Cisco Catalyst 2960-X Series

Contents

Product overview

Q. **What are the notable differences between the Cisco® Catalyst® 2960-S and 2960-X Series Switches?**

A. Cisco Catalyst 2960-X Series Switches are the next generation of the world's most widely deployed access switches. They are **scalable, smart, simple, and secure** and at the same time provide investment protection. These switches also provide Layer 3 routing capability, application-aware intelligence, and double the scale. They are the greenest Cisco Catalyst access switches ever. These switches are built to reduce total cost of ownership.

The Cisco Catalyst 2960-X Series Switches, like the 2960-S Series, are line-rate nonblocking switches with the following added features:

- Dual-core CPU at 600 MHz
- Cisco FlexStack-Plus stacking
  - 80-Gbps bandwidth
  - 8-member stack
- Cisco FlexStack-Extended stacking
  - 40-Gbps bandwidth
  - 8-member stack
- Dual-FRU power supply with integrated fan (2960-XR only)
- 24 port fan less model with 2 SFP and 210/100/1000BT uplinks
- Flexible (Full) NetFlow and NetFlow-Lite on all downlink and uplink ports
- Switch Hibernation mode integrated with Cisco EnergyWise®
- Energy-Efficient Ethernet (EEE) downlink ports
- Signed Cisco IOS® Software images
- Layer 3 features with IP Lite feature set (2960-XR only)
- Cisco DNA Center™ support

Q. **What are the notable differences between the Cisco Catalyst 2960-X and 2960-XR switches?**

A. The Cisco Catalyst 2960-XR switch models have the following additional capabilities in addition to the features in the 2960-X models:

- Dual-FRU power supply with integrated fan
- Layer 3 features with IP Lite feature set (2960-XR only)
- Configurable 8 queues per port (standalone)
- 48 Ether channel groups

Q. **What Cisco IOS Software feature sets are supported in Cisco Catalyst 2960-X Series Switches?**

A. The Cisco Catalyst 2960-X Series come with a common universal image and supports LAN Lite, LAN Base, and IP Lite feature sets, as shown in Table 1.

Table 1.   Feature sets supported in the 2960-X Series

Platform	IP Lite (Layer 3)	LAN Base (Layer 2)	LAN Lite (Basic Layer 2)
2960-XR	Yes	No	No
2960-X	No	Yes	Yes

Q. What is the difference between the Cisco IOS Software feature sets?

A. The differences between the three Cisco IOS Software feature sets are:

- LAN Lite feature set has entry-level Layer 2 features and is targeted at midmarket deployments

- LAN Base feature set comes with advanced Layer 2 features and is typically targeted at enterprise customers

- IP Lite feature set comes with enterprise access Layer 3 features and is typically targeted at enterprise customers

Q. How can I tell the difference between IP Lite, LAN Base, and LAN Lite switches for the Cisco Catalyst 2960-X Series?

A. The Cisco Catalyst 2960-X Series front panel sticker has the feature set name. From the rear of the Cisco Catalyst 2960-X Series Switches, the LAN Lite models do not support stacking. The left side does not have a location for a stacking module to be inserted.

From the Cisco IOS Software command line, there are two ways to tell which software image the switch has.

- The last letter in the product ID. If the last letter is "-L," it's LAN Base. If it's "-LL," it's LAN Lite. If it's "-I," it's IP Lite

  For example:

  WS-C2960XR-48FPS-I is IP Lite

  WS-C2960X-48LPS-L is LAN Base

  WS-C2960X-48TS-LL is LAN Lite

- The output from the "show license" Cisco IOS Software command-line interface (CLI) command. If LAN Base is being used, that will be the active license. If it's LAN Lite, that will be the active license. In the following example output, LAN Base is the active license

  C2960-X_Switch# show license

  Index 1 Feature: lanlite

  Period left: 0 minute 0 second

  Index 2 Feature: lanbase

  Period left: Lifetime

  License Type: Permanent

  License State: Active, In Use

  License Priority: Medium

  License Count: Non-Counted

Q. What are the notable hardware differences between the LAN Base and LAN Lite switches in 2960-X switches?

A. The Cisco Catalyst 2960-X switches support LAN Base and LAN Lite software feature sets. Following are the notable hardware components present only in LAN Base switches:

- Ease of management with Cisco FlexStack-Plus and FlexStack-Extended
- Power over Ethernet/Power over Ethernet Plus (PoE/PoE+) capabilities
- Power redundancy support via Cisco Redundant Power System 2300 (RPS 2300)

Q. What features does IP Lite bring to the 2960-XR switch models?

A. IP Lite introduced enterprise access Layer 3 features to the 2960-XR switch models. IP Lite is subset of IP Base features. Some of the IP Lite features are:

- Routing Information Protocol (RIP) v1
- Routing Information Protocol (RIP) v2
- Open Shortest Path First (OSPF) v2 stub
- Open Shortest Path First (OSPF) v3 stub
- Enhanced Interior Gateway Routing Protocol (EIGRP) stub
- Equal-cost routing
- Hot Standby Router Protocol (HSRP)
- Protocol Independent Multicast PIM (Sparse Mode, Dense Mode, Sparse Dense Mode, Source Specific Multicast) stub
- Virtual Router Redundancy Protocol (VRRP) for IPv4
- Private VLAN
- IPv6 First Hop Security source guard
- Per-VLAN and per-port policers

Q. Do I need a software license for the Cisco Catalyst 2960-X Series Switches?

A. No. Cisco Catalyst 2960-X Series Switches use the Universal image, but no license is required. The feature set is bound to the hardware model type and cannot be changed. For convenience, a single software image is used for all Cisco Catalyst 2960-X and 2960-XR switches, regardless of whether they are IP Lite, LAN Base, or LAN Lite models.

