Deploying Eltex ESR Routers (basic level) v.1

Course Duration: 40 academic hours (5 days)

Target Audience:

- System administrators;
- Technical and engineering service specialists;
- Maintenance and technical Support engineers;
- Network software developers.

Course Pre-requisites:

- Knowledge of basic information technologies;
- Knowledge of the TCP/IP protocol stack and the OSI model;
- Knowledge of protocols and their roles in computer networks;
- Understanding of the differences in operation of network devices (switch, router);
- Knowledge of the following concepts: IP address, MAC address, subnet mask and prefix, VLAN, Trunk, and Access;
- Knowledge of cable and connector types;
- Understanding of subnetting and IP network summarization.

Upon completion of the course, the participants will:

Be able to:

- configure equipment via command line interface (CLI);
- configure the RIP dynamic routing protocol;
- configure IP services: DNS, DHCP, NAT, and NTP;
- configure router access protection;
- configure syslog, backup, and configuration recovery;
- update router firmware.

Have the knowledge of:

- switching and routing operation principles;
- VLAN, TRUNK, ICMP, ARP operation principles;
- ESR firewall operation principles;
- principles of static and dynamic routing;
- methods of backup and configuration recovery.

Acquire the following skills:

- skills in working with the command line, router configuration and firmware;
- skills in configuring router network interfaces;
- skills in configuring a router for a small network;
- skills in troubleshooting.

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Curriculum

"Deploying Eltex ESR Routers (basic level) v.1"

Activity	Description	Time
Topic:	**1. Product Line Overview.**	**3 hours**
Description:	1.1. Router models. 1.1.1. Specifications. 1.1.2. Functional capabilities. 1.2. Router hardware structure. 1.2.1. Hardware design. 1.2.2. Methods of access to the network device. 1.2.3. Connecting the router. 1.2.4. Router boot process. 1.3. Command line. 1.3.1. Mode hierarchy. 1.3.2. Switching between modes. 1.3.3. Command structure. 1.3.4. Command line help. 1.3.4.1. Contextual help. 1.3.4.2. Syntax check. 1.3.4.3. Hotkeys. 1.3.5. Commit and confirm mechanism. 1.4. Device identification. 1.4.1. Device name and banner messages. 1.4.2. Date and time configuration.	2 hours
Lab:	1. Introduction to the command line: 1.1. Clear the router. 1.2. Configure device name and banner messages. 1.3. Configure date and time.	1 hour

Activity	Description	Time
Topic:	**2. Data Link Layer Functionality.**	**4 hours**
Description:	2.1. Interface operation modes. 2.1.1. SFP modules. 2.2. Switching. 2.2.1. Switching on a router. 2.2.2. Subscriber router. 2.2.3. Frame structure. 2.2.4. Broadcast domain. 2.3. Virtual Local Area Networks (VLANs). 2.3.1. General information. 2.3.2. Access and Trunk. 2.3.3. MAC-based VLAN. 2.3.4. VLAN diagnostics.	2 hours

	2.4. Link layer discovery protocol. 2.5. LLDP-MED. 2.6. Port Mirroring. 2.7. Port isolation.	
Lab:	2. Configuring data link layer functionality: 2.1. Configure a physical interface in L2 and L3 mode. 2.2. Configure VLAN. 2.3. Configure LLDP. 2.4. Configure SPAN.	2 hours

Activity	Description	Time
Topic:	**3. Interfaces.**	**3 hours**
Description:	3.1. Logical interfaces. 3.1.1. Loopback. 3.1.2. Sub. 3.1.3. Q-in-Q. 3.1.4. Bridge. 3.1.5. Port-channel. 3.2. Pluggable interfaces. 3.2.1. USB modem. 3.2.2. E1. 3.3. Interface diagnostics.	2 hours
Lab:	3. Configuring interfaces: 3.1. Configure loopback, sub, and q-in-q interfaces. 3.2. Configure bridge. 3.3. Interface diagnostics.	1 hour

Activity	Description	Time
Topic:	**4. Network Layer Functionality.**	**4 hours**
Description:	4.1. General information. 4.1.1. IP packet structure. 4.1.2. Addressing. 4.1.3. Internet Control Message Protocol (ICMP). 4.1.4. Address Resolution Protocol (ARP). 4.2. Routing table. 4.2.1. Host ARP cache and routing table. 4.2.2. Router ARP cache and routing table. 4.2.3. Routing table entries. 4.2.4. Best route entry selection. 4.2.5. Packet processing order on ESR. 4.3. Packet routing. 4.3.1. Switching and routing.	2 hours

	4.3.2. Sending a packet within a local network. 4.3.3. Sending a packet to another network.	
Lab:	4. Configuring Network Layer functionality: 4.1. Study ICMP and ARP. 4.2. Check ARP cache and routing table.	2 hours

Activity	Description	Time
Topic:	**5. Static and Dynamic Routing.**	**3 hours**
Description:	5.1. Static routes. 5.1.1. Tasks of static and dynamic routing. 5.1.2. Static route syntax. 5.1.3. Types of static routes. 5.2. Dynamic routes. 5.2.1. Dynamic routing protocols. 5.2.2. Components and characteristics. 5.2.3. Classification. 5.3. Distance-vector algorithm. 5.4. Link-state algorithm. 5.5. RIPv2. 5.5.1. Message format. 5.5.2. RIPv2 configuration. 5.5.3. RIPv2 configuration example.	2 hours
Lab:	5. Configuring routing: 5.1. Configure static routes. 5.2. Configure RIPv2.	1 hour

