



# Upgrading Field Programmable Hardware Devices for Cisco ASR 1000 Series Routers

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Beginning with Cisco IOS XE Release 3.1.0S, Cisco ASR 1000 Series Routers have the capability to allow users to perform upgrades in the field on programmable hardware devices. Field programmable hardware devices include the Complex Programmable Logic Device (CPLD) and the field programmable gate array (FPGA). This document describes the procedures to perform an upgrade on a field programmable hardware device.

## Finding Feature Information

For the latest feature information and caveats, see the release notes for your platform and software release. To find information about the features documented in this module, and to see a list of the releases in which each feature is supported, see the “[Feature Information](#)” section on page 22.

Use Cisco Feature Navigator to find information about platform support and Cisco IOS XE software image support. To access Cisco Feature Navigator, go to <http://www.cisco.com/go/cfn>. An account on Cisco.com is not required.

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## Upgrading Field Programmable Hardware Devices Overview

If the Cisco ASR 1000 Series Router contains an old version of the hardware programmable firmware on the Cisco ASR1000-RP, Cisco ASR1000-SIP, or Cisco ASR1000-ESP, then that hardware programmable firmware may need to be upgraded. To do this upgrade, a hardware programmable package, `asr1000-hw-programmables.<release_name>.pkg`, is released to customers.

Generally an upgrade is only necessary in cases where a system message indicates one of the field programmable devices on the Cisco ASR 1000 Series Routers needs an upgrade or a Cisco technical support representative suggests an upgrade.

In Cisco IOS XE Release 3.1.0S and later, a CPLD field upgrade is required to support old versions of firmware on Cisco ASR1000-RP2 and Cisco ASR1000-SIP10 modules in the Cisco ASR 1013 Router. See the [“CPLD Field Programmable Upgrade, Cisco IOS XE Release 3.1S”](#) section on page 3 for upgrade procedures you can use in the field.



### Caution

Do not power down or reset the linecard or interrupt the router during the field programmable upgrade. If a linecard is reset during an upgrade it can lead to a dead card. Although the Cisco ASR 1000 Series Router should be able to recover from most interruptions during the upgrade, certain scenarios may cause unpredictable problems.

## Displaying Incompatible CPLD Version

If you received an error message indicating the field programmable device needs an upgrade and your cards are held in reset or your standby RP or SIP10 has powered down, you have an incompatible CPLD version on the device. Use the **show platform** command to display the state of your active and RPs and SIP carrier cards.

The following example shows that the Cisco ASR1000-SIP10 has a state of `cpld_incompatible` that means the SIP10 has an older, incompatible CPLD version and will require an upgrade to be compatible with the Cisco ASR 1013 Router.

```
Router# show platform
```

```
Chassis type: ASR1013
```

Slot	Type	State	Insert time (ago)
0	ASR1000-SIP40	ok	21:55:44
0/1	SPA-4XOC48POS/RPR	ok	21:54:43
1	ASR1000-SIP40	ok	21:55:44
1/0	SPA-5X1GE-V2	ok	21:54:41
1/1	SPA-5X1GE-V2	ok	21:54:39
1/2	SPA-1X10GE-L-V2	ok	21:54:35
2	<b>ASR1000-SIP10</b>	<b>cpld_incompatible</b>	21:55:44
3	ASR1000-SIP40	ok	21:55:44
3/0	SPA-2XCT3/DS0	ok	21:54:41
3/2	SPA-2XT3/E3	ok	21:54:41
4	ASR1000-SIP10	ok	21:55:44
4/1	SPA-4XT-SERIAL	ok	21:54:41
4/2	SPA-1X10GE-L-V2	ok	21:54:36
5	ASR1000-SIP40	ok	21:55:44

```

5/0      SPA-1XOC12-POS    ok                21:54:41
5/3      SPA-4XOC3-POS    ok                21:54:41
R0       ASR1000-RP2      ok, active        21:55:44
R1       ASR1000-RP2      ok, standby       21:55:44

```

For more information on performing an upgrade of the CPLD firmware, see the [“CPLD Field Programmable Upgrade, Cisco IOS XE Release 3.1S”](#) section on page 3.

## Displaying the Current Field Programmable Device Version

You can use the **show hw-programmable** command to display the current version of CPLD and FPGA running on any RP, ESP, or SIP card in your Cisco ASR 1000 Series Router.

```

Router# show hw-programmable all
Hw-programmable versions

```

Slot	CPLD version	FPGA version
R0	10021901	08112501
R1	N/A	N/A
F0	1001270D	09081902
F1	1003190E	10040702
1	07091401	N/A
2	07091401	N/A
3	07091401	N/A
4	07091401	N/A
5	07091401	N/A
4	07091401	N/A



### Note

The versions in this example are provided for illustrative purposes only.

## CPLD Field Programmable Upgrade, Cisco IOS XE Release 3.1S

This section covers the following topics:

- [CPLD Field Programmable Upgrade Overview, page 3](#)
- [Upgrading an Active Cisco ASR1000-RP2 or Cisco ASR1000-RP3, page 5](#)
- [Upgrading a Standby Cisco ASR1000-RP2 or Cisco ASR1000-RP3, page 6](#)
- [Upgrading a Cisco ASR1000-SIP10, page 7](#)
- [Unsupported ASR1000-RP2 and ASR1000-SIP10 Scenarios, page 8](#)
- [Field Programmable Hardware Devices Commands, page 9](#)

## CPLD Field Programmable Upgrade Overview

In Cisco IOS XE Release 3.1.0S and later, a CPLD field upgrade is required to upgrade old versions of firmware on Cisco ASR1000-RP2 and Cisco ASR1000-SIP10 components in the Cisco ASR 1013 Router. These hardware components are not compatible when inserted in the Cisco ASR 1013 Router because they contain an older CPLD version.

If you want to reuse existing Cisco ASR1000-RP2 and Cisco ASR1000-SIP10 components in the Cisco ASR 1013 Router, you must perform a CPLD field programmable upgrade on these components. If an incompatible component is inserted into the Cisco ASR 1013 Router, Cisco software detects out-of-revision hardware. The next sections describe how to upgrade the out-of revision hardware components in the Cisco ASR 1013 Router.