Q. Can a Cisco Catalyst 2960-X Series Switch feature set license be upgraded?

A. No. The feature set is bound to the hardware model. To get the features and capabilities of IP Lite, you must purchase an IP Lite (2960-XR) switch.

Q. How do the Cisco Catalyst 2960-X and 2960-XR switches compare to Cisco Catalyst 2960-S switches?

A. Table 2 shows a comparison of the various Cisco Catalyst 2960 switch models.

Table 2. Comparison of Cisco Catalyst 2960 Series Switches

Feature	2960-XR	2960-X	2960-S	2960
CPU	Dual core at 600 MHz	Dual core at 600 MHz	Single core	Single core
Stacking	FlexStack-Plus, FlexStack-Extended	FlexStack-Plus, FlexStack-Extended	FlexStack	No
Stack bandwidth	80 Gbps (FlexStack-Plus); 40 Gbps (FlexStack-Extended)	80 Gbps (FlexStack-Plus); 40 Gbps (FlexStack-Extended)	40 Gbps	–
Stack members	8	8	4	–
Power supply	Dual FRU	Fixed	Fixed	Fixed
Redundant Power Supply (RPS)	Yes	No	No	No
PoE+ 30W/port	Yes	Yes	Yes	No
Max PoE budget	740W	740W	740W	–
External RPS	No***	Yes	Yes	No
SFP+ uplinks	Yes	Yes	Yes	No
Uplinks	2 SFP+/4 SFP	2 SFP+/4 SFP	2 SFP+/4 SFP	2 SFP
Management options	Console RJ45, USB console, and out of band Ethernet	Console RJ45, USB console, and out of band Ethernet	Console RJ45, USB console, and out of band Ethernet	Console RJ45
Flash	256 MB	128 MB	64 MB	32 MB
DRAM	512 MB	512 MB	256 MB	64 MB
Active VLANs	1K	1K	255	64
EtherChannel groups	48	24	6	6
Egress buffers	4 MB	4 MB	2 MB	2 MB
Switched Port Analyzer (SPAN) sessions	4	4	2	2
Max MAC addresses	32K*	16K	8K	8K
IPv4 unicast routes	24K**	16 static	16 static	16 static
Flexible NetFlow and NetFlow-Lite	Yes	Yes	No	No
Hibernation Mode	Yes	Yes	No	No
EEE	Yes	Yes	No	No

* vlan sdm template, ** ipv4 sdm template, *** redundancy is provided by second power supply.

Stacking

Q. What is Cisco FlexStack-Plus stacking?

A. Cisco FlexStack-Plus is a hot-swappable, modular stacking solution that provides a true stacking capability, with all switches acting as a single switching unit with a unified data plane, using a single IP address. Cisco FlexStack-Plus is supported by the Cisco Catalyst 2960-X Series and allows the stacking of up to eight switches, with a throughput of 80 gigabits per second.

Q. What is difference between FlexStack, FlexStack-Plus, and FlexStack-Extended technology?

A. The FlexStack-Plus and FlexStack-Extended technologies are similar to FlexStack technology with the differences listed in Table 3.

Table 3.   Comparison of FlexStack, FlexStack-Plus, and FlexStack-Extended

Platform	Members	Bandwidth	Convergence
FlexStack	4	40 Gbps	1–2 sec
FlexStack-Plus	8	80 Gbps	100 msec
FlexStack-Extended	8	40 Gbps	100 msec

Q. **What are the FlexStack-Plus high-availability features?**

A. The following features enhance high availability and manageability across a stack:

- Cross-stack EtherChannel
- SPAN
- FlexLink technology
- Hitless voice calls

Q. **What is Cisco FlexStack-Extended?**

A. Cisco FlexStack-Extended enables long-distance out-of-the-wiring-closet stacking. FlexStack-Extended allows back-panel stacking of up to eight Cisco Catalyst 2960-X or 2960-XR Series Switches. FlexStack-Extended can be added to the Cisco Catalyst 2960-X or 2960-XR Series with a back stacking slot. FlexStack-Extended is available in two module configurations: Fiber module (C2960X-FIBER-STK) and Hybrid module (C2960X-HYBRID-STK).

Q. **What is the difference between the Hybrid (C2960X-HYBRID-STK) and Fiber (C2960X-FIBER-STK) modules of FlexStack-Extended?**

A. The Hybrid module has one copper port that enables short-reach connectivity across a local stack of switches and one SFP+ port for long-range connectivity. The Hybrid module provides investment protection and compatibility with FlexStack-Plus.

The Fiber module has two SFP+ ports supporting long-reach out-of-the-wiring-closet stacking.

Q. **What optics are supported on the FlexStack-Extended modules?**

A. For information about supported SFP+ modules, refer to the transceiver compatibility matrix at cisco.com/en/US/products/hw/modules/ps5455/products_device_support_tables_list.html.

Q. **Which cables are supported with the copper port of the Hybrid module (C2960X-HYBRID-STK) in Cisco FlexStack-Extended?**

A. CAB-STK-E-0.5M stacking cable with a 0.5 m length.
CAB-STK-E-1M stacking cable with a 1.0 m length.
CAB-STK-E-3M stacking cable with a 3.0 m length.

