



ESR series service routers

ESR-10, ESR-12V, ESR-12VF, ESR-15, ESR-15R, ESR-15VF,
ESR-20, ESR-21, ESR-30, ESR-31, ESR-100, ESR-200, ESR-1000,
ESR-1200, ESR-1500, ESR-1511, ESR-1700, ESR-3100,
ESR-3200, ESR-3200L, ESR-3300

Release notes

Firmware version 1.24

Version 1.24.6

- Support for ESR-1511 Rev.B routers

Version 1.24.5

- Support for TopGateWAN-E1 modules on ESR-31 for XG interfaces

Version 1.24.1

- Routing:
 - RIP:
 - Added the split-horizon with poison-revers feature management

Version 1.24.0

- Clustering functionality in Active-Standby mode
- ESR virtualization functionality in the form of a vESR image
- Support for the primary/secondary attribute for IPv4 addresses
- Support for TopGateWAN-E1 modules on ESR-3300
- Monitoring and management:
 - CLI:
 - Implemented the possibility of using the logical operator "or" in the search template when filtering the output
 - Added a command to display the cause of the last reboot, "**show system reload**"
 - Implemented the "**unmount storage-device**" command to correctly eject USB/MMC drives
 - Implemented the "**show interfaces switch-port vlans**" command to display VLANs, configured on interfaces
 - Added information about filtering processes to the output of the "**show syslog configuration**" command
 - Added the "**show version**" command keys to display information about the versions of only individual components
 - Added the "inactive" key for the "**boot system**" command
 - Changed the error output when applying the configuration from the file
 - Date, time and uptime output have been brought to a single format in all show commands
 - The format of the table display of commands has been changed:
 - show bootvar
 - show interfaces counters
 - show interfaces status
 - show interfaces description
 - The width of tables displayed via the following commands has been reduced to 110 characters:
 - show interfaces bridge switch-communities summary
 - show interfaces status voice-port
 - show content-filter
 - show pbx peers
 - show wlc clients
 - show wlc ap interfaces
 - show wlc service-activator aps
 - show wlc airtune rrm optimization report
 - show aaa radius-servers
 - Syslog :
 - Implemented the generation of syslog messages about changes in the current speed of an aggregated interface
 - SNMP:
 - Added support for SNMP OID sysServices
 - LLDP:
 - Implemented the ability to specify an IP address from VRF as an "lldp management- address"
 - Zabbix:
 - Updated the iperf2 version from 2.0.13 to 2.2.0
- Routing:
 - Implemented the possibility of route redistribution from RIPng to ISIS
 - BGP:
 - Added the ability to specify the "all" key for the "**next-hop-self**" command to replace nex-hop in all announced routes. Without this key, next-hop replacement occurs only for routes received via eBGP

- Added the possibility of assigning a route-map to the announced subnet (network) for changing/setting attributes
- Implemented BGP AS-list
- Implemented increasing/decreasing BGP metric by a certain value by track
- Added support for the replace-as mechanism in the BGP AS-Path attribute
- Implemented BGP Conditional Advertisement
- Implemented the `eltEsrBgp4V2PeerLastEstablChange` SNMP OID, which returns the time in seconds from the moment a BGP neighbor switches to the Established or Down state
- Implemented the `eltEsrBgp4V2PeerImpRouteCount` SNMP OID, which returns the number of routes received from a BGP neighbor
- OSPF:
 - Implemented the display of OSPF LSDB in an expanded form
 - Implemented ECMP operation for OSPF External routes-2
 - Implemented OSPF ttl security
- Security:
 - Implemented a command to display detailed information about PKCS#12 containers – "**show crypto certificates pfx**"
 - Implemented a command to display detailed information about the CRL – "**show crypto certificates crl**"
 - Added "valid-after" and "invalid-after" keys for "**update crypto default ca**", "**update crypto default cert**" and "**crypto generate cert**" commands
 - Increased the maximum number of entries in "**object-group url**" from 32 to 128
 - Firewall:
 - Added possibility of using **object-group mac** in the Firewall rules
 - Implemented the Application Firewall for IPv6
 - Replaced "**ip firewall sessions allow-unknown**" command with "**ip firewall sessions unknown permit | deny | reject**" with the option to select an action when packets of an unconfirmed tcp session arrive.
 - Added information output about "Description" in "**show security zone-pair**" command
 - IPsec:
 - Implemented `make_before_break` mode for rekeying in IKEv2, regulated by "**security ike session reauthentication**" command
 - Protection against attacks:
 - Implemented protection against arp-spoofing attacks for individual interfaces
 - Implemented logging of arp-spoofing attacks
 - Implemented protection against DoS/DDoS attacks for IPv6
 - Licensing:
 - Implemented license manager operation in VRF
 - Implemented the ability to launch a license request for ELM server without waiting for timers to expire using the "**update licence-manager licence**" command
 - The output of the "**show license**" command has been changed, taking into account the possibility of obtaining licenses from ELM servers
 - IDS/IPS:
 - Implemented logging of connection loss with user-server signatures
 - Changed the sequence of incoming traffic processing. IDS/IPS traffic is processed after Firewall finishes operation
 - Web filtering:
 - Implemented web filtering support for **https** protocol
 - Added support for temporary web filtering licenses
 - Implemented the possibility of using the **master-category** when configuring web filtering
 - Updated the list of categories when configuring web filtering
 - ACL