If out-of-revision hardware is detected, you will receive the following types of error messages notifying you of the out-of-revision component:

For an incompatible active ASR1000-RP2:

```
%CMRP-2-RP_CPLD_INCOMPATIBLE: R0/0: cmand: All other cards in the system has been held in reset because the Active RP's CPLD firmware version is incompatible with this Chassis.
```

For an incompatible standby ASR1000-RP2:

```
%CMRP-2-FRU_CPLD_INCOMPATIBLE: R0/0: cmand: R1 has been held in reset because the FRU's CPLD firmware version is incompatible with this Chassis.
```

For an incompatible Cisco ASR1000-SIP10:

```
“%CMRP-2-FRU_CPLD_INCOMPATIBLE: R0/0: cmand: SIP10 has been held in reset because the FRU's CPLD firmware version is incompatible with this Chassis.
```

To corroborate or determine if one of the components has an incompatible CPLD version, you can use the **show platform** command. See the “[Displaying Incompatible CPLD Version](#)” section on page 2.



#### Note

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No CPLD upgrade is necessary for the Cisco ASR1000-ESP40 and Cisco ASR1000-SIP40.

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If you have an incompatible Cisco ASR1000-RP2 or Cisco ASR1000-SIP10 components on your chassis, the active RP behaves differently than the standby RP or SIP10:

- If the active RP has an incompatible version—the active RP will hold the standby RP and SIP10 cards in reset, even if those cards have the latest CPLD version. The active RP will continue to run to allow you to upgrade the firmware. You will receive an error message stating that and requesting you to upgrade the CPLD version.
- If the standby RP or SIP10 has an incompatible version—the standby RP or SIP10 will power down. You will receive an error message stating that and requesting you to upgrade the CPLD version.

In Cisco IOS XE Release 3.1.0S, a hardware programmable package called “asr1000-hw-programmables.03.01.00.S.150-1.S.pkg” is released to customers in cases where a CPLD upgrade is required.

To download the hardware programmable package from Cisco.com, log in to the Download Software page with your Cisco.com password at: <http://www.cisco.com/cisco/web/download/index.html>. In the “Select a Software Product Category,” select “Routers,” select a product such as “Service Provider Edge Routers,” select “Cisco ASR 1000 Series Aggregation Services Routers,” select “Cisco ASR 1013 Router,” select the “15.0(1)S” release, and then click on “Download Now.”

A CPLD upgrade using the downloaded image is only necessary in cases where a system message indicates one of the CPLDs on the Cisco ASR 1000 Series Routers needs an upgrade.

You can upgrade the CPLD firmware on the Cisco ASR1000-RP2 and Cisco ASR1000-SIP10 individually using the **upgrade hw-programmable** command. The CPLD upgrade can take up to ten minutes for each component or card. You can perform the upgrade on the Cisco ASR1000-RP2 and Cisco ASR1000-SIP10 at any time as long as you can access the privileged EXEC mode prompt on the router.

If the Cisco ASR 1013 Router is being used in a production environment, you can perform the CPLD upgrade for incompatible versions of the Cisco ASR1000-RP2 and Cisco ASR1000-SIP10 on a Cisco ASR 1004 or Cisco ASR 1006 chassis. However, the difference is you will not receive any error messages notifying you of the out-of-revision component on the Cisco ASR 1004 or Cisco ASR 1006 chassis.

**Caution**

Do not power down or reset the linecard or interrupt the router during the CPLD upgrade. If a linecard is reset during an upgrade it can lead to a dead card. Although the Cisco ASR 1013 Router should be able to recover from most interruptions during the CPLD upgrade, certain scenarios may cause unpredictable problems.

## Upgrading an Active Cisco ASR1000-RP2 or Cisco ASR1000-RP3

The following steps describe a Cisco ASR1000-RP2 or Cisco ASR1000-RP3 CPLD field upgrade on the Cisco ASR Router. In the example described in these steps, R0 is the active RP2. If R1 is the active RP, follow the same upgrade steps on R1.

**Note**

If the active RP has an incompatible version—the active RP will hold the standby RP, SIP10, and ESP cards in reset, even if those cards have the latest CPLD version. The active RP will continue to run to allow you to upgrade the firmware.

**Step 1** Cold boot the active RP.

**Step 2** During bootstrap, if you receive the following error message:

```
%CMRP-2-RP_CPLD_INCOMPATIBLE: R0/0: cmand: All other cards in the system has been held in
reset because the Active RP's CPLD firmware version is incompatible with this Chassis.
```

This means that the active RP did the minimum CPLD version check and the check failed. All other cards are held in reset, even if they have the latest CPLD or FPGA version, and the active RP will continue to run to allow the user to upgrade the firmware.

Explanation of error message: The active RP requires a newer CPLD firmware to function properly in this chassis. You need to upgrade the CPLD firmware.

**Note**

If you chose the option to perform the CPLD upgrade on a non-production Cisco ASR 1004 Router or Cisco ASR 1006 Router, you will not see this error message on those routers.

**Step 3** Copy the hw-programmable upgrade package to your hard disk as follows:

```
copy tftp://...asr1000-hw-programmables.03.01.00.S.150-1.S.pkg harddisk:
```

To download this package from Cisco.com, log in with your Cisco.com password to:

<http://tools.cisco.com/support/downloads/go/Redirect.x?mdfid=268437899>.

**Step 4** Upgrade the active Cisco ASR1000-RP CPLD with the following command:

```
Router# upgrade hw-programmable CPLD filename harddisk:
asr1000-hw-programmables.03.01.00.S.150-1.S.pkg R0
```

```
Upgrade CPLD on Route-Processor 0 from current version 08103002 to 10021901 [confirm]
This command could take up to 10 minutes, please wait and do not power cycle the box or
the card (hardware may be unrecoverable). This command also issues a reset to the linecard
at the end of upgrade. [confirm]
```

- Step 5** The active Cisco ASR1000-RP CPLD firmware is upgraded successfully and you will receive the following success message:

```
SYSTEM HAS SUCCESFULLY UPGRADED THE cpld hw-programmable on Route-Processor 0. PLEASE
POWER CYCLE THE CHASSIS NOW.
```

- Step 6** Power cycle the chassis.
- Step 7** After the power cycle, the active RP reboots with the latest CPLD programmable firmware and comes online.

