Integrated networking solutions

- 48x10GBASE-R/1000BASE-X interfaces
- 4x40GBASE-LR4/SR4(QSFP) interfaces
- Bandwidth – 1.28 Tbps
- L3 switch
- Non-blocking architecture
- Stacking up to 8 devices
- Hot-swappable redundant power supplies
- Front-to-back cooling
- Hot-swappable fans

MES5448

Eltex MES5448 switches provide full Layer 2 and Layer 3 functionality for carrier networks and data centers. MES5448 r the DC requirements for Top-of-Rack и End-of-Row switches and requirements of service provider for aggregation and backbone networks, providing high performance and cost-effective solution.

Technical features

	MES5448
Packet processor	Broadcom BCM56846A1
Interfaces	48x10GBASE-R(SFP+)/1000BASE-X (SFP) 4x40GBASE-SR4/LR4 (QSFP)
Bandwidth	1.28 Tbps
Buffer memory	9 MB
MAC table	128K
VLAN table	4094
SQinQ rules	4094
Quality of Service (QoS)	7 queues
TCAM	2K Ingress, 1K Egress
L2 Multicast groups	2K
VRRP routers	20
ARP table	6K
L3 interfaces	128
Virtual Loopback interfaces	64
Link Aggregation Groups (LAG)	64, 32 ports per LAG
MSTP	32
Jumbo frames	12270 bytes
IPv4 Unicast routes	16K
IPv6 Unicast routes	8K
Stacking	up to 8 devices

Features and capabilities

Switching

– IEEE 802.3 10BASE-T
– IEEE 802.3u 100BASE-T
– IEEE 802.3ab 1000BASE-T
– IEEE 802.3ac VLAN tagging
– IEEE 802.3ad Link aggregation
– IEEE 802.3ae 10GbE
– IEEE 802.3bj- Forward Error Correction (FEC) CL91
– IEEE 802.1ak Multiple Registration Protocol (MRP)
– IEEE 802.1as Timing and Synchronization for Time-Sensitive Applications in Bridged Local Area Networks
– IEEE 802.1s Multiple Spanning Tree compatibility
– IEEE 802.1w Rapid Spanning Tree compatibility
– IEEE 802.1D Spanning Tree Compatibility
– Per VLAN Spanning Tree Protocol (PVSTP)
– Per VLAN Rapid Spanning Tree Protocol (PVRSTP)
– Generic Attribute Registration Protocol (GARP)
– Dynamic L2 multicast registration (GMRP)
– Dynamic VLAN registration (GVRP)
– Virtual Port Channel (MLAG)
– IEEE 802.1Q Virtual LANs with Port-based VLANs
– IEEE 802.1Qat Multiple Stream Reservation Protocol (MSRP)
– IEEE 802.1Qav Forwarding and Queuing Enhancements for Time-Sensitive Streams
– IEEE 801.1Qbb Priority-based Flow Control
– IEEE 802.1v Protocol-based VLANs
– IEEE 802.1p Ethernet priority with user provisioning and mapping
– IEEE 802.1X Port-based authentication and supplicant support
– IEEE 802.3x Flow control
– RFC 4541 IGMP Snooping and MLD Snooping
– RFC 5171 Unidirectional Link Detection (UDLD) Protocol
– IEEE 802.1AB Link Layer Discovery Protocol (LLDP)
– ANSI/TIA-1057 LLDP-Media Endpoint Discovery (MED)
– Authentication, Authorization and Accounting (AAA)
– Broadcast/Multicast/Unicast storm recovery
– Double VLAN/VMAN tagging
– Independent VLAN learning (IVL) support
– IPv6 Classification APIs
– Jumbo Ethernet frames
– Port mirroring
– Static MAC filtering
– IGMP and MLD snooping querier
– Multicast VLAN Registration (MVR)
– Port MAC locking
– VLAN MAC locking
– Protected ports
– Voice VLANs
– IP subnet-based VLANs
– MAC-based VLANs
– DHCP snooping (IPv4 and IPv6)
– IP source guard (IPv4 and IPv6)
– Dynamic ARP Inspection
– MAC Authentication Bypass
– RSPAN
– MGMD snooping SSM
– Switchport mode configuration
– Link Dependency
– IPv6 RA Guard (Stateless)
– Event and Error Logging Facility
– Run-time and configuration download capability
– PING utility
– Xmodem
– Authentication Tiering
– FTP transfers via IPv4/IPv6
– Malicious code detection
– RFC 768 UDP
– RFC 783 TFTP
– RFC 791 IP
– RFC 792 ICMP
– RFC 793 TCP
– RFC 826 Ethernet ARP
– RFC 894 Transmissions of IP datagrams over Ethernet networks
– RFC 896 Congestion control in IP/TCP networks
– RFC 951 BootP
– RFC 1034 Domain names - concepts and facilities
– RFC 1035 Domain names - implementation and specification
– RFC 1321 Message digest algorithm
– RFC 1534 Interoperation between BootP and DHCP
– RFC 2021 Remote Network Monitoring Management Information base v2
– RFC 2030 Simple Network Time Protocol (SNTP) v4 for IPv4, IPv6, and OSI
– RFC 2131 DHCP Client/Server
– RFC 2132 DHCP options and BootP vendor extension
– RFC 2347 TFTP option extension
– RFC 2348 TFTP block size option
– RFC 2819 Remote Network Monitoring Management Information Base
– RFC 2865 RADIUS client
– RFC 2866 RADIUS accounting
– RFC 2868 RADIUS attributes for tunnel protocol support
– RFC 2869 RADIUS Extensions - Support for Extensible Authentication Protocol (EAP)
– RFC 3162 RADIUS and IPv6
– RFC 3164 The BSD syslog protocol
– RFC 3580 IEEE 802.1X RADIUS usage guidelines
– RFC 5176 Dynamic Authorization Server (Disconnect-Request processing only)
– RFC 5424 The Syslog Protocol
– TACACS+
– sFlow Version 5
– sFlow LAG Counters Structure
– IEEE 1588v2 Precision Time Protocol (PTP)
– Synchronous Ethernet (SyncE)

