Upgrade and Downgrade Device Software

Upgrade considerations

Describes the issues to consider when planning to upgrade the software of a device operating in a Cisco Catalyst SD-WAN network.

Software image to use from Cisco IOS XE Catalyst SD-WAN Release 17.2.1r

From Cisco IOS XE Catalyst SD-WAN Release 17.2.1r, use the universalk9 image to deploy both Cisco IOS XE Catalyst SD-WAN and Cisco IOS XE on Cisco IOS XE Catalyst SD-WAN devices.

From Cisco IOS XE Catalyst SD-WAN Release 17.2.1r, UCMK9 image is not available.

Upgrade considerations: Multirate interfaces

Describes the multirate interface issues to consider when planning to upgrade the software of a device operating in a Cisco Catalyst SD-WAN network.

The following Cisco IOS XE Catalyst SD-WAN devices support multirate interfaces and support the 1GE small form-factor pluggable (SFP) (optical and CU) and 10GE SFP+ (optical and CU) modules on their 10G interfaces ports:

- Cisco ASR 1001-HX Router
- Cisco Catalyst 8500-12X4QC
- Cisco Catalyst 8500-12X

Upgrade considerations: Autonegotiation

Describes autonegatiation issues to consider when planning to upgrade the software of a device operating in a Cisco Catalyst SD-WAN network.

These considerations apply to auto-negotiation in both Catalyst SD-WAN and non-SD-WAN modes of the router models that support multirate interfaces:

Before upgrading

Before upgrading to Cisco Catalyst SD-WAN Manager Release 20.12.1 or Cisco IOS XE Catalyst SD-WAN Release 17.12.1a or later releases, contact Cisco TAC to check and drop any non-compatible indexes. Non-compatible old index can impact successful upgrade to newer version.

CLI configuration

For releases before Cisco IOS XE 17.6.1a, auto-negotiation can be configured using the CLI.

10G interface with a 10GE SFP+ module

For releases before Cisco IOS XE 17.6.1a, if you use the CLI or Cisco Catalyst SD-WAN to reboot a device with a 10G interface that includes a 10GE SFP+ module, that interface will not come up. In this situation, use Cisco Catalyst SD-WAN or the CLI to configure **`no negotiation auto`** for the interface, then reboot the device.

Feature templates

From Cisco IOS XE Release 17.6.3a, **`auto neg`** values for auto-negotiation are pushed to 10G interfaces on supported devices through feature templates. Ensure that you know which SFP module is on which 10G interface on a device so that you can properly configure the feature template.

Restriction for the negotiation auto CLI command

On software releases up to Cisco IOS XE Release 17.6.3a, the **negotiation auto** command is not supported on a 10G interface that includes a 10GE SFP+ module.

Restriction for the no negotiation auto CLI command

On software releases up to Cisco IOS XE Release 17.6.3a, the **no negotiation auto** command with the default OFF option must be sent through a feature template to all 10G interfaces that include a 10GE SFP+ module. Otherwise, the template push fails.

Support for 10G interface with 10 GE SFP+ module

If you upgrade to Cisco IOS XE Release 17.6.3a from a release in which auto-negotiation was enabled on a 10G interface that includes a 10GE SFP+ module, that interface will not come up. In this situation, use the CLI to configure **no negotiation auto** for the interface after the upgrade completes.

From Cisco IOS XE Release 17.6.4 onwards, the **negotiation auto** command is supported on a 10G interface with 10 GE SFP+ module. In this scenario, in the output of **show interface Tengig** *x*/*y*/*z*, the link type is force-up regardless of **negotiation auto/no negotiation auto** configuration. The same is applicable when the configurations are pushed through Cisco SD-WAN Manager template.

Preparation for 10G interfaces with 10GE SFP+ module

Before upgrading to Cisco IOS XE Release 17.6.3a, use a feature template, a CLI add-on feature templates, or the CLI to apply the **no negotiation auto** command to all 10G interfaces that include a 10GE SFP+ module.

Support for 10G interface with 1GE Fiber and Copper SFP

From Cisco IOS XE Release 17.6.4 onwards, the **negotiation auto** command is supported on a 10G interface that includes a 1GE Fiber and Copper SFP.

ASR 1001-HX multirate support

For an ASR 1001-HX platform, multirate is supported only on the last four ports of bay1 8X10G/1G.

Redeploy configuration after upgrade

After upgrading a device, configurations for new features in the updated version are not applied automatically. To enable these new features, you must manually redeploy the configuration group or device template.

Upgrade considerations: Cisco 8000 Series Routers

Describes the issues to consider when planning to upgrade the software of C8300 and C8500L-8S4X routers operating in a Cisco Catalyst SD-WAN network.

