

# Cisco Catalyst 3560-CX and 2960-CX Series Switches

## General

- Q.** What are Cisco® Catalyst® 3560-CX and 2960-CX Series compact switches?
- A.** The Cisco Catalyst 3560-CX and 2960-CX switches are fan-less, small-form-factor, Gigabit Ethernet (GE) and Multigigabit Ethernet switches. Because these switches are quiet, attractive, and provide mounting flexibility, they allow for innovative new deployments outside the wiring closet.
- Q.** How can I use the compact switches?
- A.** The compact switches are ideal for building next-generation workspaces and extending wireless LAN networks. They are suited for deployments where space is at a premium and multiple cable runs could be difficult or costly. These switches address unique requirements in the education, retail, hospitality, healthcare, and manufacturing sectors. Typical deployment scenarios include classrooms, conference rooms, retail branch locations, and places that need secure end-to-end connectivity.
- Q.** What is new on the 3560-CX and 2960-CX compact switches?
- A.** The new compact switches support:
- 10 Gigabit Ethernet connectivity over SFP+ uplinks
  - Multigigabit Ethernet (100-Mbps and 1-, 2.5-, 5-, and 10-Gbps) downlink/uplink ports
  - Power over Ethernet (PoE)/PoE+ with up to 240W of PoE+
  - PoE passthrough
  - Network Plug and Play (PnP) for easy configuration
  - An option to run in [Instant Access mode](#)
  - Cisco IOS NetFlow Lite
  - Perpetual PoE
  - Switch Hibernation Mode
  - An option to upgrade to the advanced Layer 3 IP Services feature set
- Q.** What models are available?
- A.** Table 1 shows the different models available. All switch models are shipped from the factory with the proper feature set license installed. All switch models support copper as well as SFP Fiber uplinks.

**Table 1.** Available 3560-CX and 2960-CX Series Models

Category	Port Density (Downlink)	PoE	Access Ports	Uplink Ports	Model
3560-CX (IP Base/IP Services)	8	Non PoE	8 x 1G	2 x 1 G SFP 2 x 1 G Cu	WS-C3560CX-8TC-S
		PoE+ (240W)	8 x 1G	2 x 1 G SFP 2 x 1 G Cu	WS-C3560CX-8PC-S
			6 x 1G + 2 x Multigigabit Ethernet	2 x 10 G SFP+	WS-C3560CX-8XPD-S

Category	Port Density (Downlink)	PoE	Access Ports	Uplink Ports	Model
	12	PoE+ (up to 146W)	8 x 1G	2 x 1 G Cu (Cisco UPOE™ input)	WS-C3560CX-8PT-S
		Non PoE	12 x 1G	2 x 1 G SFP 2 x 1 G Cu	WS-C3560CX-12TC-S
		PoE+ (240W)	12 x 1G	2 x 1 G SFP 2 x 1 G Cu	WS-C3560CX-12PC-S
			12 x 1G	2 x 10 G SFP+ 2 x 1 G Cu	WS-C3560CX-12PD-S
<b>2960-CX (LAN Base)</b>	8	Non PoE	8 x 1G	2 x 1 G SFP 2 x 1 G Cu	WS-C2960CX-8TC-L
		PoE+ (124W)	8 x 1G	2 x 1 G SFP 2 x 1 G Cu	WS-C2960CX-8PC-L

## Switch Comparisons

**Q.** Specifically, how do the new compact Cisco Catalyst switches compare to other Cisco Catalyst compact switches?

**A.** The switches' key **new** technical capabilities include:

- 10 Gigabit SFP+ uplinks for high-bandwidth applications and business growth
- Multigigabit (100 Mbps and 1-, 2.5-, 5-, and 10-Gbps) copper downlink/uplink ports on WS-C3560CX-8XPD-S
- WS-C3560CX-8PT-S, the industry's first Cisco Universal Power over Ethernet (Cisco UPOE)-powered switch with Power over Ethernet (PoE) pass-through, which enables the compact switch to draw power from the wiring closet and pass it to end devices. It has the option to also be powered by an auxiliary AC-DC or DC-DC power adapter. It offers up to 146W of PoE+ which is about six times the power budget of the previous generation.
- Standalone mode, complemented by [Cisco Catalyst Instant Access mode](#) for management simplicity. [See Instant Access FAQ here](#)
- Support for Cisco Application Policy Infrastructure Controller Enterprise Module (APIC-EM) for software-defined networking (SDN) and programmability
- Cisco TrustSec® SXP support to simplify security and policy enforcement throughout the network
- Up to 240W of available power for PoE+ per switch - twice the available power of previous-generation switches - for supporting more PoE devices
- Perpetual PoE for providing uninterrupted power to a powered-down device even when the switch is booting.
- Switch Hibernation Mode and Energy Efficient Ethernet (EEE) for lower energy costs
- Cisco IOS NetFlow Lite for end-to-end visibility into the flows on the network

**Q.** How do you differentiate between the 3560-CX and the 2960-CX switch families?

**A.** Table 2 compares the Cisco Catalyst 3560-CX and 2960-CX Series switches.

**Table 2.** Switch Comparison

Parameter	2960-CX	3560-CX
<b>10G SFP+ Uplinks</b>	No	Yes (WS-C3560CX-12PD-S and WS-C3560CX-8XPD-S)
<b>Multigigabit Downlinks</b>	No	Yes
<b>Downlinks</b>	8 (max)	12 (max)
<b>MACsec (802.1ae) on downlink ports</b>	Not supported	Hardware Capable
<b>PoE+ on downlinks</b>	124W	240W
<b>PoE Pass-Through</b>	No	Yes (WS-C3560CX-8PT-S)
<b>Instant Access</b>	No	Yes (10G SKUs)
<b>Layer 3 Routing</b>	No	Yes
<b>Software feature license</b>	LAN Base	IP Base/IP Services

**Q.** How do the new compact switches compare to the existing 3560-C and 2960-C Gigabit Ethernet Series compact switches?

