



Performing Extended Fast Software Upgrade

- [Prerequisites for Extended Fast Software Upgrade, on page 1](#)
- [Restrictions for Extended Fast Software Upgrade, on page 1](#)
- [Information About Extended Fast Software Upgrade, on page 2](#)
- [How to Perform Extended Fast Software Upgrade on a Standalone Switch, on page 3](#)
- [How to Perform Extended Fast Software Upgrade on a Stacked Switch, on page 15](#)
- [Verifying Software Upgrade or Reload, on page 27](#)
- [Configuration Examples for Extended Fast Software Upgrade, on page 27](#)
- [Additional References, on page 31](#)
- [Feature History for Extended Fast Software Upgrade, on page 31](#)

Prerequisites for Extended Fast Software Upgrade

- The Extended Fast Software Upgrade feature is supported starting with Cisco IOS XE Amsterdam 17.3.2a. Ensure that the software version that is installed on your switch is Cisco IOS XE Amsterdam 17.3.2a or later before you start the upgrade process.
- You must disable manual boot using the **no boot manual** command.

Restrictions for Extended Fast Software Upgrade

The following restrictions are applicable to both standalone and stacked switch:

- This feature is supported only if the switch is running in install mode.
- This feature is not supported on a switch that is configured with Spanning Tree Protocol (STP) only. The switch must also be configured with either Rapid Spanning Tree Protocol (RSTP) or Multiple Spanning Tree Protocol (MSTP).
- For a root device, Extended Fast Software Upgrade feature is not supported if any of the device ports in forwarding state are connected to an STP peer (A device with STP configured and directly connected to root device).
- For a device, with STP configured and not defined as a root device, Extended Fast Software Upgrade feature is supported only if the number of device ports in the forwarding state that is connected to an STP peer is less or equal to 1.

- Application hosting may not restart automatically after performing Extended Fast Software Upgrade. You may need to disable and re-enable Cisco IOx, configure application hosting, and install, activate, and start an application again.
- This feature is not supported on a device that is configured either with Locator ID Separation Protocol (LISP) or Virtual Extensible LAN (VXLAN).
- This feature is not supported on a device that is configured with Software-Defined Access (SDA) and Ethernet VPN (EVPN) Fabric.

The following restrictions are applicable for a stacked switch:

- This feature is not supported if the stacked switch is configured in the partial-ring state.
- This feature is not supported on a stacked switch that is configured with Bidirectional Forwarding Detection (BFD).
- This feature is not supported on a stacked switch that is configured with MACsec Key Agreement (MKA).
- This feature is not supported on a stacked switch that is configured with Cisco TrustSec.
- Configured UniDirectional Link Detection (UDLD) message intervals are ignored during traffic downtime. The intervals are restored to the configured values after Extended Fast Software Upgrade is completed.
- This feature is not supported on a stacked switch that is configured with multicast as Protocol Independent Multicast (PIM) is not supported on stacked switch.

Information About Extended Fast Software Upgrade

Extended Fast Software Upgrade reduces the traffic downtime during software reload or upgrade operations. Compared to Fast Software Upgrade, the traffic downtime is reduced to less than 30 seconds, depending on the switch configuration. Extended Fast Software Upgrade uses graceful restart capability (also known as Cisco NSF) to ensure that switch configurations, such as certain routing protocols, remain unaffected during a software upgrade or reload.



Note Extended Fast Software Upgrade works on access layer switches only.

Perpetual Power over Ethernet (PoE), if configured, continues to provide uninterrupted power to the connected devices during software reload or upgrade.

Protocols Supported with Extended Fast Software Upgrade

The following protocols are supported with Extended Fast Software Upgrade feature:



Note For all protocols other than the following, the traffic downtime will be longer than 30 seconds:

- BGP (IPv4 and IPv6 address families)
- Flexible NetFlow

- IEEE 802.1X Port-Based Authentication
- Intermediate System-to-Intermediate System (IS-IS)
- Internet Group Management Protocol (IGMP) snooping
- Layer 2 Switching
- Link Aggregation Control Protocol (LACP)
- MAC authentication bypass
- Multicast Listener Discovery (MLD) snooping
- Open Shortest Path First (OSPF) or OSPFv2 or OSPFv3
- Per VLAN Spanning Tree (PVST)
- QoS
- Static Port-channels (Mode on)
- STP with RSTP or MSTP
- UDLD
- Virtual routing and forwarding (VRF)
- Web authentication

How to Perform Extended Fast Software Upgrade on a Standalone Switch

The following sections provide configuration information on how to perform Extended Fast Software Upgrade on a standalone switch.

Upgrading the Software on a Standalone Switch

To upgrade the software on a standalone switch, perform the following procedure:

Before you begin

- Use the **show graceful-reload** command in privileged EXEC mode to ensure that all the routing protocols are in **UP** status.
- Use the **install remove inactive** command in privileged EXEC mode to free the disk space for the new software, if necessary.

Procedure

	Command or Action	Purpose
Step 1	enable	Enables privileged EXEC mode.

	Command or Action	Purpose
	Example: Device> enable	Enter your password, if prompted.
Step 2	install add file <i>image</i> activate {xfsu reloadfast} }commit Example: Device# install add file bootflash: cat9k_iosxe.17.03.02.SPA.bin activate reloadfast commit or Device# install add file bootflash: cat9k_iosxe.17.08.01.SPA.bin activate xfsu commit	Upgrades the switch with the new software image. Note The xfsu keyword was introduced from Cisco IOS XE Cupertino 17.8.1. For releases prior to Cisco IOS XE Cupertino 17.8.1, use the reload keyword instead. The <i>image</i> keyword includes the location of the file (TFTP, HTTP, flash drives) and the image name.

Upgrading the Software on a Standalone Switch Configured with IPv6

To upgrade the software on a standalone switch, perform the following procedure:

Before you begin

- Use the **show graceful-reload** command in privileged EXEC mode to ensure that all the routing protocols are in **UP** status.
- Use the **install remove inactive** command in privileged EXEC mode to free the disk space for the new software, if necessary.

