

Datasheet SoftWLC

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General information

SoftWLC is a software Wi-Fi controller that provides a complex solution for organizing guest and service networks. SoftWLC software package combines Wi-Fi access points, access switches and routers manufactured by Eltex into a single product. The package allows configuring and maintaining networks and user services in accordance with a client's requirements.

Key features of SoftWLC

- Automation of access point commissioning
- Providing functions for network elements monitoring: access points, access switches, routers
- Providing functions for network element individual control
- Providing functions for network element group control
- Providing functions for group policies, customer lists, individual/group shapers configuring and other service functions management
- Providing access points' firmware automatic update
- Providing guest portal authorization of Wi-Fi users with different identification methods: incoming SMS, outgoing SMS, voice call, vouchers, preconfigured accounts of mass events participants
- Possibility to create flexible portal scenarios with time or traffic limits for users. Paid scenarios are also available
- Possibility of identification portal to flexibly work on schedule
- Possibility to set up scheduled network operation including password rotation for primary connection to the portal identification network
- Providing Enterprise user authorization with traffic encryption. The identification can be performed with a login/password or with an integrated TLS certificate
- Possibility of "portal" user roaming between access points and user id keeping between sessions
- Providing a graphical provider console for system management and monitoring
- Possibility to deploy a supervisory-level system with some settings and monitoring functions possible to be transferred from a provider to a client in accordance with B2B
- Providing enterprise clients of the provider with B2B Admin Panel graphical interface that comprises basic elements for obtaining network operation statistics and tools for Wi-Fi users' accounts management
- Providing GUI for setting guest portals for enterprise clients (in accordance with B2B), that includes basic elements for design, identification options and other features
- Providing service interface (Northbound) for system settings automation and connection with the provider's or its B2B clients' OSS
- Controller redundancy in active/standby mode

Main SoftWLC modules and their functions

- **EMS server**
 - management and monitoring of other modules of the system
 - receiving and processing of SNMP traps sent by system components
 - device initialization and configuration
 - performing group operations with devices
 - notification on failures occurred
 - scheduled activation of monitors controlling the proper operation of the system
 - providing Graphical User Interface (GUI)
 - monitoring with saving data to a Round-Robin Database (RRD)
- **WEB portal**
 - an application providing a set of WEB portals for user authorization in Hotspot networks
- **Portal Constructor**
 - a tool that allows creating and configuring virtual portals for user authorization in Hotspot networks
- **B2B Admin Panel**
 - providing interface for new Wi-Fi users' accounts creation and basic service management operations
- **Database**
 - MySQL
 - MongoDB
- **RADIUS server**
 - AAA operations
 - WPA-Enterprise authorization
- **DHCP Server**
 - assigning primary (external) IP addresses to access points with option 43 (suboptions 11 and 12) that allows creating GRE tunnels to ESR
 - assigning secondary (management, tunnel) IP addresses to access points with option 43 (suboptions 10 and 13) for management, detection and automatic initialization of access points
 - assigning IP addresses to Wi-Fi users connected to access points
 - classification of DHCP clients by 82, 60 options and giAddr Field

- **APB service**
 - roaming of users authorized via WEB portal
 - configuration and transmission of public IP address lists for portal authorization
- **Notification Gateway**
 - centralized interchange between platform elements and external systems (SMS gateways, Call centers and E-mail servers) via SMTP, SMPP, HTTP, WebSocket
- **PCRF**
 - authorization and authentication of users connected via BRAS (a server which allows providing user service based on third-party vendors' access points)
 - accounting information collection for all authorization mechanisms and transferring it to a database
 - controlling the number of Wi-Fi users' simultaneous sessions for all authorization mechanisms
 - deauthentication of Wi-Fi users authorized via WPA-enterprise modes and BRAS
- **Airtune**
 - management of access points radio resources
- **NBI**
 - connection between SoftWLC components via the SOAP protocol
 - service operation maintenance
 - Customer Cab
 - Portal Constructor
 - PCRF
 - generation of TLS authorization certificates