**A.** Tables 3 and Table 4 show the differences between Cisco Catalyst CX and C Series switches.

**Table 3.** Comparison of 3560-CG and 3560-CX Compact Switches

Parameter	Feature	3560-CG	3560-CX
<b>Ports</b>	Uplinks	2 x 1 G Copper or 2 x 1 G SFP	2 x 1 G Copper and 2 x 10 G SFP+ and 2 x 1 G SFP*
	Downlinks	8 x 1 G Copper	8 x 1 G, 12 x 1 G, 6 x 1 G + 2 x Multigigabit Ethernet Copper
<b>PoE</b>	PoE	124W PoE+	240W PoE+
	Perpetual PoE	NO	YES
	Cisco UPOE-powered and PoE Pass-Through	NO	YES (WS-C3560CX-8PT-S)
<b>Ease of Management</b>	Instant Access	NO	YES (10 G SKUs)
<b>Software</b>	Cisco IOS® Software	IP Base Only	IP Base, IP Services (upgradable)
<b>Hardware</b>	DRAM, Flash	128 MB, 64 MB	512 MB, 128 MB
<b>Other</b>	Security	802.1x, MACsec	802.1x, MACsec
	AVC	NO	NetFlow Lite
	IPv6	Basic	Enhanced

\* Uplinks are all active at the same time.

**Table 4.** Comparison of 2960-CG and 2960-CX Compact Switches

Parameter	Feature	2960-CG	2960-CX
<b>Ports</b>	Uplinks	2 x 1 G Copper or 2 x 1 G SFP	2 x 1 G Copper and 2 x 1 G SFP+*
	Downlinks	8 x 1 G Copper	8 x 1 G Copper
<b>PoE</b>	PoE	NO	124W PoE+
	Perpetual PoE	NO	YES
<b>Hardware</b>	DRAM, Flash	128 MB, 64 MB	512 MB, 128 MB

\* Uplinks are all active at the same time.

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## Multigigabit Ethernet Technology

**Q.** What is Cisco Multigigabit Ethernet?

**A.** Growth in wireless applications and faster wireless standards are driving the demand for more aggregation bandwidth; specifically, for speeds higher than 1 Gbps on all cabling infrastructure. Cisco Multigigabit Ethernet technology is a unique Cisco innovation that allows you to achieve bandwidth between speeds of 100 Mbps and 10 Gbps over traditional Cat 5e cabling or above. Multigigabit ports on the Cisco Catalyst compact switch support Power over Ethernet (POE) and POE+ to address next-generation workspaces and Internet of Things (IoT) ecosystems. Multigigabit Ethernet ports can also be used as uplinks to connect to traditional access switches like the Cisco Catalyst 3850/4500 switches.

Cisco Multigigabit Ethernet technology benefits can be grouped into three different areas:

- Multiple speeds: Cisco Multigigabit Ethernet technology supports auto-negotiation of multiple speeds on switch ports. The supported speeds are 100 Mbps, 1 Gbps, 2.5 Gbps, and 5 Gbps on Cat 5e cable and up to 10 Gbps over Cat 6a cabling.
- Cable type: The technology supports a wide range of cable types including Cat 5e, Cat 6, Cat 6a and above.
- POE power: The technology supports POE and POE+ for all the supported speeds and cable types

**Q.** Does the compact switch support Multigigabit Ethernet technology?

**A.** Yes, the WS-C3560CX-8XPD-S has 2 Multigigabit Ethernet ports.

**Q.** Are the Multigigabit ports on WS-C3560CX-8XPD-S line rate and does it support PoE?

**A.** Both the Multigigabit ports on WS-C3560CX-8XPD-S are line rate and support PoE+.

**Q.** Can you use both the 2 x 10G SFP+ uplinks along with 2 x Multigigabit ports on WS-C3560CX-8XPD-S at the same time?

**A.** Yes, all 4 ports can be used at the same time and are line rate.

Find more information about the Cisco Multigigabit Ethernet technology and FAQs at the links below:

- Cisco Catalyst Multigigabit Switching: <http://www.cisco.com/c/en/us/solutions/enterprise-networks/catalyst-multigigabit-switching/index.html>.
- Cisco Catalyst Multigigabit Ethernet Q&A: <http://www.cisco.com/c/dam/en/us/solutions/collateral/enterprise-networks/catalyst-multigigabit-switching/multigigabit-ethernet-technology.pdf>

## Switch Mounting

**Q.** What are the mounting options available with the compact switches?

**A.** The compact switches are designed for easy and flexible mounting outside the wiring closet. They can be mounted vertically or horizontally, using one of the following options:

- Magnet Mount (on a desk, wall, or shelf)
- DIN Rail Mount
- Rack mount (with rack mount kit)
- Power adapter bracket for AC-DC and DC-DC auxiliary power adapter for WS-C3560CX-8PT-S SKU

See the Cisco Catalyst 3560-CX and 2960-CX Switch Hardware Installation Guide for more information about switch mounting options.