Q. **What is the minimum Cisco IOS Software version required for FlexStack-Extended?**

A. FlexStack-Extended is supported from version 15.2(6)E onward.

Q. **What are the stackable models of the Cisco Catalyst 2960-X Series?**

A. The LAN Base and IP Lite feature set models are stackable models in the Cisco Catalyst 2960-X Series. The LAN Lite feature set model is a standalone model. **Note:** The fanless SKU (WS-C2960X-24PSQ-L with Lan Base) does not support stacking.

Q. Can LAN Base and IP Lite feature set models stack together in the Cisco Catalyst 2960-X Series?

A. No, LAN Base and IP Lite feature set models cannot be stacked together. LAN Base feature set models can stack with LAN Base feature set models only. Similarly, IP Lite feature set models can stack with IP Lite feature set models only.

Q. Can Cisco Catalyst 2960-X switches stack with Cisco Catalyst 2960-XR switches?

A. No. Cisco Catalyst 2960-X and 2960-XR switches can't stack together since they don't share common feature set model.

Investment protection

Q. Is FlexStack-Plus stacking backward compatible with FlexStack?

A. Yes. Unlike competing products, the FlexStack-Plus stacking is backward compatible with FlexStack to preserve customer investment. This allows mixed stacking of Cisco Catalyst 2960-S and Cisco Catalyst 2960-SF LAN Base series with 2960-X LAN Base series for investment protection.

Q. Is FlexStack-Extended supported with FlexStack-Plus?

A. Only the Hybrid module (C2960X-HYBRID-STK) can connect to the FlexStack-Plus module using the copper port.

Q. Is FlexStack-Extended supported with FlexStack?

A. No, FlexStack-Extended is not supported with FlexStack.

Q. What is a mixed stack?

A. The stack is called a mixed stack if it has both the Cisco Catalyst 2960-S Series Switch and Cisco Catalyst 2960-X Series Switches. The mixed stack features are limited to Cisco Catalyst 2960-S Series features. (See Table 4.)

Table 4.　　FlexStack combinations

Stack combination	Max stack bandwidth	Stack limit	Cisco IOS license
2960-XR	80G	8	IP Lite
2960-X	80G	8	LAN Base
2960-S/SF	40G	4	LAN Base
Mixed stack: 2960-X (C2960X-STACK) and 2960-S/SF (C2960S-STACK)	40G	4	LAN Base

Q. Does mixed stacking require any configuration on Cisco Catalyst 2960-X Series Switches?

A. Yes. The switch stack speed should be set to 40 using configure mode command "switch stack-speed 40" on Cisco Catalyst 2960-X switches to stack with Cisco Catalyst 2960-S switches. While forming a homogenous stack of Cisco Catalyst 2960-X revert back the stack speed to 80 using "no switch stack-speed 40".

Q. Can Cisco Catalyst 2960-X and 2960-XR Series Switches stack together?

A. No. Cisco Catalyst 2960-X and 2960-XR Series Switches can't be stacked together. Even though they belong to the same 2960-X Series, they do not share same Cisco IOS license models.

Q. What are the possible mixed-stack combinations?

A. The LAN Base models can only form mixed stacks. The possible mixed-stack combinations are listed in Table 5.

Table 5. Possible mixed-stack combinations

Mixed-stack combination	2960-XR IP Lite	2960-X LAN Base	2960-S/SF LAN Base
2960-XR IP Lite	Yes	No	No
2960-X LAN Base	No	Yes	Yes (C2960X-STACK only)
2960-S/SF LAN Base	No	Yes (C2960X-STACK only)	Yes

Q. Which SDM template should be selected on the Cisco Catalyst 2960-X Series with LAN Base to form a mixed stack with Cisco Catalyst 2960-S?

A. If Cisco Catalyst 2960-S is running the "default" SDM template, then Cisco Catalyst 2960-X must use the "default" template. If Cisco Catalyst 2960-S is running the "lanbase-routing" template, then Cisco Catalyst 2960-X must use the same.

Q. Can Cisco Catalyst 2960-S be the stack primary in a mixed stack of 2960-S and 2960-X switches?

A. Yes. Cisco Catalyst 2960-S can be stack primary in a mixed stack.

Q. In a mixed stack of Cisco Catalyst 2960-S and 2960-X, must all the switches be on the same Cisco IOS Software release?

A. Yes. All the switches in the stack, regardless of model, must be on the same Cisco IOS Software release. This includes the rebuild number. The minimum Cisco IOS Software release that will support both 2960-S and 2960-X is 15.0(2)EX.

Q. Can we use FlexStack stacking modules with Cisco Catalyst 2960-X Series?

A. No. The form factors of FlexStack-Plus and FlexStack modules are different. The FlexStack stacking module cannot be used with the Cisco Catalyst 2960-X Series. Similarly, the FlexStack-Plus module cannot be used with the Cisco Catalyst 2960-S Series.

Energy efficiency

Q. How much power can be saved with energy efficiency features in the Cisco Catalyst 2960-X Series?

A. The Cisco Catalyst 2960-X Series introduced new, innovative energy-saving modes for the switch.

- 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 90 percent of power during nonbusiness hours.
- Downlink hibernation mode powers down the PHY and the optics of the downlink port when not in use.
- Energy Efficient Ethernet (EEE) enables dynamic power savings on all switch ports; **saves about 15W for a 48-port switch** and **8W for a 24-port switch.**
- Cisco EnergyWise puts IP endpoints in energy saver mode, **saving more than 60 percent power** with nonactive IP devices

The collective power savings with different energy efficient technologies will reduce the power consumption by up to 80 percent.

Q. What is downlink hibernation mode in the Cisco Catalyst 2960-X Series?

A. Downlink hibernation mode (DHM) feature enables all 2960-X switches to save power on the downlink ports. The switch supports static downlink port power-down where only the PHY and Optics are powered down when not in use.