SoftWLC technologies:

- equipment management and monitoring
 - SNMP
 - ICMP
- user authorization
 - portal authorization on Eltex access points
 - EAP authorization (WPA2 enterprise) on the RADIUS server
 - portal authorization on third- party access points (BRAS + PCRF)
- Roaming
 - portal user roaming on Eltex access points
- Integration with external systems
 - SMS gateways
 - SMSC gateway
 - GSM gateways (NetPing SMS)
 - Active Directory
 - Hot-WiFi

Compliance of used technologies (protocols) with standards and specifications:

- EAP (WPA2)
 - IEEE 802.11i (Wi-Fi Protected Access II, defines security mechanisms for wireless networks)
 - AES (encryption standard)
 - RFC 3748
- SNMP
 - defined as a component of TCP/IP by the IETF
 - RFC 1157
- ICMP
 - an Internet standard (included in the STD 5 standard)
 - RFC 792
- RADIUS
 - RFC 2866 RADIUS Accounting
- RRM
 - IEEE 802.11h – Dynamic Channel Selection and Transmission Power Control for wireless local area networks
 - IEEE 802.11k – RRM for wireless local area networks
- SMTP
 - RFC 5321
- HTTP
 - RFC 2616
- WebSocket
 - RFC 6455
- Roaming is carried out in accordance with IEEE 802.11r standard

System requirements for SoftWLC server

- Operation systems: **Ubuntu Server 18.04 LTS / Astra Linux Common Edition 2.12.44 / Debian 9 / Astra Linux Special Edition 1.7.1**

When selecting a server, the following system requirements must be taken into account (*requirements are provided for the VM without taking into account system redundancy*):

Number of devices	VM name	CPU core, Xeon	RAM, GB	HDD, GB
10 – 200 APs	SoftWLC	4, 64-bit x86 CPUs	8	200
200 – 500 APs	SoftWLC	4, 64-bit x86 CPUs	16	200
500 – 1000 APs	SoftWLC	6, 64-bit x86 CPUs	12	200
	DataBase	4, 64-bit x86 CPUs	16	200
1000 – 2000 APs	EMS	6, 64-bit x86 CPUs	14	200
	RADIUS	4, 64-bit x86 CPUs	6	100
	WEB Portal	4, 64-bit x86 CPUs	8	40
	MySQL	4, 64-bit x86 CPUs	24	500
	MongoDB	4, 64-bit x86 CPUs	10	200

System requirements for SoftWLC server (multihost installation)

- Operation systems: **Ubuntu Server 18.04 LTS / Astra Linux Common Edition 2.12.44 / Debian 9 / Astra Linux Special Edition 1.7.1**

When selecting a server, the following system requirements must be taken into account (*requirements are provided for the VM taking into account system redundancy*):

Number of devices	VM name	CPU core, Xeon	RAM, GB	HDD, GB	Packages
10 – 200 APs	EMS-1	4, 64-bit x86 CPUs	8	200	tomcat jdk eltex-ems eltex-axis eltex-radius-nbi eltex-radius eltex-pcrf eltex-apb eltex-portal mysql eltex-ems-db eltex-radius-db eltex-auth-service-db eltex-portal-db mongodb isc-dhcp-server eltex-wifi-cab eltex-portal-constructor eltex-ngw
	EMS-2	4, 64-bit x86 CPUs	8	200	tomcat jdk eltex-ems eltex-axis eltex-radius-nbi eltex-radius eltex-pcrf eltex-apb eltex-portal mysql eltex-ems-db eltex-radius-db eltex-auth-service-db eltex-portal-db mongodb isc-dhcp-server eltex-wifi-cab eltex-portal-constructor eltex-ngw
	MongoDB (arbitier)	1, 64-bit x86 CPUs	2	20	mongodb (arbitier)
200 – 500 APs	EMS-1	4, 64-bit x86 CPUs	16	200	tomcat jdk eltex-ems eltex-axis eltex-radius-nbi eltex-radius eltex-pcrf eltex-apb eltex-portal mysql eltex-ems-db eltex-radius-db eltex-auth-service-db eltex-portal-db mongodb isc-dhcp-server eltex-wifi-cab eltex-portal-constructor eltex-ngw