Procedure

	Command or Action	Purpose
Step 1	enable Example: Device> enable	Enables privileged EXEC mode. Enter your password, if prompted.
Step 2	configure terminal Example: Device# configure terminal	Enters global configuration mode.
Step 3	ipv6 nd reachable-time <i>seconds</i> Example: Device(config)# ipv6 nd reachable-time 3600000	Sets the time limit for a remote IPv6 node to be considered reachable after a reachability confirmation event has occurred.
Step 4	end Example: Device(config)# end	Returns to privileged EXEC mode.

	Command or Action	Purpose
Step 5	write memory Example: Device# <code>write memory</code>	Saves the configuration on the switch.
Step 6	install add file <i>image</i> activate {xfsu reloadfast }commit Example: Device# <code>install add file bootflash: cat9k_iosxe.17.03.02.SPA.bin activate reloadfast commit</code> or Device# <code>install add file bootflash: cat9k_iosxe.17.08.01.SPA.bin activate xfsu commit</code>	Upgrades the switch with the new software image. Note The xfsu keyword was introduced from Cisco IOS XE Cupertino 17.8.1. For releases prior to Cisco IOS XE Cupertino 17.8.1, use the reload keyword instead. The <i>image</i> keyword includes the location of the file (TFTP, HTTP, flash drives) and the image name.

Upgrading the Software on a Standalone Switch Configured with IPv6 MLD

To upgrade the software on a standalone switch configured with IPv6 MLD, perform the following procedure:

Before you begin

- Use the **show graceful-reload** command in privileged EXEC mode to ensure that all the routing protocols are in **UP** status.
- Use the **install remove inactive** command in privileged EXEC mode to free the disk space for the new software, if necessary.

Procedure

	Command or Action	Purpose
Step 1	enable Example: Device> <code>enable</code>	Enables privileged EXEC mode. Enter your password, if prompted.
Step 2	configure terminal Example: Device# <code>configure terminal</code>	Enters global configuration mode.
Step 3	ipv6 mld snooping Example: Device(config)# <code>ipv6 mld snooping</code>	Enables IPv6 MLD snooping.
Step 4	end Example:	Returns to privileged EXEC mode.

	Command or Action	Purpose
	Device(config)# end	
Step 5	write memory Example: Device# write memory	Saves the configuration on the switch.
Step 6	install add file <i>image</i> activate {xfsu reloadfast} commit Example: Device# install add file bootflash: cat9k_iosxe.17.03.02.SPA.bin activate reloadfast commit or Device# install add file bootflash: cat9k_iosxe.17.08.01.SPA.bin activate xfsu commit	Upgrades the switch with the new software image. Note The xfsu keyword was introduced from Cisco IOS XE Cupertino 17.8.1. For releases prior to Cisco IOS XE Cupertino 17.8.1, use the reload keyword instead. The <i>image</i> keyword includes the location of the file (TFTP, HTTP, flash drives) and the image name.

Upgrading the Software on a Standalone Switch Configured with BGP

To upgrade the software on a standalone switch configured with BGP, perform the following procedure:

Before you begin

- Use the **show graceful-reload** command in privileged EXEC mode to ensure that all the routing protocols are in **UP** status.
- Use the **install remove inactive** command in privileged EXEC mode to free the disk space for the new software, if necessary.

Procedure

	Command or Action	Purpose
Step 1	enable Example: Device> enable	Enables privileged EXEC mode. Enter your password, if prompted.
Step 2	configure terminal Example: Device# configure terminal	Enters global configuration mode.
Step 3	router bgp <i>autonomous-system-number</i> Example: Device(config)# router bgp 65000	Enters BGP router configuration mode.

	Command or Action	Purpose
Step 4	bgp graceful-restart Example: Device(config-router)# bgp graceful-restart	Enables NSF awareness on a switch. By default, NSF awareness is disabled.
Step 5	end Example: Device(config-router)# end	Returns to privileged EXEC mode.
Step 6	write memory Example: Device# write memory	Saves the configuration on the switch.
Step 7	install add file <i>image</i> activate {xfsu reloadfast} commit Example: Device# install add file bootflash: cat9k_iosxe.17.03.02.SPA.bin activate reloadfast commit or Device# install add file bootflash: cat9k_iosxe.17.08.01.SPA.bin activate xfsu commit	Upgrades the switch with the new software image. Note The xfsu keyword was introduced from Cisco IOS XE Cupertino 17.8.1. For releases prior to Cisco IOS XE Cupertino 17.8.1, use the reload keyword instead. The <i>image</i> keyword includes the location of the file (TFTP, HTTP, flash drives) and the image name.

Upgrading the Software on a Standalone Switch Configured with OSPF

To upgrade the software on a standalone switch configured with OSPF, perform the following procedure:

Before you begin

- Use the **show graceful-reload** command in privileged EXEC mode to ensure that all the routing protocols are in **UP** status.
- Use the **install remove inactive** command in privileged EXEC mode to free the disk space for the new software, if necessary.

Procedure

	Command or Action	Purpose
Step 1	enable Example: Device> enable	Enables privileged EXEC mode. Enter your password, if prompted.

	Command or Action	Purpose
Step 2	configure terminal Example: Device# <code>configure terminal</code>	Enters global configuration mode.
Step 3	router ospf process-id Example: Device(config)# <code>router ospf 1</code>	Enters OSPF router configuration mode.
Step 4	router-id ip-address Example: Device(config-router)# <code>router-id 192.0.2.5</code>	Sets a fixed router ID for the OSPF instance.
Step 5	exit Example: Device(config-router)# <code>exit</code>	Exits router configuration mode and enters global configuration mode.
Step 6	interface interface_id Example: Device(config)# <code>interface gigabitethernet 1/0/1</code>	Enters interface configuration mode.
Step 7	ip ospf retransmit-interval seconds Example: Device(config-if)# <code>ip ospf retransmit-interval 10</code>	Increases the retransmission interval on the device. Note The minimum interval required for retransmission during Extended Fast Software Upgrade is 10 seconds.
Step 8	end Example: Device(config-if)# <code>end</code>	Returns to privileged EXEC mode.
Step 9	write memory Example: Device# <code>write memory</code>	Saves the configuration on the switch.
Step 10	install add file image activate {xfsu reloadfast }commit Example: Device# <code>install add file bootflash: cat9k_iosxe.17.03.02.SPA.bin activate reloadfast commit</code> or Device# <code>install add file bootflash:</code>	Upgrades the switch with the new software image. Note The xfsu keyword was introduced from Cisco IOS XE Cupertino 17.8.1. For releases prior to Cisco IOS XE Cupertino 17.8.1, use the reload keyword instead.

