

- Virtual solution
- Data routing
- Multiprotocol Label Switching (MPLS)
- Building a secure network (NAT, Firewall)
- Intrusion Detection and Prevention System (IPS/IDS)<sup>1</sup>
- Filtering of network data by various criteria (including filtering by applications)
- Organization of secure network tunnels between company branches
- Remote connection of employees to an office
- Internet channel management and bandwidth allocation within an office using QoS
- Organization of a backup connection
- L2 client connections termination, bandwidth limitation, BRAS<sup>1</sup>



**vESR** is a virtual service router designed for connection of small and middle-sized offices in enterprise networks. The functionality of firewall and router allows ensuring security with various Internet connection options. **vESR** supports advanced routing, WAN organization and network security functions.

### Minimum system requirements<sup>1</sup>

Processor	x86-64 architecture, clock frequency no less than 1.8 GHz Support for MMX, SSE, SSE2, SSE3, SSSE3, SSE4.1, SSE4.2 instructions (processor generation Intel Nehalem/AMD Barcelona CPU or higher)
RAM	No less than 3 GB
Storage	No less than 375 MB
Hypervisors	VirtualBox version 6.0, Xen in HVM mode, version 4.16 or higher, Proxmox version 8.1.4, QEMU 2 version 2.6.2, VMWare Workstation/ESXi version 6.7.0 GNS 3 version 2.2.5 EVE-NG version 6.2.0 PNETLab version 4.2.10
I/O	Emulation: Intel E1000, Intel E1000E, VMXNET2, VMXNET3 Paravirtualization: VirtIO PCI Pass-through: Intel XL710 Ethernet Controller (2x40/1x40/4x10/2x20/2x10/1x10), Intel X722 Ethernet Controller (2x10/4x10) RTL8169 PCI Gigabit Ethernet Controller RTL810xE PCI Express Fast Ethernet controller RTL-8110SC/8169SC Gigabit Ethernet RTL8111/8168/8411 PCI Express Gigabit Ethernet Controller RTL-8100/8101L/8139 PCI Fast Ethernet Adapter

Functionality for firmware version 1.37.

<sup>1</sup> The requirements allow to perform vESR installation and initial launch with basic configuration.

## Performance (single core)

Processor	Adapter	Mbit/s result			PPS result		
		74B	1518B	IMIX	74B	1518B	IMIX
Intel(R) Xeon(R) Silver 4208 CPU @ 2.10GHz	PCI	171.621	4146.848	1846.154	289898	341440	335211
	VMXNET3	130.678	2962.065	1456.598	220744	243906	264670
Intel(R) Xeon(R) CPU E5-2620 v4 @ 2.10GHz	PCI	147.289	2502.180	1360.824	248810	206043	246887
	VMXNET3	82.682	1677.985	804.037	139761	138173	146370

## Technical features

Number of CPUs by role			
	vESR (1 CPU)	vESR (2 CPU)	vESR (3 or more CPU)
Controlling CPU <sup>1</sup>	0	0	0
Balancing CPU <sup>2</sup>	0	1	1
Service CPU <sup>3</sup>	0	1	2+
Switching			
LLDP		interfaces port policies – 8 network policies – 64	
MAC address table		128k	
Switching by labels			
MPLS		LDP neighbors – 1024 pseudowires – 1024 pseudowire classes – 64 Ethernet over MPLS – 256	
System features			
Maximum number of competitive sessions		8.5M	
VLAN	up to 4k active VLANs in accordance with 802.1Q		
FIB size		3M	
VRF		32	
PBR		instances – 50 rules for all instances – 512	

Functionality for firmware version 1.37.

<sup>1</sup>The processor core that runs the operating system and processes the control-plane traffic.

<sup>2</sup>The separate core dedicated to balancing transit sessions between service CPUs.

<sup>3</sup>Cores processing the data-plane.

## Technical features (continued)

Object-groups	
Object-group network	instances – 1024 ip prefixes in group – 1024 ip ranges in group – 1024
Object-group address:port	instances – 500 address:port in group – 64
Object-group service	instances – 500 ports ranges in group – 64
Object-group application	instances – 50 apps in group – 128
Object-group content filter	instances – 64 categories per vendor – 500
Object-group URL	instances – 128 plain URL in group – 128 regex URL in group – 128
Object-group MAC	instances – 500 macs in group – 64
Routing	
Static routes	11k
BGP	instances – 64 networks in instance – 512 neighbors – 1k RIB – according to the license
OSPFv3	instance, neighbors in interface – 64 summaries in instance – 128 areas – 256 networks in area – 64 virtual links – 1024 RIB – according to the license
IS-IS	instances, circuits – 64 RIB – according to the license
RIP(ng)	neighbors – 16 summaries – 8 networks – 128 RIB – according to the license
QoS	
QoS limitations	class-maps – 1024 policy-maps – 1024 classes in policy-map – 3072
Tunneling	
VPN tunnels	IPIP – 500 GRE – 3200 Ethernet over GRE – 500 GRE SUB – 500 SoftGRE – 8161 L2TPv3 – 500 LT – 128 IPsec VTI – 500
IPsec VPN tunnels	3200