	EMS-2	4, 64-bit x86 CPUs	16	200	tomcat jdk eltex-ems eltex-axis eltex-radius-nbi eltex-radius eltex-pcrf eltex-apb eltex-portal mysql eltex-ems-db eltex-radius-db eltex-auth-service-db eltex-portal-db mongodb isc-dhcp-server eltex-wifi-cab eltex-portal-constructor eltex-ngw
	MongoDB (arbitier)	1, 64-bit x86 CPUs	2	20	mongodb (arbitier)
500 – 1000 APs	EMS-1	6, 64-bit x86 CPUs	12	200	tomcat jdk eltex-ems eltex-axis eltex-radius-nbi eltex-radius eltex-pcrf eltex-apb eltex-portal isc-dhcp-server eltex-wifi-cab eltex-portal-constructor eltex-ngw mongodb (arbitier)
	EMS-2	6, 64-bit x86 CPUs	12	200	tomcat jdk eltex-ems eltex-axis eltex-radius-nbi eltex-radius eltex-pcrf eltex-apb eltex-portal isc-dhcp-server eltex-wifi-cab eltex-portal-constructor eltex-ngw mongodb (arbitier)
	DataBase-1	4, 64-bit x86 CPUs	16	200	mysql eltex-ems-db eltex-radius-db eltex-auth-service-db eltex-portal-db mongodb
	DataBase-2	4, 64-bit x86 CPUs	16	200	mysql eltex-ems-db eltex-radius-db eltex-auth-service-db eltex-portal-db mongodb
1000 – 2000 APs	EMS-1	6, 64-bit x86 CPUs	14	200	tomcat jdk eltex-ems eltex-axis eltex-radius-nbi eltex-wifi-cab eltex-portal-constructor
	EMS-2	6, 64-bit x86 CPUs	14	200	tomcat jdk eltex-ems eltex-axis eltex-radius-nbi eltex-wifi-cab eltex-portal-constructor
	RADIUS-1	4, 64-bit x86 CPUs	6	100	jdk eltex-radius eltex-pcrf isc-dhcp-server

	RADIUS-2	4, 64-bit x86 CPUs	6	100	jdk eltex-radius eltex-pcrf isc-dhcp-server
	WEB-Portal-1	4, 64-bit x86 CPUs	8	40	tomcat jdk eltex-portal eltex-apb
	WEB-Portal-2	4, 64-bit x86 CPUs	8	40	tomcat jdk eltex-portal eltex-apb
	MySQL-1	4, 64-bit x86 CPUs	24	500	mysql jdk eltex-ems-db eltex-radius-db eltex-auth-service-db eltex-portal-db
	MySQL-2	4, 64-bit x86 CPUs	24	500	mysql jdk eltex-ems-db eltex-radius-db eltex-auth-service-db eltex-portal-db mongodb (arbiter)
	MongoDB-1	4, 64-bit x86 CPUs	10	200	mongodb
	MongoDB-2	4, 64-bit x86 CPUs	10	200	mongodb
	MongoDB-3 (arbiter)	4, 64-bit x86 CPUs	10	200	mongodb (arbiter)
2000 – 3000 APs	EMS-1	6, 64-bit x86 CPUs	18	200	tomcat jdk eltex-ems
	EMS-2	6, 64-bit x86 CPUs	18	200	tomcat jdk eltex-ems
	NBI-1	2, 64-bit x86 CPUs	4	40	tomcat jdk eltex-axis eltex-radius-nbi
	NBI-2	2, 64-bit x86 CPUs	4	40	tomcat jdk eltex-axis eltex-radius-nbi
	RADIUS-1	4, 64-bit x86 CPUs	8	100	jdk eltex-radius eltex-pcrf isc-dhcp-server
	RADIUS-2	4, 64-bit x86 CPUs	8	100	jdk eltex-radius eltex-pcrf isc-dhcp-server
	WEB-Portal-1	4, 64-bit x86 CPUs	10	40	tomcat jdk eltex-portal eltex-apb
	WEB-Portal-2	4, 64-bit x86 CPUs	10	40	tomcat jdk eltex-portal eltex-apb
	MySQL-1	4, 64-bit x86 CPUs	56	500	mysql jdk eltex-ems-db eltex-radius-db eltex-auth-service-db eltex-portal-db
	MySQL-2	4, 64-bit x86 CPUs	56	500	mysql jdk eltex-ems-db eltex-radius-db eltex-auth-service-db eltex-portal-db
	MongoDB-1	4, 64-bit x86 CPUs	20	200	mongodb

