



Upgrading the Software on the Cisco ASR 920 Series Routers

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CHAPTER 1

Feature History

The following table lists the new and modified features supported in the Upgrading the Software on the Cisco ASR 920 Series Routers in Cisco IOS XE 17 releases.

Feature	Description
Cisco IOS XE Bengaluru 17.6.1	
Upgrading Power Supply Monitoring Firmware	This feature allows you to manually upgrade the firmware of the power supply monitoring device in a router. The firmware upgrade reduces unplanned hardware-related downtime caused by input voltage transients during a power outage.
Cisco IOS XE Bengaluru 17.5.1	
Secondary ROMMON Version Auto Upgrade	After primary ROMMON version is auto upgraded, secondary ROMMON version auto upgrade process takes place. The secondary ROMMON upgrade is only completed during the next planned manual reload of the router.
Cisco IOS XE Bengaluru 17.4.1	
Secure SD Card Configuration	The features uses the following command to provide enhanced security to the routers: platform secure-cfg When you enable the command, the router does not boot if the SD card is replaced, swapped, or modified externally. Thus, you cannot format the SD card externally and this prevents the misuse of the router.



CHAPTER 2

Software Packaging on the Router

- [Software Package Modes, on page 3](#)
- [Understanding Software Packages, on page 4](#)
- [Provisioning Files, on page 5](#)
- [File Systems on the Cisco ASR 920 Series Router, on page 5](#)
- [System Requirements, on page 5](#)
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Software Package Modes

The router can be booted using any of the following:

- **Consolidated**—A single software image containing a full collection of software packages. This mode provides a simplified installation and can be stored in the bootflash, a TFTP server, or a network server.
- **Sub-package**—One or more sub-images that are extracted from the consolidated image. This mode provides optimized memory usage and requires that you store files in the bootflash directory.

Upgrade IOS Image in Sub-packages Mode

To upgrade IOS image in sub-packages mode for the Cisco ASR 920 routers:

```
request platform software package expand file source-URL [to destination-URL] [force]
[verbose] [wipe]
configure terminal
config-register 0x2
boot system flash [flash-fs:] [partition-number:] [filename]
exit
copy running-configuration startup-configuration
reload
```

Description of Commands

Command	Description
<code>config-register 0x2</code>	Use the command to boot the router using a specified image in NVRAM.

Command	Description
request platform software package expand file <i>source-URL [to destination-URL] [force] [verbose]</i> [wipe]	Use the command to expand the consolidated image file on the router.
boot system flash <i>[flash-fs:] [partition-number:]</i> <i>[filename]</i>	Use the command to set the router to boot using the packages.conf file.

Configuration Example for Upgrading IOS Image in Sub-packages Mode

The following example shows the upgrade of IOS image in sub-packages mode:

```
Router#request platform software package expand file
bootflash:asr920igp-universalk9.17.03.01.SPA.bin
Verifying parameters
Expanding superpackage bootflash:asr920igp-universalk9.17.03.01.SPA.bin
Validating package type
*Jul 16 14:41:05.881 IST: %INSTALL-5-OPERATION_START_INFO: R0/0: packtool:Started expand
package bootflash:asr920igp-universalk9.17.03.01.SPA.bin

Copying package files
WARNING: packages.conf will replace the identical file that already exists in bootflash:
SUCCESS: Finished expanding all-in-one software package.
Router#
*Jul 16 14:45:30.606 IST: %INSTALL-5-OPERATION_COMPLETED_INFO: R0/0: packtool:Completed
expand package bootflash:asr920igp-universalk9.17.03.01.SPA.bin

Router#config t
Router(config)#config-reg 0x2
Router(config)#no boot sys
Router(config)#boot system bootflash:packages.conf
Router(config)#exit
Router#copy running-config startup-config
Destination filename [startup-config]?
Building configuration...
[OK]

Router#reload
```

Understanding Software Packages

Table 1: Individual Sub-Packages

Sub-Package	Purpose
RBase	Route Switch Processor (RSP) operating system
RPControl	Control plane processes between IOS process and the rest of the platform.
RPAccess	Handles security features including Secure Socket Layer (SSL) and Secure Shell (SSH)
RPIOS	Cisco IOS kernel, which is where IOS features are stored and run.
	Note Each consolidated image has a unique RPIOS package.