## Technical features (continued)

Remote access	
Remote Access	L2TP tunnels (client) – 10 PPTP tunnels (client) – 10 OpenVPN tunnels (client) – 10 OpenVPN remote addresses per tunnel – 8 OpenVPN concurrent users – 64 instance – 16 peers per instance – 128 local addresses – 1 addresses per peer (address-range & obj-group) – 10k
WireGuard tunnel, RA	
Services	
Source NAT	ruleset – 1024 rules in ruleset – 1024 pool – 1024
Destination NAT	ruleset – 1024 rules in ruleset – 1024 pool – 1024
DHCP Server	pools – 100 pool size – 10k static address in pool – 128
Security	
ACL	instances – 1533 rules – 1533
Firewall	zone – 128 zone-pair – 512 rules – 10k
IPS	user update servers – 32 ips-categories – 20 rules – 500
IKE (v1/v2), IPsec (esp/ah)	
Authentication	md5, sha1, sha2-256, sha2-384, sha2-512
Encryption	des, blowfish128, aes128, camellia128, aes128ctr (IKEv2 only), blowfish192, aes192, camellia192, 3des, aes192ctr (IKEv2 only), blowfish256, aes256, camellia256, aes256ctr (IKEv2 only)
Diffie Hellman	Regular Groups: 1,2,5,14-18. Modulo Prime Groups with Prime Order Subgroup: 22-24. NIST Elliptic Curve Groups: 19-21, 25-26. Brainpool Elliptic Curve Groups: 27-30. Elliptic Curve 25519: 31

## Features and capabilities

### Switching

- Up to 4094 VLAN (802.1Q)
- Voice-VLAN
- Q-in-Q (802.1ad)
- MAC-based VLAN
- Bridge domain
- LAG/LACP (802.3ad)
- Jumbo frames

### MPLS

- LDP
- L2VPN VPWS
- L2VPN VPLS Martini Mode, Kompella Mode
- L3VPN MP-BGP (Option A, B, C)
- L2VPN/L3VPN over GRE, DMVPN
- Transparent transmission of service protocols

### Routing

#### BGP:

- IPv4, IPv6, VPv4, L2VPN, IPv4 label-unicast, Flow-spec
- Support for Conditional Advertisement, Route Aggregation and Local-AS mechanisms
- High scalability and configuration flexibility: support for peer-group, dynamic neighbor, as-range, Route-reflector and Confederation
- Fall over based on BFD protocol and Fast Error Peer Detection
- Graceful restart
- Authentication
- Flexible redistribution from/to BGP process of other protocol routes
- Running up to 64 processes simultaneously
- ECMP
- Support for policy-based routing

#### OSPF (v3):

- Normal, Stub, Totally stub, NSSA, Totally NSS
- Broadcast, NBMA, Point-to-point, Point-to-multipoint, Point-to-multipoint non-broadcast
- Summarizing and filtering of route information
- Authentication
- ECMP
- Passive interface
- Flexible redistribution from/to OSPF process of other protocol routes
- Running up to 64 processes simultaneously
- Support for BFD protocol
- Auto cost calculation
- Support for policy-based routing

### IS-IS:

- Broadcast, Point-to-point
- Setting the L1/L2 layers neighboring
- Metric style: narrow, wide, transition
- Authentication
- Routing information filtering
- Flexible redistribution from/to the IS-IS process of other protocol routes
- Running up to 64 processes simultaneously
- Support for policy-based routing

### RIP(ng):

- Broadcast, Multicast, Unicast modes (RIP only)
- Summarizing and filtering of route information
- Route metrics management
- Authentication
- Passive interface
- Flexible redistribution from/to the RIP process of other protocol routes
- Support for policy-based routing

### Static:

- Support for BFD protocol
- Recursive search
- Route metrics management
- Selecting the option to notify the sender when traffic is blocked

### Quality of Service (QoS)

- Up to 8 priority or weighted queues per port
- L2 and L3 traffic prioritization (802.1p (CoS), DSCP, IP Precedence (ToS))
- Hierarchical QoS
- Management of RED, GRED, SFQ, CBQ, WFQ, WRR queues
- Inlet and outlet labeling
- Policing, shaping

## Features and capabilities (continued)

### IPsec

- Policy-based and route-based modes
- Tunnel and transport modes
- Pre-shared key, public key, xauth (ikev1 only), eap (ikev2)
- Support for mobike (ikev2 only)
- Support for ike ikering authentication key sets

### Remote access

- Remote access to the corporate network via PPTP, L2TP over IPsec, OpenVPN, WireGuard
- Support for PPPoE/PPTP/L2TP client
- User authentication
- Connection encryption

### Security

- ACL based on L2/L3/L4 fields
- Zone-based Firewall in stateful and stateless modes. Rule triggering logging, counters
- Filtering by applications
- Protection against DoS/DDoS/Spoof attacks and their logging
- Intrusion detection and prevention system (IPS/IDS) and their logging<sup>1</sup>
- Signature analysis via IPS in transit and mirrored traffic analysis modes<sup>1</sup>

