Cisco Embedded Services 3300 Series

Contents

The Cisco® Embedded Services 3300 Series can be used for myriad applications across verticals that need custom switching solutions in terms of form-factor size, weight, and power.

Product overview

Cisco Embedded Services 3300 Series Switches (ESS 3300) revolutionize Cisco's embedded networking portfolio with 1G/10G capabilities. ESS 3300 switches are optimized to meet specialized form-factor, ruggedization, port density, and power needs of many applications requiring customization and complement Cisco's off-the-shelf Industrial Ethernet switching portfolio.

The Small Form Factor (SFF), board configuration options, and optimized power consumption provide Cisco partners and integrators the flexibility to design custom solutions for defense, oil and gas, transportation, mining, and other verticals. The ESS 3300 runs the trusted and feature-rich Cisco IOS® XE Software, allowing Cisco partners and integrators to offer their customers the familiar Cisco IOS CLI and management experience on their ESS 3300-based solutions.

ESS 3300 Mainboard
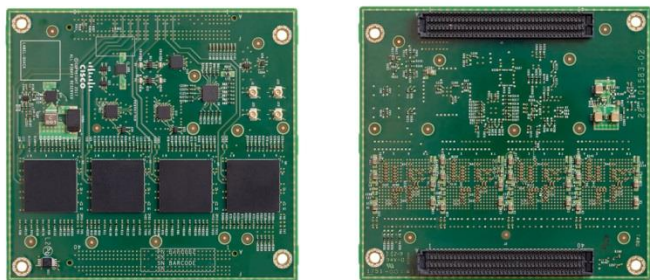
ESS 3300 Expansion board

The ESS 3300 is designed for embedded applications requiring low power, small size, and ruggedization:

- Consists of main board and optional port expansion board

- Small Form-Factor (SFF) board size (approximately 4" x 4")

- Main board:

  - 2x 10 Gigabit: Small Form-Factor Pluggable Plus (SFP+)

  - 8x 10/100/1000BASE-T Ethernet ports (4 of 8 ports can be combo ports)

  - RS-232 and USB console

- Expansion board (optional):

  - 16x 10/100/1000BASE-T Ethernet ports (4 of 16 ports can be combo ports)

- Common +3.3Vdc and +5Vdc power inputs

- Advanced next generation Cisco IOS-XE software

- Low power - 24W(typical) for mainboard + expansion board configuration

Primary features

Feature	Benefit
10G uplinks, 1G downlinks	Enables high-quality video and data communication for next generation of bandwidth-intensive use cases such as tactical data centers, HD video surveillance, self-driving vehicles, and future-proofing
Robust industrial design	Small Form-Factor (SFF) packing Gigabit Ethernet allows integrators to pack higher port density in a compact form factor and build custom solutions that can withstand harsh environments (-40 to 85°C temperature)
Security	Enterprise-grade Cisco IOS-XE switching security features ensure highly secure voice, video, and data communication
Manageability	Facilitates easy deployment and rapid configuration with easy-to-use WEB UI and familiar Cisco CLI
Power over Ethernet	Enables integrators to offer PoE on up to 24 ports with visibility and management from Cisco IOS-XE Software
Layer 2 switching	Enables third-party integrators to offer rich enterprise-grade Layer 2 switching feature set to end customers
Quality of service	Allows customers to prioritize flows and ensure make sure that mission-critical flows are not affected by low-priority traffic

Hardware specifications

Description	Specification
Interfaces	Main board: 2 ports of 1G/10 GE (copper or fiber), 4 ports of 1G combo (which can support 1000Base T/100BaseTX/10Base-T or 1G SFP/100M SFP), 4 ports of 1000BaseT/100Base-TX/10Base-T Expansion board (optional): 4 ports of 1G combo (which can support 1000Base-T/100BaseTX/10Base-T or 1G SFP/100M SFP), 12 ports of 1000BaseT/100Base-TX/10Base-T RS-232 and USB console
Memory	4 GB DDR4 DRAM 4 GB onboard eMMC flash storage
Power supply	3.3Vdc and +5Vdc (+/−3%)
Power consumption	Main board: 16W (typical) Expansion board: 8W (typical) Both boards: 24W (typical)
Connectors	Commercially available board-to-board connectors
Dimensions (W x D)	ESS-3300-NCP: 103mm x 96mm ESS-3300-16T-NCP: 91mm x 96mm ESS-3300-CON: 103mm x 96mm ESS-3300-16T-CON: 91mm x 96mm
Weight	ESS-3300-NCP: 81 grams ESS-3300-16T-NCP: 59 grams