Sub-Package	Purpose
FP Pkg	Controls FP daemons.
IO Pkg	Controls input/output driver daemons.
LC Base	Controls basic kernel functions including runtime, initialization scripts, and chassis control daemons.

Provisioning Files

Provisioning files manage the boot process when the router is configured to boot in sub-packages. The provisioning file manages the bootup of each individual sub-package. Provisioning files are extracted automatically when individual sub-package files are extracted from a consolidated package. Provisioning files are not necessary for running the router using the complete consolidated package.

File Systems on the Cisco ASR 920 Series Router

The table below provides a list of file systems that can be seen on the Cisco ASR 920 Series Router.

Table 2: File Systems

File System	Description
bootflash:	The boot flash memory file system.
cns:	The Cisco Networking Services file directory.
nvrn:	Router NVRAM. You can copy the startup configuration to NVRAM or from NVRAM.
system:	The system memory file system, which includes the running configuration.
bin:	The archive file system.
tmpsys:	The temporary system files file system.
usb[0-1]:	The Universal Serial Bus (USB) flash drive file systems.

If you see a file system not listed in the table above, enter the **?** help option or see the **copy** command reference for additional information on that file system.

System Requirements

The following sections describe the system requirements for the Cisco ASR 920 Series Router software:

Memory Recommendations

These are the recommendation for the routers for the Cisco IOS XE images and packages:

- DRAM Memory—4 GB
- Software Image—`asr920-universalk9_npe.bin`—420 MB (ASR 920-24SZ-IM)
- Software Image—`asr920-universalk9_npe.bin`—430 MB (ASR 920-12SZ-IM)

Autogenerated Files and Directories



Caution Any autogenerated file in the bootflash: directory should not be deleted, renamed, moved, or altered in any way unless directed by customer support; altering these files can have unpredictable consequences for system performance.

Table 3: Autogenerated Files

File or Directory	Description
crashinfo files	A crashinfo file may appear in the bootflash: file system. Crashinfo files are useful for tuning and troubleshooting, but are not related to router operations: you can erase them without impacting the router's performance.
core files	The bootflash/core directory is the storage area for .core files. Warning Do not erase or move the core directory.
lost+found directory	This directory is created on bootup if a system check is performed. Its appearance is completely normal and does not indicate any issues with the router.
tracelogs files	The storage area for trace files is bootflash/tracelogs. Trace files are useful for troubleshooting; you can access trace files using diagnostic mode to gather information related to the IOS failure. Warning Do not erase or move the tracelog directory.

Additional References

Related Documents

Related Topic	Document Title
Cisco IOS master command list	Cisco IOS Master Command List , All Releases
Cisco IOS High Availability commands	<i>Cisco IOS High Availability Command Reference</i>

Standards

Standard	Title
No new or modified standards are supported, and support for existing standards has not been modified.	--

MIBs

MIB	MIBs Link
No new or modified MIBs are supported, and support for existing MIBs has not been modified.	To locate and download MIBs for selected platforms, Cisco IOS releases, and feature sets, use Cisco MIB Locator found at the following URL: http://www.cisco.com/go/mibs

RFCs

RFC	Title
No new or modified RFCs are supported, and support for existing RFCs has not been modified.	--

Technical Assistance

Description	Link
The Cisco Support and Documentation website provides online resources to download documentation, software, and tools. Use these resources to install and configure the software and to troubleshoot and resolve technical issues with Cisco products and technologies. Access to most tools on the Cisco Support and Documentation website requires a Cisco.com user ID and password.	http://www.cisco.com/cisco/web/support/index.html



CHAPTER 3

Upgrading to Cisco IOS XE Release

- [Upgrading from Cisco IOS XE Release 16.6 to Cisco IOS XE Release 17.x.x](#), on page 9
- [Upgrading from Cisco IOS XE Release 3.x to Release 16.x](#), on page 10

Upgrading from Cisco IOS XE Release 16.6 to Cisco IOS XE Release 17.x.x

If the ROMMON version is 15.6(24r)S and the Cisco IOS XE release is 16.6.x, the router fails in the auto upgrade process during the migration to Cisco IOS XE release 17.x.x resulting in a continuous boot loop. As a workaround, ensure that you upgrade the ROMMON version to 15.6(46r)S before migrating to Cisco IOS XE release 17.x.x.