10G interface with 10GE SFP+ module

- From Cisco IOS XE Release 17.15.1 and later, the **negotiation auto** command is supported on a 10G interface that includes a 10GE SFP+ module.
- From Cisco IOS XE Release 17.15.1 and later, on a 10G interface that includes a 10GE SFP+ module, the output of **show interface Tengig** *x*/*y*/*z* always shows the link type as force-up, regardless of **negotiation auto**/**no negotiation auto** configuration. The same is applicable when the configurations are pushed through Cisco SD-WAN Manager template.

Dual rate ports

The command **show running config** does not display **no neg auto** for dual rate ports in Controller mode. Where as **show sdwan running-config** shows **no neg auto**. In case of **neg auto** configuration, the command **show interfaces** *interface-num* always displays for dual rate ports with 10G optics.

Autonegotiation

Ensure that the negotiation configuration matches with the peer device interface settings. If there is a mismatch in the interface settings, the interface may go down.

Table 1: Cisco 8300 Series platforms: Autonegotiation defaults by platform and small form-factor pluggable (SFP) module type

SFP module type	Default autonegotiation	Default speed	Default duplex
1G Copper	On	1000 M	Full
1G Optical	On	1000 M	Full
10G Optical	On	10,000 M	Full

Table 2: Cisco 8500 Series platforms: Autonegotiation defaults by platform and small form-factor pluggable (SFP) module type

SFP module type	Default autonegotiation	Default speed	Default duplex
1G Copper	Off	1000 M	Full
1G Optical	Off	1000 M	Full
10G Optical	Off	10,000 M	Full

Upgrading devices

Provides information about upgrading devices using SD-WAN Manager or CLI commands.

Use these procedures to upgrade device software:

- Upgrade using SD-WAN Manager, on page 5
- Upgrade using CLI commands, on page 5

Supported device upgrades

Describes supported upgrade paths for various platforms.

Cisco CSR1000V and Cisco ISRv routers

You can upgrade to...	from these releases
Cisco IOS XE Catalyst SD-WAN Release 17.4.1a	Cisco IOS XE SD-WAN 17.3.1a or later Cisco IOS XE SD-WAN 17.2.2 or later Cisco IOS XE SD-WAN 16.12.4a or later **Note** • To upgrade a Cisco CSR1000V or Cisco ISRv router to Cisco IOS XE Catalyst SD-WAN Release 17.4.1a from a release not listed here requires first upgrading to one of these releases. • Upgrading a Cisco CSR1000V or Cisco ISRv router to Cisco IOS XE Catalyst SD-WAN Release 17.4.1a includes upgrading to the Cisco Catalyst 8000V.
Cisco IOS XE 17.3.x	Cisco IOS XE Catalyst SD-WAN Release 17.2.1r Cisco IOS XE Release 17.2.1v Cisco IOS XE SD-WAN 16.12.x Cisco IOS XE SD-WAN 16.11.x Cisco IOS XE SD-WAN 16.10.x Cisco IOS XE SD-WAN 16.9.x

You can upgrade to...	from these releases
Cisco IOS XE Catalyst SD-WAN Release 17.2.1r	Cisco IOS XE SD-WAN 16.12.x Cisco IOS XE SD-WAN 16.11.x Cisco IOS XE SD-WAN 16.10.x Cisco IOS XE SD-WAN 16.9.x

All routers supported by Cisco Catalyst SD-WAN except Cisco CSR1000V, Cisco ISRv, and Cisco Catalyst 8000V

You can upgrade to...	from these releases
Cisco IOS XE Catalyst SD-WAN Release 17.4.1a	Cisco IOS XE SD-WAN 17.3.1a or later Cisco IOS XE SD-WAN 17.2.1 or later Cisco IOS XE SD-WAN 16.12.4a or later
Cisco IOS XE 17.3.x	
Cisco IOS XE Catalyst SD-WAN Release 17.2.1r	Cisco IOS XE SD-WAN 16.12.x Cisco IOS XE SD-WAN 16.11.x Cisco IOS XE SD-WAN 16.10.x Cisco IOS XE SD-WAN 16.9.x

Upgrade using SD-WAN Manager

Using SD-WAN Manager to upgrade devices keeps devices and the SD-WAN Control Components synchronized.

Procedure

From the Cisco SD-WAN Manager menu, choose **Maintenance** > **Software Upgrade**.

Upgrade using CLI commands

We recommend using Cisco SD-WAN Manager to upgrade. This keeps devices and SD-WAN Manager synchronized. If it is necessary to upgrade using the CLI, use the procedure here.

Before you begin

Back up configuration files. Without first backing up, the device loses its configuration during the upgrade. You can use these commands to back up the Cisco IOS XE Catalyst SD-WAN configuration and running configuration:

```
show sdwan running-config | redirect bootflash:/sdwan/sdwan.cli
show running-config | redirect bootflash:/sdwan/ios.cli
```

Procedure

Step 1 Download the software image for your device from https://software.cisco.com .

Step 2 Upload the image to the device.

Step 3 Install the new software.

Example:

```
Device# request platform software sdwan software install bootflash:/isr4300-universalk9.17.2.1.SPA.bin
```

Step 4 Activate the software. The device reloads when the activation is complete.