Features and capabilities

Stacking

– Redundant Management Unit support
– Single IP address management
– Automatic election of management control unit
– Distribution of code and configuration throughout stack
– Hot-plug support: optional modules and stack units
– Offline configuration of modules and stack units
– Stack Template Manager to enable stacking switches with differing hardware capabilities

Routing

– ECMP
– ICMP Throttling
– Loopback interfaces
– Multinetting
– OSPF
– ARP and Proxy ARP
– RIP
– Route redistribution across RIP, OSPF and BGP
– Static routing
– VLAN and port-based routing
– VRRP
– UDP Relay/IP Helper
– Policy-Based Routing
– Virtual Route Forwarding
– Bidirectional Forwarding Detection
– Algorithmic longest prefix match (ALPM)
– RFC 1027 Using ARP to implement transparent subnet gateways (Proxy ARP)
– RFC 1256 ICMP router discovery messages
– RFC 1765 OSPF database overflow
– RFC 1812 Requirements for IP version 4 routers
– RFC 1997 BGP Communities Attribute
– RFC 2082 RIP-2 MD5 authentication
– RFC 2131 DHCP relay
– RFC 2328 OSPFv2
– RFC 2370 OSPF Opaque LSA Option
– RFC 2385 Protection of BGP Sessions via the TCP MD5 Signature Option
– RFC 2453 RIP v2
– RFC 2545 BGP-4 Multiprotocol Extensions for IPv6 Inter-Domain Routing
– RFC 2918 Route refresh capability for BGP-4
– RFC 3021 Using 31-Bit Prefixes on IPv4 Point-to-Point Links
– RFC 3046 DHCP/BootP relay
– RFC 3101 The OSPF “not so stubby area” (NSSA) option
– RFC 3137 OSPF stub router advertisement
– RFC 3623 Graceful OSPF restart
– RFC 3704 Unicast Reverse Path Forwarding (uRPF)
– RFC 3768 Virtual Router Redundancy Protocol (VRRP) version 2
– RFC 5187 OSPFv3 Graceful Restart
– RFC 5340 OSPF for IPv6
– RFC 5549 Advertising IPv4 Network Layer Reachability Information with an IPv6 Next Hop
– RFC 5798 Virtual Router Redundancy Protocol (VRRP) version 3
– RFC 5880 Bidirectional Forwarding Detection
– RFC 5881 BFD for IPv4 and IPv6 (Single Hop)
– RFC 6860 Hiding Transit-Only Networks in OSPF