This issue on the router failure is specific to the following PIDs: ASR-920-12SZ-IM, ASR-920U-12SZ-IM, ASR-920-12SZ-IM-CC, ASR-920-24SZ-IM, ASR-920-24SZ-M, ASR-920-24TZ-M, and A900-RSP2A-128.

Follow these steps to upgrade from 15.6(24r)S to 15.6(46r)S:

1. Copy the ROMMON pkg file **asr920_15_6_46r_s_rommon.pkg** to the bootflash on the Cisco ASR 920 router.
2. Use the **upgrade rom-monitor filename asr920_15_6_46r_s_rommon.pkg all** command to upgrade the version.

Example:

```
Router#upgrade rom-monitor filename bootflash: asr920_15_6_46r_s_rommon.pkg all

Upgrade rom-monitor on Route-Processor 0
Target copying rom-monitor image file
...
ROMMON upgrade complete.
To make the new ROMMON permanent, you must restart the RP.
Router#reload <-- Reloads the active router processor and boot the IOS 17.x.x image
. . .
```

3. Reload the router, boot the router with any IOS version of 16.x.x.

Example:

```
System Bootstrap, Version 15.6(24r)S, RELEASE SOFTWARE (fc1)
Technical Support: http://www.cisco.com/techsupport
Copyright (c) 2018 by Cisco Systems, Inc.
```

```

Compiled Thu 30-Aug-18 06:23 by pallavik
Boot ROM1
Last reset cause: RSP-Board
Rommon upgrade requested
Flash upgrade reset 1 in progress
.....
System Bootstrap, Version 15.6(46r)S, RELEASE SOFTWARE (fc1)
Technical Support: http://www.cisco.com/techsupport
Copyright (c) 2020 by cisco Systems, Inc.
Compiled Tue 19-May-20 22:55 by pallavik
*Upgrade in progress* Boot ROM0
Last reset cause: BootRomUpgrade
link status 0
link status 0
UEA platform with 3670016 Kbytes of main memory

We're coming up from a flash upgrade reset cookie
rommon 1 >

```

- Once the router is up, verify if the ROMMON version is upgraded to 15.6(46r)S.

Example:

```

Router#show platform
...
Slot CPLD Version Firmware Version
-----
R0 19071012 15.6(46r)S <-- Rommon version depends on the type of
system
F0 19071012 15.6(46r)S

```

- If the ROMMON is upgraded to 15.6(46r)S, install the IOS XE 17.x.x universal image, save the configuration, and reload the device.

The router comes up with the new Cisco IOS XE version 17.x.x.



Note During migration to Cisco IOS XE version 17.x.x, the ROMMON auto-upgrade and FPGA upgrade completes in two reloads.

Upgrading from Cisco IOS XE Release 3.x to Release 16.x

Downloading an Image

Download the image to the same partition of the bootflash where the base image exists. For information on downloading images see, [Loading and Managing System Images Configuration Guide, Cisco IOS XE Release 3S](#).



Note Ensure that you have chosen an upgrade image that is supported by your current software version.

Bootflash Space Requirements

The dual-rate functionality requires a minimum of 10 MB available space in bootflash memory on Cisco ASR 920 Series Router (ASR-920-12CZ-A, ASR-920-12CZ-D, ASR-920-4SZ-A, ASR-920-4SZ-D, ASR-920-10SZ-PD, ASR-920-8S4Z-PD, and ASR-920-12SZ-IM).



Note Always use bootflash instead of flash on all the system operations.

Restrictions for Upgrading from Cisco IOS XE Release 3.x to Cisco IOS XE Release 16.x

- Upgrading from Cisco IOS Release 3.x to Cisco IOS Release 16.x is only supported with consolidated mode.
- Upgrading from Cisco IOS Release 3.x to Cisco IOS Release 16.x using sub-package mode is *not* supported and vice-versa.
- Extracting the Cisco IOS XE Release 16.x image in Cisco IOS XE Release 3.x is not supported, and vice versa.

Upgrading from Cisco IOS XE Release 3.x to Cisco IOS XE 16.x



Note A full upgrade procedure may require reloading the system repeatedly (around two times). Use the **show version** command, after each reload to verify the image version and license level.

Before you begin

- Download the Cisco IOS XE 16.x image from Cisco.com.



Note Cisco IOS XE Release 16.5.1 and onwards is supported.

- Download the ROMMON release from Cisco.com.



Note The system automatically reboots twice, on a FGPA upgrade.

Step 1 Backup the running configuration.

