

L2+/L3 Lite Gigabit Ethernet Access / Aggregation Switch with 4 10G Uplinks

Product Overview

The EKS - EC 4TX/20+4FX switch is a Gigabit Ethernet access switch with four 10G uplink ports. The switch is ideal for Internet Service Providers (ISPs) and Multiple System Operators (MSOs) to provide home users with triple-play services with up to Gigabit bandwidth. It is also an ideal Gigabit access switch for SMB, enterprise, and campus networks. The EC 4TX/20+4FX switch is packed with features that bring high availability, comprehensive security, robust multicast control, and advance QoS to the network edge, while maintaining simple management. The switch also supports the most advance IPv6 management, IPv6 security, and IPv6 multicast control in accordance with the growth of IPv6 deployment. ISPs can expand their services from home to business users by providing a more reliable and resilient network (ITU-T G.8032 ERPS), L2 VPNs, and advanced OAM (Operations, Administration, and Maintenance) functions to ensure service-level agreements.

Key Features and Benefits

Performance and Scalability

The EC 4TX/20+4FX is a high-performance Gigabit Ethernet L2+/L3 Lite managed switch with 128Gbps/176Gbps switching capacity. The switch delivers wire-speed switching performance on all Gigabit ports, taking full advantage of existing high-performance Gigabit CPEs, PCs, 11n/ac Wi-Fi APs etc, significantly improving the responsiveness of applications and file transfer times.

The four built-in 10G SFP+ ports provide uplink flexibility, allowing the insertion of fiber or copper, Gigabit or 10G transceivers, to create up to 10 Gbps high-speed uplinks to servers or service provider, corporate, or campus networks, reducing bottlenecks and increasing the performance of the access network.

The Voice VLAN function automatically detects VoIP devices by OUI or LLDP and groups the voice traffic into a separate VLAN for better performance. It can also automatically change port priorities, so a higher CoS value can be assigned for guaranteed voice quality.

Continuous Availability

The IEEE 802.1w Rapid Spanning Tree Protocol provides a loop-free network and redundant links to the core network with rapid convergence, to ensure faster recovery from failed links, enhancing overall network stability and reliability.

The IEEE 802.1s Multiple Spanning Tree Protocol runs STP per VLAN base, providing Layer 2 load sharing on redundant links up to 64 instances.

The EC 4TX/20+4FX switch supports IEEE 802.3ad Link Aggregation Control Protocol (LACP). LACP increases bandwidth by automatically aggregating several physical links together as a logical trunk and offers load balancing and fault tolerance for uplink connections.

The EC 4TX/20+4FX switch supports G.8032 Ethernet Ring Protection Switching with the ability for the network to detect and recover from incidents without impacting users, meeting the most demanding quality and availability requirements. Rapid recovery time when problems do occur is as low as 50ms.

Reliability and Energy Efficiency

The fanless design of EC 4TX/20+4FX switch ensures noiseless operation and increases the reliability of the system.

The design of the EC 4TX/20+4FX switch incorporates high energy efficiency in order to reduce the impact on the environment. The Green Ethernet power-saving features and fanless design significantly reduce the power consumption.

Enhanced Security

Port security limits the total number of devices from using a switch port and protects against MAC flooding attacks. IEEE 802.1X port-based or MAC-based access control ensures all users are authorized before being granted access to the network. When a user is authenticated, the VLAN, QoS and security policy are automatically applied to the port where the user is connected, otherwise the port is grouped in a guest VLAN with limited access.

DHCP snooping allows a switch to protect a network from rogue DHCP servers that offer invalid IP addresses. IP Source Guard prevents people from using IP addresses that were not assigned to them.

Access Control Lists (ACLs) can be used to restrict access to sensitive network resources by denying packets based on source and destination MAC addresses, IP addresses, or TCP/UDP ports. ACLs are hardware supported, so switching performance is not compromised.

Private VLANs (traffic segmentation per port) isolate edge ports to ensure user privacy.

DAI (Dynamic ARP Inspection) is a security feature that validates Address Resolution Protocol (ARP) packets in a network. DAI allows a network administrator to intercept, log, and discard ARP packets with invalid MAC-to-IP address bindings.

Secure Shell (SSH) and Secure Sockets Layer (SSL/HTTPS) encrypt Telnet and web access to the switch, providing secure network management.

The EC 4TX/20+4FX Series also supports both RADIUS and TACACS+ authentication methods to secure your network.

Key Features and Benefits

Comprehensive QoS

The EC 4TX/20+4FX switch offers advanced QoS for marking, classification, and scheduling to deliver best-in-class performance for data, voice, and video traffic at wire speed. Eight egress queues per port enable differentiated management of up to eight traffic types through the switch.