Q. What is switch hibernation mode in the Cisco Catalyst 2960-X Series?

A. When the switch is not in use, switch hibernation mode can be scheduled to save power. When the switch is in hibernation mode, it powers off application-specific integrated circuits (ASICs), and connected PoE devices. Power to most of the components is off. The DRAM is in refresh mode, keeping data intact. Switch hibernation mode is integrated with Cisco EnergyWise.

Q. Is a Cisco Catalyst 2960-X Series Switch usable while in hibernation mode?

A. No. All hardware components on the data path are switched off on Cisco Catalyst 2960-X Series Switches during hibernation mode.

Q. How do I get the Cisco Catalyst 2960-X Series out of switch hibernation mode?

A. The Cisco Catalyst 2960-X Series provides the following wake-up triggers from switch hibernation mode:

- Wake on scheduled real-time clock alarm/trigger
- Wake on mode button trigger

Q. Can Cisco Catalyst 2960-X Series Switches be scheduled to switch hibernation mode using the Cisco EnergyWise management tool?

A. Yes, the switch hibernation mode is integrated with Cisco EnergyWise. Cisco Catalyst 2960-X Series Switches can be put to switch hibernation mode using a Cisco EnergyWise management tool like any other IP devices.

Q. Is it possible to wake up a Cisco Catalyst 2960-X Series Switch in switch hibernation mode before the scheduled wake-up time?

A. Yes, the mode button trigger will get the Cisco Catalyst 2960-X Series Switch out of switch hibernation mode.

Q. Can we schedule switch hibernation mode for some members only in a stack of Cisco Catalyst 2960-X Series Switches?

A. No. The whole stack of Cisco Catalyst 2960-X Series Switches can only be scheduled to switch hibernation mode.

Q. How long does it take for a Cisco Catalyst 2960-X Series Switch to be operational when it wakes up from switch hibernation mode?

A. A Cisco Catalyst 2960-X Series Switch coming out of switch hibernation mode is similar to a switch booting from reload. If the switches are stacked, primary reelection is triggered after wake-up.

Q. Is Energy-Efficient Ethernet (EEE) 802.3az supported on the Cisco Catalyst 2960-X Series?

A. Yes, Energy-Efficient Ethernet (EEE) is supported on all downlink ports of the Cisco Catalyst 2960-X Series.

Q. Do we need to enable EEE on the Cisco Catalyst 2960-X Series?

A. EEE is enabled by default on all the downlink ports of the Cisco Catalyst 2960-X Series. If needed, EEE can be disabled.

Q. How is power saved with EEE on the Cisco Catalyst 2960-X Series?

A. Cisco Catalyst 2960-X 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.

Q. How do I check if EEE is working?

A. The **"**show eee status interface Gigabit Ethernet xxx" command can be used to check if EEE is agreed between both the endpoints.

Switch architecture

Q. What management ports are available?

A. The Cisco Catalyst 2960-X Series provides two types of console ports and one out-of-band Ethernet port:

- USB Type B console port
- Standard RJ-45 serial port
- 10/100 Ethernet management port

Q. Can both USB Type B console and RJ-45 console ports be used simultaneously?

A. No. Only one can be used for input, but both can receive output. When the USB console is connected, "it is used for input (by default)". This design allows the administrator to see when the USB console port is in use. This capability is useful for remote administrators.

Q. Does the switch support auto-baud on the console port?

A. No. This was a tradeoff between console speed sensing and the ability to use the USB console.

Q. Which management port has priority?

A. The RJ-45 console port is always the default management port, but when a PC is connected to the USB console port, the USB console takes over. The RJ-45 port continues to receive the output (a copy) of everything that gets displayed on the USB console port. This capability allows remote administrators to continue monitoring or logging the output showing what is happening at the switch location, sending it to a storage device.

Q. When a PC is left unattended on the USB console port, would remote administrators get locked out from the RJ-45 management port?

A. The USB console port has a default activity timer that can also be programmed by the user. This activity timer will expire and return control to the RJ-45 management port to avoid locking the remote administrator out.

Q. What can I do with the USB Type A port of the Cisco Catalyst 2960-X Series?

A. It is used to connect to an external USB memory drive for additional storage. This USB port can be used to perform software upgrades, store configurations, and even write memory core dumps for troubleshooting purposes. All Cisco USB memory drives can be used. Currently up to 8-GB USB drives are supported.

Q. Can a third-party USB Flash drive be used with the Cisco Catalyst 2960-X Series?

A. Yes, a third-party USB Flash drive can be used with the Cisco Catalyst 2960-X Series. They will work, but are not officially supported.

Q. What is the performance of the Cisco Catalyst 2960-X Series Switches?

A. The Cisco Catalyst 2960-X Series have a nonblocking switching architecture capable of forwarding traffic for all forty-eight 1 Gigabit ports plus two 10 Gigabit ports at line rate. See the datasheet for the MPPS information for each model.

Q. Do the Cisco Catalyst 2960-X Series Switches consume less power than the Cisco Catalyst 2960-S Series Switches?

A. The Cisco Catalyst 2960-X Series are based on the same building blocks as the 2960-S-Series Switches for most components. However, these switches have a new thermal design, new highly efficient power supplies, and new efficient fans, which use less power.

Q. Do the Cisco Catalyst 2960-X Series Switches support front-to-back airflow?

A. The airflow on the Cisco Catalyst 2960-X Series is "front and sides" to back airflow.

Q. Is the airflow reversible in the Cisco Catalyst 2960-X Series Switches?

A. No. The airflow is not reversible.

Q. Do Cisco Catalyst 2960-X Series Switches support field-replaceable power supplies?

A. Cisco Catalyst 2960-XR switch models have field replaceable power supplies, whereas the 2960-X switch models have fixed power supplies.