Example:

```
Router# copy running-config bootflash:demo.cfg
Destination filename [demo.cfg]?
1834 bytes copied in 0.112 secs (16375 bytes/sec)
```

Step 2 Upgrade the ROMMON image.

Example:

```
Router# upgrade rom-monitor filename bootflash:<rommon-file-name>.pkg all

Upgrade rom-monitor on Router-Processor 0
Target copying rom-monitor image file
. . .
ROMMON upgrade complete
To make the new ROMMON permanent, you must restart the linecard

Router# reload <-- Reloads the active router processor and boot the IOS 3.x image
. . .
Router# show platform
. . .

Slot      CPLD Version      Firmware Version
-----
R0         16040627          15.6(14r)S   □--- Rommon version depends on the type of system

R1         16112128          15.6(14r)S
F0         16040627          15.6(14r)S
F1         16112128          15.6(14r)S
```

Step 3 Install the IOS XE 16.x universal image, save the configuration, and reload the device.

Example:

```
Router# configure terminal
Router(config)# no boot system bootflash:previous_image.bin <-- Removes the previous boot statement
Router(config)# boot system bootflash:16.x-universal-image.bin <-- Adds the new boot statement
Router(config)# end
Router# write
Building configuration...
[OK]
Router# reload <-- Reload the active router processor and boot the IOS XE 16.x Universal image
```

Step 4 Restore the backup configuration to the running configuration.

Example:

```
Router# copy bootflash:demo.cfg running-config
Destination filename [running-config]?

Router# config terminal
Router(config)# no boot system bootflash:previous_image.bin <-- Removes the previous boot statement
Router(config)# end
Router# write
Building configuration...
[OK]
```


Secure SD Card Configuration

Table 4: Feature History

Feature Name	Release Information	Description
Secure SD Card Configuration	Cisco IOS XE Bengaluru 17.4.1	<p>The features uses the following command to provide enhanced security to the routers:</p> <p>platform secure-cfg</p> <p>When you enable the command, the router does not boot if the SD card is replaced, swapped, or modified externally. Thus, you cannot format the SD card externally and this prevents the misuse of the router.</p>

Effective with Cisco IOS XE Bengaluru Release 17.4.1, use the **platform secure-cfg** command to provide enhanced security to the routers. When you enable the command, the router does not boot if the SD card is replaced, swapped, or modified externally. Thus, you cannot format the SD card externally and this prevents the misuse of the router.

This feature is applicable on the Cisco ASR-920-24SZ-IM, Cisco ASR-920-24SZ-M, Cisco ASR-920-24TZ-M, Cisco ASR 920-10SZ-PD (OD), Cisco ASR-920-12CZ-A/ASR-920-12CZ-D, and Cisco ASR-920-4SZ-A/ASR-920-4SZ-D routers.

To enable the **platform secure-cfg** command:

```
Router#enable
Router#configure terminal
Router(conf)#platform secure-cfg
Router(conf)#end
Router# write memory
```

Use the following command to verify that the **platform secure-cfg** command is enabled.

```
Router#show running-config | i secure-cfg
platform secure-cfg
```




CHAPTER 4

Upgrading the ROMMON

Table 5: Feature History

Feature Name	Release Information	Description
Secondary ROMMON Version Auto Upgrade	Cisco IOS XE Bengaluru 17.5.1	After primary ROMMON version is auto upgraded, secondary ROMMON version auto upgrade process takes place. The secondary ROMMON upgrade is only completed during the next planned manual reload of the router.

Starting with Cisco IOS XE Bengaluru release 17.5.1, after primary ROMMON version is auto upgraded, secondary ROMMON version auto upgrade process takes place. The secondary ROMMON upgrade is only completed during the next planned manual reload of the router.



Note If the secondary ROMMON version is lesser than that of the primary ROMMON version, the secondary ROMMON gets auto upgraded.

The router has two ROMMON regions (ROM0 and ROM1). We recommend that the upgrade is performed on both the regions.



Caution To avoid actions that might make your system unable to boot, read this entire section before starting the upgrade.

