



Wireless access controllers
WLC-15, WLC-30, WLC-3200
ESR series service routers
ESR-15, ESR-30, ESR-3100, ESR-3200

Release notes
Firmware version 1.30.4

Version 1.30.4

Revisions:

- Implemented synchronization of AP firmware in the backup scheme
- Monitoring and management:
 - Added critlog directory to **show tech-support** command output
 - WEB:
 - Full audit of administrator actions in the WEB interface via TACACS+ / RADIUS
 - Optimized operation of WEB server when operating with clients and AP
 - Improved adaptation of the WEB interface to different screen resolution
 - Monitoring
 - Filtering on the "Access points" and "Clients" pages
 - Pagination when displaying data on the "Access points", "Clients", "Event log" pages
 - CPU load graph
 - Client IP address on client monitoring pages
 - "VLAN number" column in the virtual access points table
 - "Range" column in the clients table
 - Monitoring of the 802.11v parameter on the "Roaming data" page
 - **Client IP address changed** check-box in the client log
 - Unified pop-up windows and snack bars when operating with tables
 - Configuration
 - Portal authorization settings
 - Ability to limit the traffic speed (clients, VAP, broadcast, multicast)
 - Configuring the 82 DHCP option on AP in radio profile
 - Configuring the 802.11v in the AirTune profile
 - Configuring the "Country code" in the AP profile to comply with local restrictions on channels and transmitter power corresponding to the selected country
 - Changed order of settings in the SSID profile
 - Configuring the IEEE 802.11 n/ac, a/n/ac modes for 5 GHz radio interface in the individual AP settings
- WLC:
 - **wlc-journal storage** command to transfer WLC logs to HDD
 - Optimized AP connection speed
 - Optimized AP connection stability
 - Monitoring
 - Display the "VLAN" in the **show wlc ap vap** command output
 - Display the range in which the client operates in the **show wlc clients** command output
 - Display the ap-location in the AP log (**show wlc journal ap**)
 - Display the band in the AP log (**show wlc journal client**)
 - Configuration
 - **country-code** command in the ap-profile to comply with local restrictions on channels and transmitter power corresponding to the selected country
 - The maximum size of WLC logs is limited to 90 days. When updating to 1.30.4 firmware version, the size of existing logs will be automatically reduced
 - Configuring the MQTT positioning for WEP-1L, WEP-2L, WOP-2L, WEP-3L
 - Configuring the WIDS/WIPS for WEP-200L and WOP-20L
 - **neighbour-scan** command in the ap-profile for configuring passive scanning on WOP/ WEP-30L, WEP-30L-Z, WOP-30LS, WOP-30LI
 - **show wlc statistics** command block for displaying statistics on clients and AP events
 - **arp suppression** command for configuring ARP conversion
 - **lldp-server** command block in ap-profile/services for configuring LLDP
 - **lldp command** block in ap-profile/trace for configuring LLDP logging
 - Ability to add **NAS IP** to the redirect address when configuring portal authorization via RADIUS

- Processing of **deauth-attack** in WIDS
- **load-balance roaming clients max/min** commands in airtune-profile for configuring the maximum/minimum number of users during balancing
- **802.11r cross-location-roaming** command in AirTune settings to enable 802.11r roaming between locations
- Syslog:
 - **syslog web-commands** for logging actions on WEB
 - **logging wlc-events/logging wlc-journal** command for enabling WLC logs to syslog server
- SNMP:
 - Optimization of WLC tables

Fixed:

- Duplication of wireless client sessions in the WEB
- Incorrect status when ending a session in the WEB
- Error "RRM:rrm request for start optimization, location '<location name>' failed, reason: 'failure from airtune api'" when starting AirTune optimization for location
- Reason for the "RRM:Cannot backup domains info: 'malformed answer from airtune api'" log
- AP status change to the "Cfg failed" after deleting radio-2g-profile/radio-5g-profile
- AP status change to the "Failed" due to: "CoA timeout expired" when switching to the backup controller
- Service wlc_gre error termination
- Problem with obtaining an IP address via DHCP for clients using Broadcast check-box in the tunneling scheme
- Reason for the "IS_NE check failed: stat_map->entry_sz (170 != 8) !!! on WLC-3200" log
- Error when entering the path of external media for storing IPS rules
- Error "PLUGIN_AUTH_USER_PASS_VERIFY failed with status 1" due to the use of uppercase letters in the OpenVPN server configuration
- Traffic classification by match access-group and DSCP
- show mac address-table command output when WLC is operating in a client traffic tunneling scheme
- Allowed to specify the user name as a MAC address in the access profile
- IPsec tunneling with XAuth authorization
- Speed of SoftGRE tunnel establishment with LLDP enabled
- Error in the show wlc ap detailed command output when using 40 MHz radio channel width
- Error ESRinfo_wlc_service_activator_aps_MAX when requesting VAP

Version 1.30.2

Revisions:

- Monitoring and management:
 - CLI:
 - Added **logging radius** command to enable RADIUS server logs
 - Added **alarm enable journal** command block for independent configuration of trap sending and alarm logging
 - WEB:
 - Configuration
 - NAS ID configuration in radius-profile
 - MAC authorization configuration in ssid-profile
 - Syslog:
 - Syslog messages filtering for RADIUS servver (**match process-name radius-server**)
 - SNMP:
 - eltWlcApVapTable (OID .1.3.6.1.4.1.35265.1.224.1.3.2.6) table in ELTEX-WLC-MIB, which contains information about enabled VAPs on AP
 - OID eltWlcRadioUtilization (OID .1.3.6.1.4.1.35265.1.224.1.3.2.4.1.13) is added to ELTEX-WLC-MIB to get the value of the current radio channel utilization

Version 1.30.1

Revisions:

- Active-Standby clustering functionality for WLC
- Integration with ECCM
- Monitoring and management:
 - Syslog:
 - Syslog messages filtering for WLC services (**match process-name wlc**)
 - SNMP:
 - eltWlcApSaTable (OID .1.3.6.1.4.1.35265.1.224.1.3.2.5) table in ELTEX-WLC-MIB, which consists information about unregistered AP
 - eltWlcClientInfoTable (OID .1.3.6.1.4.1.35265.1.224.1.3.3.4) table in ELTEX-WLC-MIB, which contains information about clients connected to the WLC
 - WEB:
 - WEB server transfer to VRF
- Security:
 - Download encrypted keys
- WLC:
 - Monitoring:
 - Displaying the frequency range in the **show wlc clients** command output
 - Configuration:
 - **session password auth-password** command to use RADIUS key as a password for mach-auth for portal authorization
 - **session password mac <MAC FORMAT>** command to use client MAC address in the selected format as a password for mac-auth for portal authorization
 - Time zone setting on AP. Time zone is taken from the device configuration if it is not set in the location
 - **proxy-https** command to enable encrypted exchange between client and AP for portal authorization
 - **crypto cert** and **crypto private-key-password** commands to select a certificate in portal authorization and to specify the certificate password
 - **radar** command block in ap-profile to configure positioning by MQTT protocol

Version 1.30.0

Revisions:

- Monitoring and management:
 - Support for vWLC
 - Support for HDD
 - CLI:
 - **show storage-devices hdd smart** command to view the disk state
 - **unmount storage-device HDD/USB** command to disconnect a disk or USB drive
 - **clear storage-device HDD/USB** command to format a disk or USB drive
 - **show running-config/candidate-config wlc without-ap** command to output wlc section configuration without ap block
 - **show running-config/candidate-config without-wlc-ap** command to output the device configuration without ap block in the wlc section
- WEB:
 - UI optimization
 - Monitoring
 - VAP output
 - Cleaning the event log of AP and clients
 - Creating individual profile of AP from monitoring
 - Manual firmware update on AP
 - Sorting in tables
 - Clients deauthentication
 - Checking the configuration change
 - Advanced filtering in the event log of AP and clients
 - Configuration
 - Individual AP configuration page
 - Configuring AP update scheduler
 - Profile copying
 - Viewing profile bindings
 - Automatic binding of AirTune (default_airtune) when creating a location
 - Administration
 - Downloading licenses to extend functionality
 - Uploading/downloading the device configuration
 - Resetting device configuration to factory settings
 - Downloading the AP firmware
 - Downloading and updating the device firmware
 - Working with archived configurations
 - Comparing the configurations
 - Rebooting and delayed rebooting of the device
- SNMP:
 - eltWlcApLocationTable (OID .1.3.6.1.4.1.35265.1.224.1.3.1.2) table in ELTEX-WLC-MIB, which consists AP Location configuration
 - eltWlcApRadioTable (OID .1.3.6.1.4.1.35265.1.224.1.3.2.4) table in ELTEX-WLC-MIB, which contains data on radio parameters of the AP
 - OID eltWlcApHostname (OID .1.3.6.1.4.1.35265.1.224.1.3.2.3.1.11) is added to ELTEX-WLC-MIB to get AP hostname
 - OID eltWlcApLocation (OID .1.3.6.1.4.1.35265.1.224.1.3.2.3.1.12) is added to ELTEX-WLC-MIB to get AP Location
- WLC:
 - Support for WOP-30LI access point (AP)
 - Maximum number for WCL-3200 is increased to 3000
 - Optimization of WLC work, work with AP sessions is spread over several cores
 - Optimization of work of AP update manager, sliding schedule is implemented
 - Ability to increase the number of AP using ELM