	Command or Action	Purpose
	<code>cat9k_iosxe.17.08.01.SPA.bin activate xfsu commit</code>	The <i>image</i> keyword includes the location of the file (TFTP, HTTP, flash drives) and the image name.

Upgrading the Software on a Standalone Switch Configured with OSPFv3

To upgrade the software on a standalone switch configured with OSPFv3, perform the following procedure:

Before you begin

- Use the **show graceful-reload** command in privileged EXEC mode to ensure that all the routing protocols are in **UP** status.
- Use the **install remove inactive** command in privileged EXEC mode to free the disk space for the new software, if necessary.

Procedure

	Command or Action	Purpose
Step 1	enable Example: Device> enable	Enables privileged EXEC mode. Enter your password, if prompted.
Step 2	configure terminal Example: Device# configure terminal	Enters global configuration mode.
Step 3	ipv6 nd reachable-time seconds Example: Device(config)# ipv6 nd reachable-time 3600000	Sets the time limit for a remote IPv6 node to be considered reachable after a reachability confirmation event has occurred.
Step 4	snmp ifmib ifindex persist Example: Device(config)# snmp ifmib ifindex persist	Enables SNMP ifIndex persistence globally.
Step 5	router ospfv3 process-id Example: Device(config)# router ospfv3 1	Enters OSPFv3 router configuration mode.
Step 6	router-id ip-address Example: Device(config-router)# router-id 192.0.2.5	Sets a fixed router ID for the OSPFv3 instance.

	Command or Action	Purpose
Step 7	interface-id snmp-if-index Example: Device(config-router)# interface-id snmp-if-index	Enables SNMP ifIndex persistence on the specified interface.
Step 8	exit Example: Device(config-router)# exit	Exits router configuration mode and enters global configuration mode.
Step 9	interface interface_id Example: Device(config)# interface gigabitethernet 1/0/1	Enters interface configuration mode.
Step 10	ospfv3 retransmit-interval seconds Example: Device(config-if)# ospfv3 retransmit-interval 10	Increases the retransmission interval on the device. Note The minimum interval required for retransmission during Extended Fast Software Upgrade is 10 seconds.
Step 11	end Example: Device(config-if)# end	Returns to privileged EXEC mode.
Step 12	write memory Example: Device# write memory	Saves the configuration on the switch.
Step 13	install add file image activate {xfsu reloadfast }commit Example: Device# install add file bootflash: cat9k_iosxe.17.03.02.SPA.bin activate reloadfast commit or Device# install add file bootflash: cat9k_iosxe.17.08.01.SPA.bin activate xfsu commit	Upgrades the switch with the new software image. Note The xfsu keyword was introduced from Cisco IOS XE Cupertino 17.8.1. For releases prior to Cisco IOS XE Cupertino 17.8.1, use the reload keyword instead. The <i>image</i> keyword includes the location of the file (TFTP, HTTP, flash drives) and the image name.

Reloading Software on a Standalone Switch

To reload software on a standalone switch, perform the following procedure.

Before you begin

Use the **show graceful-reload** command in privileged EXEC mode to ensure that all the routing protocols are in **UP** status.

Procedure

	Command or Action	Purpose
Step 1	enable Example: Device> enable	Enables privileged EXEC mode. Enter your password, if prompted.
Step 2	reload fast Example: Device# reload fast	Reloads the switch without software upgrade.

Reloading Software on a Standalone Switch Configured with BGP

To reload software on a standalone switch configured with BGP, perform the following procedure.

Before you begin

Use the **show graceful-reload** command in privileged EXEC mode to ensure that all the routing protocols are in **UP** status.

Procedure

	Command or Action	Purpose
Step 1	enable Example: Device> enable	Enables privileged EXEC mode. Enter your password, if prompted.
Step 2	configure terminal Example: Device# configure terminal	Enters global configuration mode.
Step 3	router bgp <i>autonomous-system-number</i> Example: Device(config)# router bgp 65000	Enters BGP router configuration mode.
Step 4	bgp graceful-restart Example: Device(config-router)# bgp graceful-restart	Enables NSF awareness on the switch. By default, NSF awareness is disabled.

	Command or Action	Purpose
Step 5	end Example: Device(config-router)# end	Returns to privileged EXEC mode.
Step 6	write memory Example: Device# write memory	Saves the configuration on the switch.
Step 7	reload fast Example: Device# reload fast	Reloads the switch without software upgrade.

Reloading Software on a Standalone Switch Configured with OSPF

To reload software on a standalone switch configured with OSPF, perform the following procedure.

Before you begin

Use the **show graceful-reload** command in privileged EXEC mode to ensure that all the routing protocols are in **UP** status.

Procedure

	Command or Action	Purpose
Step 1	enable Example: Device> enable	Enables privileged EXEC mode. Enter your password, if prompted.
Step 2	configure terminal Example: Device# configure terminal	Enters global configuration mode.
Step 3	router ospf process-id Example: Device(config)# router ospf 1	Enters OSPF router configuration mode.
Step 4	router-id ip-address Example: Device(config-router)# router-id 192.0.2.5	Sets a fixed router ID for the OSPF instance.
Step 5	exit Example: Device(config-router)# exit	Exits router configuration mode and enters global configuration mode.

	Command or Action	Purpose
Step 6	interface <i>interface_id</i> Example: Device(config)# interface gigabitethernet 1/0/1	Enters interface configuration mode.
Step 7	ip ospf retransmit-interval <i>seconds</i> Example: Device(config-if)# ip ospf retransmit-interval 10	Increases the retransmission interval on the device. Note The minimum interval required for retransmission during Extended Fast Software Upgrade is 10 seconds.
Step 8	end Example: Device(config-if)# end	Returns to privileged EXEC mode.
Step 9	write memory Example: Device# write memory	Saves the configuration on the switch.
Step 10	reload fast Example: Device# reload fast	Reloads the switch without software upgrade.

Reloading Software on a Standalone Switch Configured with OSPFv3

To reload software on a standalone switch configured with OSPFv3, perform the following procedure.

Before you begin

Use the **show graceful-reload** command in privileged EXEC mode to ensure that all the routing protocols are in **UP** status.