- Increased the maximum number of rules in ACL from 255 to 400 for ESR-15/15R/15VF
- Redundancy:
 - VRRP:
 - Added the "Group" column to the output of the "**show vrrp**" command
 - SLA test:
 - Added icmp-jitter type of SLA tests
 - Implemented the possibility of setting thresholds as a success condition of an SLA test
 - Implemented the ability to set "description" for IP SLA tests
 - Implemented storage of the history of SLA test results
 - Implemented the provision of SLA test results history via SNMP
 - Changed the output of the "**show ip sla test statistics <NUM>**" command for icmp-echo tests. Replaced zero values by dashes for non-measurable parameters.
 - Track:
 - Added the "description" field to the output of the "**show tracks**" command
- Tunneling:
 - VTI:
 - Implemented the ability to specify "local interface" instead of "local address" VTI-tunnel
 - DMVPN:
 - Implemented the possibility of DMVPN HUB operation behind STATIC NAT
 - Added the display of the "P - protected" flag for NHRP-peers that have an IPsec session installed in the output of the "**show ip nhrp peers**" command
 - Added the "group name <GROUP-NAME>" key to filter the output of the "**show ip nhrp peers**" command
 - Removed the need to specify a subnet mask in the output of the "**ip nhrp nhs**" command
- vESR:
 - Added support for SCSI LSILogic hard drives in vESR installations
 - Added support for the following hypervisors:
 - Xen in the HVM mode
 - QEMU

Version 1.23.6

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

Version 1.23.3

- Support for ESR-15R/15VF/31/3200L/3300 routers
- Monitoring and management:
 - CLI:
 - The banner displayed before user authentication on the router is re-displayed when pressing the keyboard shortcut "ctrl"+"c"
 - IP addresses specified as the remote address in syslog host are checked for presence on the router itself
 - Increased the number of loopback interfaces to 32
 - Implemented the ability to write a traffic dump to a file
 - Implemented the ability to filter the output of the "**show running-config**" and "**show candidate-config**" commands using the "syslog" key
 - Implemented separation of all configuration blocks
 - Implemented the display of information about QSFP28 in the output of the "**show interfaces sfp**" command
 - sFlow:
 - Implemented the ability to send sFlow statistics to VRF
 - Zabbix:
 - implemented the possibility of launching iperf3 using Zabbix-agent
 - SNMP:
 - Implemented SNMPv3 trap sending
 - SLA:
 - Implemented track activation in case of an unsuccessful SLA test
 - Expanded the output of operational information about the operation of SLA tests
 - Implemented a mechanism for changing the SLA configuration without restarting all tests
 - SLA test execution is now tied to the state of the interface
- Routing:
 - Added a new route type NHRP Shortcut
 - Implemented the possibility of filtering routes using regular expressions
 - BGP:
 - Implemented local-as with no-prepend and replace-as suboptions
 - Implemented the ability to aggregate route information when announcing via BGP
 - Implemented the possibility of filtering routes by the BGP Next-Hop attribute
 - OSPF:
 - Implemented the possibility of switching the interface to passive mode for the OSPF protocol
 - Implemented the possibility of configuring the "reference- bandwidth" parameter on the interface
 - Implemented the ability to enable automatic OSPF-cost calculation for interfaces
 - Implemented support for point-to-multipoint broadcast mode
 - Implemented ECMP support for the OSPF External routes (E1 and E2)
 - Multiwan:
 - Redesigned the mechanism for checking multiwan parameters at the configuration stage
- MPLS:
 - Implemented the ability to configure "prefix" in the "**advertise-labels**" command with "eq", "ge" or "le" keys
 - Expanded information output when viewing VPNv4 and VPLS records in detail
- Security:
 - IPsec :
 - Implemented the ability to use "local interface" when configuring "security ike gateway" to build IPsec from interfaces with dynamic addresses
 - Implemented the "**clear security ipsec vpn <VPN-NAME>**" command to reset one of the current VPN connections