- Monitoring
 - **show wlc ap firmware** command to display information about supported AP and firmware for them
 - Extended AP event log, added information about the connection process
 - Client IP address is added to the input of **show wlc clients** command
 - Added 802.11v status outputs to AirTune monitoring commands **show wlc airtune roaming statistics <ap location>** and **show wlc airtune <ap mac>**
 - Display of the average and maximum utilization of the radio channel on which the AP is operating in the **show wlc ap <mac> detailed** command output
 - RADIUS server logging on client connection
- Configuration
 - AP configuration to operate with the portal according to Cisco-like scheme for WEP-3ax
 - Speed limitation setting for clients/SSID/broadcast/multicast traffic
 - IP address ranges configuration for the whitelist in the external portal settings
 - **rates-basic** and **rates-supported** commands to configure Supported/Basic rates in radio-2g/5g-profile and individual AP settings (ap <mac>)
 - 802.11v configuration in AirTune
 - Loosening of validation for individual AP settings (ap <mac>). Model and location are not always to be filled in
 - Increased number of WLC profiles (radio-2g/5g-profile, radio-5g-profile, ssid-profile, ap-location, radius-profile) up to 80 % of the maximum number of AP
 - **ip dhcp information option <>** commands to manage DHCP Option 82 settings on AP
- WIDS/WIPS
 - Ability to configure WIDS/WIPS, the functionality is activated by license
 - WIDS/WIPS event log
- Tunneling:
 - **tunnel-isolation** command to enable isolation in softgre-controller when operating in data-tunnel configuration wlc mode

Version 1.26.1

Revisions:

- Monitoring and management:
 - CLI:
 - Optimized ip failover setting
 - Added **show crypto certificates pfx** command to view detailed information on PKCS#12
 - Added **show crypto certificates crl** command to view detailed information on CRL
 - Added **unmount storage-device** command to correctly eject USB/SD drive
 - Added possibility to specify configuration that the device will apply on the next start
 - WEB:
 - Added configuration mode
 - Added WLC configuration block setting
 - Added access point hostname output on the 'Clients' page
 - Added possibility to download RRM reports
- WLC:
 - Added support for WLC operation on ESR-30 under license
 - Added support for access points: WEP-2ac, WEP-2ac Smart, WOP-2ac, WOP-2ac rev.B, WOP-2ac rev.C, WEP-30L-Z
 - Added Airtune redundancy
 - Added display of roaming events in client log
 - Added notification of WLC and RADIUS services when regenerating keys and certificates by default
 - Added configuration of an external portal on access point using Cisco-like scheme
 - Added possibility to save access point hostname, manually specified on the device
 - Added the description field to access point log
 - Optimized operation of access point update manager. Update is performed in sets of 50 access points, taking into account the location time zone
 - Cancelled automatic access point update after downloading firmware file
 - Added receiving access point hostname for monitoring
 - Added description field for airtune-profile
 - Supported client disconnection reason 'Death due to client DHCP fail'
 - Expanded log filtering capabilities
 - Added possibility to limit log size by days
 - Added possibility to configure a certificate and a key for service-activator
 - Added possibility to configure aliases for WLC commands
 - Added default profiles for radius-profile and airtune-profile
 - Added possibility to enable OWE security mode for SSID
 - Added **set wlc indication** command to enable access point status LED indication
 - Added possibility to configure mac-auth on access point
 - Added possibility to select dynamic parameters (client and access point MAC addresses) in monitoring mode
 - Added check of airtune optimization status at startup
 - RADIUS server:
 - Moved TLS mode enabling from global level to domain
 - AirTune:
 - Added 802.11v roaming setting for WEP-3ax

Version 1.23.6

Revisions:

- Monitoring and management:
 - SLA:
 - Added possibility to manage the DF bit for SLA tests
- Routing:
 - Expanded number of route-maps for ESR-15
 - BGP:
 - Implemented BGP fall-over feature
 - Moved BFD protocol settings to BGP fall-over section
 - Added possibility to bind a route-map to subnet announced via BGP
 - Added possibility to increase/decrease metric by a certain value
- Security:
 - Firewall:
 - Adjusted limits on the number of firewall sessions
- Tunneling:
 - DMVPN:
 - Added support for assigning a dynamic IP address to DMVPN SPOKE
- DHCP:
 - Increased number of ip helper-addresses on interface up to 6

Version 1.23.3

Revisions:

- Support for ESR-31/3200L/3300 routers
- Monitoring and management:
 - CLI:
 - Implemented repeated display of the banner displayed before user authentication on a router when pressing 'ctrl' + 'c' key combination
 - Implemented check of IP addresses specified as remote-address in syslog host for presence on a router
 - Increased number of loopback interfaces up to 32
 - Implemented possibility to record traffic dump to a file
 - Implemented possibility to filter output of **show running-config** and **show candidate-config** commands by 'syslog' key
 - Implemented separation of all configuration blocks
 - Implemented display of QSFP28 information in output of **show interfaces sfp** command
 - sFlow:
 - Implemented possibility to send sFlow statistics to VRF
 - Zabbix:
 - Implemented possibility to launch iperf3 using Zabbix-agent
 - SNMP:
 - Implemented sending SNMPv3-trap
 - SLA:
 - Implemented track triggering when SLA test fails
 - Expanded output of operational information on SLA tests
 - Implemented mechanism for changing SLA configuration without restarting all tests
 - Implemented binding of SLA test execution to interface state
- Routing:
 - Added new NHRP Shortcut route type
 - Implemented possibility to filter routes using regular expressions
 - BGP:
 - Implemented local-as feature with no-prepend and replace-as suboptions
 - Implemented possibility to aggregate route information when announcement via BGP
 - Implemented possibility to filter routes by the BGP Next-Hop attribute
 - OSPF:
 - Implemented possibility to switch an interface to passive mode for OSPF protocol
 - Implemented possibility to configure the reference-bandwidth parameter interface
 - Implemented possibility to enable automatic calculation of OSPF-cost for interfaces
 - Implemented support for point-to-multipoint broadcast mode
 - Implemented support for ECMP feature for OSPF External routes (E1 and E2)
 - Multiwan:
 - Changed mechanism for checking multiwan parameters at the configuration stage
- MPLS:
 - Implemented possibility to configure 'prefix' with the 'eq', 'ge' or 'le' keys in the **advertise-labels** command
 - Expanded information output when viewing VPNv4 and VPLS records in detail
- Security:
 - IPsec:
 - Implemented possibility to use 'local interface' when configuring 'security ike gateway' to build IPsec from interfaces with dynamic addresses
 - Implemented **clear security ipsec vpn <VPN-NAME>** command to reset one of the current VPN connections
 - Implemented possibility to specify different PSKs for different remote-addresses (ike keyring)
 - Added support for up to 31 Diffie-Hellman groups

- IPS:
 - Expanded output of the **show security ips counters** command
- Firewall:
 - Implemented possibility to specify a host/subnet in rules without using object-group network
 - Implemented possibility to filter broadcast packets for 'security zone-pair any self'
- ACL:
 - Implemented possibility to use a range of tcp/udp ports in ACL rules
- AAA:
 - Implemented possibility to authorize executed commands using a TACACS server
- QoS:
 - Implemented traffic policing feature
 - Implemented possibility to re-mark the CoS and DSCP fields on the output interface
 - Added support for peer-tunnel-QoS policies for DMVPN Spoke-to-Spoke tunnels
- Tunneling:
 - Added support for WireGuard tunneling protocol
 - DMVPN:
 - Improved speed and stability
 - Improved the output of the **show ip nhrp** command
 - Increased limit of GRE tunnels for ESR-1700 up to 3200
 - Increased limit of connected mGRE SPOKE for ESR-1700 up to 2000 for each mGRE HUB
- DHCP:
 - Implemented possibility to configure the next-server parameter for the DHCP-server pool
- NTP:
 - Implemented possibility to configure the NTP-server specifying not only an IP address, but also a domain name

Version 1.20.4

Revisions:

- Monitoring and management:
 - CLI:
 - Implemented possibility to restrict access to a router's ssh server using the **ip ssh access-addresses** command
 - Implemented possibility to restrict access to a router's telnet server using the **ip telnet access-addresses** command

Version 1.20.3

Revisions:

- Routing:
 - BGP:
 - Implemented Dynamic Neighbors feature
 - Implemented **community** and **extcommunity** removal mechanisms in announcements
 - Implemented **community** and **extcommunity** replacement mechanisms in announcements
 - Added possibility to configure **address-family** in **peer-group**
 - Implemented display of **Next Hop, Local Preference, MED, Community, EXT Community** parameters in the **show bgp** command output for a specific route
 - OSPF:
 - Added possibility to redistribute routes with External Type-1
 - Added possibility to set a route metric during redistribution
 - MultiWan:
 - Added possibility to mark sessions for MultiWAN for sending response packets to a session via the same interface via which packets for this session are received
- MPLS:
 - Implemented Inter-AS Option C feature
 - Added support for configuring **route-target both** for VPLS
 - Implemented MPLS over DMVPN operation
 - Added possibility to transmit L2 protocol frames via PW using the **l2protocol forward** command in **l2vpn-eompls-view**
- Monitoring and management:
 - CLI:
 - Added possibility to calculate checksums for certificates and licenses
 - Implemented display of detailed information on multilink status
 - Implemented **show tech-support** command to generate an archive of diagnostic information
 - Removed possibility to run **monitor** command for loopback interfaces
 - Implemented possibility to use uppercase characters in user name in ESR ssh/ftp/ssh/sftp clients
 - Changed output of the SSH connection error in host when the ssh key does not match ESR capabilities
 - Changed compatibility checks for commands in the ARCHIVE section
 - Unified hints for mail server configuration commands
 - Disabled starting a backup of the current configuration when starting the device
 - Syslog:
 - Implemented filling the **hostname** and **ip-address** fields in syslog packets
 - Changed the format of **logging service start-stop** messages
 - Changed filling the **APP-NAME** field in syslog messages
 - Changed the format of logs generated on the VoIP chip (only for ESR-12V/12VF)
 - SNMP:
 - Created the **eltexUtilizationIfTable** table in ELTEX-GENERIC-MIB, containing interface utilization counters
 - Added support for OID **cntpPeersVarTable** (OID 1.3.6.1.4.1.9.9.168.1.2.1): the **cntpPeersVarEntry** sequence with all nested attributes from CISCO-NTP-MIB
 - Added support for OID **hrSystemDate** (OID 1.3.6.1.2.1.25.1.2) from HOST-RESOURCES-MIB
 - Added support for OIDs in ELTEX-ESR-BGP4V2-MIB: **eltEsrBgp4V2PeerAdminStatus**, **eltEsrBgp4V2PeerRemoteAddrStr**, **eltEsrBgp4V2PeerRemoteaddrStr**
 - Added support for OIDs to ELTEX-GENERIC-MIB for limits monitoring and FIB/RIB utilization for ipv4/ipv6: **eltexRoutingFIBLimit**, **eltexRoutingFIBUsage**, **eltexRoutingFIB6Limit**, **eltexRoutingFIB6Usage**, **eltexRoutingRIBUsageBGP**, **eltexRoutingRIBUsageOSPF**, **eltexRoutingRIBUsageRIP**, **eltexRoutingRIBUsageISIS**, **eltexRoutingRIB6LimitsBGP**, **eltexRoutingRIB6LimitsOSPF**, **eltexRoutingRIB6LimitsRIP**, **eltexRoutingRIB6LimitsISIS**,