1. Check the booted ROMMON region (ROM0 or ROM1). The example, shows an ASR920 device booting up from ROM0 region.

Example:

```
System Bootstrap, Version 15.6(32r)S, RELEASE SOFTWARE (fc1)
Technical Support: http://www.cisco.com/techsupport
Copyright (c) 2018 by cisco Systems, Inc.
Compiled Thu 30-Aug-18 06:23 by pallavik
*Upgrade in progress* Boot ROM1
Last reset cause: BootRomUpgrade
link status 0
```

```
link status 0
UEA platform with 3670016 Kbytes of main memory
```

2. Copy the ROMMON pkg file `asr920_15_6_43r_s_rommon.pkg` to the bootflash on the Cisco ASR 920 router.
3. Use the `upgrade rom-monitor filename asr920_15_6_43r_s_rommon.pkg all` command to upgrade the version.
4. Reload the router and ensure device is booted from upgrade region ROM0.

Example:

```
System Bootstrap, Version 15.6(32r)S, RELEASE SOFTWARE (fc1)
Technical Support: http://www.cisco.com/techsupport
Copyright (c) 2018 by cisco Systems, Inc.
Compiled Thu 30-Aug-18 06:23 by pallavik
Boot ROM1
Last reset cause: RSP-Board
Rommon upgrade requested
Flash upgrade reset 1 in progress
.....
System Bootstrap, Version 15.6(43r)S, RELEASE SOFTWARE (fc1)
Technical Support: http://www.cisco.com/techsupport
Copyright (c) 2020 by cisco Systems, Inc.
Compiled Tue 19-May-20 22:55 by pallavik
*Upgrade in progress* Boot ROM0
Last reset cause: BootRomUpgrade
link status 0
link status 0
UEA platform with 3670016 Kbytes of main memory

We're coming up from a flash upgrade reset cookie
rommon 1 >
```

5. Repeat steps 3 and 4 to update the other region on the Cisco ASR920 router (ROM1) region in this procedure.



Note We recommend you to upgrade that both ROM0 and ROM1 regions.

Starting with Cisco IOS XE Amsterdam 17.3.1 and higher, secondary partition upgrade is performed only after loading version 17.3.1 or higher.

- [Example: Verifying ROMMON Upgrade on the ASR-920-12SZ-IM, on page 16](#)
- [Example: Verifying ROMMON Upgrade on the ASR-920-12CZ-A, on page 17](#)
- [Auto Upgrade, on page 18](#)

Example: Verifying ROMMON Upgrade on the ASR-920-12SZ-IM

Use the `show platform` command to verify the ROMMON upgrade.

```
Router# show platform
Chassis type: ASR-920-12SZ-IM

Slot      Type                State                Insert time (ago)
-----
0/0       12xGE-4x10GE-FIXED ok                    00:06:26
```

```

R0      ASR-920-12SZ-IM      ok, active      00:10:31
F0      ASR920-PSU0         N/A            never
P1      ASR920-PSU1         ok              00:06:50
P2      ASR920-FAN          ok              00:06:29

```

```

Slot    CPLD Version      Firmware Version
-----
R0      16112910             15.6(16r)S
F0      16112910             15.6(16r)S

```

Example: Verifying ROMMON Upgrade on the ASR-920-12CZ-A

Use the show platform command to verify the ROMMON upgrade.

```

Router# show platform
Chassis type: ASR-920-12CZ-A

```

```

Slot    Type                State                Insert time (ago)
-----
 0/0    12xGE-2x10GE-FIXED  ok                   00:33:22
R0      ASR-920-12CZ-A      ok, active           00:39:10
F0      ASR920-PSU0         ok, active           00:39:10
P0      ASR920-PSU0         ok                   never
P1      ASR920-PSU1         ps, fail             never
P2      ASR920-FAN          ok                   never

```

```

Slot    CPLD Version      Firmware Version
-----
R0      161123EE          15.6(17r)S
F0      161123EE          15.6(17r)S

```

Auto Upgrade

Table 6: Feature History

Feature Name	Release Information	Description
Secondary ROMMON Version Auto Upgrade	Cisco IOS XE Bengaluru 17.5.1	After primary ROMMON version is auto upgraded, secondary ROMMON version auto upgrade process takes place. The secondary ROMMON upgrade is only completed during the next planned manual reload of the router.