Q. Are Cisco Catalyst 2960-XR field-replaceable power supplies hot swappable?

A. Yes. Cisco Catalyst 2960-XR power supplies are hot swappable.

Q. Can a non-PoE Cisco Catalyst 2960-X Series Switch support PoE by replacing its power supply with a PoE-capable power supply?

A. No. A non-PoE Cisco Catalyst 2960-X Series Switch will not support PoE by using a PoE-capable power supply.

Q. Can we increase the PoE budget of Cisco Catalyst 2960-X Series Switch by replacing its power supply with a high-capacity power supply?

A. The available PoE budget is fixed for a given model of Cisco Catalyst 2960-X Series Switch. Replacing the switch power supply will not increase the PoE budget.

Q. Do I need two power supplies to run a Cisco Catalyst 2960-XR Series Switch?

A. No. The Cisco Catalyst 2960-XR Series Switches support two field-replaceable power supplies to provide redundancy. The power supplies are in shared mode. Three power supply options are available for use in the Cisco Catalyst 2960-XR Series, as shown in Table 6.

Table 6. Power supply options for Cisco Catalyst 2960-XR Series Switches

Part number	Description
PWR-C2-250W AC	FRU power supply and fan for all non-PoE C2960-XR switches, provides 250W AC of power
PWR-C2-640W AC	FRU power supply and fan for all 370W PoE+ C2960-XR switches, provides 640W AC of power
PWR-C2-1025W AC	FRU power supply and fan for all 740W PoE+ C2960-XR switches, provides 1025W AC of power

Q. In Cisco Catalyst 2960-XR switches, are the power supplies in shared mode or standby mode?

A. When both the power supplies are present in Cisco Catalyst 2960-XR switches, those power supplies are in shared mode. The power is drawn from both the power supplies.

Q. Do the Cisco Catalyst 2960-X Series Switches have external RPS support?

A. The Cisco Catalyst 2960-X LAN Base and LAN Lite models support RPS 2300. The Cisco Catalyst 2960-XR switches do not have external RPS support. Instead, customers looking for redundant power should insert an additional field-replaceable power supply module. For more information on RPS 2300 please refer to https://www.cisco.com/en/US/products/ps7130/index.html.

Software capabilities

Q. What software images do the Cisco Catalyst 2960-X Series Switches support?

A. All Cisco Catalyst 2960-X and 2960-XR switches use a single universal image. The tar file will be named c2960x-universalk9-tar.150-2.EX for 2960-X and 2960-XR switches. The name will change over time as new Cisco IOS Software releases are made available.

Q. Do Cisco Catalyst 2960-X Series Switches support signed images?

A. Yes. Cisco Catalyst 2960-X Series Switches support only signed images, which prevents any Cisco IOS Software image tampering.

Q. How do I get the cryptography features, and is there an additional charge for them?

A. Cisco Catalyst 2960-X Series Switches will support Cisco IOS Software images with cryptography features by default. These are the only images available. These images with cryptography features will be loaded during manufacture. Non-K9 images will not be available for the Cisco Catalyst 2960-X Series Switches.

Q. Do the Cisco Catalyst 2960-X Series Switches have feature parity with the existing Cisco Catalyst 2960 switches?

A. Yes. The Cisco Catalyst 2960-X Series has all the features of the Cisco Catalyst 2960-S Series. All Cisco Catalyst 2960 switches run the same Cisco IOS Software train, which provides maximum compatibility.

Q. What is the Switch Database Management (SDM) template for the Cisco Catalyst 2960-X Series?

A. The SDM templates supported for the Cisco Catalyst 2960-X Series are as shown in Table 7.

Table 7. SDM templates supported on the 2960-X Series

Switches	SDM description
2960-X LAN Lite	Single default SDM template; it cannot be modified.
2960-X LAN Base	lanbase-default - default LAN Base template on 2960-X Series. Supports IPv4 and IPv6 static routing. default- 2960-S default template, used for mixed stack. lanbase-routing - 2960-S routing template, used for mixed stack.
2960-XR IP Lite	default - 2960-XR default template. Supports IPv4 and IPv6 routing. vlan - Layer 2 only template with large Layer 2 entries. ipv4 - IPv4 only template with large routing entries.

Q. What are the differences between the different SDM templates of the Cisco Catalyst 2960-X?

A. Tables 8 and 9 compare the SDM templates on the Cisco Catalyst 2960-X Series.

Table 8. SDM template for 2960-X LAN Lite and LAN Base switches

SDM TCAM resources	2960-X LAN Lite default	2960-X and 2960-XR LAN Base default	2960-X LAN Base routing
Unicast MAC addresses	16K	16K	4K
IPv4 unicast direct routes	320	2k	0.875K
IPv4 unicast indirect routes	32	1K	80
IPv6 unicast direct routes	256	2K	0.75K
IPv6 unicast indirect routes	0	1K	32
IPv4 multicast routes and IGMP groups	1k	1K	0.375K
IPv6 multicast groups	1k	1K	0.25K
IPv4 QoS ACEs	384	500	0.375K

SDM TCAM resources	2960-X LAN Lite default	2960-X and 2960-XR LAN Base default	2960-X LAN Base routing
IPv6 QoS ACEs	256	500	0.125K
IPv4 security ACEs	256	625	0.375K
IPv6 security ACEs	256	625	0.25K