### Management and monitoring

- Support for standard and extended SNMP MIB, RMONv1
- Zabbix agent/proxy
- User authentication using local database via RADIUS, TACACS+, LDAP
- Protection against configuration errors, automatic configuration recovery
- CLI
- Syslog
- System resource usage monitoring
- Ping, monitor, traceroute (IPv4/IPv6), output packet information in console
- Firmware upgrade, configuration upload and download via TFTP, SCP, FTP, SFTP, HTTP(S)
- Support for NTP
- Netflow v5/v9/v10 (exporting of URL statistics for HTTP, host for HTTPS)
- Remote management, Telnet, SSH (IPv4/IPv6)
- LLDP, LLDP MED
- Local and remote saving of router configurations

### SLA<sup>1</sup>

- SLA-responder for Cisco-SLA-agent
- Eltex SLA:
  - Delay (one-way/double-way)
  - Jitter (forward/backward)
  - Packet loss (forward/backward/duplex)
  - Duplicate packet detection
  - Packet delivery sequence violation detection (forward/backward/duplex)

### Backup and clustering

- VRRP v2, v3
- Tracking based on VRRP or SLA test
- VRRP parameter management
- PBR parameter management
- Administrative interface status management
- Static route activation and deactivation
- Managing AS-PATH and preference attribute in route-map
- DHCP failover for IP addresses base backup issued by the DCHP server
- Firewall failover for Firewall and NAT session backup
- MultiWAN
- Dual-Homing

### Fault-tolerant cluster:

- Easy administration and integration: synchronization of configurations, time, versions, licenses; Zero Touch Provisioning (ZTP)
- Backup all connections in the cluster
- Router backup ("1+1" backup is supported in the current version)

Functionality for firmware version 1.37.

<sup>1</sup> Activated by a license.

<sup>2</sup> Rule sets are provided on a subscription basis. The minimum subscription period is one year.

## Features and capabilities (continued)

### Services

- DHCP client, service
- DHCP Relay Option 82
- DNS resolver
- NTP
- TFTP server

### BRAS<sup>1</sup>

- User termination
- URL whitelists/blacklists
- Quoting by traffic volume, by session time, by network applications
- HTTP/HTTPS Proxy
- HTTP/HTTPS Redirect
- Netflow
- AAA, PCRF

- Bandwidth management by office, SSID and user sessions
- User authentication by MAC or IP address

### DMVPN

- NHRP
- DMVPN phase 1,2,3
- Per-Tunnel QoS
- IPsec

### Tunneling

- IPoGRE, EoGRE
- IPIP
- L2TPv3
- LT (inter VRF routing)

## Ordering information

Option	Description
vESR FREE	vESR FREE software service router option, 1 Mbit/s, 1024 RIB BGP, 1000 RIB OSPF, 1000 RIB IS-IS, 1000 RIB RIP, 2 VPN
vESR BASIC	vESR BASIC software service router option, 100 Mbit/s, 512k RIB BGP, 500k RIB OSPF, 500k RIB IS-IS, 10k RIB RIP, 6 VPN, 1 year
vESR BASIC+	vESR BASIC+ software service router option, 500 Mbit/s, 512k RIB BGP, 500k RIB OSPF, 500k RIB IS-IS, 10k RIB RIP, 12 VPN, 1 год
vESR STANDARD	vESR STANDARD software service router option, 1 Gbit/s, 768k RIB BGP, 500k RIB OSPF, 500k RIB IS-IS, 10k RIB RIP, 24 VPN, 1 год
vESR STANDARD+	vESR STANDARD+ software service router option, 5 Gbit/s, 1024k RIB BGP, 500k RIB OSPF, 500k RIB IS-IS, 10k RIB RIP, 64 VPN, 1 год
vESR ADVANCED	vESR ADVANCED software service router option, 10 Gbit/s, 2048k RIB BGP, 500k RIB OSPF, 500k RIB IS-IS, 10k RIB RIP, 64 VPN, 1 год
vESR ADVANCED+	vESR ADVANCED+ software service router option, 25 Gbit/s, 4096k RIB BGP, 500k RIB OSPF, 500k RIB IS-IS, 10k RIB RIP, 64 VPN, 1 год
vESR PREMIUM	vESR PREMIUM software service router option, 50 Gbit/s, 5000k RIB BGP, 500k RIB OSPF, 500k RIB IS-IS, 10k RIB RIP, 256 VPN, 1 год
vESR PREMIUM+	vESR PREMIUM+ software service router option, 100 Gbit/s, 5000k RIB BGP, 500k RIB OSPF, 500k RIB IS-IS, 10k RIB RIP, 256 VPN, 1 год

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### Contact us

 +7 (383) 274 10 01  
+7 (383) 274 48 48

 eltex@eltex-co.ru

 www.eltex-co.com

### About Eltex

**Eltex Enterprise** is a leading Russian developer and manufacturer of communication equipment with 30 years of history. Complete solutions and their seamless integrability into the Customer's infrastructure are the priority growth areas of the company.