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- Q.** What are the recommended switch orientations?
- A.** Following are the recommended switch orientation options:
- Upright (on a table)
  - Inverted (under a desk)
  - Vertical (on wall, ports facing down or sides)
- Q.** What are best practices for mounting the fanless switches in closets, under tables, or in other closed environments?
- A.** Be sure that temperature around the unit does not exceed its maximum limit. Switches are rated to 113° F/45° C (WS-C3560CX-12PD-S is rated to 104° F/40° C, WS-C3560CX-8XPD-S is rated to 104° F/40° C except under certain conditions\*). Best practices allow for at least 3 inches (7.6 cm) of clearance on all sides and ventilation openings, and at least 1.75 inches (4 cm) of clearance above each switch if placed in a rack\*\*. Access to ports should be sufficient for unrestricted cabling. The rear-panel power connector should be within reach of an AC power receptacle. When wall-mounting the switch, have the switch align with ports facing left, right, or down. See the Cisco Catalyst 3560-CX and 2960-CX Switch Hardware Installation Guide for more information about best installation practices.

## Hardware

- Q.** Do 3560-CX and 2960-CX Series switches support stacking?
- A.** No.
- Q.** Do the switches run at line rate?
- A.** Yes, all switches are nonblocking line-rate switches.
- Q.** What is the function of the mode button on the front panel of the switch?
- A.** The mode button is used for resetting the switch, entering express setup mode, selecting or changing an LED mode, and manually waking up the switch from hibernation mode.
- Q.** What can I do with the USB Type A port located in the front of the Cisco Catalyst 3560-CX and 2960-CX Series?
- A.** As additional storage, the USB Type A port can be used to perform software upgrades, store configurations, and write memory core dumps for troubleshooting purposes. The switch supports Cisco 64 MB, 256 MB, 512 MB, 1 GB, 4 GB, and 8 GB flash drives.
- Q.** Can a third-party USB flash drive be used with the Cisco Catalyst 3560-CX and 2960-CX Series?
- A.** Yes, third-party USB flash drives will work, but they are not officially supported.

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\* WS-C3560CX-8XPD-S is rated at 35° C when installed inverted and under fully loaded conditions (max. PoE and 10G SFP+ transceivers installed)

\*\* For Cisco Catalyst 3560CX-12PD-S/WS-C3560CX-8XPD-S switches operating at the maximum specified temperature and fully loaded conditions (with transceivers installed and maximum PoE), when installed inverted, there should be unrestricted airflow all around the switch (and not just limited to the minimum 3 in. requirement)

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## Management

- Q.** What network management applications support the new CX switches?
- A.** The following Cisco network management applications can be used: Cisco Prime Infrastructure and Cisco Network Assistant.
- Q.** Are the new switches part of Cisco Unified Access?
- A.** Yes, and as such, they are fully integrated with Cisco Identity Services Engine (ISE) for One Policy and Cisco Prime for One Management and can be used to simplify bring-your-own- device (BYOD) deployments.
- Q.** What management ports are available?
- A.** The Cisco Catalyst 3560-CX and 2960-CX Series provide two console ports:
- USB Type B console port
  - Standard RJ-45 console port
- Q.** Do the switches have a front panel out-of-band (OOB) Ethernet management interface?
- A.** No, the switches do not support the OOB Ethernet management interface.
- Q.** Can both console ports be used simultaneously?
- A.** No. The RJ-45 console port is the default management port, but when the USB console is used, the RJ-45 console receives the output of the USB console as well. This capability allows remote administrators to monitor or log output that shows what is happening at the switch location and then send it to a storage device.

## Peripherals and Pluggables

- Q.** Do Cisco Catalyst 3560-CX and 2960-CX Series switches support field-replaceable power supplies?
- A.** No. Power supplies on all the models are built in to the switch.
- Q.** What types of small form-factor pluggable (SFP) and SFP+ modules are supported?
- A.** For supported SFP modules, see [Cisco Gigabit Ethernet Transceiver Modules Compatibility Matrix](#).  
For supported SFP+ modules, see [Cisco 10-Gigabit Ethernet Transceiver Modules Compatibility Matrix](#).
- Q.** Do the Cisco Catalyst 3560-CX and 2960-CX Series downlinks have SFP support?
- A.** No. All 3560-CX and 2960-CX Series switches only support fixed copper interfaces on downlinks.
- Q.** Can all four uplinks be used simultaneously?
- A.** Yes. Simultaneous usage will provide up to 22 Gbps of uplink bandwidth on the WS-C3560CX-12PD-S, 20 Gbps on WS-C3560CX-8XPD-S, 2 Gbps on WS-C3560CX-8PT-S and 4 Gbps on the rest of the switch models.
- Q.** Can the 10 Gigabit SFP+ slots on the Cisco Catalyst 3560-CX model support 1 Gigabit SFP modules?
- A.** Yes. The Cisco Catalyst 3560-CX models that support 10G SFP+ modules can also support 1G SFP modules on the uplinks.
- Q.** Do the Cisco Catalyst 3560-CX and 2960-CX Series switches support 100-Mbps SFP modules on the uplink ports?
- A.** Yes, the switches support one type of 100-Mbps SFP module on the uplink ports: GLC-GE-100FX