Table 9.   SDM template for 2960-XR IP Lite switches

SDM TCAM resources	2960-XR default (IP Lite)	2960-XR VLAN (IP Lite)	2960-XR IPv4 (IP Lite)
Unicast MAC addresses	16K	32K	16K
IPv4 unicast direct routes	4K	250	16K
IPv4 unicast indirect routes	1.25K	250	8K
IPv6 unicast direct routes	4K	250	0
IPv6 unicast indirect routes	1.25K	250	0
IPv4 multicast routes and IGMP groups	1k	1K	1K
IPv6 multicast groups	1k	1K	0
IPv4 QoS ACEs	500	500	500
IPv6 QoS ACEs	250	500	0
IPv4 security ACEs	1K	1K	875
IPv6 security ACEs	500	500	0

Q.   Does the Cisco Catalyst 2960-X Series support IPv6?

A.   Yes. Cisco Catalyst 2960-XSeries Switches are IPv6 certified.

These switches with LAN Base software support:

- IPv6 host
- IPv6 management
- IPv6 static routing
- IPv6 MLD v1 and v2 snooping
- IPv6 port-based ACLs
- IPv6 router ACLs
- IPv6 QoS
- IPv6 First Hop Security (RA guard, source guard, and binding integrity guard)

In addition, 2960-XR switches with IP Lite software support:

- IPv6 RIP
- OSFP v3 routed access
- DHCPv6
- HSRPv6
- IPv6 first hop security source guard

Q.   How can I manage the Cisco Catalyst 2960-X Series Switch with IPv6?

A.   The Cisco Catalyst 2960-X Series supports the IPv6 host feature. An IPv6 address can be assigned to a VLAN interface either statically or using DHCP. The following IPv6 management protocols are supported:

- HTTP, HTTP(s) over IPv6
- SNMP over IPv6

- Syslog over IPv6
- DHCP-based auto config (Auto Install) and image download
- Telnet and SSH

Q. Do the Cisco Catalyst 2960-X Series Switches support Cisco Generic Online Diagnostics (GOLD) for in-field hardware debugging?

A. Yes. The Cisco Catalyst 2960-X Series supports the following GOLD tests:

- TestPortAsicStackPortLoopback
- TestPortAsicLoopback
- TestPortAsicCam
- TestPortAsicMem
- TestInlinePwrCtlr

The Cisco Catalyst 2960-X Series Switches do not support the following GOLD tests:

- TestPortAsicRingLoopback
- TestMicRingLoopback

Q. Do the Cisco Catalyst 2960-X Series Switches support Cisco EnergyWise?

A. Yes.

Q. Do the Cisco Catalyst 2960-X Series Switches support Smart Install?

A. Yes, but only in client mode. The Cisco Catalyst 2960-X Series Switches cannot act as directors (IBD).

Q. Can I obtain a Cisco IOS Software update for the Cisco Catalyst 2960-X Series at no additional cost?

A. Yes. Cisco offers ongoing Cisco IOS Software updates for certain fixed-configuration and stackable Cisco Catalyst switches at no additional cost. For the life of the product, updates within the Cisco IOS Software package purchased (LAN Lite, LAN Base and IP Lite) will be made available.

Q. How do I get an update for the Cisco IOS Software for the Cisco Catalyst 2960-X Series at no additional cost?

A. Visit https://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.

Management

Q. Do Cisco Catalyst 2960-X and 2960-XR Series Switches support a web UI to perform a day-zero switch installation?

A. Yes, these switches support a day-zero GUI called Cisco Configuration Platform for Catalyst to help with easy deployment of the switch without the need for a CLI. Some of the capabilities supported are listed below

- Day-zero setup wizard
- Day-1 and day-2 provisioning
- Manage a stack of up to 8 switches
- Image upgrades
- Troubleshooting, diagnostics
- System monitoring, client view

Q. Does support for web UI require any additional files to be loaded on the 2960-L?

A. No, the .tar Cisco IOS Software file contains all the files required for web UI support.

Q. What browsers can be used for the web UI?

A. You can use these browsers:

- IE version 8 or later
- Chrome
- Firefox
- Safari

Q. Is Cisco DNA Center supported on Cisco Catalyst 2960-X and 2960-XR Series switches?

A. Yes. Cisco Catalyst 2960-X and 2960-XR Series Switches support Cisco DNA™ Essentials (Cisco IOS Release 15.2(6)E or later), which gives access to base Automation (SWIM, template-based provisioning) and Assurance capabilities.

Q. Do the Cisco Catalyst 2960-X and 2960-XR Series Switches support Bluetooth?

A. The 2960-X and 2960-XR Series can be configured and managed over the air with Bluetooth. The switches support an external Bluetooth dongle that plugs into the USB port on the switch and allows Bluetooth-based RF connection with an external Laptops and Tablets.

Laptops and tablets can now access the switch CLI using a telnet/ssh client over Bluetooth. The GUI can be accessed over Bluetooth with a browser.

Intelligent services

Q. What is NetFlow-Lite and Flexible NetFlow?

A. The Cisco Catalyst 2960-X Series supports hardware-driven Flexible (Full) NetFlow and NetFlow-Lite.

NetFlow-Lite 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.

Flexible NetFlow is the next generation in flow visibility technology, allowing optimization of the network infrastructure, reducing operation costs, and improving capacity planning and security incident detection with increased flexibility and scalability.

Q. Are Flexible NetFlow and NetFlow-Lite supported on all Cisco Catalyst 2960-X Series models?

A. NetFlow-Lite is not supported on LAN Lite models. It is supported on LAN Base (2960-X Series) and IP Lite (2960-XR Series) models.