IPv6 Routing

– RFC 1981 Path MTU for IPv6
– RFC 2460 IPv6 Protocol Specification
– RFC 2464 IPv6 over Ethernet
– RFC 2711 IPv6 Router Alert
–RFC 3056 Connection of IPv6 Domains via IPv4 Clouds
– RFC 3315 Dynamic Host Configuration Protocol for IPv6 (DHCPv6) (includes support for both Stateful and Stateless mechanisms)
– RFC 3484 Default Address Selection for IPv6
–RFC 3493 Basic Socket Interface for IPv6
– RFC 3513 Addressing Architecture for IPv6
– RFC 3542 Advanced Sockets API for IPv6
– RFC 3587 IPv6 Global Unicast Address Format
– RFC 3633 IPv6 Prefix Options for Dynamic Host Configuration Protocol (DHCP) version 6
– RFC 3736 Stateless DHCPv6
– RFC 4213 Basic Transition Mechanisms for IPv6
– RFC 4291 Addressing Architecture for IPv6
– RFC 4443 ICMPv6
– RFC 4861 Neighbor Discovery
– RFC 4862 Stateless Autoconfiguration
– RFC 6164 Using 127-bit IPv6 Prefixes on Inter-router Links
– RFC 6583 Operational Neighbor Discovery Problems
–Dual IPv4/IPv6 TCP/IP Stack Operation
–ICMPv6 Throttling

Management

– RFC 854 Telnet
– RFC 855 Telnet Option Specifications
– RFC 1155 SMI v1
– RFC 1157 SNMP
– RFC 1212 Concise MIB definitions
– RFC 1867 HTML/2.0 forms with file upload extensions
– RFC 1901 Community-based SNMP v2
– RFC 1908 Coexistence between SNMP v1 and SNMP v2
– RFC 2068 HTTP/1.1 protocol as updated by draft-ietf-http-v11-spec-rev-03
– RFC 2271 SNMP Framework MIB
– RFC 2295 Transparent Content Negotiation
– RFC 2296 Remote Variant Selection; RSVA/1.0 State Management “Cookies”– draft-ietf-http-state-mgmt-05
– RFC 2576 Coexistence between SNMP v1, v2, and v3
– RFC 2578 SMI v2
– RFC 2579 Textual Conventions for SMI v2
– RFC 2580 Conformance statements for SMI v2
– RFC 2616 HTTP/1.1
– RFC 3410 Introduction and Applicability Statements for Internet-Standard Management Framework
– RFC 3411 An Architecture for Describing SNMP Management Frameworks
– RFC 3412 Message Processing and Dispatching for SNMP
– RFC 3413 SNMP v3 Applications
– RFC 3414 User-Based Security Model for SNMP v3
– RFC 3415 View-Based Access Control Model for SNMP
– RFC 3416 Version 2 of the Protocol Operations for SNMP
– RFC 3417 Transport Mappings for SNMP
– RFC 3418 Management Information Base for SNMP

Features and capabilities

– RFC 6020 A Data Modeling Language for NETCONF
– RFC 6022 YANG Module for NETCONF Monitoring
– RFC 6242 Using the NETCONF Protocol over Secure Shell (SSH)
– RFC 6415 Web Host Metadata
– RFC 6536 NETCONF Access Control Model
– RFC 7223 YANG Data Model for Interface Management
– RFC 7277 YANG Data Model for IP Management
– RFC 7317 YANG Data Model for System Management
Configurable management VLAN:
– RFC 2246: The TLS Protocol, version 1.0
– RFC 2818: HTTP over TLS
– RFC 3268: AES Cipher Suites for Transport Layer Security SSH 1.5 and 2.0
– RFC 4251: SSH Protocol Architecture
– RFC 4252: SSH Authentication Protocol
– RFC 4253: SSH Transport Layer Protocol
– RFC 4254: SSH Connection Protocol
– RFC 4716: SECSH Public Key File Format
– RFC 4419: Diffie-Hellman Group Exchange For The Ssh Transport Layer Protocol
Industry-standard CLI with the following features:
– Scripting capability
– Command completion
– Context-sensitive help
– Optional user password encryption
– Multisession telnet server
– Management Access Control and Administration List