eltexRoutingRIB6UsageBGP, eltexRoutingRIB6UsageOSPF, eltexRoutingRIB6UsageRIP, eltexRoutingRIB6UsageISIS

- Netflow:
 - Implemented netflow sending via OOB interface
- Security:
 - Firewall:
 - Implemented possibility to limit the firewall sessions number for specified rules using the **action session-limit** command
 - IDS/IPS:
 - Implemented clearing counters on reboot and by the **clear security ips counters** command
 - Implemented disabling interfaces with enabled IDS/IPS features after reboot before downloading and applying IDS/IPS signatures
 - Implemented possibility to specify number of rules for a category in percent (rules percent), all (rules all) and recommended (rules recommended)
 - Implemented possibility to store downloaded signatures on an external drive (SD/USB)
 - Implemented possibility to view the statuses of responses from the EDM server in debug mode
 - IPsec:
 - Implemented display of **PFS dh-group** in the output of the **show security ipsec proposal** command
 - Implemented the DPD feature for IKEv2
- Tunneling:
 - Implemented possibility to operate with gre-keepalive when building a tunnel from an IP address in another VRF
 - Added a warning when executing the **no ip nhrp ipsec** command in the GRE tunnel settings
 - OpenVPN server client updated to version 2.5.3
- QoS:
 - Implemented the Per-Tunnel QOS feature based on group attributes for DMVPN
- Event tracking mechanism (track):
 - Reworked the mechanism for changing the BGP AS-path prepend parameter depending on the track state
 - Implemented the mechanism for changing the BGP metric parameter depending on the track state
- VoIP (only for ESR-12V/12VF):
 - Increased the maximum length of the **sip-domain address** command parameter from 31 to 235 characters in sip-profile

Version 1.19.2

Revisions:

- Support for WLC-2300
- Tunneling:
 - Added possibility to configure MTU for SoftGRE tunnels
 - Added support for softgre-controller on ESR-15/30/3200
- Monitoring and management:
 - CLI:
 - Added **commit check** command to check configuration without applying
 - Added **crypto generate pfx** command to generate pkcs12 container
- WLC:
 - Support for WOP-30LS access point
 - Transfer to universal radio profiles
 - Transfer to universal ssid-profile
 - Added **show wlc ap vap** command to view enabled VAP list
 - Added possibility to configure hostname of an access point
 - Hostname of an access point added in the main monitoring outputs
 - Added possibility to clear WLC logs
 - Added possibility to increase maximum number of access points via license
 - Added possibility to generate TLS certificates for Wi-Fi clients
 - Added possibility to redefine parameters of access points radio interfaces via individual profiles
 - Extended information on connected clients in **show wlc clients** output
 - Optimized WLC operation in redundancy scheme
 - RADIUS-server:
 - Added possibility to authorize Wi-Fi clients via LDAP server

Version 1.19.1

Revisions:

- Support for WLC-15
- Monitoring and management:
 - Added crypto-sync service for certificate synchronization
 - CLI:
 - Added possibility to generate certificates and private key
 - Added **ip http server** and **ip https server** commands to enable WEB server
 - Added **sync crypto force** command to synchronize certificates manually
 - WEB:
 - Added access points monitoring
- Tunneling:
 - Added possibility to allocate softgre-controller management tunnels by source addresses/networks
 - Added possibility to selectively enable VLAN in softgre-controller for WLC mode
- WLC:
 - Support for WOP-30L access point
 - Implemented WLC redundancy via VRRP
 - Added WPA2/WPA3, WPA3 Enterprise security modes
 - Support for EAP-TLS operation in local RADIUS server
 - Added **show wlc clients** command to view connected Wi-Fi clients list
 - Added possibility to configure PMKSA caching
 - Added possibility to configure NAS IP in RADIUS server when proxying
 - Added output of common number of clients on an access point radio interface
 - Added user name, location name, connection status to client log
 - Added possibility to set ssh/telnet/web/snmp services on an access point

Version 1.19.0

Revisions:

- Support for WLC operation on ESR-15 under license
- Monitoring and management:
 - CLI:
 - Renamed wireless-controller into softgre-controller
 - Simplified MAC address entry in object-group mac: no need to set standart netmask manually, default value is 'ff:ff:ff:ff:ff:ff'
 - Added possibility to view configuration more conveniently: by categories
- Tunneling:
 - Changed SoftGRE tunnels operation logic in wlc mode. Supported c-vlan usage in client traffic tunneling scheme. Vlan specified in the SSID settings gets into the WLC without terminating the sub-tunnel in the Bridge. For correct operation, vlan must be created in the WLC settings and must be a member of a bridge or an interface
- WLC:
 - Support for WEP-30L access point
 - Added possibility to view WLC configuration by sections
 - Added possibility to view radius-server configuration by sections
 - Changed monitoring commands
 - Added ap-location name in extended output of information on an access point
 - Added division by locations in Airtune roaming statistics
 - Added **reload wlc ap <mac>** command to reboot an access point
 - Service-activator: added functionality for registering access points using certificates:
 - Added **join wlc ap <mac_ap>** command to authorize all unauthorized access points in manual authorization mode
 - Added **show wlc service-activator aps** command to view unauthorized access points
 - Added **clear wlc ap joined <mac_ap>** command to revoke certificates from access points
 - Added **aps join auto** command to configure automatic authorization mode of access points
 - Ap-location:
 - Added **mode tunnel** command to enable tunneling in location
 - Radius-server local:
 - Added possibility to configure vlan for a user
 - Logging:
 - Added uploading of clients and access points log into syslog server

Version 1.18.1

Revisions:

- Support for ESR-15/30/3200 routers
- Implemented TFTP server functionality
- IPsec:
 - Implemented possibility to configure route-based IPsec (VTI tunnel) in VRF
 - Fixed operation of the DPD mechanism for IKEv2
- IDS/IPS:
 - Implemented possibility to configure packet queues for IPS
- Monitoring and management:
 - CLI:
 - Implemented possibility to set the number of terminal rows and columns using **terminal resize** command
 - Added **format mtdpartition data** command to reformat flash:syslog, flash:data and flash:backup partitions in accordance with firmware versions 1.13.0 and later ones (for ESR-10/12V/12VF/14VF/100/200/1000/1200/1500/1511 routers)
 - Added **clear mtd-partition data** command to delete files from flash:syslog, flash:data and flash:backup partitions (for ESR-10/12V/12VF/14VF/100/200/1000/1200/1500/1511 routers)
 - Added **no interface** command to delete the physical interface configuration
 - Added checks when executing the **copy** command, preventing incorrect combinations of copy source and destination from being specified
 - Added **system cpu load-balance overload-threshold** command to control session balancing between CPU cores
 - Added **show ip firewall session failover** and **show ip nat translations failover** commands to display firewall-failover cache
 - SNMP:
 - Implemented possibility to obtain SFP transceiver information via SNMP
 - SYSLOG:
 - Added possibility to filter syslog messages of individual processes when outputting to snmp/telnet/ssh and console sessions
 - Added 'domain lookup' setting to the factory configuration
 - Implemented possibility to add a name of the user that changed the configuration when automatically archiving the configuration by commit
 - Implemented possibility to assign static IP address to the cellular modem interface
 - Implemented support for four path-mtu-discovery modes:
 - disable
 - default
 - icmp-discard
 - secure
 - Implemented possibility to control fragmentation of GRE packets using **ip dont-fragment-bit ignore** and **ip path-mtu-discovery discovery disable**
- MPLS:
 - Implemented MPLS over GRE functionality
 - Implemented BGP Inter-AS Option B functionality
 - Implemented possibility to select bridge in LDP configuration
- Routing:
 - Implemented possibility to specify an interface as a router-id for RIP, OSPF, ISIS, BGP, LDP
 - Implemented possibility to specify an interface as an update-source for RIP, OSPF, ISIS, BGP, LDP
 - BGP:
 - Changed router-id selection algorithm to the following order:
 1. use static router-id
 2. use the lowest IP address of the loopback interface
 3. use the lowest IP address of the physical interface