- Implemented the ability to set different PSKs for different remote-address (ike keyring)
 - Support for Diffie-Hellman groups up to 31
- IPS
 - Expanded the output of the "**show security ips counters**" command
- Firewall
 - Implemented the ability to specify a host/subnet in the rules without using object-group network
 - Implemented the ability to filter broadcast packets for "security zone-pair any self"
- ACL:
 - Implemented the possibility of using a range of TCP/UDP ports in ACL rules.
- AAA:
 - Implemented the possibility of authorization of executed commands using TACACS servers
- QoS :
 - Implemented the traffic policing
 - Implemented relabeling the COS and DSCP fields on the output interface
 - Support for peer-tunnel-QoS policies for DMVPN Spoke-to-Spoke tunnels
- Tunneling:
 - Support for WireGuard tunneling protocol
 - DMVPN
 - Improved speed and stability
 - Improved the output of the "**show ip nhrp**" command
 - Increased the limit of GRE tunnels to 3,200 for ESR-1700
 - For the ESR-1700, increased the limit of connected mGRE SPOKE to 2000 for each mGRE HUB.
- DHCP:
 - Implemented the ability to configure the next-server parameter for DHCP-server pool
- NTP:
 - An NTP server can be configured to specify not only an IP address, but also a domain name.

Version 1.20.4

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

Version 1.20.3

- Routing:
 - BGP:
 - Implemented Dynamic Neighbors
 - Implemented the **community** and **extcommunity** deletion mechanisms in the announcements
 - Implemented the **community** and **extcommunity** replacement mechanisms in the announcements
 - Implemented the ability to configure the **address-family** in the **peer-group**
 - In the output of the **show bgp** command for a specific route, the following parameters are now displayed: **Next Hop**, **Local Preference**, **MED**, **Community**, **EXT Community**
 - OSPF:
 - Implemented the possibility of route redistribution with External Type-1
 - Implemented the ability to set route metrics during redistribution
 - MultiWAN:
 - Implemented labeling sessions for MultiWAN, in order to send session response packets through the same interface through which packets of this session arrive
- MPLS:
 - Implemented the Inter-AS Option
 - Implemented support for the **route-target both** configuration for VPLS
 - Implemented MPLS over DMVPN
 - Implemented the possibility of transmitting L2 protocol frames via PW using the **I2protocol forward command** in **I2vpn-eompls-view**
- Monitoring and management:
 - CLI:
 - Implemented the ability to calculate checksums for certificates and licenses
 - Implemented the display of detailed information on the multilink status
 - Implemented the **show tech-support** command to generate a diagnostic information archive
 - Removed the ability to run the **monitor** command for loopback interfaces
 - Implemented the ability to use uppercase characters in the user name in ssh/ftp/ssh/sftp ESR clients
 - Changed output of SSH connection error in host when SSH key doesn't match in accordance with ESR capabilities
 - Changed compatibility checks for commands in the ARCHIVE section
 - Unified hints for mail server configuration commands
 - Disabled the launch of the current configuration backup at device startup
 - Syslog:
 - Implemented filling of **hostname** and **ip-address** fields in syslog packets
 - Changed the format of **logging service start-stop** messages
 - Changed filling of **APP-NAME** field in syslog messages
 - Changed the format of logs generated on the VoIP chip (only for ESR-12V/12VF)
 - SNMP:
 - Created an **eltexUtilizationIfTable** in the ELTEX-GENERIC-MIB to contain interface utilization counters
 - Implemented support for OID **cntpPeersVarTable** (OID 1.3.6.1.4.1.9.9.9.168.1.2.1) – **cntpPeersVarEntry** sequence with all nested attributes from CISCO- NTP-MIB
 - Implemented support for **hrSystemDate** OID (OID 1.3.6.1.2.1.25.1.2) from HOST-RESOURCES- MIB