Q. Are Flexible NetFlow and NetFlow-Lite supported on all ports of the Cisco Catalyst 2960-X Series?

A. NetFlow-Lite is natively supported on all downlink and uplink ports of the Cisco Catalyst 2960-X Series. No service module is required to support NetFlow-Lite on the Cisco Catalyst 2960-X Series. Flexible NetFlow requires either a Cisco DNA Essentials license per switch or a Cisco ONE™ Foundation license per switch.

Q. Is NetFlow-Lite supported on mixed stacks?

A. Yes, NetFlow-Lite is supported on mixed stacks (stacks of Cisco Catalyst 2960-S and 2960-X Series Switches). But NetFlow-Lite monitor can be attached only on Cisco Catalyst 2960-X Series ports.

Q. Which version of NetFlow exporters is supported?

A. Only NetFlow Version 9 is supported for NetFlow exporter using the export-protocol command option.

Q. How many NetFlow-Lite and Flexible NetFlow flows are supported on the Cisco Catalyst 2960-X Series?

A. 16,000 NetFlow-Lite flows are supported on a stack of Cisco Catalyst 2960-X Series Switches. Flexible NetFlow supports up to 8000 flow entries.

Q. Is egress flow monitor supported on the Cisco Catalyst 2960-X Series?

A. No, only ingress flow monitors are supported on the Cisco Catalyst 2960-X Series.

Q. Can the flow monitors be attached to logical interfaces on the Cisco Catalyst 2960-X Series?

A. The flow monitors can be attached to physical interfaces and VLAN interfaces (SVI) on the Cisco Catalyst 2960-X Series. The flow monitor can't 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 in the Cisco Catalyst 2960-X Series?

A. The interface VLAN monitor will overwrite the port monitor for the traffic coming on the port in the Cisco Catalyst 2960-X Series.

Q. Can we have NetFlow-Lite monitor attached without sampling?

A. No, only sampled NetFlow-Lite monitors can be attached on the Cisco Catalyst 2960-X Series.

Q. What sampling modes are supported on the Cisco Catalyst 2960-X Series?

A. Two sampling modes are supported on the Cisco Catalyst 2960-X 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 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 2960-X Series?

A. The Cisco Catalyst 2960-X Series supports four different NetFlow-Lite samplers in the hardware.

Q. Can we have deterministic sampler attached on more than four interfaces on the Cisco Catalyst 2960-X Series?

A. No. Because each deterministic sampler attachment uses up one free hardware sampler, a deterministic sampler can't be attached to more than four interfaces. It is recommended to use a random sampler if the flows need to be monitored on more than four ports.

Q. Is Domain Name System as an Authoritative Source (DNS-AS) supported?

A. Cisco Catalyst 2960-X and 2960-XR switches support DNS-AS with either a Cisco ONE Foundation or Cisco DNA Essentials license per switch.

PoE support (IEEE 802.3af and 802.3at)

Q. **Do the Cisco Catalyst 2960-X Series PoE switches support the IEEE 802.3af or 802.3.at standards?**

A. Both standards are supported; that is, the Cisco Catalyst 2960-X Series PoE switches can detect and support 802.3af and 802.3at powered devices.

Q. **Can the Cisco Catalyst 2960-X Series PoE switches detect Type 1 and Type 2 powered devices?**

A. The Cisco Catalyst 2960-X Series supports both the PoE and PoE+ standards and can classify a powered device as either Type 1 or 2 with a one-event classification. A Type 2 powered device supports Class 4 in order to obtain more power than is supported by the legacy power levels (30W). A Type 1 powered device can support only up to Class 3, or 15.4W.

Q. **Can the Cisco Catalyst 2960-X Series PoE switches support two-event classification?**

A. No. Two-event classification is specific to mid spans that work on Power-Supplying Equipment (PSE). The Cisco Catalyst 2960-X Series supports only one-event classification.

Q. **Do the Cisco Catalyst 2960-X Series PoE switches support power classification?**

A. Yes, the Cisco Catalyst 2960-X Series Switches can optionally detect the powered device power classification signature and budget the appropriate power. This reduces the maximum power that must be budgeted by the switch and provisioned in the wiring closet.

Q. **What is the maximum power per port that the Cisco Catalyst 2960-X Series PoE switches can supply?**

A. The Cisco Catalyst 2960-X Series supports both PoE standards, 802.3af and 802.3at, which define the maximum power that can be supplied to a port. The switches can provide up to 30W per port.

Q. **To how many end devices can the Cisco Catalyst 2960-X Series provide PoE and PoE+?**

A. The Cisco Catalyst 2960X-48FPD-L and C2960X-48FPS-L can support 48 PoE ports with full Class 3 PoE power of 15.4W each, for a total output capacity of 740W. All Cisco Catalyst 2960-X Series Switches with PoE capability support PoE+. A complete list of Cisco Catalyst 2960-X and 2960-XR switches, with their PoE capacities, is given in Table 10.