- The ROMMON image upgrade from Cisco IOS XE Release 3.x to Cisco IOS XE Everest Release 16.5.1 is *not* mandatory. We recommend a ROMMON upgrade for effective utilization of the new features delivered in Cisco IOS XE Everest 16.5.1 and later releases.
- We recommend you to reload the router two times for successful ROMMON and software image upgrade.
- You cannot expand the Cisco IOS XE Release 16.x image into the Cisco IOS XE Release 3.x images. The bin. file may be used to reload the image.
- Before installing the Cisco IOS XE Amsterdam Release 17.3.1, you *must* upgrade the ROMMON to version 15_6_43r_s or higher to avoid bootup failure. This is applicable to Cisco ASR-920-12SZ-IM, Cisco ASR-920U-12SZ-IM, and Cisco ASR-920U-12SZ-IM-CC. For Cisco ASR-920-12SZ-A and Cisco ASR-920-12SZ-D, Cisco IOS XE Amsterdam Release 17.3.1 has to be installed in sub packages mode. Booting in sub package mode takes care of auto upgrade to ROMMON version 15_6_43r_s on bootup. This workaround is not applicable to devices installed with ROMMON version 15.6(9r)S.
- For Cisco IOS XE Amsterdam Release 17.3.x, a minimum disk space of 2 MB is required in the boot flash memory file system for a successful ROMMON auto upgrade process. For a disk space lesser than 2 MB, ROMMON auto upgrade fails and the router reboots.
- For Cisco IOS XE Amsterdam Release 17.3.x, Cisco IOS XE Bengaluru Release 17.4.x, and earlier, the secondary ROMMON partition is *not* auto upgraded. You must manually upgrade it using the **upgrade rom-mon filename** command.
- Secure ROMMON is supported from Cisco IOS XE Amsterdam Release 17.3.1 onwards. However, it is compatible with all the releases.
- Any future secure ROMMON upgrade or downgrade is only possible from Cisco IOS XE Amsterdam Release 17.3.1 onwards.
- Starting with Cisco IOS XE Bengaluru Release 17.4.1, Cisco ASR-920-24SZ-IM, Cisco ASR-920-24SZ-M, Cisco ASR-920-24TZ-M, Cisco ASR 920-10SZ-PD, Cisco ASR-920-12CZ-A/ASR-920-12CZ-D, Cisco ASR-920-4SZ-A/ASR-920-4SZ-D, and Cisco ASR-920-20SZ-M routers are auto upgraded to ROMMON version 15_6_44r_s.
- Starting with ROMMON release version 15.6(43r)S, ROMMON version is secure. Once the ROMMON version is upgraded, it cannot be downgraded to a non-secure ROMMON version.

- Starting with Cisco IOS XE Bengaluru Release 17.5.1, secondary ROMMON partition is also auto upgraded after a successful primary ROMMON partition upgrade is complete. You can reload the router at the next planned reload to complete the secondary ROMMON upgrade.



Note If the secondary ROMMON version is lesser than that of the primary ROMMON version, the secondary ROMMON gets auto upgraded.

- Any non-secure FPGA bundled releases moving to Cisco IOS XE Bengaluru Release 17.3.x or future releases can result in an FPGA upgrade and a ROMMON upgrade. If FPGA upgrade happens parallelly with the ROMMON upgrade, you can only expect a single reload. If FPGA upgrade gets delayed and happens post ROMMON upgrade, two reloads are expected to complete both the upgrade processes. This is followed by a successful bootup of the target release image.

However, starting with Cisco IOS XE Bengaluru Release 17.5.1, Cisco ASR-920-12SZ-IM, Cisco ASR-920U-12SZ-IM, Cisco ASR-920U-12SZ-IM-CC, Cisco ASR-920-12SZ-A and Cisco ASR-920-12SZ-D, ROMMON and FPGA upgrade are synchronized to happen in a single reload.



CHAPTER 5

Upgrading Firmware of the Power Supply Monitoring Device

Table 7: Feature History

Feature Name	Release Information	Feature Description
Upgrading Power Supply Monitoring Firmware	Cisco IOS XE Bengaluru 17.6.1	This feature allows you to manually upgrade the firmware of the power supply monitoring device in a router. The firmware upgrade reduces unplanned hardware-related downtime caused by input voltage transients during a power outage.

Starting with Cisco IOS XE Bengaluru 17.6.1, you can manually upgrade the firmware of the power supply monitoring device in a router. The firmware upgrade reduces unplanned hardware-related downtime caused by input voltage transients during a power outage.