	MongoDB-2	4, 64-bit x86 CPUs	20	200	mongodb
	MongoDB-3 (arbitier)	4, 64-bit x86 CPUs	20	200	mongodb (arbitier)
	WiFi-Cab-1	4, 64-bit x86 CPUs	10	40	tomcat jdk eltex-wifi-cab eltex-portal-constructor
	WiFi-Cab-2	4, 64-bit x86 CPUs	10	40	tomcat jdk eltex-wifi-cab eltex-portal-constructor
3000 – 4000 APs	EMS-1	8, 64-bit x86 CPUs	20	200	tomcat jdk eltex-ems
	EMS-2	8, 64-bit x86 CPUs	20	200	tomcat jdk eltex-ems
	NBI-1	2, 64-bit x86 CPUs	4	40	tomcat jdk eltex-axis eltex-radius-nbi
	NBI-2	2, 64-bit x86 CPUs	4	40	tomcat jdk eltex-axis eltex-radius-nbi
	RADIUS-1	4, 64-bit x86 CPUs	8	100	jdk eltex-radius eltex-pcrf
	RADIUS-2	4, 64-bit x86 CPUs	8	100	jdk eltex-radius eltex-pcrf
	APB-1	4, 64-bit x86 CPUs	10	40	jdk eltex-apb
	APB-2	4, 64-bit x86 CPUs	10	40	jdk eltex-apb
	WEB-Portal-1	4, 64-bit x86 CPUs	10	40	tomcat jdk eltex-portal
	WEB-Portal-2	4, 64-bit x86 CPUs	10	40	tomcat jdk eltex-portal
	MySQL-1	4, 64-bit x86 CPUs	64	500	mysql jdk eltex-ems-db eltex-radius-db eltex-auth-service-db eltex-portal-db
	MySQL-2	4, 64-bit x86 CPUs	64	500	mysql jdk eltex-ems-db eltex-radius-db eltex-auth-service-db eltex-portal-db
	MongoDB-1	4, 64-bit x86 CPUs	24	200	mongodb
	MongoDB-2	4, 64-bit x86 CPUs	24	200	mongodb
	MongoDB-3 (arbitier)	4, 64-bit x86 CPUs	24	200	mongodb (arbitier)
	DHCP-1	2, 64-bit x86 CPUs	4	40	isc-dhcp-server
	DHCP-2	2, 64-bit x86 CPUs	4	40	isc-dhcp-server
	WiFi-Cab-1	4, 64-bit x86 CPUs	12	40	tomcat jdk eltex-wifi-cab eltex-portal-constructor
	WiFi-Cab-2	4, 64-bit x86 CPUs	12	40	tomcat jdk eltex-wifi-cab eltex-portal-constructor