- Added OID support to ELTEX-ESR-BGP4V2-MIB:
 - eltEsrBgp4V2PeerAdminStatus ,eltEsrBgp4V2PeerRemoteAddrStr, eltEsrBgp4V2PeerRemot
 - eaddrStr
- ELTEX-GENERIC-MIB has added OID support for monitoring FIB/RIB limits and disposal for ipv4/ipv6: eltexRoutingFIBLimit, eltexRoutingFIBUsage, eltexRoutingFIB6Limit, eltexRoutingFIB6Usage, eltexRoutingRIBUsageBGP, eltexRoutingRIBUsageOSPF, eltexRoutingRIBUsageRIP, eltexRoutingRIBUsageISIS, eltexRoutingRIB6LimitsBGP, eltexRoutingRIB6LimitsOSPF, eltexRoutingRIB6LimitsRIP, eltexRoutingRIB6LimitsISIS, eltexRoutingRIB6UsageBGP, eltexRoutingRIB6UsageOSPF, eltexRoutingRIB6UsageRIP, eltexRoutingRIB6UsageISIS
- NetFlow:
 - Implemented sending netflow via OOB interface
- Security:
 - Firewall:
 - Implemented the ability to limit the number of firewall sessions for individual rules using the **action session-limit** command.
 - IDS/IPS:
 - Implemented counter cleanup on reboot and by the **clear security ips counters** command
 - Implemented disabling of interfaces with enabled IDS/IPS after reboot before downloading and applying IDS/IPS signatures
 - Implemented the ability to specify the number of rules for a category as a percentage (rules percent), all (rules all) and recommended (rules recommended)
 - Implemented the possibility of storing downloaded signatures on an external media (SD/USB)
 - Implemented the ability to view the response statuses from the EDM server in debug-mode
 - IPsec:
 - Implemented the display of **PFS dh-group** in the output of the **show security ipsec proposal** command
 - Implemented the DPD for IKEv2
- Tunneling:
 - Implemented the ability of gre-keepalive to operate when building a tunnel from an IP address in another VRF
 - Implemented a warning when executing the **no ip nhrp ipsec** command in the settings of a GRE tunnel
 - Updated OpenVPN server, client to version 2.5.3
- QoS:
 - Implemented Per-Tunnel QoS based on group attributes for DMVPN
- Event tracking mechanism (track):
 - Redesigned the mechanism for changing the BGP AS-path prepend parameter depending on the track status
 - Implemented a mechanism for changing the BGP metric parameter depending on the track status
- VoIP (only for ESR-12V/12VF):
 - Increased the maximum parameter length of the **sip-domain address** command from 31 to 235 characters in sip profile

Version 1.19.2

- Tunneling:
 - Added the ability 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 the configuration
 - Added **crypto generate pfx** command to generate pkcs12 container

Version 1.19.1

- Support for the new WLC-15 device
- Monitoring and management:
 - Implemented the crypto-sync service to synchronize certificates (under WLC license)
 - CLI:
 - Implemented the ability to generate certificates and a private key (under WLC license)
 - Implemented the **ip http server** and **ip https server** commands to enable a web server (under WLC license)
 - Implemented the **sync crypto force** command for manual certificate synchronization (under WLC license)
 - WEB:
 - Access point monitoring is implemented (under WLC license)
- Tunneling:
 - Implemented the possibility of distributing softgre-controller control tunnels to source addresses/networks (under WLC license)
 - Implemented the possibility of selectively enabling VLAN in softgre-controller for the WLC mode (under WLC license)
- WLC (under WLC license):
 - Support for WOP-30L access point operation
 - Implemented WLC redundancy via VRRP
 - Implemented WPA2/WPA3, WPA3 Enterprise security modes
 - Support for EAP-TLS operation on a local RADIUS server
 - Implemented **show wlc clients** command to view a list of connected Wi-Fi clients
 - Implemented the ability to configure PMKSA caching
 - Implemented configuring the NAS IP on the RADIUS server during proxying
 - Implemented displaying the total number of clients on the access point radio interface
 - User name, location name, and connection status are now included in the client log
 - Implemented configuring ssh/telnet/web/snmp services on the access point