## Upgrading a Standby Cisco ASR1000-RP2 or Cisco ASR1000-RP3

The following steps describe a Cisco ASR1000-RP2 or Cisco ASR1000-RP3 CPLD field upgrade on the Cisco ASR Router. In the example described in these steps, R1 is the standby RP. If R0 is the standby RP, follow the same upgrade steps on R0.

- Step 1** When the standby RP starts booting, the active RP checks the CPLD version of the standby RP. If the standby RP has an incompatible version, you receive the following error message and the standby RP is powered down:

```
%CMRP-2-FRU_CPLD_INCOMPATIBLE: R0/0: cmand: R1 has been held in reset because the FRU's
CPLD firmware version is incompatible with this Chassis.
```

Explanation of error message: The standby RP requires a newer CPLD firmware to function properly in this chassis. You need to upgrade the CPLD firmware.



**Note** If you chose the option to perform the CPLD upgrade on a Cisco ASR 1004 Router or Cisco ASR 1006 Router, you will not see this error message on those routers.

- Step 2** Copy the hw-programmable upgrade package to your hard disk as follows:

```
copy tftp://...asr1000-hw-programmables.03.01.00.S.150-1.S.pkg harddisk:
```

To download this package from Cisco.com, log in with your Cisco.com password to: <http://tools.cisco.com/support/downloads/go/Redirect.x?mdfid=268437899>.

- Step 3** Upgrade the standby RP with the following command:

```
Router# upgrade hw-programmable CPLD filename harddisk:
asr1000-hw-programmables.03.01.00.S.150-1.S.pkg R1
```

```
Upgrade CPLD on Route-Processor 1 from current version 08103002 to 10021901 [confirm] This
command could take up to 10 minutes, please wait and do not power cycle the box or the
card (hardware may be unrecoverable). This command also issues a reset to the linecard at
the end of upgrade. [confirm]
```

```
Upgrade cpld hw-programmable on Route-Processor 1
Reloading Route-Processor 1 to start upgrade
```

- Step 4** The standby RP is powered up and CPLD firmware on the standby RP is upgraded.
- Step 5** After the upgrade is successful, you will receive the following success message in the active RP:

```
Jul 16 16:03:02.354: %CMRP-3-FRU_HWPRG_UPG_SUCCESS: R0/0: cmand: Hardware programmable
CPLD on ASR1000-RP2 in slot R1 was successfully programed. Card will now be powercycled.
```

- Step 6** The active RP power cycles the standby RP. The standby RP reboots with the latest CPLD programmable firmware and comes online.

## Upgrading a Cisco ASR1000-SIP10

The following steps describe a Cisco ASR1000-SIP10 CPLD field upgrade on the Cisco ASR 1013 Router. In the example described in these steps, slot 2 on the SIP10 is used for the upgrade. If another slot number (zero, 1, 3, or 4) is used for the upgrade, following the same upgrade steps for that slot number.



**Note** For the ASR1000-SIP10 CPLD upgrade, do not use slot 5. Use one of slots zero (0) through 4.

- Step 1** When the Cisco ASR1000-SIP10 starts booting, the Cisco ASR1000-SIP10 relays the CPLD version to the active RP. If the SIP10 has an incompatible version, you receive the following error message:

```
%CMRP-2-FRU_CPLD_INCOMPATIBLE: R0/0: cmand: SIP10 has been held in reset because the
FRU's CPLD firmware version is incompatible with this Chassis.
```

This means that the active RP did the minimum CPLD version check and the check failed. SIP10 was powered down and the active RP logged the error message.

Explanation of error message: The SIP10 requires a newer CPLD firmware to function properly in this chassis. You need to upgrade the CPLD firmware.



**Note** If you chose the option to perform the CPLD upgrade on a non-production Cisco ASR 1004 Router or Cisco ASR 1006 Router, you will not see this error message on those routers.

- Step 2** If you receive the additional error message:

```
%CMRP-3-SIP10_CPLD_UPG_SLOtCHK_FAIL: R0/0: cmand: FRU_STR CPLD firmware cannot be
upgraded in this slot.
```

This means that the Cisco ASR1000-SIP10 CPLD card is in slot 5 and has the older CPLD firmware that does not support a field upgrade on slot 5. You must move the card to a different slot before continuing the upgrade procedure.



**Note** If you chose the option to perform the CPLD upgrade on a non-production Cisco ASR 1004 Router or Cisco ASR 1006 Router, you will not see this error message on those routers.

- Step 3** Copy the hw-programmable upgrade package to your hard disk as follows:

```
copy tftp://...asr1000-hw-programmables.03.01.00.S.150-1.S.pkg harddisk:
```

To download this package from Cisco.com, log in with your Cisco.com password to:  
<http://tools.cisco.com/support/downloads/go/Redirect.x?mdfid=268437899>.

- Step 4** Upgrade the Cisco ASR1000-SIP10 CPLD in slot 2 with the following command:

```
Router# upgrade hw-programmable CPLD filename harddisk:
asr1000-hw-programmables.03.01.00.S.150-1.S.pkg 2
```

```
Upgrade CPLD on SPA-Inter-Processor 2 from current version 08103002 to 10021901 [confirm]
This command could take up to 10 minutes, please wait and do not power cycle the box or
the card (hardware may be unrecoverable). This command also issues a reset to the linecard
at the end of upgrade.[confirm]
```

```
Upgrade cpld hw-programmable on SPA-Inter-Processor 2
Reloading SPA-Inter-Processor 2 to start upgrade
```

**Step 5** The Cisco ASR1000-SIP10 is powered up and CPLD firmware on it is upgraded.

**Step 6** After the upgrade is successful, you will receive the following success message on the RP:

```
Jul 16 15:25:03.625: %CMRP-3-FRU_HWPRG_UPG_SUCCESS: R0/0: cmand: Hardware programmable
CPLD on ASR1000-SIP10 in slot 2 was successfully programed. Card will now be powercycled.
```

**Step 7** The Cisco ASR1000-SIP10 reboots with the latest CPLD programmable firmware and comes online.

---

## Unsupported ASR1000-RP2 and ASR1000-SIP10 Scenarios

This section describes two scenarios where you would receive error messages and under what conditions when inserting a prior released ASR1000-RP2 or ASR1000-SIP10 with an incompatible CPLD version into a Cisco ASR 1013 Router.

### Unsupported Active ASR1000-RP2 Requires Upgrade

This section describes what happens when an active Cisco ASR1000-RP2 with an older version of CPLD is inserted into the Cisco ASR 1013 Router. This section describes the error message, reason, and under what types of configuration an upgrade of CPLD firmware is required.

