 Explain SSM
 - 1.5 Explain MSDP and Anycast RP
- 2 Demonstrate Operation and Configuration IP Multicast on Router 6000
 - 2.1 Configure IGMP for IPv4 Traffic
 - 2.2 Configure an IGMP Service Profile
 - 2.3 Configure IGMP Query Control
 - 2.4 Enable SSM Mapping on an IGMP Service Profile
 - 2.5 Configure PIM-SM
 - 2.6 Enable SSM for PIM
 - 2.7 Configure PIM Dual Join Mode
 - 2.8 Explain IP Multicast Manager
 - 2.9 Manage IGMP Operations
 - 2.10 Manage PIM Process





Target audience

The target audience for this course is:

Service Planning Engineer, Service Design Engineer, Network Design Engineer, Network Deployment Engineer, Service Deployment Engineer, System Technician, Service Technician, System Engineer, Service Engineer

Prerequisites

Successful completion of the following courses:

IP Networking, LZU102397

Router 6000 R17 Product Overview, LZU1082487

Duration and class size

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

Learning situation

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

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 (hours)
1	Define IP Multicast fundamentals (Theory) <ul style="list-style-type: none">• IP Multicast• IGMP• PIM• SSM• MSDP• Anycast RP	1.5
	Configure IGMP for IPv4 Traffic Manage IGMP Operations	1.5

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Configure PIM-SM Enable SSM for PIM	1
Configure PIM Dual Join Mode	0.5
Explain IP Multicast Manager	0.5
Manage PIM Process	0.5



Exercises for IPsec VPN on Router 6000



LZU1082484 R1A

Description

This course module covers hands-on configuration for IPsec VPN on Router 6000. It provides multiple configuration tasks as well as verification and troubleshooting commands.

Theory to hands-on ratio of this course is 20/80

Learning objectives

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

- 1 Define IPsec VPN fundamentals
 - 1.1 Explain IPsec VPNs
- 2 Demonstrate use of IPsec VPN
 - 2.1 Configure Interfaces for an IPsec VPN in a Security-Enabled Routing Context
 - 2.2 Configure IKEv2 Proposals
 - 2.3 Configure IKEv2 Policies
 - 2.4 Configure IPsec Proposals
 - 2.5 Configure IPsec Policies
 - 2.6 Configure IPsec ACLs
 - 2.7 Configure a Static Auto key IPsec Tunnel Endpoint
 - 2.8 Router Configuration at End A of an IPsec Tunnel
 - 2.9 Router Configuration at End B of an IPsec Tunnel
 - 2.10 Clear IPsec VPN SA Clearing Commands

Target audience

The target audience for this course is:

Service Planning Engineer, Service Design Engineer, Network Design Engineer, Network Deployment Engineer, Service Deployment Engineer, System Technician, Service Technician, System Engineer, Service Engineer





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Learning situation

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Time schedule

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Day	Topics in the course	Estimated Time (hours)
1	Define IPsec VPN fundamentals (Theory) <ul style="list-style-type: none">• IPsec fundamentals• Authentication Header (AH)• IPsec Operation Mode• AH Transport Mode• AH Tunnel Mode• Encapsulating Security Payload - ESP• ESP Transport Mode• ESP Tunnel Mode• Security Association (SA)• IKE protocol	1.5
	Configure interfaces for IPsec	1
	Configure IKEv2 and IPsec Proposals	0.5
	Configure IKEv2 and IPsec Policies	0.5

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	Configure IPsec ACLs	0.5
	Configure a Static Auto key IPsec Tunnel Endpoint	0.5
	Router Configuration at Ends of an IPsec Tunnel	1
	Clear IPsec VPN SA Clearing Commands	0.5