ME series routers are multifunctional devices with a high port density intended for use in provider networks as aggregation router and IP/MPLS network transport border routers. These routers are cost-effective, compact and high-performance solution which can be used to organize operator's points of presence when providing data services for large customers with high reliability requirements. Fault tolerance of devices is ensured by redundant power supplies (1+1) and by replaceable fan modules. All redundant units are hot-swappable.
In addition to traffic routing and switching, the main functionality of the device includes wide support for MPLS switching mechanisms, such as MPLS Layer3 VPN, VPLS (Kompella/Martini), VPWS with pseudowire backup capabilities, Multicast routing with support for PIM-SM/PIM-SSM/MSDP/Anycast PIM, as well as rich QoS capabilities. This set of functions allows to use devices as full-featured provider edge (PE) routers.

ME5000

ME5000 is a high performance modular router that has hardware architecture that provides flexible scaling and the ability of hardware configuration for various requirements both in terms of bandwidth and types of network interfaces. ME5000 router modules are installed in the chassis - standard 19" euroconstructive 15U. The chassis has two slots for installing FMC (fabric and management card) modules and 12 slots for installing LC (linecard) modules.

ME5100

ME5200

ME5100 and **ME5200** are routers with a fixed set of network interfaces, hot-swappable power supplies and fan modules and can be used in those networks points where high performance in a compact form factor is required. Routers are designed for installation in 19" constructive and have a height of 2U.

ME5000 technical features

Performance	
System throughput	Up to 2.8 Tbps with two FMC16 modules
Maximum bandwidth per slot	Up to 138 Gbps with one FMC16 module Up to 276 Gbps with two FMC16 modules LC modules provide data processing at wire speed with 256-byte packets
Routing and management modules	Up to 2 FMC modules per chassis
LC modules	Up to 12 LC modules per chassis
Module orientation	Vertical
Redundancy and reliability	Routing and management modules redundancy Software redundancy Per-slot distributed power design, two power inputs Fan modules redundancy

ME5000 technical features

Resources	
Queues	Up to 96K/line module
FIB	Up to 1M routes IPv4/512K IPv6 per LC18XGE Up to 4M routes IPv4/2.7M IPv6 per LC20XGE/LC8XLGE; FIB capacity depends on the prefix length
MAC table	Resource shared with MPLS switching tables and elements of single-hop BFD sessions. – Up to 250K per LC18XGE – Up to 750K per LC20XGE/LC8XLGE
RIB	Defined by free RAM capacity
Logical interfaces	Up to 16K per device Up to 4K per LC18XGE Up to 8K per LC20XGE/LC8XLGE
MPLS PW	Up to 12K per LC18XGE Up to 16K per LC8XGE/LC20XGE - software limit
ARP table	Up to 20K per LC18XGE Up to 57K per LC8XGE/LC20XGE
VRF (MPLS L3VPN)	Up to 1000 (up to 128 with BGP process instances launched in every VRF)

Name	Ports	Performance
Routing and management modules		
FMC16	– 2 management ports of 1GbE (RJ-45) – RS-232 console port (RJ-45)	1.4Tbps
LC modules		
LC18XGE	18x10Gbps (SFP+)	180Gbps 350Mpps
LC20XGE	20x10Gbps (SFP+)	200Gbps 720Mpps
LC8XLGE	4x40GE (QSFP) + 4x100GE/40GE (QSFP28)	560Gbps 720Mpps

ME5100/ME5200 technical features

	ME5100	ME5200
General parameters		
Packet processor	Broadcom BCM88660	Broadcom BCM88375
CPU	Broadcom XLP308, MIPS 1200Mhz	Broadcom XLP308, MIPS 1400MHz
Interfaces		
Integrated interfaces	– 20 network interfaces of 10GE SFP+. Support 1GE mode (1000BASE-X). Available usage of 1000BASE-T SFP transceivers. – Out Of Band (OOB) 1GE port (10/100/1000BASE-T) – RS-232 console port (RJ-45) – 1 x USB 2.0 – SyncE synchronization clock input and output (SMB, 50 Ohm)	– 32 network interfaces of 10GE SFP+. Support 1GE mode (1000BASE-X). Available usage of 1000BASE-T SFP transceivers. – 4 network interfaces of 40/100GE QSFP28. Support 40GE and 100GE modes. – Out Of Band (OOB) 1GE port (10/100/1000BASE-T) – RS-232 console port (RJ-45) – 1x USB 2.0 – SyncE synchronization clock input and output (SMB, 50 Ohm)
Performance		
Throughput and system performance	200 Gbps, 300 Mpps	720 Gbps, 720Mpps
Buffer memory	6GB	8GB
RAM	8GB	16GB
MAC table	250K	720K (resource shared with MPLS switching tables)
Bridge domains	up to 4K	up to 8K
Routing table	FIB: up to 1M IPv4 or up to 512K IPv6 Resource shared with MPLS switching tables and elements of single-hop BFD sessions. RIB is limited by free RAM capacity	FIB: up to 4M IPv4 or up to 2.7M IPv6. Actual FIB capacity depends on prefix length Resource shared with MPLS switching tables and elements of single-hop BFD sessions. RIB is limited by free RAM capacity
L3 interfaces	up to 4K	up to 8K
MPLS PW	up to 12K	up to 16K
ARP table	up to 20K	up to 57K
VRF (MPLS L3VPN)	up to 1000 (up to 128 with BGP process instances launched in every VRF)	
QoS queues	96K	