Version 1.19.0

- Support for WLC operation on ESR-15, activated via license
- Monitoring and management:
 - CLI:
 - Renamed wireless-controller to softgre-controller
 - Simplified the input of the MAC address into the object-group mac. Now you do not need to set a standard mask manually, "ff:ff:ff:ff:ff:ff" is automatically written by default
 - Implemented displaying the DHCP/DHCPv6 configuration by category.
- Tunneling:
 - Changed the logic of SoftGRE tunnels in WLC mode and added support for the use of c-vlan in the client traffic tunneling scheme. In the new version, VLAN specified in the SSID settings gets into WLC without terminating a sub-tunnel in Bridge (under WLC license)
 - For correct operation, VLAN must be created in the WLC settings and must be a member of Bridge or an interface (under WLC license)
- WLC (under WLC license):
 - Added support for the WEP-30L access point
 - Implemented the ability to view WLC configuration by sections
 - Implemented the ability to view radius-server configuration by sections
 - Redesigned monitoring commands
 - Added the ap-location name to the extended access point information output.
 - Added separation by location to Airtune roaming statistics
 - Implemented the **reload wlc ap <mac>** command for rebooting an access point
 - Service-activator – Implemented registering access points via certificates:
 - Implemented the **join wlc ap <mac_ap>** command to authorize all unauthorized points in manual authorization mode.
 - Implemented the **show wlc service-activator aps** command to view unauthorized points
 - Implemented the **clear wlc ap joined <mac_ap>** command to revoke certificates from access points
 - Implemented the **aps join auto** command to configure the automatic access point authorization mode.
 - Ap-location:
 - The **mode tunnel** command has been implemented to enable tunneling in the location.
 - Radius-server local:
 - Implemented the possibility of configuring VLAN for a user
 - Logging:
 - The log of clients and access points is uploaded to an external syslog server

Version 1.18.1

- Support for ESR-15/30/3200 routers
- Implemented the TFTP server functionality
- IPsec:
 - Implemented configuring route-based IPsec (VTI tunnel) in VRF
 - Fixed the DPD mechanism operation for IKEv2
- IDS/IPS:
 - Implemented the ability to configure packet queues for IPS
- Monitoring and management:
 - CLI:
 - Implemented the ability to set the number of rows and columns of the terminal with the **"terminal resize"** command
 - Implemented a command to reformat flash:syslog, flash:data, and flash partitions:backup in accordance with software versions 1.13.0 and later **format mtd- partition data** (for ESR-10/12V/12VF/100/200/1000/1200/1500/1511 routers)
 - Implemented a command to delete files from flash:syslog, flash:data and flash:backup **clear mtd-partition data** (for ESR-10/12V/12VF/100/200/1000/1200/1500/1511 routers)
 - It is possible to delete the configuration of the physical interface using the **no interface** command
 - Implemented checks when executing the **copy** command, which do not allow incorrect combinations of the copy source and destination to be set
 - Implemented the **system cpu load-balance overload-threshold** command that manages sessions balancing between CPU cores
 - Implemented commands for displaying the cache: firewall-failover **show ip firewall session failover** and **show ip nat translations failover**
 - SNMP:
 - Implemented the possibility of obtaining information about SFP transceivers via SNMP
 - SYSLOG:
 - Implemented the ability to filter syslog messages of individual processes when output to snmp/telnet/ssh and console sessions
- Added the **"domain lookup"** setting to the default configuration
- Implemented displaying the name of the user who changed the configuration, if the configuration is automatically archived by commit
- Implemented the possibility of assigning a static IP address to the interface of a cellular modem
- Added support for four path-mtu-discovery modes:
 - disable
 - default
 - icmp-discard
 - secure
- Implemented the ability to manage GRE packet fragmentation using the **ip dont- fragment-bit ignore** and **ip path-mtu-discovery discovery disable** commands
- MPLS:
 - Implemented MPLS over GRE
 - Implemented BGP Inter-AS Option B
 - Implemented the ability to select a bridge in the LDP configuration
- Routing:
 - Implemented the ability to specify an interface as a router-id for RIP, OSPF, ISIS, BGP, LDP
 - Implemented the ability to specify an interface as update source for RIP, OSPF, ISIS, BGP, LDP