Example:

```
Device# request platform software sdwan software activate 17.2.01r.9.3
```

Step 5 Verify that the software is activated.

Example:

```
Device# show sdwan software

VERSION      ACTIVE DEFAULT PREVIOUS CONFIRMED TIMESTAMP
--------------------------------------------------------------------------------
16.12.1d.0.48 false  true   true     auto     2020-03-04T10:43:45-00:00
17.2.01r.9.3   true  false  false    user     2020-03-04T11:15:20-00:00

Total Space:388M Used Space:100M Available Space:285M
```

Step 6 Optionally, to ensure that the new version is preserved if a software reset is required, use the **request platform software sdwan software set-default** command.

Example:

```
Device# request platform software sdwan software set-default 17.2.01r.9.3
```

Step 7 Verify the upgrade using **request platform software sdwan software upgrade-confirm**.

Example:

```
Device# request platform software sdwan software upgrade-confirm
```

Note
From the 17.6.1 release, you cannot perform another install, or activate or deactivate an operation for an image or a Software Maintenance Update (SMU), when the upgrade-confirm function is pending for an existing operation.

Downgrading a device from Cisco IOS XE Catalyst SD-WAN Release 17.2.1r or later releases

Describes procedures for downgrading device software.

Use these procedures to downgrade device software:

- Downgrade a Cisco IOS XE Catalyst SD-WAN device to a previously installed software image, on page 7
- Downgrade a Cisco IOS XE Catalyst SD-WAN device to an older software image, on page 8

Supported device downgrades

Describes behavior in device downgrade scenarios.

Downgrade behavior

When you downgrade from...	to these releases	Behavior
Cisco IOS XE Catalyst SD-WAN Release 17.2.1r(universalk9) in controller mode	Cisco IOS XE SD-WAN Release 16.12 and earlier (ucmk9)	Device boots up with ucmk9 image and configuration is restored if the uckm9 image was previously installed on the device. Downgrading to a fresh install of old image versions brings the device to Day 0 configuration. To proceed, use the **clean** option at activation.
Cisco IOS XE Catalyst SD-WAN Release 17.2.1r (universalk9) in autonomous mode	Cisco IOS XE Release 17.1.1 and earlier (universalk9)	Device boots up with universalk9 image and configuration is restored.

Downgrade a Cisco IOS XE Catalyst SD-WAN device to a previously installed software image

Downgrade a Cisco IOS XE Catalyst SD-WAN device to an earlier software image that is currently installed on the device, using CLI commands.

Procedure

Step 1 Display the currently installed images.

Example:

```
Device# show sdwan software
```

```
Example:
VERSION          ACTIVE  DEFAULT  PREVIOUS  CONFIRMED  TIMESTAMP
-------------------------------------------------------------------------------
16.10.400.0.0    false   true     true      auto       2019-11-20T04:40:05-00:00
17.3.1.0.102822  true    false    false     auto       2020-07-31T11:01:22-00:00
```

Step 2 Activate the image. This resets the device, deleting any existing configuration. The device starts in day zero configuration.

```
Device# request platform software software activate desired-build
```

Example:

```
Device# request platform software software activate 16.10.400.0.0
```

Downgrade a Cisco IOS XE Catalyst SD-WAN device to an older software image

Download an earlier software image and downgrade a Cisco IOS XE Catalyst SD-WAN device to an earlier software image, using CLI commands.

Procedure

Step 1 Display the currently installed images.

Example:

```
Device# show sdwan software
```

```
Example:
VERSION          ACTIVE  DEFAULT  PREVIOUS  CONFIRMED  TIMESTAMP
-------------------------------------------------------------------------------
16.10.400.0.0    false   true     true      auto       2019-11-20T04:40:05-00:00
17.3.1.0.102822  true    false    false     auto       2020-07-31T11:01:22-00:00
```

Step 2 If necessary, remove an existing software image to provide space for loading a new software image.

```
Device# request platform software sdwan software remove previous-installed-build
```

Example:

```
Device# request platform software sdwan software remove 16.10.400.0.0
```

Step 3 Download the software image for the downgrade and copy it to the device bootflash.

Step 4 Install the downloaded image.

```
Device# request platform software sdwan software install bootflash:/desired-build
```

Example:

```
Device# request platform software sdwan software install
bootflash:/isr1100be-universalk9.17.02.01a.SPA.bin
```

Step 5 Display the currently installed images, which now include the new image.

Example:

```
Device# show sdwan software
VERSION          ACTIVE  DEFAULT  PREVIOUS  CONFIRMED  TIMESTAMP
-------------------------------------------------------------------------------
17.02.01a.0.211  false    true     true      auto       2020-03-30T09:34:04-00:00
```

Step 6 Activate the new image. This resets the device, deleting any existing configuration. The device starts in day zero configuration.

```
Device# request platform software sdwan software activate desired-build clean
```

Example:

```
Device# request platform software sdwan software 17.02.01a.0.211 clean
```