

- Bandwidth up to 176 Gbps
- Non-blocking architecture
- Advanced L2 functions
- 4 ports of 10G in base configuration
- L3 switch
- Multicast support (IGMP Snooping, MVR)
- Advanced security functions (L2-L4 ACL, IP Source Guard, Dynamic ARP Inspection, etc.)
- Hot-swappable redundant power supplies
- Dual ventilation system
- Front-to-Back cooling



The new generation switches MES3400-48F can be used in service provider networks as aggregation or transport switches. They ensure high performance due to the interfaces operating at data rates of 10 Gbps or 1 Gbps. MES aggregation switches' feature set includes advanced L2 functions, static routing, dynamic routing, redundant and hot-swappable power supplies.

### Technical features

Interfaces	
1000BASE-X/100BASE-FX (SFP)	48
10GBASE-R (SFP+)/1000BASE-X (SFP)	4
Console port RS-232 (RJ-45)	1
Performance	
Bandwidth	176 Gbps
Throughput for 64 bytes <sup>1</sup>	130.95 MPPS
Buffer memory	2 MB
RAM (DDR3)	1 GB
ROM (SPI Flash)	64 MB
MAC table	32768
ARP table	1000
VLAN table	4094
L2 Multicast groups (IGMP Snooping)	4094
L3 Multicast groups (IGMP proxy)	2048
SQinQ rules	2048 (ingress <sup>2</sup> ), 1024 (egress)
MAC ACL rules	766
IPv4/IPv6 ACL rules	640/320
L3 IPv4 Unicast routes	2048
L3 IPv6 Unicast routes	512
VRRP routers	32
L3 interfaces	20 VLANs, up to 5 IPv4 addresses in each VLAN, up to 512 IPv6 GUA in total for all VLANs
Link Aggregation Groups (LAG)	24 groups, up to 8 ports in one LAG
Quality of Service (QoS)	8 egress queues per port
Jumbo frames	12288 bytes

<sup>1</sup> Values are given for one way transmission.

<sup>2</sup> MAC-based VLAN and SQinQ share hardware resources.

## Features and capabilities

### Interface functions

- Head-of-line blocking (HOL) protection
- Auto MDI/MDIX
- Jumbo frames
- Flow control (IEEE 802.3X)
- Port Mirroring (SPAN, RSPAN)

### MAC address functions

- Independent learning mode per VLAN
- MAC Multicast Support
- Configurable aging time of MAC addresses
- Static MAC Entries
- MAC change on ports
- MAC Flapping logging

### VLAN functions

- Voice VLAN
- IEEE 802.1Q
- Q-in-Q
- Selective Q-in-Q
- GVRP
- MAC-based VLAN
- Protocol-based VLAN

### L2 Multicast functions

- Multicast profiles
- Static Multicast groups
- IGMP Snooping v1,2,3
- IGMP Snooping fast-leave
- IGMP proxy-report
- IGMP via RADIUS
- IGMP Querier
- MVR

### L2 functions

- STP (Spanning Tree Protocol, IEEE 802.1d)
- RSTP (Rapid Spanning Tree Protocol, IEEE 802.1w)
- MSTP (Multiple Spanning Tree Protocol, IEEE 802.1s)
- Rapid-PVST+
- STP Root Guard
- STP Loop Guard
- STP BPDU Guard
- BPDU Filtering
- Spanning Tree Fast Link option
- Loopback Detection (LBD)
- Port isolation
- Storm Control for different types of traffic (broadcast, multicast, unknown unicast)
- Layer 2 Protocol Tunneling (L2PT)
- ERPS (G.8032v2)

### L3 Multicast functions

- IGMP proxy (RFC 4605)
- IGMP proxy fast-leave

### L3 functions

- Static IPv4, IPv6 routes
- Dynamic routing protocols RIPv1/2, OSPFv2/3
- VRRP

### Link Aggregation functions

- LAG
- LACP
- LAG Balancing Algorithm

### Service functions

- Virtual Cable Testing (VCT)
- Optical Transceiver Diagnostics

### IPv6 support

- IPv6 Host
- IPv4, IPv6 Dual stack

### Security functions

- DHCP Snooping
- DHCP Option 82
- MAC-based authentication, MAC address limitation, Static MAC entries
- Port-based authentication IEEE 802.1x
- Guest VLAN
- DoS attack prevention
- Traffic segmentation
- DHCP client filtering
- BPDU attacks prevention
- PPPoE Intermediate agent
- IP Source Guard
- Dynamic ARP Inspection
- DHCPv6 Snooping
- IPv6 Source Guard
- IPv6 ND Inspection
- IPv6 RA Guard