- BGP:
 - Changed the router-id selection algorithm to the following order:
 1. using a static router-id
 2. using the smallest IP address of a loopback interface
 3. using the smallest IP address of a physical interface
 - Implemented the possibility of recursive search on BGP routes
- OSPF:
 - Implemented the ability to set cost and metric type for the announced default routes
 - Implemented the possibility of using the OSPF protocol on VTI tunnels
- NTP:
 - Changed ranges for minpoll: 1-6 and maxpoll: 4-17 parameters
- Event tracking mechanism (track):
 - Implemented commands for displaying the track status: **show tracks** and **show track**
- AAA:
 - The minimum key length for the TACACS server has been changed to 1
- DHCP:
 - Implemented the DHCP-failover - Active/Standby mode
 - Implemented a command to specify the giaddr field in the ip helper-address gateway-ip **DHCP** packets
- Remote-access:
 - Implemented the possibility of transmitting route information via DHCP for PPTP/L2TP clients
- Adjusted restrictions on the 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/15 — 1000000

Version 1.17.3

- Monitoring and management:
 - SNMP:
 - Implemented the ability to monitor OSPF/BGP status via SNMP
 - FTP client:
 - Implemented the ability to configure the IP address of an FTP client (ip ftp source-address)
- Tunneling:
 - Implemented announcing group attributes with DMVPN-SPOKE
- IPsec:
 - Renamed rsa-public-key authentication method to public-key
 - Implemented support for PKCS1 and PKCS12 formats
 - Implemented support for ECDSA key type

Version 1.17.0

- Monitoring and management:
 - CLI:
 - Implemented the ability to set a comment when entering the **commit** command
 - Implemented the ability to set a configuration confirmation timeout when entering the **commit** command
 - Support for the delayed reboot function
 - Increased the number of prefixes and ranges of IP addresses in the object-group network to 1024
 - Implemented the ability to configure a tunnel group
 - Implemented the ability to calculate a checksum for files in the flash:backup/ section
 - Implemented the "Date of last modification" column in the **dir command** output
 - SSH:
 - Implemented disabling HOST algorithms supported on SSH- server
 - Netflow:
 - Implemented the ability to configure the ifindex value for self/dropped traffic
- Security:
 - IDS/IPS:
 - Support for mirrored traffic
- BRAS:
 - Implemented the ability to set user passwords for authorization by IP and MAC
- DHCP:
 - Server:
 - Implemented the ability to specify a description in the **address** command
- Routing:
 - Implemented the possibility of bidirectional transfer of routes between VRFs using the **route-target both** command
 - OSPF:
 - Optional Opaque LSA support has been implemented
 - Implemented the ability to set the maximum number of Nexthop for ECMP routes
 - BFD:
 - Implemented the output of information about the BFD neighborhood

Version 1.15.3

- WLC (under WLC license):
 - Support for WEP-200L access point operation
 - Board-profile:
 - Radio interface settings have been moved to the board-profile
 - Implemented the possibility to configure a single radio interface
 - SSID:
 - Implemented parameter configuration for 802.11r/kv roaming
 - Airtune:
 - Implemented monitoring and management of the Airtune service
 - Increased the size of the event log of clients and access points
 - Added serial number, board version, and operating time to the extended access point information
 - Added information on connected clients to the WLC status output (**show wlc**)
 - Support for SNMP monitoring of WLC
 - Passwords in traceroutes are now hidden
 - Log-filter:
 - Implemented filtering logs by MAC addresses of access points
 - Ap-profile:
 - Implemented logging configuration for all access point services
 - AP:
 - Implemented the ap-model parameter to determine the type of access point
 - Service-activator:
 - Optimized the access point software update algorithm