- [Supported Platforms](#), on page 21
- [Restrictions for Upgrading the Firmware](#), on page 22
- [Upgrading the Firmware Manually](#), on page 22

Supported Platforms

Table 8: Feature History

Feature Name	Release Information	Description
Support for Firmware Upgrade	Cisco IOS XE Cupertino 17.9.1	This release introduces the firmware upgrade support for ASR 920-10SZ-PD and Cisco ASR-920-24SZ-IM, Cisco ASR-920-24SZ-M, and Cisco ASR-920-24TZ-M routers.

Starting with Cisco IOS XE Cupertino Release 17.9.1, firmware upgrade is supported on the following routers:

- ASR 920-10SZ-PD
- ASR-920-24SZ-IM
- ASR-920-24SZ-M
- ASR-920-24TZ-M

The firmware upgrade reduces unplanned hardware-related downtime caused by input voltage transients during a power outage.

- ASR-920-12CZ-D
- ASR-920-4SZ-D
- ASR-920-12SZ-IM and ASR-920-12SZ-IM-CC using ASR-920-PWR-D power supply

Restrictions for Upgrading the Firmware

- Automatic firmware upgrade is not supported, you must upgrade it manually.
- For the upgrade to take effect, the router reboots automatically, which results in a service interruption for a few minutes.



Caution Ensure that there's a stable power supply during the firmware upgrade. This mitigates any unplanned hardware-related downtime in a router.

Upgrading the Firmware Manually

To upgrade the firmware, you should perform the following steps:

Step 1 Execute the **show upgrade hw-programmable** command to display the current firmware version.

Example:

```
Router#show upgrade hw-programmable adm 0 firmware-version
Hw-programmable ADM Firmware Versions

version[0]                version[1]                version[2]
-----
0                          1                          0
```

Step 2 Execute the **upgrade hw-programmable** command to upgrade the firmware.

Example:

```
Router#upgrade hw-programmable adm 0
*Jan 27 06:47:45.760: %IOSXE-3-PLATFORM: F0: cmand: ADM1066 f/w upgrade,
*Jan 27 06:47:45.764: %IOSXE-3-PLATFORM: F0: cmand: ADM1066 CONF EEPROM erase,
*Jan 27 06:47:46.312: %IOSXE-3-PLATFORM: F0: cmand: ADM1066 CONF EEPROM program,
*Jan 27 06:47:47.089: %IOSXE-3-PLATFORM: F0: cmand: ADM1066 CONF EEPROM verify,
*Jan 27 06:47:47.546: %IOSXE-3-PLATFORM: F0: cmand: ADM1066 CONF EEPROM verify done,
```

```

*Jan 27 06:47:47.547: %IOSXE-3-PLATFORM: F0: cmand: ADM1066 SE EEPROM erase,
*Jan 27 06:47:48.222: %IOSXE-3-PLATFORM: F0: cmand: ADM1066 SE EEPROM program,
*Jan 27 06:47:49.213: %IOSXE-3-PLATFORM: F0: cmand: ADM1066 SE EEPROM verify,
*Jan 27 06:47:49.714: %IOSXE-3-PLATFORM: F0: cmand: ADM1066 SE EEPROM verify done,
*Jan 27 06:47:49.714: %IOSXE-3-PLATFORM: F0: cmand: ADM Upgrade Completed System Going for Power
Cycle
Router#
System Bootstrap, Version 15.6(43r)S, RELEASE SOFTWARE (fc1)
Technical Support: http://www.cisco.com/techsupport
Copyright (c) 2020 by cisco Systems, Inc.
Compiled Mon 18-May-20 03:16 by pallavik
Starting Initialization of FMAN0
Loading ucode for FMAN0, size: 31424, ver: 106.04.14
Silicon Rev Major:Minor [1:1]
Initializing the pci..
IOFPGA version[2008241e]
Boot ROM1
Last reset cause: PowerOn
UEA platform with 1048576 Kbytes of main memory

```

Step 3 Execute the **show upgrade hw-programmable** command to verify the upgrade.

Example:

```

Router#show upgrade hw-programmable adm 0 firmware-version
Hw-programmable ADM Firmware Versions

```

version[0]	version[1]	version[2]
0	1	1

- Note**
- For Cisco ASR-920-12SZ-IM and ASR-920-12SZ-IM-CC, the current firmware version is 0.1.0 and the upgraded version is 0.1.1.
 - For Cisco ASR-920-12CZ-D and ASR-920-4SZ-D, the current firmware version is 0.0.7 and the upgraded version is 0.1.0.