Procedure

	Command or Action	Purpose
Step 1	enable Example: Device> enable	Enables privileged EXEC mode. Enter your password, if prompted.
Step 2	configure terminal Example: Device# configure terminal	Enters global configuration mode.

	Command or Action	Purpose
Step 3	ipv6 nd reachable-time <i>seconds</i> Example: Device(config)# ipv6 nd reachable-time 3600000	Sets the time limit for a remote IPv6 node to be considered reachable after a reachability confirmation event has occurred.
Step 4	snmp ifmib ifindex persist Example: Device(config)# snmp ifmib ifindex persist	Globally enables SNMP ifIndex persistence.
Step 5	router ospfv3 <i>process-id</i> Example: Device(config)# router ospfv3 1	Enters OSPFv3 router configuration mode.
Step 6	router-id <i>ip-address</i> Example: Device(config-router)# router-id 192.0.2.5	Sets a fixed router ID for the OSPFv3 instance.
Step 7	interface-id snmp-if-index Example: Device(config-router)# interface-id snmp-if-index	Enables SNMP ifIndex persistence on the specified interface.
Step 8	exit Example: Device(config-router)# exit	Exits router configuration mode and enters global configuration mode.
Step 9	interface <i>interface_id</i> Example: Device(config)# interface gigabitethernet 1/0/1	Enters interface configuration mode.
Step 10	ospfv3 retransmit-interval <i>seconds</i> Example: Device(config-if)# ospfv3 retransmit-interval 10	Increases the retransmission interval on the device. Note The minimum interval required for retransmission during Extended Fast Software Upgrade is 10 seconds.
Step 11	end Example: Device(config-if)# end	Returns to privileged EXEC mode.

	Command or Action	Purpose
Step 12	write memory Example: Device# <code>write memory</code>	Saves the configuration on the switch.
Step 13	reload fast Example: Device# <code>reload fast</code>	Reloads the switch without software upgrade.

How to Perform Extended Fast Software Upgrade on a Stacked Switch

The following sections provide configuration information on how to perform Extended Fast Software Upgrade on a stacked switch.

Upgrading the Software on a Stacked Switch

To upgrade the software on a stacked switch, perform the following procedure:

Before you begin

Use the **install remove inactive** command in privileged EXEC mode to free the disk space for the new software, if necessary.

Procedure

	Command or Action	Purpose
Step 1	enable Example: Device> <code>enable</code>	Enables privileged EXEC mode. Enter your password, if prompted.
Step 2	install add file <i>image</i> activate {xfsu reloadfast} commit Example: Device# <code>install add file bootflash: cat9k_iosxe.17.03.02.SPA.bin activate reloadfast commit</code> or Device# <code>install add file bootflash: cat9k_iosxe.17.08.01.SPA.bin activate xfsu commit</code>	The following processes happen: <ol style="list-style-type: none"> a. Upgrades the image on the active, standby, and member switches. b. Restarts the standby and member switches. Restarts the active switch and switch changeover occurs. The standby switch becomes the new active switch and the active switch becomes the standby switch.

	Command or Action	Purpose
		<p>Note The xfsu keyword was introduced from Cisco IOS XE Cupertino 17.8.1. For releases prior to Cisco IOS XE Cupertino 17.8.1, use the reload keyword instead.</p> <p>The <i>image</i> keyword includes the location of the file (TFTP, HTTP, flash drives) and the image name.</p>

Upgrading the Software on a Stacked Switch Configured with BGP

To upgrade the software on a stacked switch configured with BGP, perform the following procedure:

Before you begin

- Use the **show graceful-reload** command in privileged EXEC mode to ensure that all the routing protocols are in **UP** status.
- Use the **install remove inactive** command in privileged EXEC mode to free the disk space for the new software, if necessary.

Procedure

	Command or Action	Purpose
Step 1	enable Example: Device> enable	Enables privileged EXEC mode. Enter your password, if prompted.
Step 2	configure terminal Example: Device# configure terminal	Enters global configuration mode.
Step 3	router bgp <i>autonomous-system-number</i> Example: Device(config)# router bgp 65000	Enters BGP router configuration mode.
Step 4	bgp graceful-restart all Example: Device(config-router)# bgp graceful-restart	Enables NSF awareness on a switch. By default, NSF awareness is disabled.
Step 5	end Example: Device(config-router)# end	Returns to privileged EXEC mode.

	Command or Action	Purpose
Step 6	write memory Example: Device# <code>write memory</code>	Saves the configuration on the switch.
Step 7	install add file <i>image</i> activate {xfsu reloadfast }commit Example: Device# <code>install add file bootflash: cat9k_iosxe.17.03.02.SPA.bin activate reloadfast commit</code> or Device# <code>install add file bootflash: cat9k_iosxe.17.08.01.SPA.bin activate xfsu commit</code>	Upgrades the switch with the new software image. Note The xfsu keyword was introduced from Cisco IOS XE Cupertino 17.8.1. For releases prior to Cisco IOS XE Cupertino 17.8.1, use the reload keyword instead. The <i>image</i> keyword includes the location of the file (TFTP, HTTP, flash drives) and the image name.

Upgrading the Software on a Stacked Switch Configured with IS-IS

To upgrade the software on a stacked switch configured with IS-IS, perform the following procedure:

Before you begin

Use the **install remove inactive** command in privileged EXEC mode to free the disk space for the new software, if necessary.

Procedure

	Command or Action	Purpose
Step 1	enable Example: Device> <code>enable</code>	Enables privileged EXEC mode. Enter your password, if prompted.
Step 2	configure terminal Example: Device# <code>configure terminal</code>	Enters global configuration mode.
Step 3	router isis <i>area-tag</i> Example: Device(config)# <code>router isis tag1</code>	Enables the IS-IS routing protocol to specify an IS-IS process, and places the switch in router configuration mode.
Step 4	nsf {cisco ietf} Example: Device(config-router)# <code>nsf cisco</code> OR Device(config-router)# <code>nsf ietf</code>	Enables NSF operation for IS-IS. • ietf : Enables IS-IS in homogeneous network where adjacencies with networking switches supporting IETF draft-based restartability is guaranteed.