- Implemented possibility of recursive search for BGP routes
- OSPF:
 - Implemented possibility to set cost and metric type for advertised default routes
 - Implemented possibility to use OSPF protocol on VTI tunnels
- NTP:
 - Changed ranges for minpoll parameters: 1–6 and maxpoll: 4–17
- Event tracking mechanism (track):
 - Implemented **show tracks** and **show track** commands to display track status
- AAA:
 - Changed minimum key length for TACACS server to 1
- DHCP:
 - Implemented DHCP failover mode: Active/Standby
 - Implemented **ip helper-address gateway-ip** command to specify giaddr field in DHCP packets
- Remote-access:
 - Implemented possibility to transmit routing information via DHCP for PPTP/L2TP clients
- Corrected restrictions on maximum number of active routes (FIB):
 - ESR-1700: 3000000
 - ESR-1000/1200/1500/1511/3100/3200: 1700000
 - ESR-100/200/20/21/30, WLC-30: 1400000
 - ESR10/12V/12VF/14VF/15: 1000000

Version 1.17.3

Revisions:

- Monitoring and management:
 - SNMP:
 - Implemented possibility to monitor OSPF/BGP state via SNMP
 - FTP-client:
 - Implemented possibility to configure FTP client IP address (ip ftp sourceaddress)
- Tunneling:
 - Implemented possibility to announce group attributes with DMVPN-SPOKE
- IPsec:
 - Renamed rsa-public-key authentication method to public-key
 - Added support for PKCS1 and PKCS12 formats
 - Added support for ECDSA key type

Version 1.17.0

Revisions:

- Monitoring and management:
 - CLI:
 - Implemented possibility to specify a comment when entering the **commit** command
 - Implemented possibility to specify a configuration confirmation timeout when entering the **commit** command
 - Implemented support for the delayed reboot function
 - Increased the number of prefixes and IP address ranges in the object-group network up to 1024
 - Implemented possibility to configure a tunnel group
 - Implemented possibility to calculate a checksum for files in the flash:backup/ partition
 - Added a 'Date of last modification' column to the **dir** command output
 - SSH:
 - Implemented possibility to disable supported HOST algorithms in the SSH server
 - Netflow:
 - Implemented possibility to configure the ifindex value for self\dropped traffic
- Security:
 - IDS/IPS:
 - Support for operating with mirrored traffic
- BRAS:
 - Implemented possibility to set a user password when authorizing by IP and MAC
- DHCP:
 - Server:
 - Implemented possibility to specify a description in the **address** command
- Routing:
 - Implemented possibility to bidirectionally transmit routes between VRFs using the **route-target both** command
 - OSPF:
 - Implemented optional Opaque LSA support
 - Implemented possibility to set the maximum number of Nexthops for ECMP routes
 - BFD:
 - Implemented the output of information on BFD neighbors

Version 1.15.3

Revisions:

- WLC:
 - Support for WEP-200L access point
 - Board-profile:
 - Radio interface settings moved to the board-profile
 - Added possibility to configure only one radio interface
 - SSID:
 - Added parameter settings for 802.11r/kv roaming
 - Airtune:
 - Added Airtune service monitoring and management
 - Increased size of the event log for clients and access points
 - Added serial number, board version, and uptime to extended information on access point
 - Added information on connected clients to WLC status output (**show wlc**)
 - Supported SNMP monitoring of WLC
 - Hidden passwords in tracing
 - Log-filter:
 - Added functionality for filtering logs by MAC addresses of access points
 - Ap-profile:
 - Added possibility to configure logging for all services of access point
 - AP:
 - Added ap-model parameter to determine the type of access point
 - Service-activator:
 - Optimized algorithm for firmware update of access points

Version 1.14.5

Revisions:

- QOS:
 - Added possibility to specify bandwidth limitations in percent for complex-qos
- Routing:
 - Added possibility to set Policy-Based Routing for local traffic
- Monitoring and management:
 - Added possibility to update firmware automatically with use of DHCP options
- SYSLOG:
 - Added possibility to filter syslog messages of separate processes when recording to local syslog file or remote syslog server
 - Added possibility to log traffic flows processed by IPS/IDS to remote syslog server
- Redundancy:
 - Support for STP/RSTP in bridge for all the models
 - Support for STP/RSTP for physical interfaces in switchport mode for ESR-1x/2x
- Remote-access:
 - Added possibility to limit authentication and encryption methods of IKE and IPsec protocols encryption for L2TP server and L2TP client

Version 1.14.0

Revisions:

- AAA:
 - Added possibility to use TLS/SSL secured connection for LDAP
- DPI:
 - Added detection of the following applications: **bittorrent-networking**, **ms-netlogon**, **ms-rpc**, **ms-sms**, **rtp audio**, **secure-http**, **secure-smtp**, **vmware-vsphere**
- IDS/IPS:
 - Support for specific commands filtering for HTTP and FTP
- IPsec:
 - Support for mode transport
- QoS:
 - Added classification by URL
 - Added classification by applications
- Track:
 - Added possibility to track VRRP or SLA test state
 - Added possibility to manage VRRP, PBR parameters, interface administrative status, static route, AS-PATH attribute and preference in route-map
- Monitoring and management:
 - CLI:
 - Added possibility to display device configuration with default parameters
 - Added possibility to specify in command **ping** IPv4/IPv6/DNS host without ip/ipv6 prefixes
 - Added possibility to set passwords of less than 8 symbols
 - Added possibility to check external storage devices using the **verify storage-device** command
 - Added possibility to format external storage devices using the **clear storage-device** command
 - SSH:
 - Presence of host keys is checked at device start and if they are absent, generation occurs. Each device has unique ssh host keys
 - Removed obsolete **rsa1** key type
 - Removed **crypto key generate** command from **configure** mode, and instead of it, the **update ssh-host-key** command is added to the **root** configuration mode
 - Collecting statistics:
 - Traffic counting in the Ingress and Egress directions for Netflow

Version 1.13.0

Revisions:

- Support for ESR-1511 and ESR-3100 routers
- Support for Content-Filter functionality for HTTP traffic
- Support for Anti-Spam functionality for HTTP traffic
- Routing:
 - BGP:
 - Increased BGP RIB ESR-10/12V/12VF/14VF to 1M routes
 - Increased BGP RIB ESR-20/21/100/200 to 2.5M routes
 - Increased BGP RIB ESR-1000/1200/1500/1510 to 5M routes

Version 1.12.0

Revisions:

- IDS/IPS:
 - Supported interaction with Eltex Distribution Manager for licensed content — a set of rules provided by Kaspersky SafeStream II
- IPsec:
 - Added possibility to view debug information for IPsec
- MPLS:
 - Added support for VPLS Kompella Mode
 - Added commands to output operational information for L2VPN
- USB-Modem:
 - Support for modems with HILINK firmware
- Routing:
 - IS-IS:
 - Added possibility of 3way handshake neighborhood establishment
- Monitoring and management:
 - CLI:
 - Removed the possibility to authenticate as root
- Tunneling:
 - Added possibility to set AAA authentication lists for OpenVPN clients
- Filtering:
 - HTTP proxy
 - Added possibility to log filtering events

Version 1.11.2

Revisions:

- BRAS:
 - Supported BRAS operation in VRF for L3 switching scheme
 - Supported adding Option 82 from client DHCP packets in accounting
 - Supported getting the number of services and BRAS sessions via SNMP
- SNMP:
 - Supported breaking softgre tunnels
- Monitoring and management:
 - CLI:
 - Added the **merge** command, which merges the downloaded configuration with candidate-config
 - Added possibility to view information about the configuration of a particular Bridge
 - Added possibility to view the configuration of a certain object-groups by specifying the type
 - Added possibility to view the configuration of a certain tunnel
 - Added possibility to view the configuration of a specific route-maps
 - Added saving user login to configuration name when reserving configuration locally
 - Added possibility to view the difference between the archived configurations
 - Added the **clear vrrp-state** command, which stops VRRP execution for 3* Advertisement_Interval+1 time. This enables the router in the backup state to perform a master hijacking
 - SLA:
 - Supported IP SLA in ICMP-ECHO mode
- Tunneling:
 - Supported synchronization of wireless-controller tunnels between routers with different firmware versions

Version 1.11.1

Revisions:

- IPsec:
 - Implemented possibility to disable Mobility and Multihoming Protocol (MOBIKE) for IKEv2
 - Support for certificate IPsec authentication
 - Support for CRL and filtering by attribute field Subject-name

Version 1.11.0

Revisions:

- CLI:
 - Implemented TCP/UDP port filtering when displaying and cleaning firewall/NAT sessions
 - Implemented possibility to view mDNS configuration
- IPsec:
 - Implemented modes of reconnecting XAUTH clients with one login/password
 - Implemented possibility to disable Subject attribute field validation of local and remote XAUTH certificate
- Routing:
 - Implemented possibility to use Multiwan on pppoe, l2tp, openvpn, pptp and vti-tunnels
- Tunneling:
 - GRE
 - Implemented possibility to use as local interface for GRE tunnels: USB-modem, pptp, l2tp, pppoe-tunnel and e1, multilink-interfaces
 - Implemented possibility to build GRE tunnels from IP-interfaces of a great VRF
 - Implemented possibility to provide L2 connectivity between clients from different tunnels within one location in the scheme with wireless-controller
 - PPPoE
 - Added possibility to use ',', '/' and '\' symbols in username
- Limited file system support for USB sticks and SD/MMC cards. Only FAT is supported

Version 1.10.0

Revisions:

- Routing:
 - Added support for IS-IS routing protocol
 - Added support for RIP NG routing protocol
 - Reworked BGP configuration
 - BGP:
 - Added support for BGP Graceful restart
 - Added support for BGP Weight attribute
 - OSPF:
 - Added support for OSPF Graceful restart
- Monitoring and management:
 - Added possibility to enable monopoly access to the configuration
 - Added possibility to reset CLI sessions
 - Added possibility to clear the alarm list
- Tunneling:
 - Added user authentication method selection for L2TP and PPTP servers
 - Added possibility to use private key and certificate for OpenVPN client
- MPLS:
 - Added support for LDP
 - Added support for L2VPN VPWS
 - Added support for L2VPN VPLS Martini mode
 - Added support for L3VPN MP-BGP

Version 1.8.7

Revisions:

- USB-Modem:
 - Added the 'no compression' command to disable Van Jacobson TCP/IP header compression method
- Monitoring and management:
 - Added possibility to execute SSH commands in non-interactive command line sessions (CLI)

Version 1.8.5

Revisions:

- Security:
 - Added possibility to use demo licenses for IDS/IPS
- SLA:
 - Updated Wellink SLA agent on ESR-10/12V/12VF
- USB-Modem:
 - Added possibility to use '_', '@', ':', '-' characters for user field in cellular profile configuration mode
- Monitoring:
 - Added Zabbix-proxy functionality

Version 1.8.3

Revisions:

- IPSEC:
 - Fixed problem of unstable IPsec operation with DMVPN and L2TPv3
- Multilink:
 - Fixed problem of routing traffic from multilink
 - Fixed problem with adding the second and subsequent interfaces in multilink
- OSPF:
 - Fixed problem with route information update

Version 1.8.2

Revisions:

- Support for ESR-20/21/1500/1510 routers
- OpenVPN server:
 - Increased the number of users to 64
- ACL:
 - ESR-1X: increased the number of rules to 255

Version 1.8.1

Revisions:

- OpenVPN server:
 - Added possibility to assign a static IP address to an OpenVPN user
 - Added possibility to authorize multiple OpenVPN users with one certificate

Version 1.8.0

Revisions:

- Tunneling:
 - Support for DMVPN
- BGP:
 - Increased BGP RIB ESR-20/21/100/200 to 2M routes
 - Increased BGP RIB ESR-1000/1200/1500/1510 to 3M routes
- SNMP:
 - Support for LLDP-MIB

Version 1.7.0

Revisions:

- Filtering:
 - Support for IDS/IPS
 - HTTP proxy: added redirect port configuration
- CLI:
 - ESR-1700: Increased the maximum number of object-group networks to 1024
 - Added possibility to specify prefix 0.0.0.0/0 in Prefix List, route-map
 - Added possibility to specify links in object-group url as regular expressions
 - Added possibility to change MAC-address of physical and aggregated interfaces
 - Transfer port commands **ip http proxy redirect-port**, **ip http proxy redirect-port** from BRAS to HTTP(S) Proxy
- NAT:
 - ESR-1700: Increased the maximum number of NAT pool to 1024

Version 1.6.6

Revisions:

- Tunneling:
 - Support for the new keepalive mechanism for softgre tunnels. The tunnels are checked by ping-probe from the client devices. The new operating mode is enabled by the keepalive mode reactive command in the wireless-controller configuration

Version 1.6.5

Revisions:

- CLI:
 - Added possibility to enable single-user configuration mode
 - Added command to terminate CLI sessions
 - Added notification of unapplied configuration changes when entering/exiting configuration mode and CLI
- Tunneling:
 - Added option to enable softgre sub-tunnel in Bridge, which is in VRF

Version 1.6.4

Revisions:

- BRAS:
 - Added **show subscriber-control sessions count** command to count the number of BRAS sessions
 - Added **show subscriber-control services count** command to count the number of BRAS services
- mDNS
 - Added mDNS-reflector functionality
 - Added mDNS service filtering functionality
 - Added **show ip mdns-reflector** command to view found mDNS services
 - Added **clear ip mdns-reflector** command to update the list of services
- Monitoring and management:
 - CLI
 - Added dynamic/static and tunnel softgre filters for **show/clear mac address-table** commands
 - Tunneling:
 - Added **clear tunnels softgre remote-address <ip>** command to remove softgre tunnel for a specific point
 - Added **clear tunnels softgre** command to remove all softgre tunnels

Version 1.6.2

Revisions:

- BRAS:
 - Supported on ESR-1X/2X
 - Added possibility to set the interface with dynamic IP addresses as nas-ip
- DHCP:
 - Added possibility to clear DHCP server lease records
 - Increased the number of static DHCP entries in the pool to 128
- QOS:
 - Added classification on the outbound interface, which allows not to use ingress policies
 - Added possibility to set multiple ACLs in a class
 - Added the possibility to set a DSCP classification in a class
- VoIP:
 - Added possibility to configure PBX
- Interfaces:
 - Supported routerport/switchport/hybrid interface operation mode
 - Supported E1 HDLC
 - Supported Serial (RS-232):
 - Organization of connections using analog modems in Dial up, leased line mode
 - Controlling neighboring devices via console
- Routing
 - BGP:
 - Supported Flow Specification Rules
 - Supported weight attribute
 - Added possibility to set route-map default route, le/ge/eq
 - Added all, nearest, replace options for remove-private-as option
 - IP:
 - Supported IP Unnumbered
 - Added possibility to disable ICMP unreachable/redirect responses
 - Supported IPv6 Router Advertisement
 - Multiwan:
 - Supported mechanism to clear NAT sessions after an unreachable target is detected
- Monitoring and management:
- AAA:
 - Added possibility to set source IP address for TACACS/LDAP servers
 - Added possibility to set interface as a source for RADIUS server
 - Extended TACACS server key size to 60 characters
 - Added possibility to disable console port authentication
- CLI:
 - Added possibility to set command aliases
 - Added possibility to view interface usage statistics
 - Added possibility to view CPU usage statistics
 - Added possibility to set a name for a static route
 - Added possibility to calculate hash sums of files
 - Added possibility to view the list of current crashes
 - Added possibility to disable debugging with one command
 - Added possibility to display messages when viewing logs for a certain period of time
 - Added possibility to download bootloaders
 - Added possibility to view rule description in output of **show ip firewall counters** command
 - Added possibility to copy files via HTTP(S) protocol
 - Added possibility to view the difference between configurations (running, candidate, factory)
 - Added possibility to view the configuration with metadata
 - Removed commit update command

- SNMP:
 - Added possibility to set community for trap messages
 - Added possibility to set source IP address for trap messages
 - Added possibility to choose content of linkDown/linkUp traps between standard and cisco-like
- SSH:
 - Added possibility to set source IP address for SSH client
- Supported Cisco SLA responder
- Supported Eltex SLA
- Supported SFTP server
- Filtering and translation
 - Firewall:
 - Added filtering by ICMP message type name
 - HTTP (S) Proxy:
 - Added filtering by content type: ActiveX, JS, Cookies
 - Added possibility to filter/redirect by local/remote lists
 - Added possibility to update remote URL lists via RADIUS CoA
 - NAT:
 - Added possibility to broadcast addresses from PPTP/PPPoE tunnel
- Tunneling:
 - IPSEC:
 - Added possibility to use an IP address obtained by DHCP as a local gateway
 - Added possibility to view extended information about tunnel authentication
 - Supported XAuth client
 - Support for PFS (perfect forward secrecy) using the DH group

Version 1.4.4

Revisions:

- PPPoE client:
 - Added PAP, MS-CHAP, MS-CHAPv2, EAP authentication methods

Version 1.4.2

Revisions:

- Attack protection:
 - Added the **show ip firewall screens counters** command, which allows you to view statistics on detected network attacks
 - Implemented protection against XMAS and TCP all flags
- SNMP:
 - Added possibility to set **snmp-server contact** and **snmp-server location** Added OIDs for these parameters
 - Implemented SNMP View: allow or deny access to community and user by OID
- NTP:
 - Expanded **show ntp peers** output: added stratum and synchronization status
- Firewall:
 - Added **ip firewall sessions tracking sip port** command, allowing you to select TCP/UDP port for SIP session tracking
- Firewall:
 - Added **ip firewall sessions tracking sip port** command, allowing you to select TCP/UDP port for SIP session tracking
- Tunneling:
 - Implemented L2TP client with IPSec support
- IP SLA agent (Wellink):
 - Added possibility to manage tests without portal participation
 - Redesigned control and monitoring commands
 - Added threshold management commands: setting thresholds for exceeding and normalizing test parameters, alerting in CLI, SYSLOG and SNMP about threshold crossing

Version 1.4.1

Revisions:

- Tunneling:
 - GRE enhancement:
 - Implemented keepalive mechanism for Ethernet over GRE tunnels
 - Increased maximum number of SoftGRE tunnels to 8K (ESR-1200/ESR-1700)
 - Added possibility to configure MTU on SUB-GRE tunnels
 - IPsec enhancement:
 - Added **encryption algorithm null** command in **config-ipsec-proposal** mode to disable encryption of ESP traffic
 - Support for policy-based IPsec operation in VRF
- BRAS:
- Supports speed limit per subscriber session
- Added **session ip-authentication** command in **config-subscriber-control** configuration mode. When this option is enabled, user authentication is by IP address
- Added **show subscriber-control radius-servers** command to view information about RADIUS servers used
- SNMP:
 - Added possibility to apply the configuration and reboot the device with **commitConfirmAndReload SetRequest**
 - Support for the RMON agent, which allows to collect statistics about the nature of traffic on network interfaces
 - Implemented management of VoIP services via SNMP
 - Support for sending notifications when DoS attacks are detected
 - Implemented sending SNMP traps when thresholds are reached:
 - Network interfaces load
 - GRE/SUB-GRE tunnel
 - Number of tunnels included in the bridge-group
 - BRAS sessions
- AAA:
- Added possibility to specify the **source-address** for requests to the authentication and authorization server in **config-tacacs-server** and **config-ldap-server** configuration modes
- Multiwan:
 - Added **wan load-balance** commands in **config-cellular-modem** configuration mode to configure Multiwan using a USB modem
- L3 routing:
 - Supported BFD technology for static routing
 - BGP enhancement:
 - Added commands: **default-information originate** in **config-bgp-af** configuration mode, **default-originate** in **config-bgp-neighbor** configuration mode to allow default route advertisement
- CLI:
- Added support for the Ctrl-P and Ctrl-N hotkeys to view the history of entered commands
- Added possibility to view the current state of tracking objects using the **show tracking objects** command
- LLDP:
 - Added support for MED extension with support for announcing DSCP, VLAN, PRIORITY parameters for different device types. Through this extension the Voice VLAN transmission is realized
- Firewall:
 - Implemented application traffic classification technology
 - Added **ip firewall logging screen** command in **config** mode to log detected DoS attacks
- QOS:

- Implemented GRED (Generic RED) mechanism to manage queue overflow based on IP DSCP or IP Precedence
- VRRP:
 - Supported operation in VRF
 - Added VRRP track-ip
- Zabbix:
 - Implemented Zabbix agent
- Configuration:
 - Implemented automatic reading of the configuration from removable media when booting the device without configuration

Version 1.4.0

Revisions:

- Tunneling:
 - Added PPTP client
 - Added PPPoE client
 - Support for Ethernet over GRE tunnel
 - Support for creating subinterfaces for Ethernet over GRE tunnels
 - Added possibility to increase MTU for tunnels up to 10000
 - IPsec enhancement:
 - Supported XAuth for dynamic IPsec tunnels
 - OpenVPN enhancement:
 - Extension of the list of encryption and authentication algorithms
- BRAS:
- Added possibility to broadcast the table USER IP - PROXY IP by NetFlow for proxied connections
- L2 switching:
 - Added **force-up** command to **config-vlan** In this mode, the VLAN is always in the 'Up' state
- L3 routing:
 - Added possibility to optionally enable IPv6 stack on interfaces
 - BGP enhancement:
 - Increased the range of values for the local preference parameter
 - Extended output of the **show ip bgp neighbors** command
 - Implemented VRRP tracking: change MED and AS-path attributes based on VRRP state
- CLI:
 - Added possibility to scale the size of the terminal to the size of the window on the PC when using the console connection. **terminal resize** command
 - Extended the set of allowed characters in APN in **config-cellular-profile** Added characters: '@', '.', ',', ' '
 - Monitoring:
 - Added possibility to filter traffic by source/destination MAC address
 - Added possibility to view Firewall sessions
 - Output interface status information when calling show ip interfaces
- DHCP:
- Added possibility to exclude IP address from DHCP server address pool
- Added possibility to set arbitrary option in IP-address, string, HEX-string format
- NAT:
 - Support for Static NAT
- NTP:
 - The **ntp enable vrf <NAME>** command outdated. Protocol time synchronization is enabled by the **ntp enable** command and will be allowed for all servers and peers in the configuration
 - Added **ntp logging** command to log NTP events
 - Added **ntp source address <IP>** command to set IP address for all NTP peers
- SNMP:
 - The **snmp-server vrf <NAME>** command outdated. Protocol access is enabled with the **snmp-server** command and will be allowed for all communities and SNMPv3 users in the configuration
 - Management:
 - Support for copying firmware, configuration, certificates
 - Support for configuration operations (commit, confirm, restore, rollback, etc.)
 - Added possibility to create interfaces
 - Added possibility to change the image of the active software
 - Added possibility to reboot the device (only when **snmp-server system-shutdown** is enabled on esr)
 - Added possibility to configure VRRP

- Monitoring:
 - Added possibility to view the number of existing interfaces and tunnels of all types
 - Added possibility to view the size of the ARP table
- SYSLOG:
- Added logging of stops/starts of system processes
- VRRP:
 - Added the **vrrp force-up** In this VRRP mode, IP interface is always in the 'Up' state

Version 1.3.0

Revisions:

- Attack protection:
 - DoS attack protection:
 - ICMP flood
 - Land
 - Limit-session-destination
 - Limit-session-source
 - Syn flood
 - UDP flood
 - Winnuke
 - Blocking spy activity:
 - Fin-no-ack
 - ICMP type
 - IP sweep
 - Port scan
 - Spoofing
 - Syn-fin
 - TCP-no-flag
 - Blocking non-standard packets
 - ICMP fragment
 - IP fragment
 - Large ICMP
 - Syn fragment
 - UDP fragment
 - Unknown protocols
- Support for DNS name resolution. Caching DNS server
- Support for LLDP
- Support for 3G/4G USB modems
- AAA:
 - Added possibility to adjust the number of failed authentication attempts
 - Added possibility to set the password lifetime
 - Added possibility to set the maximum number of passwords stored in the history for each local user
 - Added reminder function of the initial password change
 - Added possibility to set a timeout for the login session
 - Added setting to allow/deny login as root when connecting via RS-232 (console)
 - Requirement to change the password after it expires
 - Added possibility to control password complexity
- BGP:
 - Combining peers into groups with a set of attributes
- BRAS:
 - Added Framed-IP-Address attribute containing subscriber IP address to Access-Request packets of RADIUS protocol
 - Optimized performance of the Proxy server
- CLI:
 - Supported SFTP for uploading/downloading firmware files, configurations and certificates
 - Support for USB memory sticks, SD/MMC cards in firmware, configuration and certificate file copying operations
 - Added possibility to view table sizes and routing protocol priorities
 - Added possibility to view all routes belonging to a specified subnet
- DHCP:
 - DHCP client. Manual IP address re-request
 - Support for DHCP server in VRF

- Support for options 150 (tftp-server ip) and 61 (client-identifier HH:<MAC>) for DHCP server
- Firewall:
 - Added possibility to control ALG modules
 - Added possibility to disable drop packets related to the session with an invalid status (e.g., in asymmetric routing)
- IPSEC:
 - Added possibility to set the local address to any when configuring the IKE gateway
 - Support for certificates
- L2 switching:
 - Added possibility to pass BPDU through the bridge on ESR-100/200
 - Added possibility to include the physical port in the bridge on the ESR-100/200
- Multiwan:
 - Implemented automatic switching to a backup channel if parameters of the current channel deteriorate (LOSS, jitter, RTT)
 - Support for VRF operation
 - Support for LT tunnels
- NTP:
 - Authentication support
 - Support for filtering by message type
- SNMP:
 - Added possibility to disable SNMPv1
 - Implemented access control lists
 - Added possibility to control password complexity for snmp-server community
- SSH
 - Added possibility to configure the maximum number of authentication attempts to connect via SSH
 - Added possibility to set the waiting interval for SSH connection authentication
 - Added possibility to set the key pair update interval for SSH
 - Selectable SSH version
 - Implemented authentication algorithms, encryption, key exchange configuration
 - Variable length RSA key generation
- VLAN
 - Operational VLAN status management (ESR-1000/ESR-1200)
 - Support for MAC based VLAN
 - Added possibility to automatically add ports to existing VLANs
- VRRP
 - Added possibility to use VRRP IP as source IP address for GRE, IP4IP4, L2TPv3 tunnels and RADIUS client
 - Listening to VRRP by L2TP/PPTP IP servers
 - Support for VRRPv3
 - Fixed incorrect order of virtual IP addresses in a packet

Version 1.2.0

Revisions:

- Tunneling:
 - GRE Keepalive support
- L3 routing:
 - BGP:
 - Adding of neighbor description
 - Possibility to enable/disable neighbors
 - Increased total number of BGP peers to 1000
 - View the total information on peers
 - Multiwan:
 - View operational information
 - VRRP:
 - Set a subnet mask for VRRP IP
 - Port-Channel Operational Status Management (ESR-100/200)
- IPSEC:
 - Support for Policy-based IPsec mode
 - Flexible tunnel key renegotiation (margin seconds/packets/bytes, randomization)
 - Closing the IPsec tunnel after a specified number of packets/bytes have been transmitted
 - Specification of the time interval after which the connection is closed if no packets are received or transmitted through the SA
- SNMP:
 - Display the current speed of the interfaces in the ifSpeed parameter of the IF-MIB
 - SNMP Trap:
 - Trap on exceeding the thresholds of CPU load and temperature, fan speed, free RAM and FLASH space
- CLI:
 - Routing information filtering by protocol
 - Filtering by interface, IP address and MAC address in ARP/ND table clear commands
 - Storing log files in the non-volatile memory of the device
 - Uploading log files from the device using the **copy** command
 - View the contents of critlog with the **show syslog** command
 - View the contents of the log files from the end. Added **show syslog from-end** command
 - Configuration confirmation timer setting. Added **system config-confirm timeout** command
 - Changes in the command interface:
 - Cisco-like paths for files:

v1.2.0: system:..

esr# copy system:running-config

v1.1.0: fs://.../

esr# copy [fs://running-config](#)

- AAA:
 - Added a mode in which the following methods will be used for authentication if the priority one is not available
- NTP:
 - Authentication support
- Firewall:
 - Increased the number of security zone pairs to 512
 - Added possibility to pass packets that could not be identified as belonging to any known connection and that are not the start of a new connection. Added **ip firewall sessions allow-unknown** command
- QOS:
 - Configuring the length of edge queues in Basic QoS
- BRAS:

- Shaping by SSID and offices
- Subscriber authentication by MAC-address
- Configuring active/reserve redundancy based on VRRP status