Scale specifications

Features	Description
Forwarding rate	Line rate for all ports and all packet sizes
Number of queues	8
Number of VRF[1]	16
MAC addresses	16K
VLAN IDs	256
IGMP groups	1K
Number of STP instances	256

Features	Description
ACL (PACL, VACL)	3K rules shared across ACL and QoS
IPv4 Indirect routes[1]	3000
IPv6 Indirect routes[1]	512
DRAM	4 GB
Flash [User Accessible]	1.5 GB
SD card capacity[2]	4 GB
Jumbo Frames	8996 bytes

[1] Supported with -A SKUs or -E SKUs (with Network Advantage license).

[2] The SD card is optional and is not shipped by default with the switch.

Software features

Network Essentials License	Description
Layer 2 switching	IEEE 802.1, 802.3 standard, NTP, UDLD, CDP, LLDP, unicast MAC filter, VTPv2, VTPv3, EtherChannel, voice VLAN, PVST+, MSTP, and RSTP
Multicast	IGMPv1, v2, v3 snooping, IGMP filtering, IGMP querier
Management	Web UI, MIB, SmartPort, SNMP, syslog, DHCP server, SPAN session (1), Full Flexible Netflow (FnF), NETCONF, RESTCONF
Security	Port security, 802.1x, Dynamic Host Configuration Protocol (DHCP) snooping, dynamic ARP inspection, IP source guard, guest VLAN. MAC authentication bypass, 802.1x multidomain authentication, storm control - unicast, multicast, broadcast, SCP, SSH, SNMPv3, TACACS+, RADIUS server/client, MAC address notification, BPDU guard, MACsec-128 (Supported on 1G downlink ports only), Central Web Authentication (Redirection), ARP Snooping
Certificate Based MACsec **Note:** Network Advantage license required when using 256-bit MACsec	Certificate-based MACsec Encryption feature uses 802.1X port-based authentication with Extensible Authentication Protocol–Transport Layer Security (EAP-TLS) to carry Certificates for ports where MACsec encryption is required This feature makes it feasible to manage the key at the centralized server over preshared key-based MACsec Uses MACsec and the MACsec Key Agreement (MKA) Protocol
Quality of service	Ingress policing, rate limit, egress queuing/shaping, auto QoS
Layer 2 IPv6	IPv6 host support, HTTP over IPv6, SNMP over IPv6
Redundancy Protocols	Resilient Ethernet Protocol (REP)
Timing	IEEE 1588 PTP v2 (default and power profile for BC[1] and TC[1]) only supported on 1G ports

[1] BC = Boundary Clock and TC = Transparent Clock

Network Advantage License	Description
IP routing	OSPF (V2 and V3), RIP (V1 and V2), ISIS (for IPv4 and IPv6), EIGRP (for IPv4 and IPv6), PBR (Policy Based Routing)
Virtualization	VRF-lite
Security	MACsec-256 (Supported on 1G downlink ports only)
IP Multicast	PIM Sparse Mode (PIM-SM), PIM dense mode (PIM-DM) and PIM Sparse dense mode
High Availability	Bidirectional Forwarding Detection (BFD) echo mode, HSRP (IPv4 and IPv6), VRRP (IPv4 and IPv6)

Note: Please refer to the "New Features for Cisco Catalyst IE and ESS Switches" section of each of the software release notes for a more complete list of features. The above tables attempt to provide the most popular features. Referring to the release notes also has the benefit of specifying the minimum required release to support the desired feature.