	Command or Action	Purpose
		<ul style="list-style-type: none"> • cisco: Runs IS-IS in heterogeneous networks that might not have adjacencies with NSF-aware networking switches.
Step 5	end Example: Device(config-router)# end	Returns to privileged EXEC mode.
Step 6	write memory Example: Device# write memory	Saves the configuration on the switch.
Step 7	install add file <i>image</i> activate {xfsu reloadfast} commit Example: Device# install add file bootflash: cat9k_iosxe.17.03.02.SPA.bin activate reloadfast commit or Device# install add file bootflash: cat9k_iosxe.17.08.01.SPA.bin activate xfsu commit	Upgrades the switch with the new software image. Note The xfsu keyword was introduced from Cisco IOS XE Cupertino 17.8.1. For releases prior to Cisco IOS XE Cupertino 17.8.1, use the reload keyword instead. The <i>image</i> keyword includes the location of the file (TFTP, HTTP, flash drives) and the image name.

Upgrading the Software on a Stacked Switch Configured with OSPF

To upgrade the software on a standalone switch configured with OSPF, perform the following procedure:

Before you begin

- Use the **show graceful-reload** command in privileged EXEC mode to ensure that all the routing protocols are in **UP** status.
- Use the **install remove inactive** command in privileged EXEC mode to free the disk space for the new software, if necessary.

Procedure

	Command or Action	Purpose
Step 1	enable Example: Device> enable	Enables privileged EXEC mode. Enter your password, if prompted.
Step 2	configure terminal Example:	Enters global configuration mode.

	Command or Action	Purpose
	Device# <code>configure terminal</code>	
Step 3	router ospf <i>process-id</i> Example: Device(config)# <code>router ospf 1</code>	Enters OSPF router configuration mode.
Step 4	router-id <i>ip-address</i> Example: Device(config-router)# <code>router-id 192.0.2.5</code>	Sets a fixed router ID for the OSPF instance.
Step 5	exit Example: Device(config-router)# <code>exit</code>	Exits router configuration mode and enters global configuration mode.
Step 6	interface <i>interface_id</i> Example: Device(config)# <code>interface gigabitethernet 1/0/1</code>	Enters interface configuration mode.
Step 7	ip ospf retransmit-interval <i>seconds</i> Example: Device(config-if)# <code>ip ospf retransmit-interval 10</code>	Increases the retransmission interval on the device. Note The minimum interval required for retransmission during Extended Fast Software Upgrade is 10 seconds.
Step 8	end Example: Device(config-router)# <code>end</code>	Returns to privileged EXEC mode.
Step 9	write memory Example: Device# <code>write memory</code>	Saves the configuration on the switch.
Step 10	install add file <i>image activate {xfsu reloadfast } commit</i> Example: Device# <code>install add file bootflash: cat9k_iosxe.17.03.02.SPA.bin activate reloadfast commit</code> or Device# <code>install add file bootflash: cat9k_iosxe.17.08.01.SPA.bin activate xfsu commit</code>	Upgrades the switch with the new software image. Note The xfsu keyword was introduced from Cisco IOS XE Cupertino 17.8.1. For releases prior to Cisco IOS XE Cupertino 17.8.1, use the reload keyword instead.

	Command or Action	Purpose
		The <i>image</i> keyword includes the location of the file (TFTP, HTTP, flash drives) and the image name.

Upgrading the Software on a Stacked Switch Configured with OSPFv3

To upgrade the software on a standalone switch configured with OSPFv3, perform the following procedure:

Before you begin

- Use the **show graceful-reload** command in privileged EXEC mode to ensure that all the routing protocols are in **UP** status.
- Use the **install remove inactive** command in privileged EXEC mode to free the disk space for the new software, if necessary.

Procedure

	Command or Action	Purpose
Step 1	enable Example: Device> enable	Enables privileged EXEC mode. Enter your password, if prompted.
Step 2	configure terminal Example: Device# configure terminal	Enters global configuration mode.
Step 3	ipv6 nd reachable-time <i>seconds</i> Example: Device(config)# ipv6 nd reachable-time 3600000	Sets the time limit for a remote IPv6 node to be considered reachable after a reachability confirmation event has occurred.
Step 4	snmp ifmib ifindex persist Example: Device(config)# snmp ifmib ifindex persist	Enables SNMP ifIndex persistence globally.
Step 5	router ospfv3 <i>process-id</i> Example: Device(config)# router ospfv3 1	Enters OSPF or OSPFv3 router configuration mode.
Step 6	router-id <i>ip-address</i> Example: Device(config-router)# router-id 192.0.2.5	Sets a fixed router ID for the OSPFv3 instance.

	Command or Action	Purpose
Step 7	interface-id snmp-if-index Example: Device(config-router)# interface-id snmp-if-index	Enables SNMP ifIndex persistence on the specified interface.
Step 8	exit Example: Device(config-router)# exit	Exits router configuration mode and enters global configuration mode.
Step 9	interface interface_id Example: Device(config)# interface gigabitethernet 1/0/1	Enters interface configuration mode.
Step 10	ospfv3 retransmit-interval seconds Example: Device(config-if)# ospfv3 retransmit-interval 10	Increases the retransmission interval on the device. Note The minimum interval required for retransmission during Extended Fast Software Upgrade is 10 seconds.
Step 11	end Example: Device(config-if)# end	Returns to privileged EXEC mode.
Step 12	write memory Example: Device# write memory	Saves the configuration on the switch.
Step 13	install add file image activate {xfsu reloadfast } commit Example: Device# install add file bootflash: cat9k_iosxe.17.03.02.SPA.bin activate reloadfast commit or Device# install add file bootflash: cat9k_iosxe.17.08.01.SPA.bin activate xfsu commit	Upgrades the switch with the new software image. Note The xfsu keyword was introduced from Cisco IOS XE Cupertino 17.8.1. For releases prior to Cisco IOS XE Cupertino 17.8.1, use the reload keyword instead. The <i>image</i> keyword includes the location of the file (TFTP, HTTP, flash drives) and the image name.

Reloading Software on a Stacked Switch

To reload software on a stacked switch, perform the following procedure.

Procedure

	Command or Action	Purpose
Step 1	enable Example: Device> enable	Enables privileged EXEC mode. Enter your password, if prompted.
Step 2	reload fast Example: Device# reload fast	The following processes happen: <ol style="list-style-type: none"> a. Reloads the standby and member switches. b. Reloads the active switch and switch changeover occurs. The standby switch becomes the new active switch and the active switch becomes the new standby switch.