4000 – 5000 APs	EMS-1	8, 64-bit x86 CPUs	24	200	tomcat jdk tex-ems
	EMS-2	8, 64-bit x86 CPUs	24	200	tomcat jdk eltex-ems
	NBI-1	2, 64-bit x86 CPUs	4	40	tomcat jdk eltex-axis eltex-radius-nbi
	NBI-2	2, 64-bit x86 CPUs	4	40	tomcat jdk eltex-axis eltex-radius-nbi
	NBI-3	2, 64-bit x86 CPUs	4	40	tomcat jdk eltex-axis eltex-radius-nbi
	NBI-4	2, 64-bit x86 CPUs	4	40	tomcat jdk eltex-axis eltex-radius-nbi
	RADIUS-1	4, 64-bit x86 CPUs	8	100	jdk eltex-radius eltex-pcrf
	RADIUS-2	4, 64-bit x86 CPUs	8	100	jdk eltex-radius eltex-pcrf
	APB-1	4, 64-bit x86 CPUs	12	40	jdk eltex-apb
	APB-2	4, 64-bit x86 CPUs	12	40	jdk eltex-apb
	WEB-Portal-1	4, 64-bit x86 CPUs	12	40	tomcat jdk eltex-portal
	WEB-Portal-2	4, 64-bit x86 CPUs	12	40	tomcat jdk eltex-portal
	MySQL-1	4, 64-bit x86 CPUs	64	500	mysql jdk eltex-ems-db eltex-radius-db eltex-auth-service-db eltex-portal-db
	MySQL-2	4, 64-bit x86 CPUs	64	500	mysql jdk eltex-ems-db eltex-radius-db eltex-auth-service-db eltex-portal-db
	MongoDB-1	4, 64-bit x86 CPUs	32	200	mongodb
	MongoDB-2	4, 64-bit x86 CPUs	32	200	mongodb
	MongoDB-3 (arbitier)	4, 64-bit x86 CPUs	32	200	mongodb (arbitier)
	DHCP-1	2, 64-bit x86 CPUs	4	40	isc-dhcp-server
	DHCP-2	2, 64-bit x86 CPUs	4	40	isc-dhcp-server
	WiFi-Cab-1	4, 64-bit x86 CPUs	14	40	tomcat jdk eltex-wifi-cab eltex-portal-constructor
	WiFi-Cab-2	4, 64-bit x86 CPUs	14	40	tomcat jdk eltex-wifi-cab eltex-portal-constructor
> 5000 APs	EMS-1	8, 64-bit x86 CPUs	32	200	tomcat jdk tex-ems

	EMS-2	8, 64-bit x86 CPUs	32	200	tomcat jdk eltex-ems
	NBI-1	2, 64-bit x86 CPUs	4	40	tomcat jdk eltex-axis eltex-radius-nbi
	NBI-2	2, 64-bit x86 CPUs	4	40	tomcat jdk eltex-axis eltex-radius-nbi
	NBI-3	2, 64-bit x86 CPUs	4	40	tomcat jdk eltex-axis eltex-radius-nbi
	NBI-4	2, 64-bit x86 CPUs	4	40	tomcat jdk eltex-axis eltex-radius-nbi
	RADIUS-1	4, 64-bit x86 CPUs	8	100	jdk eltex-radius eltex-pcrf
	RADIUS-2	4, 64-bit x86 CPUs	8	100	jdk eltex-radius eltex-pcrf
	APB-1	4, 64-bit x86 CPUs	16	40	jdk eltex-apb
	APB-2	4, 64-bit x86 CPUs	16	40	jdk eltex-apb
	WEB-Portal-1	4, 64-bit x86 CPUs	16	40	tomcat jdk eltex-portal
	WEB-Portal-2	4, 64-bit x86 CPUs	16	40	tomcat jdk eltex-portal
	MySQL-1	4, 64-bit x86 CPUs	>64	500	mysql jdk eltex-ems-db eltex-radius-db eltex-auth-service-db eltex-portal-db
	MySQL-2	4, 64-bit x86 CPUs	>64	500	mysql jdk eltex-ems-db eltex-radius-db eltex-auth-service-db eltex-portal-db
	MongoDB-1	4, 64-bit x86 CPUs	32	200	mongodb
	MongoDB-2	4, 64-bit x86 CPUs	32	200	mongodb
	MongoDB-3 (arbitier)	4, 64-bit x86 CPUs	32	200	mongodb (arbitier)
	DHCP-1	2, 64-bit x86 CPUs	4	40	isc-dhcp-server
	DHCP-2	2, 64-bit x86 CPUs	4	40	isc-dhcp-server
	WiFi-Cab-1	4, 64-bit x86 CPUs	16	40	tomcat jdk eltex-wifi-cab eltex-portal-constructor
	WiFi-Cab-2	4, 64-bit x86 CPUs	16	40	tomcat jdk eltex-wifi-cab eltex-portal-constructor
10,000 APs	EMS-1	8, 64-bit x86 CPUs	64	200	tomcat jdk tex-ems
	EMS-2	8, 64-bit x86 CPUs	64	200	tomcat jdk eltex-ems