The main page for release notes is here: https://www.cisco.com/c/en/us/support/ios-nx-os-software/ios-xe-17/products-release-notes-list.html

Please be sure to select the titles that begin with, "Release Notes for Cisco Catalyst IE3x00 Rugged, IE 3400 Heavy Duty, and ESS3300 Series Switches,"

Environmental specifications

Specification	Description
Industrial-grade board component temperature	–40 to 85°C (–40 to 185°F) component local ambient temperature specification
Operating temperature	–40 to 85°C (–40 to 185°F) for conduction cooled SKUs as measured at the center top surface of heat spreader plate Temperature range of a completed solution depends on the enclosure thermal design characteristics used by the system integrator.
Storage temperature	–40 to 85°C (–40 to 185°F)
Operating altitude	4.572m (15,000 ft) 12,200m (40,000 ft) at 25C
Nonoperating altitude	12,200m (40,000 ft)
MTBF	ESS-3300 (-CON and -NCP) Ground, fixed, controlled: 1,065,092 (in hours) ESS-3300-16T (-CON and -NCP) Ground, fixed, controlled: 5,924,708(in hours)

Management and standards

Descriptions	Specifications
SNMP MIB objects	BRIDGE-MIB
	CISCO-ACCESS-ENVMON-MIB
	CISCO-AUTH-FRAMEWORK-MIB
	CISCO-BRIDGE-EXT-MIB
	CISCO-BULK-FILE-MIB
	CISCO-CALLHOME-MIB
	CISCO-CAR-MIB
	CISCO-CDP-MIB
	CISCO-CONFIG-COPY-MIB
	CISCO-CONFIG-MAN-MIB
	CISCO-DATA-COLLECTION-MIB
	CISCO-DHCP-SNOOPING-MIB
	CISCO-ENTITY-VENDORTYPE-OID-MIB
	CISCO-ENVMON-MIB
	CISCO-ERR-DISABLE-MIB
	CISCO-FLASH-MIB
	CISCO-FTP-CLIENT-MIB
	CISCO-IF-EXTENSION-MIB
	CISCO-IGMP-FILTER-MIB
	CISCO-IMAGE-MIB
	CISCO-IP-STAT-MIB
	CISCO-LAG-MIB
	CISCO-LICENSE-MGMT-MIB
	CISCO-MAC-AUTH-BYPASS-MIB
	CISCO-MAC-NOTIFICATION-MIB
	CISCO-MEMORY-POOL-MIB
	CISCO-PAE-MIB
	CISCO-PING-MIB
	CISCO-PORT-QOS-MIB
	CISCO-PORT-SECURITY-MIB
	CISCO-PORT-STORM-CONTROL-MIB
	CISCO-PRIVATE-VLAN-MIB
	CISCO-PROCESS-MIB
	CISCO-PRODUCTS-MIB
	CISCO-ENTITY-ALARM-MIB
	CISCO-SNMP-TARGET-EXT-MIB

Descriptions	Specifications
	CISCO-STP-EXTENSIONS-MIB
	CISCO-SYSLOG-MIB
	CISCO-UDLDP-MIB
	CISCO-VLAN-IFTABLE-RELATIONSHIP-MIB
	CISCO-VLAN-MEMBERSHIP-MIB
	CISCO-VTP-MIB
	ENTITY-MIB
	ETHERLIKE-MIB
	HC-RMON-MIB
	IEEE8021-PAE-MIB
	IEEE8023-LAG-MIB
	IF-MIB
	LLDP-EXT-MED-MIB
	LLDP-MIB
	NOTIFICATION-LOG-MIB
	OLD-CISCO-CPU-MIB
	OLD-CISCO-SYSTEM-MIB
	RMON-MIB
	SMON-MIB
	SNMP-COMMUNITY-MIB
	SNMP-FRAMEWORK-MIB
	SNMP-MPD-MIB
	SNMP-NOTIFICATION-MIB
	SNMP-PROXY-MIB
	SNMP-TARGET-MIB
	SNMP-USM-MIB
	SNMP-VIEW-BASED-ACM-MIB
	SNMPV2-MIB
	802.1X MIB
IEEE standards	IEEE 802.1D MAC Bridges, STP
	IEEE 802.1p Layer2 COS prioritization
	IEEE 802.1q VLAN
	IEEE 802.1s Multiple Spanning-Trees
	IEEE 802.1w Rapid Spanning-Tree
	IEEE 802.1x Port Access Authentication
	IEEE 802.1AB LLDP
	IEEE 802.3ad Link Aggregation (LACP)