## Software: Licensing and Versions

- Q.** What are the various software license levels for the Cisco Catalyst 3560-CX and 2960-CX Series?
- A.** 3560-CX Series switches come with an IP Base feature set by default and can be upgraded to IP Services using Right-to-Use (RTU) licensing commands. 2960-CX Series switches come with a LAN Base feature set and cannot be upgraded to another license level. Table 5 shows supported license levels for each compact switch platform.

**Table 5.** Compact Switch License Levels

Platform	Default License	Upgrade/Downgrade Option
WS-C2960CX-8TC-L	LAN Base	No
WS-C2960CX-8PC-L	LAN Base	No
WS-C3560CX-8TC-S	IP Base	Upgradable to IP Services
WS-C3560CX-8PC-S	IP Base	Upgradable to IP Services
WS-C3560CX-12PD-S	IP Base	Upgradable to IP Services
WS-C3560CX-12TC-S	IP Base	Upgradable to IP Services
WS-C3560CX-12PC-S	IP Base	Upgradable to IP Services
WS-C3560CX-8PT-S	IP Base	Upgradable to IP Services
WS-C3560CX-8XPD-S	IP Base	Upgradable to IP Services

- Q.** What are Right-to-Use (RTU) licenses?
- A.** RTU licenses allow you to order and activate a specific license type and level, and then to manage license usage on your switch. RTU commands are only available for the Cisco Catalyst 3560-CX Series. There is also an option of enabling an evaluation RTU license that allows you to evaluate the feature set for 90 days at no cost. If you do not purchase a permanent license within 90 days, the evaluation license will no longer be valid due to the End User License Agreement (EULA). For more information about RTU licenses, see [Configuring Right-to-Use Licensing](#).
- Q.** How is an RTU license migrated in case of a Cisco Catalyst 3560-CX Series hardware swap/return materials authorization (RMA)?
- A.** RTU licenses can be deactivated from the old/swapped-out hardware and activated on the new switch. Deactivate using the license right-to-use deactivate EXEC command; activate using the license right-to-use activate EXEC command.
- Q.** How do I enable RTU licensing?
- A.** Enable RTU licenses by executing the following EXEC command-line interface (CLI), which activates the license level and also accepts the EULA.
- CLI for permanent license:  
`license right-to-use activate ipservices acceptEULA`
  - CLI for evaluation license:  
`license right-to-use activate ipservices evaluation`
- Q.** How do I monitor license usage?
- A.** License usage information is maintained from the initial boot across reboots, including the status of EULA, in use condition, and license type. The usage information is updated daily and can be displayed with the `show license right-to-use` EXEC command.

- Q.** What is the minimum software version required for the Cisco Catalyst 3560-CX and 2960-CX Series switches?
- A.** The minimum Cisco IOS Software version required is 15.2(3)E.
- Q.** How do I update the Cisco IOS Software for the Cisco Catalyst 3560-CX and 2960-CX Series switches at no additional cost?
- A.** Visit <http://www.cisco.com>, click “Downloads,” and select “Switch Software.” Downloading software requires a Cisco.com username and password. If you do not have a Cisco.com username, you can obtain one by clicking “Register” at the top of any page on Cisco.com.

### Software: Feature Support

- Q.** Do the Cisco Catalyst 3560-CX Series switches support the IP services feature set?
- A.** Yes. Cisco Catalyst 3560-CX Series switches can be upgraded to the IP Services feature set using the RTU licensing CLI. The IP Services license enables advanced Layer 3 features, including BGP, PIM, VRF, OSPF, HSRP, IPSLA, etc. Cisco Catalyst 3560-X Series switches and Cisco Catalyst 3560-CX Series switches have a comparable IP Services feature set.
- Q.** Is IPv6 supported on the Cisco Catalyst 3560-CX and 2960-CX Series switches?
- A.** Yes. For more details, see the Cisco Catalyst 3560-CX and 2960-CX Series release notes.
- Q.** Are cryptographic features available on the Cisco Catalyst 3560-CX and 2960-CX Series switches?
- A.** Yes, both switches support the cryptographic features by default.
- Q.** What is Boot Fast and why is it needed?
- A.** Sometimes the boot time of the switch becomes critical. You can decrease boot time more than two-fold by using boot fast mode. In this case switch will skip some diagnostic tests (IOS POST, FSCK and RAM) after reload.
- Q.** What is the difference between the Cisco IOS Software feature sets on Cisco Catalyst 3560-CX and 2960-CX Series switches?
- A.** Table 6 shows the difference in Cisco IOS Software feature sets for each series.