Activity	Description	Time
Topic:	**6. IP Services.**	**4 hours**
Description:	6.1. Domain Name System (DNS). 6.1.1. General information. 6.1.2. DNS hierarchy. 6.1.3. Operating principle. 6.1.4. Types of resource records. 6.1.5. DNS message format. 6.1.6. Configuration commands. 6.1.7. DNS configuration example. 6.2. Dynamic Host Configuration Protocol (DHCP). 6.2.1. DHCP message types. 6.2.2. Operating principle. 6.2.3. DHCP message format. 6.2.4. DHCP client.	2 hours

	6.2.5. DHCP server. 6.2.6. DHCP relay. 6.2.7. DHCP configuration examples. 6.3. Network Address Translation (NAT). 6.3.1. Operating principle. 6.3.2. NAT types. 6.3.3. Source NAT. 6.3.4. Destination NAT. 6.3.5. Static NAT. 6.4. Network Time Protocol (NTP). 6.4.1. Operating principle. 6.4.2. NTP hierarchy. 6.4.3. Operating modes. 6.4.4. NTP message format. 6.4.5. Configuration commands. 6.4.6. NTP configuration example.	
Lab:	6. Configuring IP services: 6.1. Configure DNS. 6.2. Configure DHCP client. 6.3. Configure DHCP server. 6.4. Configure Source NAT. 6.5. Configure Destination NAT. 6.6. Configure NTP.	2 hours

Activity	Description	Time
Topic:	**7. Router Security.**	**4 hours**
Description:	7.1. Authentication, Authorization, and Accounting (AAA). 7.1.1. Users. 7.1.2. Privilege levels. 7.1.3. Password configuration. 7.1.4. User activity accounting. 7.1.5. Console access. 7.2. Connecting to AAA servers. 7.2.1. Connecting to a RADIUS server. 7.2.2. Connecting to a TACACS server. 7.3. ESR firewall. 7.3.1. General information. 7.3.1.1. Security zone-based firewall. 7.3.1.2. Session state tracking firewall. 7.3.1.3. Firewall configuration procedure. 7.3.2. Security zones. 7.3.3. Assigning interfaces to security zones. 7.3.4. Creating object-group lists. 7.3.4.1. Object-group network.	2 hours

	7.3.4.2. Object-group service. 7.3.4.3. Object-group MAC. 7.3.4.4. Object-group application. 7.3.4.5. Object-group URL. 7.3.4.6. Object-group address-port. 7.3.5. Interaction between security zones. 7.3.6. Firewall rules. 7.3.6.1. Parameter matching. 7.3.6.2. Rule processing order. 7.3.6.3. Rule editing. 7.3.6.4. Rule logging. 7.3.7. Diagnostics. 7.3.8. Firewall configuration examples.	
Lab:	7. Configuring router security: 7.1. Create a user. 7.2. Limit privileges. 7.3. Connect ESR to RADIUS. 7.4. Connect ESR to TACACS. 7.5. Configure user activity accounting. 7.6. Configure authentication profile. 7.7. Configure firewall.	2 hours

Activity	Description	Time
Topic:	**8. System Logging and Backup.**	**3 hours**
Description:	8.1. Syslog. 8.1.1. Operating principle. 8.1.2. Syslog message format. 8.1.3. Configuration commands. 8.1.4. Syslog configuration example. 8.2. Backup. 8.2.1. Manual backup. 8.2.1.1. Text capture. 8.2.1.2. Saving a backup copy. 8.2.1.3. Configuration recovery. 8.2.2. Automatic backup. 8.3. Firmware upgrade. 8.4. ECCM overview.	2 hours
Lab:	8. Configuring router maintenance tools: 8.1. Configure syslog. 8.2. Create a backup and restore configuration. 8.3. Configure automatic backup. 8.4. Upgrade router firmware.	1 hour

Activity	Description	Time
Topic:	**9. Troubleshooting.**	**4 hours**
Description:	9.1. Network scaling. 9.1.1. General information. 9.1.2. LAN and WAN topologies. 9.1.3. Network scale. 9.1.4. Hierarchical structure. 9.2. Troubleshooting procedure. 9.2.1. Information collection. 9.2.1.1. Network documentation. 9.2.1.2. Network topology diagrams. 9.2.1.3. Baseline network indicators. 9.2.1.4. Data measurement. 9.2.1.5. End-user survey. 9.2.2. Fault isolation. 9.2.2.1. Using the OSI model. 9.2.2.2. Troubleshooting methods. 9.2.2.3. Troubleshooting tools. 9.2.3. Corrective actions. 9.2.3.1. Physical layer. 9.2.3.2. Data link layer. 9.2.3.3. Network layer. 9.2.3.4. Transport layer. 9.2.3.5. Application layer. 9.3. Troubleshooting IP network connectivity. 9.3.1. Checking the physical layer. 9.3.2. Checking addressing and gateway. 9.3.3. Checking the correct path. 9.3.4. Checking the transport layer. 9.3.5. Checking DNS.	2 hours
Lab:	9. Troubleshooting configuration: 9.1. Find and fix configuration issues.	2 hours

Intermediate testing and final exam: 8 hours
One free-of-charge attempt of certification test is provided within the frameworks of this course. The participant may use this attempt on the last day of the course.
In case the test attempt is unsuccessful, the participant may contact the Commercial Department for purchasing the additional attempt.
The participant may use the paid attempt within one calendar month starting from the data of course completion.

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