Traffic is prioritized according to 802.1p and DSCP to provide optimal performance for real-time applications. Weighted Round Robin (WRR) and strict priority ensure differential prioritization of packet flows and avoid congestion of ingress and egress queues.

Asymmetric bidirectional rate-limiting, per port or per traffic class, preserves network bandwidth and allows maximum control of network resources.

The EC 4TX/20+4FX switch supports Three Color Marker and Policing Single rate: Committed Information Rate (CIR) Two rate: CIR + Peak Information Rate (PIR) Traffic Policing: The switch drops or remarks the priority tags of packets when they exceed the burst size.

Robust Multicast Control

IGMP snooping prevents the flooding of multicast traffic by dynamically configuring switch ports so that multicast traffic is forwarded to only those ports associated with an IP multicast receiver. IGMP increases the performance of networks by reducing multicast traffic flooding.

IGMP groups allow you to create customer packages for IP-TV channels, making switch configuration easy. IGMP Filtering prevents subscribers seeing unsubscribed IP-TV channels. And, IGMP Throttling allows you to set how many IP-TV channels a subscriber can receive simultaneously.

Multicast VLANs are shared in the network, while subscribers remain in separate VLANs. This increases network security and saves bandwidth on core links. Multicast streams do not have to be routed in core L3 switches, which saves CPU power.

Multicast VLAN Registration (MVR) is designed for applications such as Media-on-Demand that send multicast traffic across an Ethernet network.

IPv6 Support

The switch supports a number of IPv6 features, including IPv6 Management, DCHPv6 Snooping with Option 37, IPv6 Source Guide, and MVR6.

Stacking

The EC 4TX/20+4FX switch supports hardware stacking via 10G SFP+ port with DAC cable, no special stacking module and stacking cable are needed, up to 4 switches can be stacked together. The switch stack can be managed with a single IP address as a single entity, one switch will become master and all other switches within the stack will become slave, the configuration and firmware can be automatically synchronized from master to slave for easy management. When 4 switches are stacked in a ring topology, if there is link failure on the stacking cable, traffic will go through the redundant link so there is no network downtime. The hardware stacking supports cross stack trunking, for example, 10G ports on different switches can be trunked together, if one unit fail, there is still redundant port on the switch for uplink.

Superior Management

An industry-standard command-line interface (CLI), accessed through the console port or Telnet, provides a familiar user interface and command set for users to manage the switch.

An embedded user-friendly web interface helps users to quickly and simply configure switches.

The EC 4TX/20+4FX switch supports SNMPv1,2c,3 and four-group RMON. The switch provides a complete private MIB for the configuration of most functions via the SNMP protocol.

Administrators can backup and restore firmware and configuration files via TFTP or FTP. The switch also provides the configuration of auto-provision for ease of use in large deployments.

AAA (Authentication, Authorization and Accounting) via RADIUS, TACACS+, enables centralized control of the switch. You can also authorize access rights per user and account for all actions performed by administrators.

Service Monitoring and Management

The EC 4TX/20+4FX switch supports IEEE 802.1ag and ITU-T Y.1731, allowing service providers to monitor end-to-end services, identify connectivity and performance issues, and isolate problems from a remote location without dispatching an engineer onsite.

The switch also provides the capability to monitor service availability, delay and delay variation for verifying SLA conformance (for billing purposes) and providing advance indication of performance degradation before a service outage occurs.

Virtual Private Networks

The EC 4TX/20+4FX switch supports Layer 2 VPNs by using Q-in-Q functions, where an 802.1Q tag from a customer VLAN (called CE-VLAN ID) is encapsulated in a second 802.1Q tag from a service-provider network (called an SP-VLAN ID). The switch supports rewriting the VLAN tag of egress traffic when the ingress traffic is tagged.

The switch also supports Layer 2 Protocol Tunneling for STP, CDP, VTP, PVST+, with Cisco-proprietary multicast address (01-00-0c-cd-cd-d0) replacement.