#### Error Message

```
CMRP-3-RP_CPLD_INCOMPATIBLE: All other cards in the system has been held in reset as the
Active RP [chars] in slot [chars] has CPLD firmware version that is incompatible with
[chars]"
```

```
fru_model_string: ASR1000-RP2
fru_string: R0/R1
hw_config_string: ASR1013
```

#### Reason

Active RP requires a newer CPLD firmware to function properly in this chassis.

#### Recommended Action

Upgrade the CPLD firmware on this FRU using the **upgrade hw-programmable CPLD filename pkg-file slot fru-slot** command.

#### Configurations—When an Upgrade of CPLD Firmware Is Required

In order to use existing ASR1000-RP2 and ASR1000-SIP10 hardware components in a Cisco ASR 1013 router, you must perform a CPLD upgrade on the RP2 and SIP10 components (with older CPLD) if the following configurations occur:



- System powering up with both RPs with older CPLD—The system comes up in redundant mode and the message stating that the CPLD needs upgrade (for both RPs) displays on the console with a clear warning that the system may not work properly unless it is upgraded, and a summary of the instructions to upgrade. A message for standby RP will appear in the standby console and the active RP.
- System powering up with one RP with older CPLD—The message will be printed for the RP with older CPLD.
- System powering up with RP running latest CPLD and RP with older CPLD inserted—The message will be printed for the newly inserted RP.
- System powering up with RP running older CPLD and RP with latest CPLD inserted—The message will be printed when the system powered up before this event. When the second RP is inserted no special action is taken.
- System up with RP running older CPLD and RP with older CPLD inserted—The message will be printed when the system powered up before this event. When the second RP is inserted, similar message for the new card will be printed.

## Unsupported Standby ASR1000-RP2 or ASR1000-SIP10 Requires Upgrade

This section describes what happens when a standby Cisco ASR1000-RP2 or Cisco ASR1000-SIP10 with an older version of CPLD is inserted into the Cisco ASR 1013 Router. The error message that displays at the console and the message explanation and recommended action are described.

### Error message

```
CMRP-2-FRU_CPLD_INCOMPATIBLE: [chars] in slot [chars] has been held in reset as its CPLD
firmware version is incompatible with [chars]
```

```
fru_model_string: ASR1000-RP2/ASR1000-SIP10
fru_string: [0-5]/R0/R1
hw_config_string: ASR1013
```

### Reason

This FRU requires a newer CPLD firmware to function properly in this chassis.

### Recommended action

Upgrade the CPLD firmware on this FRU using the **upgrade hw-programmable CPLD filename pkg-file slot fru-slot** command.

## Field Programmable Hardware Devices Commands

You can use the following field programmable commands to perform a CPLD upgrade or display the package file version or display progress during the upgrade:

- **upgrade hw-programmable**—to perform a CPLD upgrade on a Cisco ASR 1000 Series Router.
- **show hw-programmable**—to display the current CPLD or FPGA version in a particular line card.
- **show upgrade hw-programmable file**—to display the names and versions of individual files in the hw-programmable package file in a Cisco ASR 1000 Series Router.

- **show upgrade hw-programmable progress**—to display the upgrade progress of the line card-field upgradeable device (LC-FPD) on a Cisco ASR 1000 Series Router. This command only displays results when the upgrade is in progress. Once the upgrade has completed, this command displays no output.

For command syntax and detailed information, see the *Cisco IOS Interface and Hardware Component Command Reference* at:

[http://www.cisco.com/en/US/docs/ios/interface/command/reference/ir\\_book.html](http://www.cisco.com/en/US/docs/ios/interface/command/reference/ir_book.html)

## FPGA Field Programmable Upgrade, Cisco IOS XE Release 3.10S

This section covers the following topics:

- [FPGA Field Programmable Upgrade Overview](#)
- [Scenarios When Upgrade is Required](#)
- [Link to Download Latest HW-Programmables Package](#)
- [Upgrading Cisco ASR 1000 Ethernet Line Card](#)
- [Example: FPGA Field Programmable Logs](#)

### FPGA Field Programmable Upgrade Overview

In Cisco IOS XE Release 3.10S and later, FRU FPGA field upgrade is required to upgrade old versions of FPGA on Cisco ASR 1000 Ethernet Line Cards. If the card FPGA version is less than the minimum required version for FPGA, then a message is displayed to upgrade to the latest FPGA version.

### Scenarios When Upgrade is Required

- When Cisco IOS XE Release 3.10S image is loaded in router, the ASR1000-2T+20X1GE comes up fine with FRU FPGA version 00010016. The following output is based on XE3.10S image.

```
Router# show platform
Chassis type: ASR1013
```

Slot	Type	State	Insert time (ago)
5	ASR1000-2T+20X1GE	ok	00:09:46
5/0	BUILT-IN-2T+20X1GE	ok	00:07:40
R1	ASR1000-RP2	ok, active	00:09:46
F1	ASR1000-ESP200	ok, active	00:09:46
P0	ASR1013/06-PWR-AC	ok	00:08:54
P1	ASR1013/06-PWR-AC	ok	00:08:53
P2	ASR1013/06-PWR-AC	ok	00:08:53
P3	ASR1013/06-PWR-AC	ok	00:08:53

```
ASR1K_ELC#sh hw-programmable all
Hw-programmable versions
```

Slot	CPLD version	FPGA version
R1	13092401	10072001
F1	13030500	N/A
5	13012400	00010016

- When Cisco IOS XE Release 3.12S image is loaded in router, the ASR1000-2T+20X1GE comes up fine with FRU FPGA version 00010016. But a warning message is displayed to upgrade the FRU FPGA. The following output is based on XE3.12S image.

```
*Apr 26 16:40:13.411 IST: %CMRP-6-FRU_FPGA_UPG_REQUIRED: R1/0: cmand:
ASR1000-2T+20X1GE in slot 5 has INCOMPATIBLE FPGA firmware version with ASR1013.
Upgrade the FPGA firmware
*Apr 26 16:40:13.438 IST: %IOSXE_OIR-6-ONLINECARD: Card (cc) online in slot 5
*Apr 26 16:40:22.695 IST: %IOSXE_OIR-6-INSSPA: SPA inserted in subslot 5/0
*Apr 26 16:41:31.292 IST: %SPA_OIR-6-ONLINECARD: SPA (BUILT-IN-2T+20X1GE) online in
subslot 5/0
Router# show platform
Chassis type: ASR1013
```