Version 1.14.5

- QoS:
 - Implemented the ability to specify bandwidth limits as a percentage for complex-qos
- Routing:
 - Implemented Policy-Based Routing for local router traffic
- Monitoring and management:
 - Implemented automatic software updates using DHCP options
 - SYSLOG:
 - Implemented the ability to filter syslog messages of individual processes when writing to a local syslog file or a remote syslog server
 - Implemented the possibility of logging traffic flows processed by IPS/IDS to a remote syslog server.
- Redundancy:
 - Implemented support for STP/RSTP protocols in bridge for all models
 - Implemented support for STP/RSTP protocols for physical interfaces in the switchport mode for ESR-1x/2x
- Remote-access:
 - Implemented the ability to restrict authentication and encryption methods of IKE and IPsec protocols for L2TP-server and L2TP-client

Version 1.14.0

- AAA:
 - Implemented the ability to use a secure TLS/SSL connection for LDAP
- DPI:
 - Implemented 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 filtering of individual commands for HTTP and FTP
- IPsec:
 - Added support for mode transport
- QoS:
 - Implemented classification by URL
 - Implemented classification by application
- Track
 - Implemented the ability to track the status of a VRRP or SLA test.
 - Added management of the VRRP, PBR, administrative interface status, static route, AS-PATH attribute and preference parameters in the route-map.
- Monitoring and management:
 - CLI:
 - Implemented the display of the device configuration with the default parameters
 - Implemented the ability to specify an **IPv4/IPv6/DNS** host without ip/ipv6 prefixes in the ping command
 - Implemented the ability to set passwords less than 8 characters long
 - Implemented the ability to check external drives using the **verify storage-device** command
 - Implemented the ability to format external drives using the **clear storage-device** command
 - SSH:
 - At device startup, host keys are checked and if they are missing, generation is performed. Each device has unique ssh host keys
 - The obsolete **rsa1** key type has been removed
 - The **crypto key generate** command has been removed from the **configure** configuration mode, and instead the **update ssh-host-key** command has been implemented in the **root** configuration mode
 - Collecting statistics:
 - Counting Ingress and Egress traffic for Netflow

Version 1.13.0

- 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

- 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 the possibility of establishing 3-way handshake neighborhood
- Monitoring and management:
 - CLI:
 - Removed the possibility of authentication under the root user
- Tunneling:
 - Added possibility to set AAA authentication lists for OpenVPN clients
- Filtering:
 - HTTP proxy
 - Added possibility to log filtering events

Version 1.11.10

- Monitoring and management:
 - CLI:
 - Added possibility to view the reason for the reboot using the **show system reload** command.

Version 1.11.6

- Monitoring and management:
 - CLI:
 - Added the possibility to view the number of softgre tunnels using the **show tunnels count softgre** command (under a WLC license)
 - Added the possibility to view summary information about the wireless-controller using the **show wireless-controller access-points** command (under a WLC license)
 - Implemented the ability to set multiple filtering criteria in pipe
 - Implemented the ability to save CLI output to a file
 - Implemented the until and counter output modifiers

Version 1.11.4

- Monitoring and management:
 - CLI:
 - Added the **clear vrrp-state** command to switch mastery between VRRP MASTER and BACKUP
- QoS:
 - Optimized the process of applying dynamic QoS
 - Added traffic prioritization for dynamic QoS
 - Supported SFQ mechanism for software implementation of QoS

Version 1.11.2

- Support for ESR-3100 router
- BRAS:
 - Supported BRAS operation in VRF for L3 switching scheme
 - Supported adding Option 82 from DHCP packets of clients 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 specific 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

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

Version 1.11.0

- 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 a single 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 tunnels and e1, multilink interfaces
 - Implemented possibility to establish GRE tunnels from IP interfaces of a different VRF
 - Implemented the ability to provide L2 connectivity between clients from different tunnels within one location in the scheme with wireless-controller
 - PPPoE
 - Implemented the ability to use the ",", "/" and "\" characters in username
- Limited file system support for USB drives and SD/MMC cards. Only FAT is supported

Version 1.10.0

- Routing:
 - Added support for the IS-IS routing protocol
 - Added support for the RIP NG routing protocol
 - Reworked BGP configuration
 - BGP:
 - Added support for BGP Graceful restart
 - Added support for the BGP Weight attribute
 - OSPF:
 - Added support for OSPF Graceful restart
- Monitoring and management:
 - Added possibility to enable exclusive 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 an OpenVPN client
- MPLS:
 - Added support for the LDP
 - Added support for L2VPN VPWS
 - Added support for L2VPN VPLS Martini mode
 - Added support for L3VPN MP-BGP