EC 4TX/20+4FX Switch Product Specifications



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Port	RJ-45 10/100/1000BASE-T Ports	0
	100/1000BASE-X SFP Ports (Support DDM)	20
	Combo Gigabit (RJ-45/SFP) Ports	4
	SFP+ 10 Gigabit Uplink Ports	4
	GE Out-of-Band Management Port	1
	RJ-45 Console Port	1
Performance	Switching Capacity	128 Gpbs
	Forwarding Rate	95 Mpps
	Flash Memory	256 MB
	DRAM	512 MB
	MAC Address Table Size	16 K
	Jumbo Frames	9 KB
Mechanical	Auto-negotiation, Auto-MDI/MDIX	Yes
	Rack Space	19"
	Dimension (W x D x H) cm	44 x 22 x 4.4
	Weight	3.32 kg
Power Supply	100-240 VAC, 50-60 Hz	Yes
	DC Power Input (48-60 V)	Yes
	Max System Power Consumption (Watts)	21.48 W
Environmental	Operating Temperature	-10°C to 65°C
	Storage Temperature	-40°C to 70°C
	Operating Humidity (non-condensing)	10% to 90%
	Storage Humidity (non-condensing)	10% to 90%
	Environmental Regulation Compliance: WEEE	Yes
	Environmental Regulation Compliance: RoHS	Yes
Certification	FCC Class A	Yes
	CE	Yes
	Safety Compliance: CB	Yes
	Safety Compliance: UL	Yes



EC 4TX/20+4FX Switch Product Specifications



Features

L2 Features

- Tri-speed (10/100/1000BASE-T) copper interfaces
- Auto-negotiation for port speed and duplex mode
- Auto MDI/MDI-X
- 100 M/1 G fiber interface
- SFP ports support:
 - IEEE802.3 100BASE-FX
 - IEEE 802.3z (1000BASE-SX/LX/LHX/ZX) transceivers
- Transceiver-threshold current/rx-power/temperature/tx-power/voltage/high-low alarm and warning
- Digital Diagnostic Monitoring (DDM) on SFP port only
- Flow Control:
 - IEEE 802.3x for full duplex mode
 - Back-Pressure for half duplex mode
- Jumbo frames: 12 KB
- Broadcast/Multicast/ Unknown Unicast Storm Control
- Spanning Tree Protocol:
 - IEEE 802.1D Spanning Tree Protocol (STP)
 - IEEE 802.1w Rapid Spanning Tree Protocol (RSTP)
 - IEEE 802.1s Multiple Spanning Tree Protocol (MSTP), 64 instances Spanning-tree restricted-tcn
 - Spanning-tree tc-prop-stop Stops propagation of topology change information
 - BPDU Guard
 - BPDU filtering
 - Root Guard
 - BPDU transparent
 - Loopback detection
- Non-Spanning Tree Loopback detection
- ITU-T G.8032 Ethernet Ring Protection Switching:
 - Sub 50 msec convergence
 - Non-revertive operation mode
 - Multiple-ring topology
 - Multiple instance
- VLANs:
 - Supports 4K VLAN
 - Port-based VLAN
 - IEEE 802.1Q VLAN
 - GVRP (256 VLAN)
 - IEEE 802.1v Protocol-based VLAN
 - IP Subnet-based VLAN
 - MAC-based VLAN
 - Traffic Segmentation
- L2 Virtual Private Networks (Q-in-Q):
 - Selective QinQ
 - VLAN Translation
 - L2 Protocol tunneling (xSTP, CDP, VTP and PVST+, LLDP)
 - CDP/PVST+ Filtering
- Link Aggregation:
 - Static Trunk
 - IEEE 802.3ad Link Aggregation Control Protocol
 - Trunk groups: 16, up to 8 GE ports per group
 - Load Balancing: SA+DA, SA, DA, SIP+DIP, SIP, DIP
- IGMP Snooping:
 - IGMP v1/v2/v3 snooping
 - IGMP Proxy reporting
 - IGMP Filtering
 - IGMP Throttling
 - IGMP Immediate Leave
 - IGMP Querier
 - IGMP mrouter-forward mode
 - IGMP router-alert-option-check
 - IGMP router-port-expire-time
 - IGMP tcn-flood
 - IGMP tcn-query-solicit
 - IGMP unregistered-data-flood
- MVR (Multicast VLAN Registration): Supports 5 multicast VLANs
- Port mirroring (many source ports to one destination port. One source port to one destination port only)
- Remote port mirror (RSPAN)