Slot	Type	State	Insert time (ago)
5	ASR1000-2T+20X1GE	ok	00:04:40
5/0	BUILT-IN-2T+20X1GE	ok	00:02:39
R1	ASR1000-RP2	ok, active	00:04:40
F1	ASR1000-ESP200	ok, active	00:04:40
P0	ASR1013/06-PWR-AC	ok	00:03:50
P1	ASR1013/06-PWR-AC	ok	00:03:49
P2	ASR1013/06-PWR-AC	ok	00:03:49
P3	ASR1013/06-PWR-AC	ok	00:03:49

```
Router#show hw-programmable all
Hw-programmable versions
```

Slot	CPLD version	FPGA version
R1	13092401	10072001
F1	13030500	N/A
5	13012400	00010016

## Upgrading FPGA on ASR1001-X, ASR1002-HX, and ASR1001-HX

### Prerequisites

Download the image from the CCO website and copy it to USB or bootflash of the router which is scheduled for the upgrade.



### Note

Do not perform any power cycle or remove the power cable during the FPGA upgrade. If there is a power loss during the upgrade, it may result in corruption of the boot image and it may require RMA of the equipment.

To run the utility:

**Step 1** Copy the utility to USB or to bootflash: using FTP or TFTP.

**Step 2** Save the current running configurations and backup it to bootflash.

```
Router#copy running-config bootflash:running-config_15may2019
Destination filename [running-config_15may2019]?
6222 bytes copied in 0.536 secs (11608 bytes/sec)
Router#
```

```
Router#write memory
Building configuration...
[OK]
Router#
```

**Step 3** Change the configuration register to 0x0.

```
Router#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#config-register 0x0
Router(config)#end
Router#wr
```

**Step 4** Issue the router **reload** command and ensure that the Rommon prompt is displayed on the router.

```
Router#reload

System configuration has been modified. Save? [yes/no]: yes
Building configuration...
[OK]
```

**Step 5** Initiate the upgrade using the following CLI.

```
File size is 0x015a3814
Located ASR1K-fpga_prog.16.0.0.xe.bin
Image size 22689812 inode num 32, bks cnt 5540 blk size 8*512
#####
#####
#####
Boot image size = 22689812 (0x15a3814) bytes

ROM:RSA Self Test Passed
ROM:Sha512 Self Test Passed

Package header rev 1 structure detected
Calculating SHA-1 hash...done
validate_package_cs: SHA-1 hash:
    calculated c55a44e3:d0433d49:ef3e0f29:04956cc7:3232af02
    expected   c55a44e3:d0433d49:ef3e0f29:04956cc7:3232af02
Validating main package signatures

RSA Signed RELEASE Image Signature Verification Successful.
Image validated
```

Cisco ASR1K FPGA Programming Utility

```
*****
**
** DO NOT TURN OFF THE POWER OR **
** RESET THE BOX DURING THE UPGRADE **
**
*****
```

Press 'Y' or 'y' to upgrade  
or any other key to reboot

Detected Board Type: ASR1001-X

SPI Flash Device ID: 009d6016

```
Programming Flash ...
|.....|.....|.....|.....|.....|.....|.....|.....|
#####
Verifying Flash ...
|.....|.....|.....|.....|.....|.....|.....|.....|
```

```
#####
FPGA image verified correctly !!

Router Power Cycle is needed for the changes to take effect

Press a key to Power cycle ...

Power cycling the box ...

  a

Initializing Hardware ...

System integrity status: 00000610
U

System Bootstrap, Version 16.9(4r), RELEASE SOFTWARE
Copyright (c) 1994-2018 by cisco Systems, Inc.

Current image running: Boot ROM1
Last reset cause: PowerOn

ASR1001-X platform with 4194304 Kbytes of main memory
```

**a. If the Upgrade fails, retry the upgrade by issuing Yes to retry the upgrade.**

Use can issue "y" or "Y" to retry.

```
Detected Board Type: ASR1001-HX
SPI Flash Device ID: 00202015
```

```
Programming Flash ...
|.....|.....|.....|.....|.....|.....|.....|.....|
#####
Verifying Flash ...
|.....|.....|.....|.....|.....|.....|.....|.....|
```

FPGA image failed to verify correctly !!

Upgrade failed. Retrying ...

Cisco ASR1K FPGA Programming Utility

```
*****
**
** DO NOT TURN OFF THE POWER OR **
** RESET THE BOX DURING THE UPGRADE **
**
**
*****
```

Press 'Y' or 'y' to upgrade  
or any other key to reboot

```
Detected Board Type: ASR1001-HX
```

```
SPI Flash Device ID: 00202015
```

```
Programming Flash ...
|.....|.....|.....|.....|.....|.....|.....|.....|
#####
Verifying Flash ...
|.....|.....|.....|.....|.....|.....|.....|.....|
```

```
#####
FPGA image verified correctly !!

Router Power Cycle is needed for the changes to take effect

Press a key to Power cycle ...

Power cycling the box ...

ÿü

Initializing Hardware ...

System integrity status: 90170400 12030106

U

System Bootstrap, Version 16.3(2r), RELEASE SOFTWARE
Copyright (c) 1994-2016 by cisco Systems, Inc.

Current image running: Boot ROM0

Last reset cause: CPU-ResetRequest

ASR1001-HX platform with 8388608 Kbytes of main memory

rommon 1 >
```

**b.** After the retry, if the upgrade still fails, reach out to Cisco TAC for further assistance.

**Step 6** Once the upgrade is complete, device power cycles automatically, and the rommon prompt is displayed to boot the IOS image.

Sample IOS boot steps are:

```
rommon 1 > dir bootflash:
File System: EXT2/EXT3

15          526240224 -rw-r--r--      asr1001x-universalk9.03.16.06.S.155-3.S6-ext.SPA.bin

rommon 2 > boot bootflash:asr1001x-universalk9.03.16.06.S.155-3.S6-ext.SPA.bin
```

**Step 7** Once the IOS is up, verify that the FPGA images are upgraded to the latest version.

Ex:  
Router#sh hw-programmable 0  
Hw-programmable versions

```
Slot          CPLD version          FPGA version
-----
0              19022811              N/A
```

Platform type and FPGA Version details.