Version 1.8.7

- 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

- 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 the user field in the cellular profile configuration mode
- Monitoring:
 - Implemented Zabbix-proxy

Version 1.8.3

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

Version 1.8.2

- 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

- 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

- 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

- 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 of **ip http proxy redirect-port**, **ip http proxy redirect-port** port commands from BRAS to HTTP(S) Proxy
- NAT:
 - ESR-1700: Increased the maximum number of NAT pools to 1024

Version 1.6.6

- 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

- 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 located in VRF

Version 1.6.4

- 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

- 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
 - Managing 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 the 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 authentication via console port
 - 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 the 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 broadcasting
 - 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

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

Version 1.4.2

- Protection against attacks:
 - Added the **show ip firewall screens counters** command, which allows you to view statistics on detected network attacks
 - Added 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, making it possible 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
 - 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

- 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 being used
- SNMP:
 - Added possibility to apply the configuration and reboot the device using **commitConfirmAndReload** SetRequest
 - Support for the RMON agent, which makes it possible 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 for:
 - Network interfaces load
 - GRE/SUB-GRE tunnels
 - 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 the ability 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 types of devices. Voice VLAN transmission is implemented via this extension.
- Firewall:
 - Implemented application traffic classification technology
 - Added **ip firewall logging screen** command in **config** mode to log detected DoS attacks

- QoS:
 - Implemented the GRED (Generic RED) mechanism for queue overflow management 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

- 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 the state of VRRP
- CLI:
 - Added possibility to scale the size of the terminal to the size of the window on PC when using 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
 - The ability to view Firewall expect 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 is outdated. Time synchronization over the protocol 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 is outdated. Protocol access is enabled by 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

- Protection against attacks:
 - 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)
 - Added 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 Generation of
 - RSA key with variable length
- 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

- Tunneling:
 - Support for GRE Keepalive
- L3 routing:
 - BGP:
 - Possibility to add neighbor description
 - Possibility to enable/disable neighbors
 - Increased total number of BGP peers to 1000
 - Viewing the summary 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 via the SA
- SNMP:
 - Display the current speed of the interfaces in the ifSpeed parameter of the IF-MIB
 - SNMP Trap:
 - Trap on exceeding CPU load and temperature thresholds, 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 file paths:

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 via MAC address
 - Configuring active/reserve redundancy based on VRRP status

Version 1.1.0

- 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 via MAC address
- Netflow:
 - Netflow v10. Exporting statistics by URL
 - Support for VRF
 - Support for Domain Observation ID
 - Information about NAT sessions
 - HTTPS Host export
 - Exporting information about 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
 - Support for VRF
 - 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

- 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

- Device control: configuring the operation mode of the fans
- L3 routing:
 - Automatically allocated VLANs (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
 - Support for BGP
 - BGP ECMP
 - Keepalive timer autocalculation
 - Support for Policy-based routing (IPv4 only)
 - Logging of 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:
 - Support for BGP
 - Support for OSPF
 - Support for QoS
 - Router management (AAA, Telnet, SSH, SNMP, Syslog, **copy** command)
 - IPv6 enhancement:
 - Support for BGP
 - 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

- Management and monitoring:
 - Automatic configuration redundancy
 - Collecting statistics:
 - 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**

vi.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 preshared- 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

- 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 lists (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 resources monitoring:
 - Connection/flow monitoring
 - Routing tables 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

- 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

- 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 for viewing the serial number
 - Command for viewing hardware version
 - Support for ARP table cleaning
- System edits:
 - 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

- Configuration:
 - Added possibility to copy configuration to(from) TFTP server(s)
 - Hostname
 - System time (manual)
 - Description of interfaces
 - 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

- Address translation:
 - Source NAT
 - Destination NAT
 - Static NAT
- Virtualization, VPN:
 - IKE
 - Tunneling (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>Number of static routes</u>	<u>100</u>
<u>Number of competitive sessions</u>	<u>512,000</u>

Version restrictions:

- Bandwidth is limited (500 Mbps 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