### ACL (Access Control Lists)

- L2-L3-L4 ACL (Access Control List)
- IPv6 ACL
- ACL based on:
  - Switch port
  - IEEE 802.1p
  - VLAN ID
  - EtherType
  - DSCP
  - IP Protocol type
  - TCP/UDP port number
  - User Defined Bytes

### Quality of Service (QoS)

- Shaping
- Policing according to sr-TCM and tr-TCM
- IEEE 802.1p Class of Service
- Strict Priority/Weighted Round Robin (WRR)
- Setting the IEEE 802.1p priority for VLAN management
- ACL-based traffic classification
- ACL-based CoS/DSCP assignment
- DSCP to CoS remarking
- CoS to DSCP remarking
- ACL-based VLAN assignment

## Features and capabilities (continued)

### OAM

- IEEE 802.3ah, Ethernet OAM
- IEEE 802.3ah Unidirectional Link Detection (UDLD)

### Management functions

- Download and upload of configuration file via TFTP/SFTP
- Automatic backup of configuration file via TFTP/SFTP
- SNMP
- Command Line Interface (CLI)
- Web interface
- Syslog
- SNTP (Simple Network Time Protocol)
- Traceroute
- LLDP (IEEE 802.1ab) + LLDP MED
- Processing traffic management with two IEEE 802.1Q headers
- Authorization of entered commands using TACACS+ server
- IPv4/IPv6 ACL support for device management
- Access control — privilege levels
- Management interface blocking
- Local authentication
- IP addresses filtering for SNMP
- RADIUS, TACACS+ clients (Terminal Access Controller Access Control System)
- Telnet, SSH client
- Telnet, SSH server
- Macrocommands
- Logging of input commands via TACACS+
- DHCP autoconfiguration
- DHCP Relay (IPv4 support)
- DHCP Relay Option 82
- DHCP server
- Adding PPPoE Circuit-ID tag
- Flash File System
- Debugging commands
- Rate limit of traffic to CPU
- Password encryption
- Ping (IPv4/IPv6 support)
- IPv4/IPv6 static routes
- Support for multiple versions of configuration file

### Monitoring functions

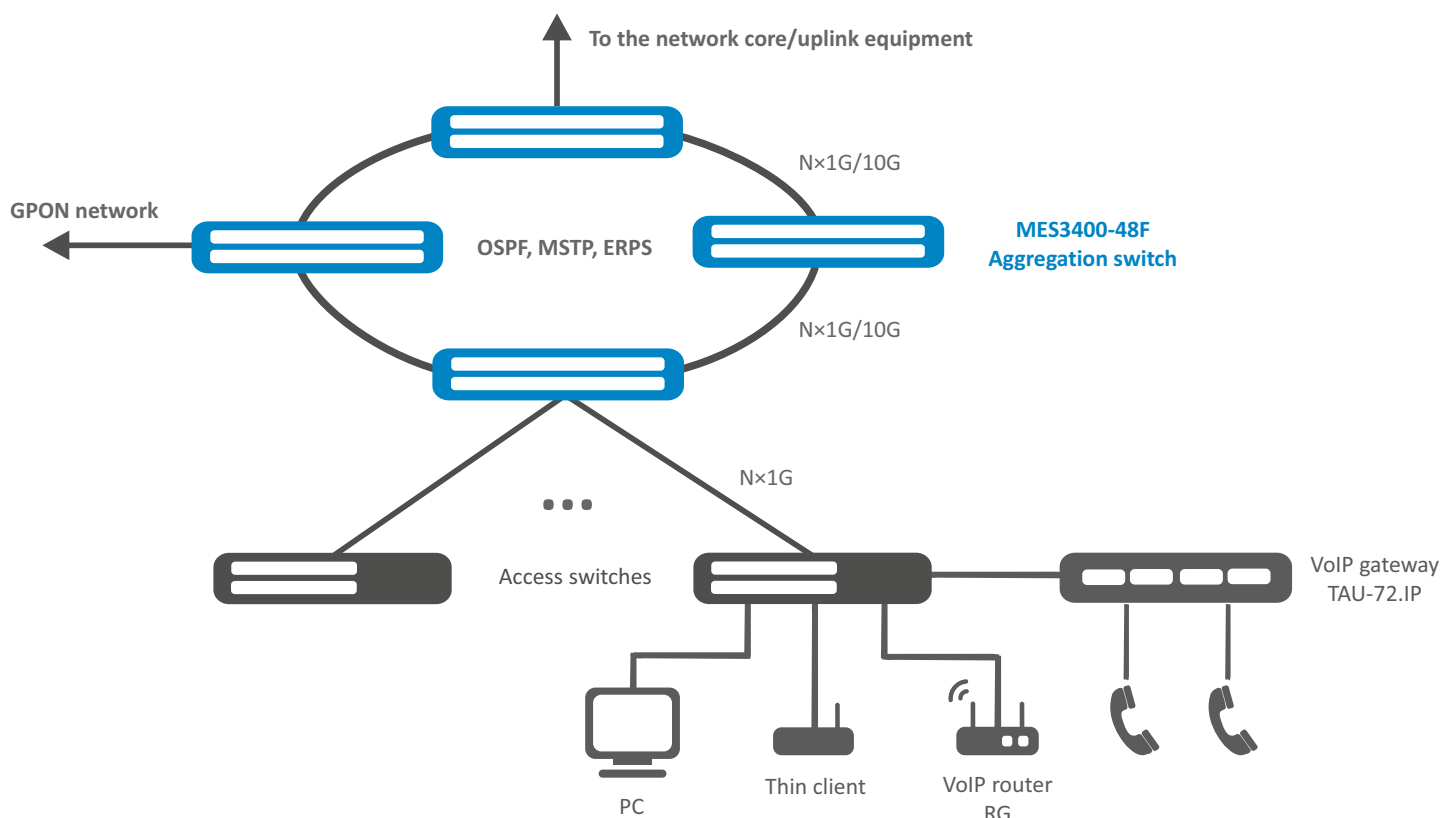
- Statistics of interfaces
- CPU utilization monitoring per task and per traffic type
- RAM utilization monitoring
- Temperature monitoring
- TCAM monitoring