S.No	Platform	FPGA Version
1	ASR1001-X	19022811
	ASR1002-HX	19030211
3	ASR1001-HX	19030215

## Link to Download Latest HW-Programmables Package

The latest HW-programmables package for ASR 1000 Ethernet Line Cards can be downloaded from the following link.

[https://software.cisco.com/download/release.html?i=!y&mdfid=282450665&softwareid=283425232&release=15.4\(3\)S1&os=](https://software.cisco.com/download/release.html?i=!y&mdfid=282450665&softwareid=283425232&release=15.4(3)S1&os=)

## Upgrading Cisco ASR 1000 Ethernet Line Card

1. Download the HW-programmables package from the following link and copy it to router's harddisk:

[https://software.cisco.com/download/release.html?i=!y&mdfid=282450665&softwareid=283425232&release=15.4\(3\)S1&os=](https://software.cisco.com/download/release.html?i=!y&mdfid=282450665&softwareid=283425232&release=15.4(3)S1&os=)

2. Find the slot in which Cisco Ethernet Line Card is plugged in.
3. Upgrade the Cisco ASR 1000 Ethernet Line Card with the following command:

```
Router# upgrade hw-programmable fpga filename
harddisk:asr1000-hw-programmables.03.13.01.S.154-3.S1-ext.pkg 5
```

```
File: asr1000-hw-programmables.03.13.01.S.154-3.S1-ext.pkg (downloaded from the link
mentioned above)
```

```
Slot: 5
```

```
Location: Harddisk (Router's harddisk)
```

4. User will be asked to confirm if they really want to upgrade.
5. The new FRU FPGA will be programmed in the line card. Line card will then reload to successfully complete the upgrade process.

## Example: FPGA Field Programmable Logs

```
Router# show hw-programmable all
Hw-programmable versions
```

Slot	CPLD version	FPGA version	
R1	13092401	10072001	
F1	13030500	N/A	
5	13012400	00010016	ⓓ Before FPGA Upgrade

```
Router# upgrade hw-programmable fpga filename
harddisk:asr1000-hw-programmables.03.13.01.S.154-3.S1-ext.pkg 5
Upgrade FPGA on SPA-Inter-Processor 5 from current version 00010016 to 00010024 [Press
Enter to confirm]
```

```
This command could take up to 15 minutes, please wait and do not power-cycle the chassis
or the card. Otherwise, hardware may be unrecoverable. It is recommended that all cards
are running the same version IOS-XE software prior to the upgrade. At the end of upgrade,
cc/5 will be power-cycled. [Press Enter to confirm]
```

```
Upgrade fpga hw-programmable on SPA-Inter-Processor 5
Reloading SPA-Inter-Processor 5 to start upgrade
Router#
```

```

*Apr 26 16:55:27.798 IST: %IOSXE_OIR-6-REMSPA: SPA removed from subslot 5/0, interfaces
disabled
*Apr 26 16:55:27.804 IST: %SPA_OIR-6-OFFLINECARD: SPA (BUILT-IN-2T+20X1GE) offline in
subslot 5/0
*Apr 26 16:55:27.806 IST: %IOSXE_OIR-6-OFFLINECARD: Card (cc) offline in slot 5
*Apr 26 16:58:22.907 IST: %CMRP-3-FRU_HWPRG_UPG_SUCCESS: R1/0: cmand: Hardware
programmable FPGA on ASR1000-2T+20X1GE in slot 5 was successfully programmed. The card
will now be power-cycled or reset.
*Apr 26 17:00:08.535 IST: %IOSXE_OIR-6-ONLINECARD: Card (cc) online in slot 5
*Apr 26 17:00:17.753 IST: %IOSXE_OIR-6-INSSPA: SPA inserted in subslot 5/0
*Apr 26 17:00:37.618 IST: %LINK-3-UPDOWN: SIP5/0: Interface EOBC5/1, changed state to up
*Apr 26 17:01:26.378 IST: %SPA_OIR-6-ONLINECARD: SPA (BUILT-IN-2T+20X1GE) online in
subslot 5/0
Router#
Router#
Router#show platform
Chassis type: ASR1013

```

Slot	Type	State	Insert time (ago)
5	ASR1000-2T+20X1GE	ok	00:22:58
5/0	BUILT-IN-2T+20X1GE	ok	00:01:01
R1	ASR1000-RP2	ok, active	00:22:58
F1	ASR1000-ESP200	ok, active	00:22:58
P0	ASR1013/06-PWR-AC	ok	00:22:07
P1	ASR1013/06-PWR-AC	ok	00:22:07
P2	ASR1013/06-PWR-AC	ok	00:22:06
P3	ASR1013/06-PWR-AC	ok	00:22:06

```

ASR1K_ELC#
ASR1K_ELC#show hw-programmable all
Hw-programmable versions

```

Slot	CPLD version	FPGA version
R1	13092401	10072001
F1	13030500	N/A
5	13012400	00010024 D After FPGA Upgrade

## CPLD and FPGA Field Programmable Upgrade, Cisco IOS XE Release 17.2.1r

This section covers the following topics:

- [CPLD and FPGA Field Programmable Upgrade Overview](#)
- [Upgrading CPLD of Cisco ASR 1000-ESP100-X and ASR 1000-ESP200-X](#)
- [Upgrading FPGA of Cisco ASR 1000-ESP100-X and ASR 1000-ESP200-X](#)
- [Sample Logs after Upgrading CPLD and FPGA](#)
- [Example: Sample CPLD Field Programmable Logs](#)
- [Example: FPGA Field Programmable Logs](#)
- [Troubleshooting](#)



## CPLD and FPGA Field Programmable Upgrade Overview

In Cisco IOS XE Release 17.2.1r and later, it is mandatory to upgrade old versions of CPLD and FPGA on Cisco ASR 1000-ESP100-X and ASR 1000-ESP200-X.