**Table 6.** Cisco IOS Software Feature Set Differences

Functions	LAN Base	IP Base	IP Services
	2960-CX	3560-CX	
<b>Layer 2 (L2)+</b>	Enterprise Access L2 Wide range of L2 access features for enterprise deployments	Complete Access L2 Supports all Cisco Catalyst 2000 and Cisco Catalyst 3000 L2 features	
<b>Layer 3 (L3)</b>	Static IP routing support Support for SVI	Enterprise Access L3 RIP, PIM stub, IPv4 EIGRP stub, OSPF for Routed Access, PBR, IPv4 Static Routing	Complete Access L3 OSPF, EIGRP, BGP, IS-IS VRF-lite, WCCP
<b>Manageability</b>	Basic Manageability Support for a wide range of MIBs, IPSLA Responder, and RSPAN	Enterprise Access Manageability EEM, Gold-Lite and Smart Install Director, PnP Agent, Instant Access Client	
<b>Security</b>	Enterprise Access Security DHCP Snooping, IPSG, DAI, PACLs, Cisco Identity 4.0, NAC and 802.1x features	Complete Access Security Router and VLAN ACLs, Private VLANs, Complete Identity & Security, IEEE 802.1ae capable in hardware, Threat Defense	
<b>QoS</b>	Enterprise Access QoS Ingress policing, Trust Boundary, AutoQoS, and DSCP mapping	Complete Access QoS Support for all Cisco Catalyst 2000 and Cisco Catalyst 3000 QoS features, including per-VLAN policies	



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- Q.** Do the Cisco Catalyst 3560-CX and 2960-CX Series switches support Cisco Energy Management Suite (formerly Cisco EnergyWise®)?
- A.** Yes.
- Q.** Do the Cisco Catalyst 3560-CX and 2960-CX Series switches support Smart Install?
- A.** Yes. The switches support Smart Install client functionality.
- Q.** Is there a way to configure switch ports on compact switches automatically?
- A.** Yes, by using the AutoConf feature.
- Q.** What is AutoConf?
- A.** AutoConf is a feature that lets you configure the switch ports of an end device automatically upon detection. Use it to manage port configurations for data/voice VLANs, quality-of-service parameters, storm control, and MAC-based port security on switches deployed in the network access layer.
- Q.** How does AutoConf work?
- A.** Each type of port configuration has been chosen and grouped into templates by Cisco, creating best-practice configurations. The switch automatically applies the best-practice configurations needed on the switch ports to enable the efficient performance of each directly connected end device. AutoConf uses the device classification information gleaned from Cisco Discovery Protocol, LLDP, DHCP, and MAC OUI from Device Classifier.
- Q.** Do the Cisco Catalyst 3560-CX and 2960-CX Series switches support interface templates?
- A.** Yes. Interface templates provide a mechanism to configure multiple commands at the same time and associate them with a target such as an interface. An interface template is a container of configurations or policies that can be applied to specific ports.
- Q.** Is static IP routing supported in the LAN Base feature set on Cisco Catalyst 2960-CX Series switches?
- A.** Yes.
- Q.** Do the Cisco Catalyst 3560-CX and 2960-CX Series switches support the Network Plug and Play (PnP) agent?
- A.** Yes. PnP technology automates the installation and configuration of Cisco IOS Software using an embedded PnP agent on Cisco Catalyst switches. It requires a preconfigured network PnP Server that manages sites, site devices, and their images, configurations, files, and licenses for deployment.
- Q.** What is the Switch Database Management (SDM) template for Cisco Catalyst 3560-CX and 2960-CX Series switches?
- A.** Cisco Catalyst 3560-CX and 2960-CX Series switches support unique default templates that cannot be modified.
- Q.** What is NetFlow Lite?
- A.** Supported in the Cisco Catalyst 3560-CX and 2960-CX compact switches, it is a Cisco IOS Software feature that uses sampled flows to provide statistics for network traffic accounting, network monitoring, and network planning. A flow is created using a flow record, which defines the unique keys of the flow. NetFlow Lite provides valuable information about network users and applications, peak usage times, and traffic routing. For more details on NetFlow, visit [Cisco NetFlow-Lite Solution Overview](#).
- Q.** What is the minimum license level needed to enable NetFlow Lite functionality?
- A.** LAN Base.

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- Q.** Is NetFlow Lite supported on all ports of the Cisco Catalyst 3560-CX and 2960-CX Series?
- A.** NetFlow Lite is natively supported on all downlink and uplink ports.
- Q.** Which version of NetFlow exporters is supported?
- A.** NetFlow Version 9 is supported for NetFlow exporter using the export-protocol command option.
- Q.** How many NetFlow Lite flows are supported?
- A.** 16K NetFlow Lite flows are supported.
- Q.** Is egress flow monitor supported?
- A.** No, only ingress flow monitors are supported.
- Q.** Can the flow monitors be attached to logical interfaces on the Cisco Catalyst 3560-CX and 2960-CX Series?
- A.** The flow monitors can be attached to physical interfaces and VLAN interfaces. The flow monitor cannot be attached to logical interfaces such as EtherChannel or Layer 2 VLANs.
- Q.** If flow monitors are attached on both the physical port and VLAN interface, which one will take precedence?
- A.** The interface VLAN monitor will overwrite the port monitor for the traffic coming on the port.
- Q.** What sampling modes are supported?
- A.** Two sampling modes are supported on the Cisco Catalyst 3560-CX and 2960-CX Series:
- Deterministic sampler is dedicated to single attachment. It always makes sure the correct number of flows is sampled on the attached port. Every attachment with the same deterministic sampler uses one free sampler available in the hardware.
  - Random sampler is shared among all the attached interfaces. Only the first attachment uses a new sampler; subsequent attachments of the same sampler on different interfaces share the same hardware sampler.
- Q.** How many different NetFlow Lite samplers are supported by the hardware in the Cisco Catalyst 3560-CX and 2960-CX Series?
- A.** The Cisco Catalyst 3560-CX and 2960-CX Series support four NetFlow Lite samplers in the hardware.
- Q.** Can we have deterministic sampler attached on more than four interfaces?
- A.** No. Each deterministic sampler attachment uses up one free hardware sampler; a deterministic sampler cannot be attached to more than four interfaces. We recommend using the random sampler if the flow needs to be monitored on more than four ports.