ME5000 components power consumption

Name	Description	Energy consumption, W
FMC16	Routing and management module	Up to 200
LC18XGE	Line module 18x 10Gbps 10GBASE-R/1000BASE-X (SFP+)	Up to 200
LC20XGE	Line module 20x 10Gbps 10GBASE-R/1000BASE-X (SFP+)	Up to 250
LC8XLGE	Line module 4x 40Gbps (QSFP) + 4x40/100 Gbps (QSFP28)	Up to 250
ME5000-FB	Fan module	Up to 400

ME5000/ME5100/ME5200 physical parameters

	ME5000	ME5100	ME5200
Air flow	Front-to-back air flow. Two hot-swappable fan modules.	Front-to-back air flow. Three hot-swappable fan modules.	
Power sources	Two input power lines: 36..72V DC	Two hot-swappable power modules. AC: 150..250V 50Hz DC: 36..72V	
Maximum power consumption	4200 W	250 W	350 W
Operating temperature	from 0 to 45°C		
Weight	Chassis without LC/FMC - 46.7 kg FMC16 - 3.4 kg LC18XGE - 3.6 kg LC20XGE - 3.7 kg LC8XLGE - 3.9 kg	9.5 kg	9.8 kg
Dimensions (WxHxD)	487 x 661 x 495 mm	440 x 87 x 500 mm	

ME series features and capabilities

Interfaces functions
– Link aggregation groups: static LAG and LACP
– Equal load balancing in group
– Multi-chassis LAG
– BFD (Bidirectional Frowarding Detection) over LAG, single connection failure detection (RFC 7130)
– Traffic mirroring - SPAN, RSPAN

L2 functions
– Providing Ethernet switching through the bridge domains and cross-connects
– IEEE bridging (IEEE 802.1d)
– VLAN (IEEE 802.1q)
– Q-in-Q (IEEE 802.1ad) with push/pop/swap/replace tag operations
– SpanningTree protocols (STP, RSTP, MSTP)
– LLDP

L3 protocols and functions
– Static IPv4, IPv6 Unicast Routing
– IS-IS
– OSPFv2, OSPFv3
– Border Gateway Protocol (BGP)
– BGP Route Reflector, BDP Additional Path
– Route filtering (routemap, prefix-list)
– BFD protocol for routing protocols and static routes
– IP FastReroute/Loop Free Alternate for OSPF/IS-IS
– VRRP (version 2), DHCP relay agent
– IPv4 ACL (access control lists) for transit traffic
– ECMP load balancing

Multicast management
– PIM-SM, PIM-SSM, Anycast RP
– IGMP v2/v3, SSM mapping
– MSDP
– IPv6 MLDv1, v2

MPLS functions
– Multiprotocol extensions for BGP-4
– Label Distribution Protocol (LDP)
– MPLS pseudowire with PW backup functionality
– L2VPN
  -VPWS
  -VPLS LDP signalling (draft-martini)
  -VPLS BGP signalling (draft-kompella)
– L3VPN
  - L3VPN for AFI/SAFI vpnv4 unicast and vpnv6 unicast
  -L3VPN inter-AS option A

Quality of Service (QoS)
– Ingress policing, ingress/egress shaping
– SP and DeficitWRR queuing algorithms
– Rate limiting, Storm Control
– Up to 8 queues per logical interface, up to 32K queues per physical interface

Reliability functions
– Management modules redundancy; module fault detection time is 300 ms max[1]
– Synchronization of FIB/ARP tables between management modules[1]
– Graceful Restart for routing protocols
– Non-stop forwarding
– In-service Software Upgrade[1]
– Active and backup firmware images
– Ability to restore the previous firmware version during update

Management and monitoring
– Command Line Interface (CLI), SSH, Telnet for remote management
– SNMPv1, v2c for monitoring the device status
– NETCONF protocol
– Statistic data export (Netflow V9)
– Configuration backup and restore (local, FTP, SFTP, TFTP)
– RADIUS, TACACS+ authentication and authorization, accounting via TACACS+
– Remote software retrofit
– System parameters and resources monitoring
– Syslog
– Time synchronization, NTP, SNTP
– Control-plane protection and rate-limiting

[1] For ME5000 routers

ME5000 ordering information

Name	Description
Chassis	
ME5000 chassis	ME5000 universal edge router chassis
Line modules	
LC18XGE	Line module 18x10Gbps 10GBASE-R/1000BASE-X (SFP+)
LC20XGE	Line module 20x10Gbps 10GBASE-R/1000BASE-X (SFP+)
LC8XLGE	Line module 4x40Gbps (QSFP) + 4x40/100 Gbps (QSFP28)
Routing and management modules	
FMC16	Routing and management module
Other modules	
ME5000-FB	Fan module (mounting of two modules in the chassis is required)
ME5000-FP	Slot blank
ME5000-SM-STAT	Statistics submodule* for LC18XGE
ME5000-SM-STAT2	Statistics submodule* for LC20XGE/LC8XLGE

ME5100/ME5200 ordering information

Name	Description
ME5100	ME5100 router Equipped with fan modules, no power supplies
ME5200	ME5200 router Equipped with fan modules, no power supplies
Other modules	
PM350-48/12	DC power supply
PM350-220/12: rev.B	AC power supply
ME5100-FAN/ME5200-FAN	Fan module
ME5000-SM-STAT	Statistics submodule* for ME5100
ME5000-SM-STAT2	Statistics submodule* for ME5200

* Statistics submodule is required for providing NetFlow/IPFIX protocols operation and for extended statistics - Pseudowire timers, QoS queues, etc.

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About Eltex

Eltex company is a leading Russian developer and manufacturer of telecommunication equipment with more than 25 years of history. Integrity of solutions and seamless integration capability into Customer infrastructure is a priority area of company development.