Upgrading the CPLD and FPGA involves the following high-level steps:

- 
- Step 1** Check if all the FRU's are functional by using the show platform command.
- Check the version of FPGA and CPLD on Cisco ASR 1000-ESP100-X and ASR 1000-ESP200-X by using the **show hw-programmable all** command.
  - If you are on ASR 1009-X/ASR-1006-X, the recommended version of FPGA is 1908010d,
  - If you are on ASR 1013, the recommended version of FPGA version is 19080510
- For any of the supported platforms, the recommended version of CPLD is 20030413.
- If the FPGA and CPLD versions are lower than what is recommended, it is strongly recommended to run the upgrade procedure.
- Step 2** Upgrade the software image of the device to IOS XE 17.2.1r.
- Step 3** Check the ROMmon version. If the ROMmon version is less than 16.12(8r), upgrade to 16.12(8r) from [Cisco Software Downloads page](#). For details on upgrading ROMmon, see [ROMmon upgrade guide](#).
- Step 4** Download the IOS XE Hardware Programmable Devices Package from the following link and copy it to the router's hard disk:
- <https://software.cisco.com/download/home/282450665/type/283425232/release/17.2.1>
- Step 5** Execute the process to update the CPLD and FPGA versions. For details see, [Upgrading CPLD of Cisco ASR 1000-ESP100-X and ASR 1000-ESP200-X](#) and [Upgrading FPGA of Cisco ASR 1000-ESP100-X and ASR 1000-ESP200-X](#).
- Step 6** Verify that the FPGA and CPLD is upgraded using **show hw-programmable all** commands.
- 

## Upgrading CPLD of Cisco ASR 1000-ESP100-X and ASR 1000-ESP200-X

- 
- Step 1** Locate the slot in which ASR 1000 ESP 100-X and ASR 1000 ESP-200-X are plugged in.
- Step 2** Upgrade CPLD ASR 1000 ESP 100-X and ASR 1000 ESP-200-X with the following command:
- ```
Router# upgrade hw-programmable cpld filename  
harddisk:asr1000-hw-programmables.17.02.01.SPA.pkg f0
```
- Step 3** Confirm that you want to proceed with the upgrade. The CPLD versions are upgraded and the ASR 1000 ESP 100-X and ASR 1000 ESP-200-X cards are reloaded to complete the upgrade process.
- 

## Upgrading FPGA of Cisco ASR 1000-ESP100-X and ASR 1000-ESP200-X

- 
- Step 1** Locate the slot in which ASR 1000 ESP 100-X and ASR 1000 ESP-200-X are plugged in.

**Step 2** Upgrade FPGA of ASR 1000 ESP 100-X and ASR 1000 ESP-200-X FPGA with the following command:

```
Router# upgrade hw-programmable fpga filename
harddisk:asr1000-hw-programmables.17.02.01.SPA.pkg f0
```

**Step 3** Confirm that you want to proceed with the upgrade. The FPGA versions are upgraded and the ASR 1000 ESP 100-X and ASR 1000 ESP-200-X are reloaded to complete the upgrade process.

## Sample Logs after Upgrading CPLD and FPGA

### Example: Sample CPLD Field Programmable Logs

```
Router# show hw-programmable all
Hw-programmable versions
Slot          CPLD version          FPGA version
-----
R0            17042115             N/A
R1            N/A                  N/A
F0            19041811             18101201
F1            19041811             18101201
0             15072100             N/A
1             13012400             N/A
2             15072100             N/A
Router# upgrade hw-programmable cpld filename harddisk:
asr1000-hw-programmables.17.02.01.SPA.pkg F0
Start service Upgrade CPLD on Embedded-Service-Processor 0 from current version 19041811
to 20030413 (Y)es/(N)o/(C)ontinue? [Y]
Start service This command could take up to 10 minutes, please wait and do not power-cycle
the chassis or the card. Otherwise, hardware may be unrecoverable. It is recommended that
all cards are running the same version IOS-XE software prior to the upgrade. At the end of
upgrade, fp/0 will be reset. (Y)es/(N)o/(C)ontinue? [Y]

Upgrade cpld hw-programmable on Embedded-Service-Processor 0
Reloading Embedded-Service-Processor 0 to start upgrade
<7>%Reloading the fp 0
Router# show platform
Chassis type: ASR1009-X

Slot      Type              State              Insert time (ago)
-----
0         ASR1000-MIP100    ok                 00:06:27
0/0      EPA-10X10GE       ok                 00:04:14
0/1      EPA-1X100GE       ok                 00:04:00
1         ASR1000-6TGE      ok                 00:06:27
1/0      BUILT-IN-6TGE     ok                 00:04:21
2         ASR1000-2T+20X1GE ok                 00:06:27
2/0      BUILT-IN-2T+20X1GE ok                 00:04:13
R1       ASR1000-RP3       ok, active         00:06:27
F0       ASR1000-ESP100-X ok, standby        00:06:27
F1       ASR1000-ESP100-X ok, active         00:06:27
P0       ASR1000X-AC-1100W ps, fail           00:05:13
P1       ASR1000X-AC-1100W ok                 00:05:10
P2       Unknown           empty              never
P3       Unknown           empty              never
P4       Unknown           empty              never
P5       Unknown           empty              never
P6       ASR1000X-FAN      ok                 00:04:58
```

```
P7      ASR1000X-FAN      ok      00:04:56
P8      ASR1000X-FAN      ok      00:04:55
```

```
Router# show hw-programmable all
Hw-programmable versions
```

| Slot | CPLD version | FPGA version |
|------|--------------|--------------|
| R0   | 17042115     | N/A          |
| R1   | N/A          | N/A          |
| F0   | 19041811     | 18101201     |
| F1   | 19041811     | 18101201     |
| 0    | 15072100     | N/A          |
| 1    | 13012400     | N/A          |
| 2    | 15072100     | N/A          |

```
Router# request platform hardware slot f0 oir power-cycle
Router# show platform
Chassis type: ASR1009-X
```