Table 10.   PoE capacity of Cisco Catalyst 2960-X Series Switches

Switch model	Maximum number of PoE+ (IEEE 802.3at) ports[*]	Maximum number of PoE (IEEE 802.3af) ports[*]	Maximum PoE power
Cisco Catalyst 2960X-48FPD-L	24 ports up to 30W	48 ports up to 15.4W	740W
Cisco Catalyst 2960X-48LPD-L	12 ports up to 30W	24 ports up to 15.4W	370W
Cisco Catalyst 2960X-24PD-L	12 ports up to 30W	24 ports up to 15.4W	370W
Cisco Catalyst 2960X-48FPS-L	24 ports up to 30W	48 ports up to 15.4W	740W
Cisco Catalyst 2960X-48LPS-L	12 ports up to 30W	24 ports up to 15.4W	370W
Cisco Catalyst 2960X-24PS-L	12 ports up to 30W	24 ports up to 15.4W	370W
Cisco Catalyst 2960X-24PSQ-L	3 ports of 30W	6 ports of 15.4W	92W
Cisco Catalyst 2960XR-48FPD-L	24 ports up to 30W	48 ports up to 15.4W	740W
Cisco Catalyst 2960XR-48LPD-L	12 ports up to 30W	24 ports up to 15.4W	370W
Cisco Catalyst 2960XR-24PD-L	12 ports up to 30W	24 ports up to 15.4W	370W
Cisco Catalyst 2960XR-48FPS-I	24 ports up to 30W	48 ports up to 15.4W	740W
Cisco Catalyst 2960XR-48LPS-I	12 ports up to 30W	24 ports up to 15.4W	370W
Cisco Catalyst 2960XR-24PS-I	12 ports up to 30W	24 ports up to 15.4W	370W
Cisco Catalyst 2960XR-48FPD-I	24 ports up to 30W	48 ports up to 15.4W	740W

Switch model	Maximum number of PoE+ (IEEE 802.3at) ports[*]	Maximum number of PoE (IEEE 802.3af) ports[*]	Maximum PoE power
Cisco Catalyst 2960XR-48LPD-I	12 ports up to 30W	24 ports up to 15.4W	370W
Cisco Catalyst 2960XR-24PD-I	12 ports up to 30W	24 ports up to 15.4W	370W
Cisco Catalyst 2960XR-48FPS-I	24 ports up to 30W	48 ports up to 15.4W	740W
Cisco Catalyst 2960XR-48LPS-I	12 ports up to 30W	24 ports up to 15.4W	370W
Cisco Catalyst 2960XR-24PS-I	12 ports up to 30W	24 ports up to 15.4W	370W

Transceivers

Q. What types of 10 Gigabit SFP+ modules are supported by the Cisco Catalyst 2960-X Series Switches?

A. For a list of the 10 Gigabit SFP+ modules, visit
https://www.cisco.com/en/US/products/hw/modules/ps5455/products_device_support_tables_list.html.

Q. What types of SFP modules are supported by the Cisco Catalyst 2960-X Series Switches?

A. For a list of the 1G SFP modules, visit
https://www.cisco.com/en/US/products/hw/modules/ps5455/products_device_support_tables_list.html.

Q. Are the 10 Gigabit SFP+ modules hot swappable?

A. Yes.

Q. Does the 10 Gigabit uplink upgrade require a separate module?

A. No. The SFP+ and SFP slots are built in.

Q. Can the 10 Gigabit SFP+ slots on the Cisco Catalyst 2960-X model support 1 Gigabit SFP modules?

A. Yes. The Cisco Catalyst 2960-X models that support 10 Gigabit SFP+ modules can also support SFP modules that operate at 1 Gigabit.

Q. Can the 10 Gigabit SFP+ slots on the Cisco Catalyst 2960-X models support 100-Mb SFP modules?

A. Please refer to the compatibility matrix for a list of supported modules:
https://www.cisco.com/c/en/us/td/docs/interfaces_modules/transceiver_modules/compatibility/matrix/100MB_Tx_Matrix.html.

Q. Can I reuse the 10 Gigabit X2 modules from the Cisco Catalyst 3750-E Series in the Cisco Catalyst 2960-X Series?

A. No. The Cisco Catalyst 2960-X uses SFP+ modules only.

Warranty

Q. What are the hardware warranty and return policy on the Cisco Catalyst 2960-X Series Switches?

A. Cisco Catalyst 2960-X 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 but adds 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. We encourage you to review carefully the warranty statement shipped with your specific product before use.

Cisco reserves the right to refund the purchase price as its exclusive warranty remedy. For further information about warranty terms, visit cisco.com/go/warranty.

Table 11. Warranty terms

Cisco enhanced limited lifetime hardware warranty	
Device covered	Applies to all Cisco Catalyst 2960-X Series Switches.
Warranty duration	As long as the original end user continues to own or use the product, provided that fan and power supply warranty is limited to 5 years.
End-of-life policy	In the event of discontinuance of product manufacture, Cisco warranty support is limited to 5 years from the announcement of discontinuance.
Hardware replacement	Cisco or its service center will use commercially reasonable efforts to ship a Cisco Catalyst 2960-X replacement part for next-business-day delivery, where available. Otherwise, a replacement will be shipped within 10 working days after the receipt of the RMA request. Actual delivery times might vary depending on customer location.
Effective date	Hardware warranty commences from the date of shipment to customer (and in case of resale by a Cisco reseller, not more than 90 days after original shipment by Cisco).
TAC support	Cisco will provide during customer's local business hours, 8 hours per day, 5 days per week basic configuration, diagnosis, and troubleshooting of device-level problems for up to 90 days from the date of shipment of the originally purchased Cisco Catalyst 2960-X product. This support does not include solution or network-level support beyond the specific device under consideration.
Cisco.com access	Warranty allows guest access only to Cisco.com.

Q. **What is the software update policy for Cisco Catalyst 2960-X Series Switches?**

A. Customers with Cisco Catalyst LAN Lite, LAN Base, or IP Lite (2960-XR Series only) software licenses will be provided with maintenance 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.

How to buy

To view buying options and speak with a Cisco sales representative, visit https://www.cisco.com/c/en/us/buy.html.

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