Quality of Service

– RFC 1858 Security Considerations for IP Fragment Filtering
– RFC 2474 Definition of the Differentiated Services Field (DS Field) in the IPv4 and IPv6 headers
– RFC 2475 An architecture for differentiated services
– RFC 2597 Assured forwarding Per Hop Behavior (PHB) group
–RFC 2697 Single-Rate Policing
–RFC 3246 An expedited forwarding PHB
– RFC 3260 New terminology and clarifications for DiffServ

Permit/deny actions for inbound or outbound IP (IPv4 and IPv6) traffic classification based on:
–Type of Service (ToS) or Differentiated Services (DS) DSCP field
– Source IP address
–Destination IP address
– TCP/UDP source port
– TCP/UDP destination port
– IP protocol number
– IPv6 flow label

Permit/deny actions for inbound or outbound Layer-2 traffic classification based on:
– Source MAC address
– Destination MAC address
– EtherType
– IEEE 802.1p user priority (outer and/or inner VLAG tag)
– VLAN identifier value or range (outer and/or inner VLAN tag)

DiffServ and ACL actions:
– Assign matching traffic flow to a specific queue
– Specific-port redirect or mirror matching traffic flow
– Generate trap log entries containing rule hit counts

Auto VoIP: Automatic VoIP Class of Service (CoS) settings
Direct user configuration of the following:
– IP DSCP to traffic class mapping
– IP precedence to traffic class mapping
– Interface trust mode: IEEE 802.1p, IP precedence, IP DSCP, or untrusted
– Interface traffic shaping rate
– Minimum and maximum bandwidth per queue
– Strict priority versus weighted (WRR/WFQ) scheduling per queue
– Tail drop versus Weighted Random Early Detection (WRED) queue depth management

BGP4

– RFC 1997BGP Communities Attribute
– RFC 2385 Protection of BGP Sessions via the TCP MD5 Signature Option
– RFC 2545BGP-4 multiprotocol extensions for IPv6 inter-domain routing
– RFC 2918 Route Refresh Capability for BGP-4
–RFC 4271 A Border Gateway Protocol 4 (BGP-4)
–RFC 4360BGP Extended Communities Attribute
– RFC 4456 BGP Route Reflection: An Alternative to Full Mesh Internal BGP (IBGP)
– RFC 4486 Subcodes for BGP Cease Notification Message
–RFC 4724 Graceful Restart
–RFC 4760Multiprotocol Extensions for BGP-4
–RFC 5492 Capabilities Advertisement with BGP-4
–RFC 6793 BGP Support for Four-Octet Autonomous System (AS) Number Space

METRO

–IEEE 802.1ad Double VLAN tagging (in compliance with TR-101)
– IEEE 802.1ag Connectivity Fault Management (CFM)
–IEEE 802.3ah Operations, Administration and Maintenance (OAM)
– DSL Forum TR-069 CPE WAN Management Protocol (supports objects from TR-098)
–Layer-2 Protocol Tunneling (L2PT)

DATA CENTER

–IEEE 802.1Qau Virtual bridged local area networks amendment 13: congestion notification (Draft 2.4)
– IEEE 802.1Qaz Enhanced transmission election for bandwidth sharing between traffic classes (Draft 2.4)
–ANSI/INCITS Fibre Channel backbone-5 (FC-BB-5)
–Rev 2.0.0 - FIP snooping bridge
– OpenFlow Switch Specification, Version 1.0.0 (Wire Protocol 0x01) and Version 1.3.4
–RFC 7047 Open vSwitch Database Management Protocol

Integrated networking solutions

Physical specification

	MES5448
Power supply	220 VAC+-20%, 50 Hz -36..-72 VDC Power supply options: 1 AC/DC power source 2 AC/DC hot-swappable power sources
Maximum power consumption	150 W
Operating temperature	from 0 to +50
Storage temperature	from -40 to +70
Operating humidity	80%
Cooling	Front-to-Back, 4 fans
Dimensions (WxDxH), mm	440x425x44
Weight	6.2 kg max

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About EltexAlatau

EltexAlatau company is one of the first communication equipment manufacturers in Kazakhstan established in 2012. The main focus of the enterprise is a set of solutions and the opportunity of their seamless connection to the customer's infrastructure.