## Security

- Q.** How do Cisco Catalyst compact switches help keep unauthorized users from accessing the network?
- A.** Cisco Catalyst compact switches provide superior Layer 2 threat defense capabilities for mitigating man-in-the-middle attacks (such as MAC, IP, and ARP spoofing). [Cisco TrustSec](#) SXP simplifies security and policy enforcement throughout the network. In addition, these switches also support advanced security features, including Private VLAN Edge, Multidomain Authentication, Port-Based ACLs, TACACS+, and RADIUS authentication.
- Q.** What is Cisco TrustSec security?
- A.** Cisco [TrustSec](#) is a network segmentation technology that works from the endpoint to the data center.

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- Q.** What Cisco Cyber Threat Defense security features do the Cisco Catalyst 2560-CX and 2960-CX Series switches support?
- A.** The compact switches support threat defense features such as Port Security, DHCP Snooping, Dynamic ARP Inspection, and IP Source Guard.
- Q.** How can I protect administration passwords and traffic going to the switch during configuration or troubleshooting?
- A.** To protect administration traffic during the configuration or troubleshooting of a switch, the best approach is to encrypt the data using both Secure Shell Protocol (SSH) and Simple Network Management Protocol (SNMP) v3.
- Q.** Is MACsec supported?
- A.** Cisco Catalyst 3560-CX Series switches are hardware-capable of MACsec (IEEE 802.1ae).

### Power, PoE Powered, and PoE Pass-Through

- Q.** What is the input voltage range for the AC-powered compact switches?
- A.** The input voltage range on the AC-powered switches is 100V-240V.
- Q.** What input receptacle is used on the AC-powered compact switch?
- A.** IEC C14 is the standard input receptacle on the AC-powered compact switches.
- Q.** How many fans do the Cisco Catalyst 3560-CX and 2960-CX Series switches have?
- A.** None. The Cisco Catalyst 3560-CX and 2960-CX switches are fanless.
- Q.** How does cooling work in the Cisco Catalyst 3560-CX and 2960-CX Series switches?
- A.** Because the 3560-CX and 2960-CX Series switches do not have any fans, they are cooled by convection.
- Q.** What is the noise level on the Cisco Catalyst 3560-CX and 2960-CX Series switches?
- A.** The switches are silent and produce ambient noise levels.
- Q.** Can the switches be powered using RPS/XPS?
- A.** No.
- Q.** Is the compact switch surface hot to the touch when it is operational?
- A.** The compact switch is warm when operational but not hot. Hence it is safe to touch the switch.
- Q.** Do the compact switches support power injectors to power the switch?
- A.** Yes. The compact switches support any IEEE-compliant PoE or PoE+ power injector.
- Q.** Can the Cisco Catalyst 3560-CX and 2960-CX Series switches provide Power over Ethernet (PoE)+ on the downlinks?
- A.** All Cisco Catalyst 3560-CX and 2960-CX Series switches are capable of providing PoE+ on the downlink ports except 3560CX-8TC-S, 3560CX-12TC-S, and 2960CX-8TC-L, which are data only (non-PoE) switches.
- Q.** How are the Cisco Catalyst 3560-CX and 2960-CX Series switches powered?
- A.** WS-C3560CX-8PT-S can be completely powered by Cisco UPOE/PoE+/PoE upstream switch; the rest of Cisco Catalyst 3560-CX and 2960-CX Series switches are powered using the built-in AC power supply. WS-C3560CX-8PT-S can also be powered by an auxiliary AC-DC or DC-DC power adapter.