Descriptions	Specifications
	IEEE 802.3ah 100BASE-X SMF/MMF only
	IEEE 802.3x full duplex on 10BASE-T
	IEEE 802.3 10BASE-T specification
	IEEE 802.3u 100BASE-TX specification
	IEEE 802.3ab 1000BASE-T specification
	IEEE 802.3z 1000BASE-X specification
	IEEE 802.3af – 15.4 W PoE (optional)
	IEEE 802.3at – 30.0 W PoE+ (optional)
	IEEE 1588v2 PTP Precision Time Protocol
RFC compliance	RFC 768: UDP
	RFC 783: TFTP
	RFC 791: IPv4 protocol
	RFC 792: ICMP
	RFC 793: TCP
	RFC 826: ARP
	RFC 854: Telnet
	RFC 959: FTP
	RFC 1157: SNMPv1
	RFC 1901,1902-1907 SNMPv2
	RFC 2273-2275: SNMPv3
	RFC 2571: SNMP Management
	RFC 1166: IP Addresses
	RFC 1256: ICMP Router Discovery
	RFC 1305: NTP
	RFC 1492: TACACS+
	RFC 1493: Bridge MIB Objects
	RFC 1643: Ethernet Interface MIB
	RFC 1757: RMON
	RFC 2068: HTTP
	RFC 2131, 2132: DHCP
	RFC 2236: IGMP v2
	RFC 3376: IGMP v3
	RFC 2474: DiffServ Precedence
	RFC 3046: DHCP Relay Agent Information Option
	RFC 3580: 802.1x RADIUS
	RFC 4250-4252 SSH Protocol
	RFC 4884 Extended ICMP to Support Multi-Part Messages

Supported Optics

Optics	Description
SFP transceivers	GLC-FE-100FX-RGD 2km/MMF2
	GLC-FE-100FX 2km/MMF
	GLC-FE-100LX-RGD 10km/MMF
	GLC-FE-100EX 40km/SMF3
	GLC-FE-100LX 10km/SMF
	GLC-FE-100BX-D 10km/SMF
	GLC-FE-100BX-U 10km/SMF
	GLC-FE-100ZX 80km/SMF
	GLC-SX-MM-RGD 220-550m/MMF
	GLC-SX-MM 220-550m/MMF
	GLC-SX-MMD DOM supported
	GLC-LH-SM 550m/MMF, 10km/SMF
	GLC-LH-SMD 550m/MMF, 10km/SMF DOM
	GLC-LX-SM-RGD 550m/MMF, 10km/SMF
	GLC-ZX-SM-RGD 70-100km/SMF
	GLC-EX-SMD DOM supported
	GLC-BX-D 10km/SMF
	GLC-BX-U 10km/SMF
	GLC-TE
	GLC-T-RGD
	SFP-10G-SR-X
	SFP-10G-LR-X
	SFP-10G-SR
	SFP-10G-LR
	SFP-10G-ER
	SFP-10G-BXD-I
	SFP-10G-BXU-I
	SFP-10G-BX40D-I
	SFP-10G-BX40U-I
	SFP-H10G-CU1M
	SFP-10G-LR-S
	SFP-10G-LRM
	SFP-10G-T-X
	CWDM-SFP-1610
	CWDM-SFP-1530