### MIB/IETF standards

- RFC 1065, 1066, 1155, 1156, 2578 MIB Structure
- RFC 1212 Concise MIB Definitions
- RFC 1213 MIB II
- RFC 1215 MIB Traps Convention
- RFC 1493, 4188 Bridge MIB
- RFC 1157, 2571-2576 SNMP MIB
- RFC 1901-1908, 3418, 3636, 1442, 2578 SNMPv2 MIB

- RFC 2465 IPv6 MIB
- RFC 2737 Entity MIB
- RFC 4293 IPv6 SNMP Mgmt Interface MIB
- Private MIB
- RFC 1398, 1643, 1650, 2358, 2665, 3635 Ether-like MIB
- RFC 2668 802.3 MAU MIB
- RFC 2674, 4363 802.1p MIB
- RFC 2233, 2863 IF MIB
- RFC 2618 RADIUS Authentication Client MIB
- RFC 4022 MIB для TCP
- RFC 4113 MIB для UDP
- RFC 3289 MIB для Diffserv
- RFC 2620 RADIUS Accounting Client MIB
- RFC 768 UDP
- RFC 791 IP
- RFC 792 ICMPv4
- RFC 2463, 4443 ICMPv6
- RFC 793 TCP
- RFC 2474, 3260 DS field in the IPv4 and IPv6 header
- RFC 1321, 2284, 2865, 3580, 3748 Extensible Authentication Protocol (EAP)
- RFC 2571, RFC 2572, RFC 2573, RFC 2574 SNMP
- RFC 826 ARP
- RFC 854 Telnet
- IEC 61850

### Use case



### Physical parameters

#### Physical parameters and environmental features

Power supply	100–240 V AC, 50–60 Hz; 36–72 V DC
Maximum power consumption	105 W
Heat dissipation	105 W
Input current	0.4–1.1 A for AC 1.2–2.8 A for DC
Operating temperature	from -10 to +45 °C
Storage temperature	from -40 to +70 °C
Cooling	active, Front-to-Back, 4 fans
Operating humidity	no more than 80 %
Form factor	19", 1U
Dimensions (W × H × D)	440 × 44 × 330 mm
Weight	5.53 kg

## Ordering information

Name	Description
MES3400-48F	MES3400-48F Ethernet switch, 48 ports of 1000BASE-X/100BASE-FX (SFP), 4 ports of 10GBASE-R (SFP+)/1000BASE-X (SFP), L3

### Related products

PM160-220/12	PM160-220/12 power module, 100–240 V AC, 160 W
PM100-48/12	PM100-48/12 power module, 36–72 V DC, 100 W

### Related software

ECCM-MES3400-48F	ECCM-MES3400-48F option of Eltex ECCM control system to manage and monitor Eltex network elements: 1 network element MES3400-48F
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## About ELTEX



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