- Q.** How much PoE budget do the Cisco Catalyst 3560-CX and 2960-CX Series PoE-capable switches provide?
- A.** The Cisco Catalyst 3560-CX Series provides 240W of PoE+ (up to 146W in case of WS-C3560CX-8PT-S). The Cisco Catalyst 2960-CX Series PoE-capable switches provide 124W of PoE+. This is used to power other devices such as access points, LED lights, IP cameras, etc.
- Q.** Are the Cisco Catalyst 3560-CX and 2960-CX Series switches full PoE, providing 30W of PoE on each downlink port?
- A.** The 8-port PoE model of Cisco Catalyst 3560-CX Series switches is Full-PoE, capable of providing up to 30W on all 8 ports.
- Q.** What is Cisco PoE Pass-Through?
- A.** PoE pass-through is the capability of the switch to supply PoE on the downlink ports. PoE pass-through gives the ability to power PoE end devices through drawing Cisco UPOE from the wiring closet. The Cisco Catalyst 3560CX-8PT-S has eight downlink ports with two UPOE input ports that allow it to be powered by another switch. These switches do not need a power supply and receives power over the uplink from an upstream PoE or Cisco UPOE device, providing deployment flexibility and availability.
- Q.** What is the difference between Power over Ethernet (PoE) powered and PoE pass-through?
- A.** PoE powered is the capability of the switch to power using PoE, PoE+, or Cisco UPOE from its uplinks. PoE pass-through is the capability of the switch to supply PoE on the downlink ports. The PoE that is available for PoE pass-through is the PoE drawn from the uplink port's (switch consumption) internal losses.
- Q.** Which switches support Cisco UPOE powered and PoE pass-through?
- A.** The WS-C3560CX-8PT-S is Cisco UPOE powered and provides PoE pass-through on downlinks.
- Q.** Does the PoE pass-through SKU support DC powering option?
- A.** Yes. The PoE pass-through SKU supports external AC-DC and DC-DC auxiliary powering option.
- Q.** Can the compact switches be powered over Cisco UPOE?
- A.** Yes, the WS-C3560CX-8PT-S has uplinks that can take Cisco UPOE input and it will power the switch. It is industry's first switch powered over Cisco UPOE.
- Q.** Can I power the switch using both the uplink Cisco UPOE and aux power input to get a higher PoE budget?
- A.** Yes, when both auxiliary and Cisco UPOE uplinks are connected, the aux power input provides redundancy as well as increases the PoE budget. Refer to Table 7 for the PoE pass-through availability.

**Table 7.** Powering Options and Availability for Cisco Catalyst 3560-CX Switches

Model	Powering Option	Available PoE Power (W)	Can Switch Be Powered with Uplinks?
<b>3560CX-8TC-S</b>	Internal Power Supply	0W	No
<b>3560CX-12TC-S</b>	Internal Power Supply	0W	No
<b>3560CX-8PC-S</b>	Internal Power Supply	240W	No
<b>3560CX-12PC-S</b>	Internal Power Supply	240W	No
<b>3560CX-12PD-S</b>	Internal Power Supply	240W	No
<b>3560CX-8PT-S</b>	1 PoE Uplink	0W	No
	2 PoE Uplinks	0W	Yes
	1 PoE+ Uplink	0W	Yes
	2 PoE+ Uplinks	20W	Yes
	1 Cisco UPOE Uplink	22W	Yes

Model	Powering Option	Available PoE Power (W)	Can Switch Be Powered with Uplinks?
	2 Cisco UPOE Uplinks	68W	Yes
	Auxiliary Input	54W	Yes
	1 PoE Uplink + Auxiliary Input	65W	Yes
	2 PoE Uplinks + Auxiliary Input	76W	Yes
	1 PoE+ Uplink + Auxiliary Input	76W	Yes
	2 PoE+ Uplinks + Auxiliary Input	98W	Yes
	1 Cisco UPOE Uplink + Auxiliary Input	100W	Yes
	2 Cisco UPOE Uplinks + Auxiliary Input	146W	Yes
<b>3560CX-8XPD-S</b>	Internal Power Supply	240W	No

- Q.** Can I power the switch using any combination of Cisco UPOE and PoE+ on the uplink ports? For example, can one uplink be powered using Cisco UPOE and the other being powered using PoE+?
- A.** Yes. A Cisco UPOE-powered switch can accept any combination of Cisco UPOE, PoE+ and PoE.
- Q.** To what upstream switches can the compact switch connect to get Cisco UPOE/PoE+ power?
- A.** The compact switches can connect to any of the IEEE-compliant Cisco UPOE/PoE+ switches such as the Cisco Catalyst 3850 Series or 4500 Series Switches. Cisco UPOE-capable switches will provide more PoE budget on the downlinks as compared to the PoE+ capable switches.
- Q.** What happens to the PoE-powered devices on the downlink ports on the WS-C3560CX-8PT-S when one of the uplinks gets disconnected?
- A.** If one of the uplink ports gets disconnected, the available PoE budget for the downlink ports is reduced. Under such circumstances, the switch performs intelligent load shedding. Devices that need less PoE than the available PoE budget are serviced, and devices that need more PoE than the available PoE budget might lose power.
- Q.** When powering a switch using uplink Cisco UPOE/PoE+, what is the maximum length of the CAT5/CAT6 cable that I can use on the uplinks to help make sure that the documented PoE budget is available?
- A.** To make sure that the compact switch gets the desired PoE, the cable connecting the compact switch and the uplink switch should not exceed 100 meters in length as per the IEEE specification for PoE cabling.
- Q.** What is Perpetual PoE?
- A.** Perpetual PoE allows compact switches to provide uninterrupted power to a powered-down device even when the switch is booting. You can connect any PoE-powered device (access point, IP phone, etc.) to the switch port and reload the switch. The PoE-powered device will continue to work and get last negotiated power.
- Q.** What is the minimum license level needed to enable Perpetual PoE functionality?
- A.** LAN Base.

