+7 (383) 274-48-48, ext. 5158 info@academy.eltex-co.com

Deploying Eltex SMB Wireless Networks (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 the OSI model and the role of protocols in data transmission;
- understanding the fundamentals of switching and routing;
- understanding the core network terms: switch, service router, IP address, MAC address, VLAN, Ethernet Frames, Encapsulation, etc;
- understanding of fundamental network protocols and services (ARP, DNS, DHCP, HTTP, NTP);
- knowledge of networking fundamentals, the TCP/IP stack, Ethernet, and Wi-Fi technologies;
- experience with the command line interface (CLI).

Upon completion of the course, the participants will:

Be able to:

- evaluate the performance of network devices and software;
- read and understand technical documentation for Wi-Fi networks;
- configure network equipment;
- detect and resolve faults;
- select appropriate equipment for deploying Wi-Fi networks.

Have the knowledge of:

- network device installation principles;
- hardware and software configuration stages;
- network device and software troubleshooting;
- Wi-Fi protocols and terminology;
- Wi-Fi roaming standards (802.11r/k/v);
- digital modulation techniques.

Acquire the following:

- skills in configuring network devices;
- skills in deploying Eltex SMB Wireless Networks;
- skills in troubleshooting faults and failures.

Curriculum
"Deploying Eltex SMB Wireless Networks (basic level) v.1"

Activity	Description	Time
Topic:	**1. Fundamentals of Wireless Communications.**	**2 hours**
Description:	1.1. The Shannon-Hartley Theorem. 1.2. The Fresnel Zone. 1.3. Antenna types. 1.4. MIMO (Multiple-Input Multiple-Output) Technology. 1.5. Main Methods of Digital Modulation. 1.6. Modulation and Coding Schemes (MCS Index).	2 hours

Activity	Description	Time
Topic:	**2. Standards and Basic Concepts.**	**2.5 hours**
Description:	2.1. Devices in a wireless network 2.2. BSS и BSA. 2.3. BSSID. 2.4. SSID. 2.5. ESS. 2.6. Mesh. 2.7. Ad hoc. 2.8. Infrastructure Mode. 2.9. WDS.	2.5 hours

Activity	Description	Time
Topic:	**3. Frame Format.**	**2 hours**
Description:	3.1. IEEE 802.11-2020 Frame formats. 3.2. PV0 IEEE 802.11-2020 Frame Header Fields . 3.3. Subfields of the 802.11 Frame Control Field. 3.4. 802.11 Frame Header Fields. 3.5. 802.11 Frame Fragmentation. 3.6. Address Fields in 802.11 Frames. 3.7. Frame Transmission through the Distribution System (DS). 3.8. Frame Transmission in Ad-hoc Mode. 3.9. Frame Transmission in Wireless Bridge Mode (WDS) . 3.10. EEE 802.11 Address Field Values for Different Network Modes. 3.11. The CSMA/CA Method and RTS/CTS Control Frames. 3.12. Beacon frames.	2 hours

Activity	Description	Time
Topic:	**4. Security Methods.**	**1 hour**
Description:	4.1. Security in Wi-Fi networks.	1 hour

Activity	Description	Time
Topic:	**5. Wi-Fi Roaming.**	**2.5 hours**
Description:	5.1. IEEE 802.11k, 802.11v, and 802.11r Standards. 5.2. Authentication Modes. 5.2.1. Open Authentication. 5.2.2. WEP2-PSK Authentication Process. 5.2.3. 802.1X Authentication: Key Agreement Between STA and WLC. 5.2.4. 802.1X Authentication: Key Agreement Between STA and AP. 5.3. 802.11r Fast Transition Standard. 5.4. Roaming Aggressiveness. 5.5. IEEE 802.11k Standard. 5.6. IEEE 802.11v Standard. 5.7. Support for Fast Roaming Standards.	2.5 hours

Activity	Description	Time
Topic:	**6. Fundumentals of Radio Planning.**	**1.5 hours**
Description:	6.1. Channel Bands for 2.4 GHz. Channel selection for Neighboring Access Points. 6.2. Allowed Channels for 2.4 and 5 GHz Bands 6.3. Channel Allocation for Neighboring Access Points in the 2.4 GHz Band using a 20 MHz Channel Width.	1.5 hours