Version 1.1.0

Revisions:

- BRAS:
 - User termination
 - RADIUS CoA processing, interaction with AAA
 - URL whitelists/blacklists
 - Quoting by traffic volume and session time, or quoting by both
 - HTTP proxy
 - HTTP Redirect
 - HTTPS Proxy
 - HTTPS Redirect
 - Getting URL lists from PCRF
 - Session accounting via Netflow protocol
 - Optional additional verification of authorized users by MAC-address
- Netflow:
 - Netflow v10. Exporting statistics by URL
 - VRF support
 - Support for Domain Observation ID
 - Information on NAT sessions
 - HTTPS Host export
 - Exporting information on L2/L3 location
 - Active-timeout configuration
 - Setting the source IP address for packets sent to the Netflow collector
 - Configuring exports on an interface with the Firewall enabled
- VRRP:
 - Tracking routes based on the state of the VRRP process
- CLI:
 - Autocomplete and display the names of created objects in tooltips
 - Display summary information by Firewall and NAT sessions
 - View real-time information on running services/processes
 - Informative tooltip in case of incorrect parameter entry
- SYSLOG:
 - Added possibility to set source IP-address for interaction with SYSLOG servers
- L2 switching:
 - Q-in-Q subinterfaces
- L3 routing:
 - VRF enhancement:
 - Virtual Ethernet Tunnel (tunnel linking VRF)
 - BGP enhancement:
 - Configuring the source IP address for routing information exchange (update-source)
 - Support for BFD
- DHCP Relay:
- Support for Option 82
- VRF support
- Support for point-to-point interfaces (GRE, IP-IP, etc.)
- Management interfaces:
 - SNMP:
 - Support for MAU-MIB
- QOS:
- Increasing the number of QoS policy-map to 1024 and class-map to 1024
- Wi-Fi Controller:

- Retrieve settings (tunnel-served SSID and shaping parameters) of DATA tunnels from RADIUS server

Version 1.0.8

Revisions:

- Improved health monitoring of network services
- AAA:
 - Setting a source IP to communicate with RADIUS servers
 - Deleting SSH host keys
 - Support for legacy encryption protocols for SSH connections from third-party devices
- L3 routing:
 - MultiWAN: per-flow routing
 - Recursive static routing
 - BGP support for setting blackhole/unreachable/prohibit as Nexthop
 - VRF-lite enhancement:
 - support for NTP
 - Support for GRE tunnels
- CLI enhancement:
 - Support for correct addition of partially entered parameters
 - Display the network interfaces uptime in the **show interfaces status** command
 - Replacing private data when logging entered commands with ***
 - Added **no nat { source | destination }** commands to quickly remove the entire NAT configuration
- VRRP:
 - Support for version 3
 - Support for configuring GARP Master parameters
 - Simultaneous configuration of up to 8 Virtual IPs per process
- Reservation of Firewall sessions is now configured independently of the Wi-Fi Controller
- Multiwan:
 - Output messages about changes in route states
- ESR-100/ESR-200:
 - Support for 100BASE-X transceivers on combo ports
- ESR-1000:
 - Bridge: Prohibit switching of unknown-unicast traffic
- Management interfaces:
 - SNMP:
 - SNMP Trap:
 - Trap on high CPU load
 - SNMP MIB:
 - IP-MIB
 - TUNNEL-MIB
 - ELTEX-TUNNEL-MIB
 - RL-PHYS-DESCRIPTION-MIB
 - CISCO-MEMORY-POOL-MIB
 - CISCO-PROCESS-MIB

Version 1.0.7

Revisions:

- Device control: configuring the operation mode of the fans
- L3 routing:
 - Automatically allocated VLAN (Internal Usage VLAN) do not change when the configuration is applied
 - MultiWAN: unconditional target check
 - Removed mutual crossing check for DirectConnect networks and static routes
 - Changes in TCP MSS
 - Changed restrictions on the maximum number of active routes (FIB)
 - Limited maximum number of routes for each dynamic routing protocol (RIB)
 - Added possibility to filter the default route in the Prefix List
 - BGP support
 - BGP ECMP
 - Keepalive timer autocalculation
 - Support for Policy-based routing (IPv4 only)
 - Logging changes in the state of connections with peers in the OSPF and BGP
 - Added possibility to use route-map for OSPF, RIP
 - VRF-lite enhancement:
 - BGP support
 - Support for OSPF
 - Поддержка QoS
 - Router management (AAA, Telnet, SSH, SNMP, Syslog, **copy** command)
 - IPv6 enhancement:
 - BGP support
 - Support for setting Nexthop in route-map
 - Support for RADIUS/TACACS/LDAP
 - Support for MultiWAN
- Tunneling:
 - Authentication via RADIUS server for PPTP/L2TP servers
 - OpenVPN
 - Expiration of automatically raised Ethernet-over-GRE tunnels (Wi-Fi controller)
 - IPsec enhancement:
 - Support for DES protocol
 - Obtain operational information
- ARP/ND:
- Configuring the lifetime of entries
- DHCP Server:
 - Configuring the netbios-name-server option in the DHCP address pool
- CLI enhancement:
 - Viewing load on network interfaces
 - Extended list of protocols in ACL
 - The untagged/tagged parameter is made optional when removing a VLAN with the **switchport general allowed vlan remove** command
 - Viewing traffic on network interfaces
- VRRP:
 - Preempt delay configuration
 - Simultaneous configuration of multiple Virtual IP
- Multiwan:
 - Verification of all targets on the target list
- ESR-100/ESR-200:
 - Policy-based QoS
 - ACL

- ESR-1000:
 - Automatic SFP transceiver detection for 10G ports
 - Bridge: Isolation of tunnels or sub-interfaces in the bridge
 - Integration of third-party software:
 - IP SLA agent (Wellink)
- SYSLOG: Added timezone setting before displaying messages
- Management interfaces:
 - SNMP:
 - SNMP Trap
 - SNMP MIB:
 - ENTITY-MIB
 - IANA-ENTITY-MIB

Version 1.0.6

Revisions:

- Management and monitoring:
 - Automatic configuration redundancy
 - Statistics collection:
 - Netflow v5/v9/v10(IPFIX)
 - sFlow
- MAC table:
 - Added possibility to limit the MAC-addresses being learnt
 - Added possibility to adjust the storage time of MAC-addresses
- Syslog enhancement:
 - Logging critical commands
 - Logging routing protocols operation
- CLI enhancement:
 - Command trace filtering by | include/exclude/begin/count
 - Improvement of the page view mode of commands
 - Switching syslog file browsing to page mode
 - Support for entering the port on which the TFTP/SSH/FTP service on the remote server works in the **copy** command
 - Added age display of ARP/IPv6 entries and self entries in **show arp** and **show ipv6 neighbors** commands
 - Changes in the command interface:
 - Added **ip path-mtu-discovery** command
 - DHCP: The **ip address dhcp enable** command changed to **ip address dhcp**

v.1.0.6:(config)# interface gigabitethernet 1/0/1

(config-if-gi)# ip address dhcp

v.1.0.5:(config)# interface gi 1/0/15

(config-if)# ip address dhcp enable

- DHCP: The **ip address dhcp server <IP>** command changed to **ip dhcp server address <IP>**

v.1.0.6: (config)# interface gigabitethernet 1/0/1

(config-if)# ip dhcp server address 10.10.0.1

v.1.0.5: (config)# interface gigabitethernet 1/0/1

(config-if)# ip address dhcp server 10.10.0.1

- DHCP: The **ip address dhcp {<Ignore, lease-time, reboot, set reboot time, retry, select-timeout, timeout, vendor-class-id>}** command changed to **ip dhcp client {<Ignore, lease-time, reboot, set reboot time, retry, select-timeout, timeout, vendor-class-id>}**

v.1.0.6: (config)# interface gigabitethernet 1/0/1

(config-if)# ip dhcp client timeout 60

v.1.0.5: (config)# interface gigabitethernet 1/0/1

(config-if)# ip address dhcp timeout 60

- Firewall: The **show security zone-pair counters** command changed to **show ip firewall counters**

v.1.0.6: # show ip firewall counters

v.1.0.5: # show security zone-pair counters

- Firewall: The **clear security zone-pair** command changed to **clear ip firewall counters**

v.1.0.6: # clear ip firewall counters

v.1.0.5: # clear security zone-pair

- sNAT: The **service nat source** command changed to **nat source**

v.1.0.6: (config)# nat source

v.1.0.5: (config)# service nat source

- dNAT: The **service nat destination** command changed to **nat destination**

v.1.0.6: (config)# nat destination

v.1.0.5: (config)# service nat destination

- NTP: The **service ntp {< broadcast-client, dscp, enable, peer, server>}** command changed to **ntp {< broadcast-client, dscp, enable, peer, server>}**

v.1.0.6: (config)# ntp peer 10.10.10.10

v.1.0.5: (config)# service ntp peer 10.10.10.10

- MULTIWAN: The **target <IP>** command changed to **ip address <IP>**

v.1.0.6: (config)# wan load-balance target-list eltex

(config-wan-target-list)# target 3

(config-wan-target)# ip address 10.10.0.1

v.1.0.5: (config)# wan load-balance target-list eltex

(config-wan-target-list)# target 3

(config-wan-target)# target 10.10.0.1

- IPsec: The **ipsec authentication method psk** command changed to **ipsec authentication method pre-shared-key**

v.1.0.6: (config)# remote-access l2tp elt

(config)# ipsec authentication method pre-shared-key

v.1.0.5: (config)# remote-access l2tp elt

(config)# ipsec authentication method psk

- QoS enhancement:
- Prioritizing control traffic
- Firewall enhancement:
- Managing timers and number of sessions
- SSH enhancement:
- RSA, DSA, ECDSA, Ed25519 key generation
- NAT enhancement:
- Added possibility to run NAT when Firewall is disabled
- Using bridge in the command to limit the scope of a rule group
- MultiWAN enhancement:
- Specifying SUB-interfaces as a gateway
- SNMP enhancement:
- Support for ifXTable
- SNMP IPv6
- Enable/disable user for low-level technical support access
- Arbitrary MAC address settings on the network bridge
- L3 routing:
- BGP enhancement:
 - ExtCommunity
 - Private AS deletion mode
 - Mode of default-route announcement along with other routes
- Filtering and assigning parameters to routes in redistribution