Optics	Description
	CWDM-SFP-1490
	CWDM-SFP10G-1470
	DWDM-SFP-3033
	DWDM-SFP10G-3033
	For more information, please visit the Cisco Optics-to-Device Compatibility Matrix.
	https://tmgmatrix.cisco.com/

Regulatory compliance

Network Essentials	Description
Emissions	EN 55022/ CISPR 22, EN 55032/ CISPR 32
	FCC, ICES-003
Immunity	EN 55024/CISPR 24, EN 55035/ CISPR 35
	EN 61000-4-2 Electrostatic Discharge
	EN 61000-4-3 Radiated Immunity
	EN 61000-4-4 Electrical Fast Transient/Bursts
	EN 61000-4-5 Surge
	EN 61000-4-6 Conducted Immunity
	EN 61000-4-8 Magnetic Field Immunity
	EN 61000-4-16 Immunity to Conducted, Common mode disturbances
	EN 61000-4-18 Damped Oscillatory Wave Immunity
UL recognition	UL 60950-1

Compliance tests performed using Test Platform.

Ordering information

The ESS 3300 is available in the following configurations:

PID	Product description
ESS-3300-NCP-E	ESS 3300 mainboard, no cooling plate, Network Essentials software
ESS-3300-CON-E	ESS 3300 mainboard, with cooling plate, Network Essentials software
ESS-3300-24T-NCP-E	ESS 3300 mainboard + Expansion board, no cooling plate, Network Essentials software
ESS-3300-24T-CON-E	ESS 3300 mainboard + Expansion board, with cooling plate, Network Essentials software
ESS-3300-NCP-A	ESS 3300 mainboard, no cooling plate, Network Advantage software
ESS-3300-CON-A	ESS 3300 mainboard, with cooling plate, Network Advantage software

PID	Product description
ESS-3300-24T-NCP-A	ESS 3300 mainboard + Expansion board, no cooling plate, Network Advantage software
ESS-3300-24T-CON-A	ESS 3300 mainboard + Expansion board, with cooling plate, Network Advantage software
ESS3300-NW-A=	Cisco Network Advantage license for ESS3300 Series Spare

Warranty information

ESS3300 has a 1-year Limited Hardware Warranty.

Further warranty information for the ESS 3300 switch is available at
https://www.ciscoservicefinder.com/warrantyfinder.aspx.

Cisco and Partner Services

At Cisco, we're committed to minimizing our customers' TCO, and we offer a wide range of services programs to accelerate customer success. Our innovative programs are delivered through a unique combination of people, processes, tools, and partners, resulting in high levels of customer satisfaction. Cisco Services help you protect your network investment, optimize network operations, and prepare your network for new applications to extend network intelligence and the power of your business. Some of the primary benefits our customers can get from Cisco Services include:

- Mitigating risks by enabling proactive or expedited problem resolution
- Lowering TCO by taking advantage of Cisco expertise and knowledge
- Minimizing network downtime
- Supplementing your existing support staff so they can focus on additional productive activities

For more information about Cisco Services, refer to Cisco Technical Support Services or Cisco Advanced Services at https://www.cisco.com/web/services/.

Cisco Capital

Flexible payment solutions to help you achieve your objectives

Cisco Capital makes it easier to get the right technology to achieve your objectives, enable business transformation and help you stay competitive. We can help you reduce the total cost of ownership, conserve capital, and accelerate growth. In more than 100 countries, our flexible payment solutions can help you acquire hardware, software, services and complementary third-party equipment in easy, predictable payments. Learn more.

For more information

For more information about the Cisco Embedded 3300 Series Switches, visit
https://www.cisco.com/go/ess3300 or contact your local account representative.

Document history

New or Revised Topic	Described In	Date
Removed IOx	In Software Features Network Essential License	April 12, 2023
Added Caption for the table in Management and Standards Section	Under Management and Standards Section	April 25, 2023
Added Certificate based MACsec In Software Features	Network Essential License	January 10, 2024
Added a footnote in Compliance Section	Compliance Section	January 12, 2024
Added PTP support	In Software Features Network Essential License section	October 9, 2024