Activity	Description	Time
Topic:	**7. Eltex Wireless Product Portfolio Overview.**	**1 hour**
Description:	7.1. Hardware Overview and Technical Specifications. 7.1.1. Wireless Access Points (APs). 7.1.2. Wireless LAN Controllers (WLCs). 7.1.3. AirTune Service. 7.1.4. Wireless Intrusion Detection and Wireless Prevention Systems.	1 hour

Activity	Description	Time
Topic:	**8. WLC Wireless Access Controllers.**	**1 hour**
Description:	8.1. Controller Features and Technical Specifications. 8.2. Licensing. 8.3. Typical WLC Deployment Topologies.	1 hour

Activity	Description	Time
Topic:	**9. Connecting to the Controller and Command Line Interface.**	**2 hours**
Description:	9.1. Connecting to the Controller. 9.2. Command Line Interface (CLI). 9.3. Context Help. 9.4. Configuration Files. 9.5. Creating and Configuring Users.	2 hours

Activity	Description	Time
Topic:	**10. Configuring Network Interfaces.**	**3 hours**
Description:	10.1. Interface Types. 10.2. Interface Configuration. 10.3. Interface Diagnostics. 10.4.WLC Interface Basic Configuration.	2 hours
Lab:	10.1 Initial Configuring WLC Interfaces.	1 hour

Activity	Description	Time
Topic:	**11. Configuring DHCP, DNS, and NTP.**	**3 hours**
Description:	11.1. Configuring the DHCP Server. 11.2. Configuring the DNS Server. 11.3. Configuring the NTP Server.	2 hours
Lab:	11.1 Configuring DHCP, DNS, NTP on the controller.	1 hour

Activity	Description	Time
Topic:	**12. Configuring the WLC AP Management Module.**	**3 hours**
Description:	12.1. General Principles of Wireless Network Configuration. 12.2. Configuring the RADIUS Profile. 12.3. Configuring the SSID Profile. 12.4. Configuring AP Configuration Profiles. 12.5. Configuring AP Radio Profiles. 12.6. Creating Locations and Defining AP Configuration Rules per Location. 12.7. Defining Subnets for Access Points. 12.8. Configuring the AP Auto-Registration Service on the WLC. 12.9. Commands to Check WLC Status and Operations.	2 hours
Lab:	12.1. Configuring the WLC AP Management Module.	1 hour

Activity	Description	Time
Topic:	**13. Configuring the RADIUS Server.**	**3 hours**
Description:	13.1. RADIUS Protocol Overview and Basic Concepts 13.2. Configuring the Local RADIUS Server. 13.3. Configuring RADIUS Proxying to an External Server.	2 hours
Lab:	13.1. Configuring Enterprise authentication	1 hour

Activity	Description	Time
Topic:	**14. Configuring the Controller for SoftGRE DATA Tunnels.**	**3 hours**
Description:	14.1. Interface Configuration. 14.2. Configuring SoftGRE DATA Tunnels. 14.3. Configuring Automatic SoftGRE Tunnel Establishment. 14.4. Configuring DHCP Options for AP-Initiated Tunnels. 14.5. Configuring the SSID Profile for SoftGRE Tunnel Traffic. 14.6. Configuring Locations to Enable Controller-Initiated SoftGRE Tunnels.	2 hours
Lab:	14.1 Configuring an L3 Scheme with RADIUS Proxying	1 hour

Activity	Description	Time
Topic:	**15. Configuring the AirTune Service.**	**3 hours**
Description:	15.1. Service Overview. 15.2. AirTune Operation Algorithm. 15.3. Configuring the AirTune Service.	2 hours
Lab:	15.1 Configuring the AirTune Service.	1 hour

Activity	Description	Time
Topic:	**16. Software Upgrade.**	**3 hours**
Description:	16.1. WLC Software Upgrade. 16.2. AP Software Upgrade.	2 hours
Lab:	16.1 AP Software Upgrade via WLC.	1 hour

Activity	Description	Time
Topic:	**17. WLC Web Interface Overview.**	**2 hours**
Description:	17.1.WLC Web Interface Overview.	2 hours

Final exam: 1,5 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.