Version 1.0.5

Revisions:

- CLI enhancement:
- Deleting entities of the same type with one command via the 'all' option
- Interfaces:
- Support for Jumbo Frame (MTU up to 10000 bytes)
- Assigning /32 prefixes to Loopback interfaces
- Firewall:
- Added possibility to interrupt/clean up established sessions
- Disabling Firewall function
- QoS:
- Marking/remarking traffic
- DSCP code mutation
- Hierarchic QoS (HQoS)
- Bandwidth management (shaping), 1 kbit/s step
- Bandwidth reservation by traffic class (shaping per queue)
- RED, GRED queue overload management
- SFQ queue management
- Policy-based QoS
- Network services:
- Access control list (ACL)
- Support for issuing IP addresses by DHCP-server according to client's MAC-address
- Support for filtering by MAC-addresses in Firewall
- Support for simultaneous operation of DHCP server and Relay agent
- Telnet, SSH clients
- Support for E1 interfaces:
- CHAP
- PPP
- MLPPP (Multilink PPP)
- AAA:
- Authentication and authorization by local user base, RADIUS, TACACS+, LDAP
- Command accounting via the TACACS+ protocol
- Session accounting: SYSLOG, RADIUS, TACACS+
- Managing command privilege levels
- L3 routing:
- BGP enhancement:
 - Attribute filtering and attribute modification (local preference, AS-path, community, nexthop, origin, metric, subnet)
 - Support for Route-Reflector feature
 - Configuration of authentication options for a specific neighbor
 - Support for 32-bit numbers of autonomous systems
 - Added possibility to view prefixes received from neighbor and announced to neighbor
 - Added possibility to view information by specific prefix
- RIP enhancement:
 - Summation of advertised subnets
 - Static neighborhood
- OSPF enhancement:
 - Summation of advertised subnets
 - Support for the eligible parameter for NBMA interfaces
- Route propagation management (prefix lists with the ability to specify valid prefixes using eq, le, ge rules)
- Static routes with blackhole/prohibit/unreachable destination
- VRF Lite:

- Operation of network functions in the context of VRF:
 - IPv4/IPv6 addressing
 - Static routing
 - NAT
 - Firewall
- System resource monitoring:
- Connection/flow monitoring
- Routing table monitoring
- Improvements in Syslog operation
- Router redundancy:
 - Firewall session redundancy
 - DHCP server lease redundancy
 - SoftGRE tunnel redundancy for Wi-Fi access points
- Support for IPv6 addressing in the following network services:
 - Addressing
 - Static routing
 - Firewall
 - OSPFv3
 - Prefix-List
 - NTP
 - Syslog
 - Ping, traceroute utilities
 - Telnet client/server
 - SSH client/server
 - DHCP Server/Relay/Client
- SNMP:
 - Added support for SNMPv3
 - Added SNMP MIB (monitoring) for QoS

Version 1.0.4

Revisions:

- CLI:
 - Added possibility to import and export files using FTP, SCP
 - Viewing configurations by section
 - Added possibility to update u-boot from the system command interface
 - Changes in the command interface:
 - NAT: The **proxy-arp interface** command changed to **ip nat proxy-arp**

v.1.0.4: (config)# service nat source
 (config-snat)# proxy-arp interface gigabitethernet 1/0/15 SPOOL
 v.1.0.3: (config)# interface gigabitethernet 1/0/15
 (config-if)# **ip nat proxy-arp** SPOOL

- IKE: The **policy** command changed to **ike-policy**

v.1.0.4: (config)# security ike gateway gw1
 (config-ike-gw)# policy ik_pol1
 v.1.0.3: (config)# security ike gateway gw1
 (config-ike-gw)# **ike-policy** ik_pol1

- IPsec: The **vpn-enable** command changed to **enable**

v.1.0.4: (config)# security ipsec vpn vpn1
 (config-ipsec-vpn)# vpn-enable
 v.1.0.3: (config)# security ipsec vpn vpn1
 (config-ipsec-vpn)# enable

- VTI: The **interface vti** command changed to **tunnel vti**

v.1.0.4: (config)# tunnel vti 1
 v.1.0.3: (config)# interface vti 1

- DHCP: The **service dhcp-server** command changed to **ip dhcp-server**

v.1.0.4: (config)# ip dhcp-server
 v.1.0.3: (config)# **service** dhcp-server

- SNMP:
 - Added support for SNMP monitoring
 - Supported standard SNMP MIB (monitoring)
- Routing features:
 - Authentication key-chain
 - OSPF:
 - NSSA
 - Stub Area
 - MD5 Authentication
 - MTU Ignore mode
 - RIP:
 - MD5 Authentication
 - BGP:
 - Support for EBGp Multihop
 - Support for next-hop-self attribute
 - Static routing:
 - Support for configuring multiple default routes
 - Configurable preference for routing protocols
- Redundancy features:
 - Support for VRRP
 - Support for DualHoming redundancy

- Control and redundancy of WAN (Wide Area Network) connections
- Load balancing on WAN interfaces
- DHCP:
 - Support for DHCP relay
- QOS:
 - Traffic prioritization
 - L3 priority processing (DSCP)
 - Support for 8 priority queues
 - SP, WRR queue processing algorithms
 - Setting interface bandwidth limits for incoming and outgoing traffic
- Interfaces:
 - Support for loopback interfaces
- NAT/Firewall:
 - Support for renumbering rules
 - Viewing information about established sessions
 - Improved session monitoring for a number of protocols (H.323, GRE, FTP, SIP, SNMP)
 - Activating and deactivating session traffic counters
 - Change in the command interface: improved commands autocompletion
- Mirroring:
 - Support for traffic mirroring

Version 1.0.3

Revisions:

- Switching:
 - VLAN configuration
 - LAG (static and LACP)
 - STP/RSTP/MSTP
 - Port isolation
 - Bridge groups
- Routing:
 - OSFP
 - BGP
 - RIP
- NAT:
 - Proxy ARP for Source NAT
- Remote access:
 - L2TPv3
 - IPv4-over-IPv4
 - GRE
- Syslog:
 - Added possibility to configure logging in remote sessions (SSH and Telnet)
 - The message format is in accordance with RFC5424
 - Entered commands logging
- CLI:
 - Added possibility to update the software via the CLI
 - Added possibility to view the operational status of interfaces
 - Support for port utilization
 - Support for viewing the ARP table
 - Command to view the serial number
 - View hardware version command
 - Support for ARP table cleaning
- System:
 - Support for licensing
 - Support for Flash button
 - Implemented automatic load balancing between router cores
- Security:
 - Support for group SHA-2 authentication methods in IKE IPsec

Version 1.0.2

Revisions:

- Configuration:
 - Added possibility to copy configuration to (c) TFTP server(s)
 - Hostname
 - System time (manual)
 - Interface description
 - Added possibility for the firewall to filter the traffic broadcast or non-broadcast DNAT service
 - Added possibility to ignore certain options in the DHCP client
 - Changes in IPSec commands related to authentication and encryption
 - Checking for duplicate information in object-group service/network
 - Added possibility to reset to factory configuration
 - Added possibility to set time zones
- Operative information:
 - System environment parameters
 - Active user sessions
 - Load on physical interfaces
 - Status of logical interfaces
 - Counters of logical interfaces
- Remote access:
 - PPTP
 - L2TP/IPSec
- NTP:
 - Server, peer, client modes
- 10G port indication
- Utilities:
 - Ping

Version 1.0.1

Revisions:

- Address translation:
 - Source NAT
 - Destination NAT
 - Static NAT
- Virtualization, VPN:
 - IKE
 - Tunnelling (IPsec)
 - Connection encryption (3DES, AES)
 - Message authentication by MD5, SHA1, SHA256, SHA384, SHA512
- Network services:
 - DHCP Server
 - DHCP Client
 - DNS
- L3 routing:
 - Static routes
- Network security:
 - Firewall
- Management:
 - Management interfaces:
 - CLI
 - Telnet, SSH
 - Access control (local user base)
 - Configuration management
 - Automatic configuration restore
 - Updating the firmware (u-boot)
- Monitoring:
 - Syslog

Performance:

<u>Firewall performance (large packets)</u>	<u>5.9 Gbps</u>
<u>NAT performance (large packets)</u>	<u>5.9 Gbps</u>
<u>IPsec VPN performance (large packets)</u>	<u>3.7 Gbps (AES128bit / SHA1)</u>
<u>Number of VPN tunnels</u>	<u>100</u>
<u>Quantity of static routes</u>	<u>100</u>
<u>Number of competitive sessions</u>	<u>512,000</u>

Version restrictions:

- Bandwidth is limited (500Mbit/s per IPsec tunnel)
- CPU load balancing is supported with limitations
- Policy-based VPN is not supported
- Updating firmware only by means of u-boot
- Static switch control
- No hardware bridging acceleration
- No VLAN configuration (bridging)
- No support for SNMP, Webs
- No timezone configuration

- No NTP