Reloading Software on a Stacked Switch Configured with BGP

To reload software on a stacked switch configured with BGP, perform the following procedure.

Before you begin

Use the **show graceful-reload** command in privileged EXEC mode to ensure that all the routing protocols are in **UP** status.

Procedure

	Command or Action	Purpose
Step 1	enable Example: Device> enable	Enables privileged EXEC mode. Enter your password, if prompted.
Step 2	configure terminal Example: Device# configure terminal	Enters global configuration mode.
Step 3	router bgp <i>autonomous-system-number</i> Example: Device(config)# router bgp 65000	Enters BGP router configuration mode.
Step 4	bgp graceful-restart all Example: Device(config-router)# bgp graceful-restart all	Enables NSF awareness on all switches in the stack. By default, NSF awareness is disabled.

	Command or Action	Purpose
Step 5	end Example: Device(config-router)# end	Returns to privileged EXEC mode.
Step 6	write memory Example: Device# write memory	Saves the configuration on the switch.
Step 7	reload fast Example: Device# reload fast	Reloads the switch without software upgrade.

Reloading Software on a Stacked Switch Configured with IS-IS

To reload software on a stacked switch configured with IS-IS, perform the following procedure.

Procedure

	Command or Action	Purpose
Step 1	enable Example: Device> enable	Enables privileged EXEC mode. Enter your password, if prompted.
Step 2	configure terminal Example: Device# configure terminal	Enters global configuration mode.
Step 3	router isis area-tag Example: Device(config)# router isis tag1	Enables the IS-IS routing protocol to specify an IS-IS process, and places the switch in router configuration mode.
Step 4	nsf {cisco ietf} Example: Device(config-router)# nsf cisco OR Device(config-router)# nsf ietf	Enables NSF operation for IS-IS. <ul style="list-style-type: none"> • ietf: Enables IS-IS in homogeneous network where adjacencies with networking switches supporting IETF draft-based restartability is guaranteed. • cisco: Runs IS-IS in heterogeneous networks that might not have adjacencies with NSF-aware networking switches.
Step 5	end Example: Device(config-router)# end	Returns to privileged EXEC mode.

	Command or Action	Purpose
Step 6	write memory Example: Device# <code>write memory</code>	Saves the configuration on the switch.
Step 7	reload fast Example: Device# <code>reload fast</code>	Reloads the switch without software upgrade.

Reloading Software on a Stacked Switch Configured with OSPF

To reload software on a standalone switch configured with OSPF, perform the following procedure.

Before you begin

Use the **show graceful-reload** command in privileged EXEC mode to ensure that all the routing protocols are in **UP** status.

Procedure

	Command or Action	Purpose
Step 1	enable Example: Device> <code>enable</code>	Enables privileged EXEC mode. Enter your password, if prompted.
Step 2	configure terminal Example: Device# <code>configure terminal</code>	Enters global configuration mode.
Step 3	router ospf <i>process-id</i> Example: Device (config)# <code>router ospf 1</code>	Enters OSPF router configuration mode.
Step 4	router-id <i>ip-address</i> Example: Device (config-router)# <code>router-id 192.0.2.5</code>	Sets a fixed router ID for the OSPF instance.
Step 5	exit Example: Device (config-router)# <code>exit</code>	Exits router configuration mode and enters global configuration mode.
Step 6	interface <i>interface_id</i> Example:	Enters interface configuration mode.

	Command or Action	Purpose
	Device(config)# interface gigabitethernet 1/0/1	
Step 7	ip ospf retransmit-interval <i>seconds</i> Example: Device(config-if)# ip ospf retransmit-interval 10	Increases the retransmission interval on the device. Note The minimum interval required for retransmission during Extended Fast Software Upgrade is 10 seconds.
Step 8	end Example: Device(config-if)# end	Returns to privileged EXEC mode.
Step 9	write memory Example: Device# write memory	Saves the configuration on the switch.
Step 10	reload fast Example: Device# reload fast	Reloads the switch without software upgrade.

Reloading Software on a Stacked Switch Configured with OSPFv3

To reload software on a standalone switch configured with OSPFv3, perform the following procedure.

Before you begin

Use the **show graceful-reload** command in privileged EXEC mode to ensure that all the routing protocols are in **UP** status.

Procedure

	Command or Action	Purpose
Step 1	enable Example: Device> enable	Enables privileged EXEC mode. Enter your password, if prompted.
Step 2	configure terminal Example: Device# configure terminal	Enters global configuration mode.

	Command or Action	Purpose
Step 3	ipv6 nd reachable-time <i>seconds</i> Example: Device(config)# ipv6 nd reachable-time 3600000	Sets the time limit for a remote IPv6 node to be considered reachable after a reachability confirmation event has occurred.
Step 4	snmp ifmib ifindex persist Example: Device(config)# snmp ifmib ifindex persist	Enables SNMP ifIndex persistence globally.
Step 5	router ospfv3 <i>process-id</i> Example: Device(config)# router ospfv3 1	Enters OSPFv3 router configuration mode.
Step 6	router-id <i>ip-address</i> Example: Device(config-router)# router-id 192.0.2.5	Sets a fixed router ID for the OSPF instance.
Step 7	interface-id snmp-if-index Example: Device(config-router)# interface-id snmp-if-index	Enables SNMP ifIndex persistence on the specified interface.
Step 8	exit Example: Device(config-router)# exit	Exits router configuration mode and enters global configuration mode.
Step 9	interface <i>interface_id</i> Example: Device(config)# interface gigabitethernet 1/0/1	Enters interface configuration mode.
Step 10	ospfv3 retransmit-interval <i>seconds</i> Example: Device(config-if)# ospfv3 retransmit-interval 10	Increases the retransmission interval on the device. Note The minimum interval required for retransmission during Extended Fast Software Upgrade is 10 seconds.
Step 11	end Example: Device(config-if)# end	Returns to privileged EXEC mode.

	Command or Action	Purpose
Step 12	write memory Example: Device# <code>write memory</code>	Saves the configuration on the switch.
Step 13	reload fast Example: Device# <code>reload fast</code>	Reloads the switch without software upgrade.