NBI-1	2, 64-bit x86 CPUs	4	40	tomcat jdk eltex-axis eltex-radius-nbi
NBI-2	2, 64-bit x86 CPUs	4	40	tomcat jdk eltex-axis eltex-radius-nbi
NBI-3	2, 64-bit x86 CPUs	4	40	tomcat jdk eltex-axis eltex-radius-nbi
NBI-4	2, 64-bit x86 CPUs	4	40	tomcat jdk eltex-axis eltex-radius-nbi
RADIUS-1	4, 64-bit x86 CPUs	8	100	jdk eltex-radius eltex-pcrf
RADIUS-2	4, 64-bit x86 CPUs	8	100	jdk eltex-radius eltex-pcrf
APB-1	4, 64-bit x86 CPUs	16	40	jdk eltex-apb
APB-2	4, 64-bit x86 CPUs	16	40	jdk eltex-apb
WEB-Portal-1	4, 64-bit x86 CPUs	16	40	tomcat jdk eltex-portal
WEB-Portal-2	4, 64-bit x86 CPUs	16	40	tomcat jdk eltex-portal
MySQL-1	4, 64-bit x86 CPUs	>16	200 10k RAID10	mysql jdk eltex-ems-db eltex-auth-service-db eltex-portal-db
MySQL-2	4, 64-bit x86 CPUs	>16	200 10k RAID10	mysql jdk eltex-ems-db eltex-auth-service-db eltex-portal-db
MySQL-3 (RADIUS)	4, 64-bit x86 CPUs	>120	1 T 10k RAID10	mysql eltex-radius-db
MySQL-4 (RADIUS)	4, 64-bit x86 CPUs	>120	1 T 10k RAID10	mysql eltex-radius-db
MongoDB-1	4, 64-bit x86 CPUs	32	200	mongodb
MongoDB-2	4, 64-bit x86 CPUs	32	200	mongodb
MongoDB-3 (arbitier)	4, 64-bit x86 CPUs	32	200	mongodb (arbitier)
DHCP-1	2, 64-bit x86 CPUs	8	40	isc-dhcp-server
DHCP-2	2, 64-bit x86 CPUs	8	40	isc-dhcp-server
WiFi-Cab-1	4, 64-bit x86 CPUs	16	40	tomcat jdk eltex-wifi-cab eltex-portal-constructor
WiFi-Cab-2	4, 64-bit x86 CPUs	16	40	tomcat jdk eltex-wifi-cab eltex-portal-constructor

Minimum requirements for the system operator's workstation

Dual core processor with 2.5 GHz or more frequency

RAM 4 GB or more

Monitor resolution 1920x1080 or more

Stable server connection, recommended speed 10Mbit/s or more, keyboard, mouse

java jre 1.8 (with relevant updates)

Chrome or Firefox browser (with relevant updates)