## Energy Efficiency

- Q.** What are the energy-efficiency features on the Cisco Catalyst 3560-CX and 2960-CX Series switches?
- A.** The switches introduce new innovative energy-saving modes:
- The Switch Hibernation Mode puts the switch to sleep when the switch is not in use. This feature enables the switch to save up to 80 percent of power during nonbusiness hours.
  - Energy Efficient Ethernet (EEE) enables dynamic power savings on all switch ports.

- Cisco Energy Management Suite (formerly Cisco EnergyWise) puts IP endpoints in Energy Saver mode, saving 60 percent or more power with nonactive IP devices.
- Q.** Are Cisco Catalyst 3560-CX and 2960-CX Series switches usable while in Switch Hibernation Mode?
- A.** No. All hardware components on the data path are switched off during Switch Hibernation Mode.
- Q.** How do I get the Cisco Catalyst 3560-CX and 2960-CX Series out of Switch Hibernation Mode?
- A.** There are two wake-up triggers to use to awake switches from hibernation mode:
- Wake from Switch Hibernation Mode on scheduled real-time clock alarm/trigger
  - Wake from Switch Hibernation Mode using mode button trigger
- Q.** Can Cisco Catalyst 3560-CX and 2960-CX Series switches be scheduled to Switch Hibernation Mode using the Cisco Energy Management (formerly Cisco EnergyWise) management tool?
- A.** Yes, the switches can be put into Switch Hibernation Mode using a Cisco Energy Management tool like any other IP device.
- Q.** Is it possible to awaken a switch in hibernation mode before the scheduled wake-up time?
- A.** Yes, the mode button trigger will bring the switch out of hibernation mode.
- Q.** How long does it take for Cisco Catalyst 3560-CX and 2960-CX Series switches to be operational when they awake from Switch Hibernation Mode?
- A.** The time is similar to a switch booting from reload.
- Q.** Is Energy-Efficient Ethernet (EEE) 802.3az supported by Cisco Catalyst 3560-CX and 2960-CX Series switches?
- A.** Yes, both series support EEE on all download links. EEE is disabled by default on all downlink ports. If needed, EEE can be enabled on specific interfaces of the switch.
- Q.** How is power saved with EEE?
- A.** Switch downlink ports switch to low-power idle (LPI) mode during gaps in the data stream, saving power.
- Q.** Do both sides of the Ethernet interface have to support EEE for it to work?
- A.** Yes. Both endpoints of the Ethernet link must support EEE to get the power-saving advantages.

## Instant Access

- Q.** What is Cisco Instant Access?
- A.** Cisco Catalyst Instant Access is a solution that allows customers to dramatically simplify campus network operations through a single point of operation and management for campus access and backbone. Multiple access switches connect to the Cisco Catalyst 6500 or 6800 backbone switches and the entire configuration works as a single extended switch with a single management domain. In this mode the access switches inherit all the features of the Cisco Catalyst 6500 or 6800.
- Q.** Which models of the 3560-CX and 2960-CX Series Switches can work as Instant Access clients?
- A.** The Cisco Catalyst 3560-CX switches with 10G uplinks; specifically WS-C3560CX-12PD-S and WS-C3560CX-8XPD-S, supports Cisco Catalyst Instant Access and can work both in Standalone and Instant Access Client mode.
- Q.** How is a standalone 3560-CX converted to Instant Access mode?
- A.** The switch is converted from standalone mode to Instant Access mode using command “fex-mode enable” on the switch’s CLI. The switch reboots in the process.

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- Q.** How is 3560-CX in Instant Access client mode converted back to standalone mode?
- A.** The conversion happens when you use the command “reload fex <fex-id> standalone” on the Instant Access parent. This causes the 3560-CX switch to reload.
- Q.** Where can more details on Instant Access technology be found?
- A.** For more details, visit: [http://www.cisco.com/en/US/prod/collateral/switches/ps10902/ps715/ps13198/qa\\_c67-728684\\_ns1240\\_Networking\\_Solutions\\_Q\\_and\\_A.html](http://www.cisco.com/en/US/prod/collateral/switches/ps10902/ps715/ps13198/qa_c67-728684_ns1240_Networking_Solutions_Q_and_A.html).

## Warranty

- Q.** What are the hardware warranty and return policy on the Cisco Catalyst 3560-CX and 2960-CX Series switches?
- A.** Cisco Catalyst 3560-CX and 2960-CX Series switches come with an enhanced limited lifetime warranty (E-LLW). The E-LLW provides the same terms as Cisco’s standard limited lifetime warranty with the addition of next business day delivery of replacement hardware, where available, and 90 days of 8X5 Cisco Technical Assistance Center (TAC) support. Your formal warranty statement, including the warranty applicable to Cisco software, appears in the Cisco information packet that accompanies your Cisco product. See [Product Warranties](#) for further information about quality and reliability backed by Cisco.
- Q.** What is the software update policy for Cisco Catalyst 3560-CX and 2960-CX Series switches?
- A.** Customers with Cisco Catalyst LAN Base and IP Base software feature sets will be provided with updates and bug fixes designed to maintain the compliance of the software with published specifications, release notes, and industry standards compliance as long as the original end user continues to own or use the product or up to one year from the end-of-sale date for this product, whichever occurs earlier. For details on the software update policy for Cisco Catalyst products, read about our [terms for updating software](#).



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