Verifying Software Upgrade or Reload

Use the following commands in privileged EXEC mode to verify the software upgrade or reload is successful.

Table 1: Commands to Verify the Software Upgrade or Reload

Command	Purpose
<code>clear xfsu state</code>	Clears the last state of the reload.
<code>show version</code>	Displays the hardware and software information for a device.
<code>show log in FAST</code>	Displays whether software upgrade or reload using Extended Fast Software Upgrade is completed.
<code>show install summary</code>	Displays information about an active package.
<code>show install log</code>	Displays information about installation requests.
<code>show tech-supp xfsu</code>	Displays information about the Extended Fast Software Upgrade for use by technical support.
<code>show version running</code>	Displays the status of the reload.
<code>show version in reason</code>	Displays the reason for the last reload.
<code>show xfsu status</code>	Displays the status of the reload.
<code>show xfsu eligibilty</code>	Displays whether the device is eligible for software upgrade or reload using Extended Fast Software Upgrade.

Configuration Examples for Extended Fast Software Upgrade

This section provides the configuration examples for Extended Fast Software Upgrade.

Example: Upgrading Switch with Software Upgrade

The following example shows how to upgrade the software on a switch using the **install add file activate reloadfast commit** command:



Note The **xfsu** keyword was introduced from Cisco IOS XE Cupertino 17.8.1. For releases prior to Cisco IOS XE Cupertino 17.8.1, use the **reload** keyword instead.

```

Device> enable
Device# install add file flash:cat9k_iosxe.V178_1A_FC2_2.SSA.bin activate xfsu commit
STACK_GR: Inside xFSU check if switch stack
Checking STP eligibility: Eligible

[1]: Performing xFSU-pre-check
300+0 records in
300+0 records out
307200 bytes (307 kB, 300 KiB) copied, 0.196216 s, 1.6 MB/s
SUCCESS: xFSU-pre-check finished
[1]: xFSU-pre-check package(s) on switch 1
For all other than the below protocols, the traffic downtime will be longer than 30 seconds.
1) Layer 2 Switching, 2) Per VLAN Spanning Tree (PVST), 3) STP with RSTP or MSTP
4) Static Port-channels (Mode on), 5) UDLD, 6) LACP, 7) BGP (IPv4 and IPv6)
   Open Shortest Path First (OSPF) or OSPFv2 or OSPFv3, 9) IS-IS,
10) Virtual routing and forwarding (VRF), 11) Flexible NetFlow, 12) QoS
SUCCESS: xFSU requirement pre-check
Downloading file flash:cat9k_iosxe.V178_1A_FC2_2.SSA.bin
Finished downloading file flash:cat9k_iosxe.V178_1A_FC2_2.SSA.bin to
flash:cat9k_iosxe.V178_1A_FC2_2.SSA.bin
install_add_activate_commit: Adding PACKAGE
install_add_activate_commit: Checking whether new add is allowed ....

--- Starting initial file syncing ---
Info: Finished copying flash:cat9k_iosxe.V178_1A_FC2_2.SSA.bin to the selected switch(es)
Finished initial file syncing

--- Starting Add ---
Performing Add on all members
[1] Add package(s) on switch 1
[1] Finished Add on switch 1
Checking status of Add on [1]
Add: Passed on [1]
Finished Add

Image added. Version: 17.08.01.0.1516
install_add_activate_commit: Activating PACKAGE
Following packages shall be activated:
/flash/cat9k-wlc.V178_1A_FC2_2.SSA.pkg
/flash/cat9k-webui.V178_1A_FC2_2.SSA.pkg
/flash/cat9k-srdriver.V178_1A_FC2_2.SSA.pkg
/flash/cat9k-sipsa.V178_1A_FC2_2.SSA.pkg
/flash/cat9k-sipbase.V178_1A_FC2_2.SSA.pkg
/flash/cat9k-rpboot.V178_1A_FC2_2.SSA.pkg
/flash/cat9k-rpbase.V178_1A_FC2_2.SSA.pkg
/flash/cat9k-lni.V178_1A_FC2_2.SSA.pkg
/flash/cat9k-guestshell.V178_1A_FC2_2.SSA.pkg
/flash/cat9k-espbase.V178_1A_FC2_2.SSA.pkg
/flash/cat9k-cc_srdriver.V178_1A_FC2_2.SSA.pkg

```

```

--- Verifying Platform specific xFSU admission criteria ---
SUCCESS: xFSU image pre-check

This operation requires a fast reload of the system. Do you want to proceed? [y/n]y
--- Starting Activate ---
Performing Activate on all members
[1] Activate package(s) on switch 1
--- Starting list of software package changes ---
Old files list:
Modified cat9k-cc_srdriver.17.08.01a.SPA.pkg
Modified cat9k-espbase.17.08.01a.SPA.pkg
Modified cat9k-guestshell.17.08.01a.SPA.pkg
Modified cat9k-lni.17.08.01a.SPA.pkg
Modified cat9k-rpbase.17.08.01a.SPA.pkg
Modified cat9k-rpboot.17.08.01a.SPA.pkg
Modified cat9k-sipbase.17.08.01a.SPA.pkg
Modified cat9k-sipsa.17.08.01a.SPA.pkg
Modified cat9k-srdriver.17.08.01a.SPA.pkg
Modified cat9k-webui.17.08.01a.SPA.pkg
Modified cat9k-wlc.17.08.01a.SPA.pkg
New files list:
Added cat9k-cc_srdriver.V178_1A_FC2_2.SSA.pkg
Added cat9k-espbase.V178_1A_FC2_2.SSA.pkg
Added cat9k-guestshell.V178_1A_FC2_2.SSA.pkg
Added cat9k-lni.V178_1A_FC2_2.SSA.pkg
Added cat9k-rpbase.V178_1A_FC2_2.SSA.pkg
Added cat9k-rpboot.V178_1A_FC2_2.SSA.pkg
Added cat9k-sipbase.V178_1A_FC2_2.SSA.pkg
Added cat9k-sipsa.V178_1A_FC2_2.SSA.pkg
Added cat9k-srdriver.V178_1A_FC2_2.SSA.pkg
Added cat9k-webui.V178_1A_FC2_2.SSA.pkg
Added cat9k-wlc.V178_1A_FC2_2.SSA.pkg
Finished list of software package changes
[1] Finished Activate on switch 1
Checking status of Activate on [1]
Activate: Passed on [1]
Finished Activate
#
#
<<output truncated>>