Security

- User Security for Enterprise:
 - IEEE 802.1X port based and MAC based authentication
 - Dynamic VLAN Assignment, Auto QoS
 - MAC authentication
 - Web authentication
 - Voice VLAN
 - Guest VLAN
- User Security for ISP/MSO:
 - L2/L3/L4 Access Control List
 - MAC Access control list (Source/Destination MAC, Ether type, Priority ID/ VLAN ID)
 - IP standard access control list (Source IP)
 - IP extended access control list (Source/Destination IP, Protocol, TCP/UDP port number)
 - DHCP Snooping
 - DHCP Option 82
 - DHCP Option 82 Relay
 - IP Source Guard
- Network Security:
 - IPv6 ACL
 - Port security
 - Sticky MAC
 - PPPoE IA
 - Dynamic ARP Inspection
 - CPU guard
 - CPU/Memory threshold and alarm
 - Denial of Service protection
 - echo-charge
 - smurf
 - tcp-flooding
 - tcp-null-scan
 - tcp-syn-fin-scan
 - tcp-xmas-scan
 - udp-flooding
 - win-nuke
- Management Security:
 - Login Security
 - RADIUS authentication
 - RADIUS accounting
 - TACACS + authentication
 - TACACS + accounting
 - TACACS + authorization
 - Management Interface Access Filtering (SNMP, Web, Telnet)
 - SSH (v1.5/v2.0) for security Telnet
 - Cipher:
 - aes192-ctr
 - aes256-ctr
 - aes256-gcm@openssh.com
 - chacha20-poly1305@openssh.com
 - aes128-ctr
 - aes128-gcm@openssh.com
 - KEY
 - ssh-rsa
 - rsa-sha2-512
 - rsa-sha2-256" in below
- SSL for HTTPS
- SFTP IPv4/ IPv6
- SNMPv3

Green Ethernet

- IEEE 802.3az Energy-Efficient Ethernet (EEE)

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Features

OAM

- IEEE 802.3ah Link
- IEEE 802.1ag Connectivity Fault Management:
 - Connectivity check
 - Loopback
 - Linktrace
- ITU-T Y.1731 Performance and Throughput Management:
 - Frame Delay
 - Frame Delay variation

QoS Features

- Priority Queues: 8 hardware queues per port
- Traffic classification:
 - IEEE 802.1p CoS
 - IP Precedence
 - DSCP
 - MAC Access control list (Source/Destination MAC, Ether type, Priority ID/ VLAN ID)
 - IP Standard access control list (Source IP)
 - IP extended access control list (Source/Destination IP, Protocol, TCP/UDP port number)
- Traffic Scheduling:
 - Strict Priority
 - Weighted Round Robin
 - Strict + WRR
- Ingress policy map (police rate, remark CoS)
- Egress policy map (police rate, remark CoS/DSCP)
- Rate Limiting (Ingress and Egress, per port base):
 - GE: Resolution 64Kbps ~ 1,000Mbps
- Auto Traffic Control

IPv6 Features

- IPv4/IPv6 Dual Protocol stack
- IPv6 Address Types Stack: Unicast
- IPv6 Neighbor Discovery:
 - Duplicate address
 - Address resolution
 - Unreachable neighbor detection
- Stateless auto-configuration
- Manual configuration
- Remote IPv6 ping
- IPv6 Telnet support
- HTTP over IPv6
- SNMP over IPv6
- IPv6 Syslog support
- IPv6 TFTP support
- IPv6 MLD filter: MLD max-groups(throttling)
- IPv6 ND snooping
- MLD Snooping v1/v2
- IPv6 source guard
- DHCPv6 snooping
- MVR6
- TACACS IPv6

Routing

- IPv4 Static Route
- IPv6 Static Route
- RIP v1/v2
- Traceroute
- Traceroute6
- Dying Gasp

Management

- Switch Management:
 - CLI via console port or Telnet
 - Web management
 - SNMP v1, v2c, v3
- IP clustering (32 members)
- Firmware & Configuration:
 - Firmware upgrade via TFTP/HTTP/FTP server Dual images
 - Multiple configuration files
 - Configuration file upload/download via TFTP/HTTP/FTP server Firmware auto upgrade
- RMON (groups 1, 2, 3 and 9)
- BOOTP, DHCP client for IP address assignment
- DHCP dynamic provision option 66,67
- SNTP/NTP IPv4/ IPv6
- DNS client
- Event/Error Log
- Syslog
- SMTP
- Support LLDP (802.1ab) IPv4/ IPv6
- sFlow v4, v5
- Cable diagnostics
- Traceroute
- Traceroute6
- DHCP server (8 pools, 512 IP address)
- TWAMP probe and responder

Safety

- UL (CSA 22.2. NO 60950-1 & UL60950-1)
- CB (IEC60950-1)

Electromagnetic Compatibility

- CE Mark
- FCC Class A
- CISPR Class A
- BSMI

Environmental Specifications

- Temperature:
 - 40°C to 70°C (Non-Operating)
- Humidity: 10% to 90% (Non-condensing)

Power Supply

- Power input
 - 100 to 240 VAC, 50/60 Hz