```

Example: Reloading Software on a Switch

Example

The following example shows how to reload a software on a switch using the **reload fast** command:

```

Device> enable
Device# reload fast
Reload fast command is being issued on Active unit, this will reload fast the whole stack
Proceed with reload fast? [confirm]
STACK_GR: Inside xFSU check if switch stack
Checking STP eligibility: Eligible

[1]: Performing xFSU-pre-check
300+0 records in
300+0 records out
307200 bytes (307 kB, 300 KiB) copied, 0.196405 s, 1.6 MB/s
SUCCESS: xFSU-pre-check finished

```

Example: Reloading Software on a Switch

```

[1]: xFSU-pre-check package(s) on switch 1
For all other than the below protocols, the traffic downtime will be longer than 30 seconds.
1) Layer 2 Switching, 2) Per VLAN Spanning Tree (PVST), 3) STP with RSTP or MSTP
4) Static Port-channels (Mode on), 5) UDLD, 6) LACP, 7) BGP (IPv4 and IPv6)
  Open Shortest Path First (OSPF) or OSPFv2 or OSPFv3, 9) IS-IS,
10) Virtual routing and forwarding (VRF), 11) Flexible NetFlow, 12) QoS
SUCCESS: xFSU requirement pre-check

--- Verifying Platform specific xFSU admission criteria ---
SUCCESS: xFSU image pre-check
Check xFSU support and verification on switch
[1]: xFSU-Verify-Package package(s) on switch 1
Finished preverifying before xFSU
SUCCESS to verify packages
SUCCESS to verify before xFSU
[1]: Finished xFSU-Verify-Package successful on switch 1
(-2) SUCCESS: Finished xFSU-Verify-Package: Success on [1]
[1]: Performing Upgrade_Service
300+0 records in
300+0 records out
307200 bytes (307 kB, 300 KiB) copied, 0.196099 s, 1.6 MB/s
mount: /tmp/microcode_update/boot_pkg: WARNING: source write-protected, mounted read-only.
SUCCESS: Upgrade_Service finished
PID TTY TIME CMD
Starting GR:#
Waiting for UDLD processing:UDLD processing complete
cat: /: Is a directory
Wait for ifm backup: Ifm backup is completeApr 19 21:43:03.283: %PMAN-5-EXITACTION: F0/0:
pvp: Process manager is exiting: reload fp action requested
Apr 19 21:43:05.337: %PMAN-5-EXITACTION: R0/0: pvp: Process ger is exiting: rp processes
exit with reload switch code

Initializing Hardware.....
Reload Fast Detected

System Bootstrap, Version 17.9.0.4r, DEVELOPMENT SOFTWARE
Copyright (c) 1994-2022 by cisco Systems, Inc.
Compiled Tue 03/22/2022 10:39:31.69 by m jagatap

Current ROMMON image : Primary
Last reset cause : SoftwareReload
C9300-24T platform with 8388608 Kbytes of main memory

Preparing to autoboot. [Press Ctrl-C to interrupt] 0
boot: attempting to boot from [flash:packages.conf]
boot: reading file packages.conf
#
#####
#
#
<<output truncated>>

```

Example: Viewing Extended Fast Software Upgrade Status

Example

The following example shows how to reload a software on a switch using the **show xfsu status** command:



Note The **show xfsu status** was introduced from Cisco IOS XE Cupertino 17.8.1. For releases prior to Cisco IOS XE Cupertino 17.8.1, use the **show reload status** command instead.

```
Device> enable
Device# show xfsu status
Reload Fast PLATFORM Status: Dataplane update done
Graceful Reload Infra Status: Not running
Minimum required system uptime before fast reload can be supported is 10 seconds
Client OSPFV3 : (0x10203008) Status: Up
Client OSPF : (0x10203007) Status: Up
Client GR_CLIENT_BGP : (0x10203006) Status: Up
Client IS-IS : (0x10203005) Status: Up
Client LACP_xFSU : (0x10203004) Status: Up
Client GR_CLIENT_TOPO : (0x10203003) Status: Up
Client GR_CLIENT_VRF : (0x10203002) Status: Up
Client GR_CLIENT_RIB : (0x10203001) Status: Up
Client GR_CLIENT_FIB : (0x10203000) Status: Up
```

Additional References

Related Documents

Related Topic	Document Title
Information on routing protocols	See the <i>IP Routing Configuration Guide of the Software Configuration Guide (Catalyst 9300 Switches)</i>
Information on STP, PVST, and UDLD	See the <i>Layer 2 Configuration Guide of the Software Configuration Guide (Catalyst 9300 Switches)</i>
Information on Perpetual PoE	See the <i>Network Powered Lighting Configuration Guide of the Software Configuration Guide (Catalyst 9300 Switches)</i>
Information on Application Hosting	See the <i>Programmability Configuration Guide of the Software Configuration Guide (Catalyst 9300 Switches)</i>

Feature History for Extended Fast Software Upgrade

This table provides release and related information for features explained in this module.

These features are available on all releases subsequent to the one they were introduced in, unless noted otherwise.

Release	Feature	Feature Information
Cisco IOS XE Amsterdam 17.3.2a	Extended Fast Software Upgrade	Extended Fast Software Upgrade reduces the traffic downtime during software reload or upgrade operations. Support for this feature was introduced on the 9300 and 9300L switch models of the Cisco Catalyst 9300 Series Switches.
Cisco IOS XE Cupertino 17.7.1	Extended Fast Software Upgrade	Support for this feature was introduced on the 9300X switch models of the Cisco Catalyst 9300 Series Switches.
Cisco IOS XE Cupertino 17.8.1	Commands modification and command introduction	<ol style="list-style-type: none"> 1. The xfsu keyword was introduced as an alternative to the reloadfast keyword in the install add file image activate reloadfast commit command. The reloadfast keyword is being deprecated in further releases. 2. The reload keyword was changed to xfsu keyword in the following commands: <ul style="list-style-type: none"> • show xfsu status • show tech-support xfsu • clear xfsu state 3. The show xfsu eligibilty command was introduced.