| Slot | Type               | State       | Insert time (ago) |
|------|--------------------|-------------|-------------------|
| 0    | ASR1000-MIP100     | ok          | 00:06:27          |
| 0/0  | EPA-10X10GE        | ok          | 00:04:14          |
| 0/1  | EPA-1X100GE        | ok          | 00:04:00          |
| 1    | ASR1000-6TGE       | ok          | 00:06:27          |
| 1/0  | BUILT-IN-6TGE      | ok          | 00:04:21          |
| 2    | ASR1000-2T+20X1GE  | ok          | 00:06:27          |
| 2/0  | BUILT-IN-2T+20X1GE | ok          | 00:04:13          |
| R1   | ASR1000-RP3        | ok, active  | 00:06:27          |
| F0   | ASR1000-ESP100-X   | ok, standby | 00:06:27          |
| F1   | ASR1000-ESP100-X   | ok, active  | 00:06:27          |
| P0   | ASR1000X-AC-1100W  | ps, fail    | 00:05:13          |
| P1   | ASR1000X-AC-1100W  | ok          | 00:05:10          |
| P2   | Unknown            | empty       | never             |
| P3   | Unknown            | empty       | never             |
| P4   | Unknown            | empty       | never             |
| P5   | Unknown            | empty       | never             |
| P6   | ASR1000X-FAN       | ok          | 00:04:58          |
| P7   | ASR1000X-FAN       | ok          | 00:04:56          |
| P8   | ASR1000X-FAN       | ok          | 00:04:55          |

```
Router# show hw-programmable all
Hw-programmable versions
```

| Slot | CPLD version | FPGA version |
|------|--------------|--------------|
| R0   | 17042115     | N/A          |
| R1   | N/A          | N/A          |
| F0   | 20030413     | 18101201     |
| F1   | 19041811     | 18101201     |
| 0    | 15072100     | N/A          |
| 1    | 13012400     | N/A          |
| 2    | 15072100     | N/A          |

## Example: FPGA Field Programmable Logs

```
Router#show hw-programmable all
Hw-programmable versions
```

| Slot | CPLD version | FPGA version |
|------|--------------|--------------|
| R0   | 17042115     | N/A          |
| R1   | N/A          | N/A          |
| F0   | 20030413     | 18101201     |
| F1   | 19041811     | 18101201     |
| 0    | 15072100     | N/A          |
| 1    | 13012400     | N/A          |
| 2    | 15072100     | N/A          |

Router#**upgrade hw-programmable fpga filename harddisk:**

asr1000-hw-programmables.17.02.01.SPA.pkg F0

Start service Upgrade FPGA on Embedded-Service-Processor 0 from current version 18101201 to 1908010d (Y)es/(N)o/(C)ontinue? [Y] y

Start service This command could take up to 15 minutes, please wait and do not power-cycle the chassis or the card. Otherwise, hardware may be unrecoverable. It is recommended that all cards are running the same version IOS-XE software prior to the upgrade. At the end of upgrade, fp/0 will be reset. (Y)es/(N)o/(C)ontinue? [Y]

Upgrade fpga hw-programmable on Embedded-Service-Processor 0

Reloading Embedded-Service-Processor 0 to start upgrade

<7>%%Reloading the fp 0

Router# **show platform**

Chassis type: ASR1009-X

| Slot | Type               | State       | Insert time (ago) |
|------|--------------------|-------------|-------------------|
| 0    | ASR1000-MIP100     | ok          | 00:06:27          |
| 0/0  | EPA-10X10GE        | ok          | 00:04:14          |
| 0/1  | EPA-1X100GE        | ok          | 00:04:00          |
| 1    | ASR1000-6TGE       | ok          | 00:06:27          |
| 1/0  | BUILT-IN-6TGE      | ok          | 00:04:21          |
| 2    | ASR1000-2T+20X1GE  | ok          | 00:06:27          |
| 2/0  | BUILT-IN-2T+20X1GE | ok          | 00:04:13          |
| R1   | ASR1000-RP3        | ok, active  | 00:06:27          |
| F0   | ASR1000-ESP100-X   | ok, standby | 00:06:27          |
| F1   | ASR1000-ESP100-X   | ok, active  | 00:06:27          |
| P0   | ASR1000X-AC-1100W  | ps, fail    | 00:05:13          |
| P1   | ASR1000X-AC-1100W  | ok          | 00:05:10          |
| P2   | Unknown            | empty       | never             |
| P3   | Unknown            | empty       | never             |
| P4   | Unknown            | empty       | never             |
| P5   | Unknown            | empty       | never             |
| P6   | ASR1000X-FAN       | ok          | 00:04:58          |
| P7   | ASR1000X-FAN       | ok          | 00:04:56          |
| P8   | ASR1000X-FAN       | ok          | 00:04:55          |

Router#**show hw-programmable all**

Hw-programmable versions

| Slot | CPLD version | FPGA version |
|------|--------------|--------------|
| R0   | 17042115     | N/A          |
| R1   | N/A          | N/A          |
| F0   | 20030413     | 1908010d     |
| F1   | 19041811     | 18101201     |
| 0    | 15072100     | N/A          |
| 1    | 13012400     | N/A          |
| 2    | 15072100     | N/A          |

## Troubleshooting

If the ASR 1000 ESP 100-X and ASR 1000 ESP-200-X does not display the recommended CPLD version, use the following command.

```
Router# request platform hardware slot f0 oir power-cycle Slot: f0
```


**Note**

Ensure that the slot specified in this command should match the slot number specified in step 3 of the upgrade procedure.

## Additional References

The following sections provide references related to this function.

### Related Documents

| Related Topic         | Document Title                                               |
|-----------------------|--------------------------------------------------------------|
| Cisco IOS XE commands | <a href="#">Cisco IOS Master Commands List, All Releases</a> |

### Standards

| Standard                                                                                                                              | Title |
|---------------------------------------------------------------------------------------------------------------------------------------|-------|
| No new or modified standards are supported by this feature, and support for existing standards has not been modified by this feature. | —     |

## 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 XE software releases, and feature sets, use Cisco MIB Locator found at the following URL:<br><a href="http://www.cisco.com/go/mibs">http://www.cisco.com/go/mibs</a> |

## RFCs

| RFC                                                                                                                         | Title |
|-----------------------------------------------------------------------------------------------------------------------------|-------|
| No new or modified RFCs are supported by this feature, and support for existing RFCs has not been modified by this feature. | —     |

## Technical Assistance

| Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Link                                                                                                              |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------|
| <p>The Cisco Support website provides extensive online resources, including documentation and tools for troubleshooting and resolving technical issues with Cisco products and technologies.</p> <p>To receive security and technical information about your products, you can subscribe to various services, such as the Product Alert Tool (accessed from Field Notices), the Cisco Technical Services Newsletter, and Really Simple Syndication (RSS) Feeds.</p> <p>Access to most tools on the Cisco Support website requires a Cisco.com user ID and password.</p> | <a href="http://www.cisco.com/cisco/web/support/index.html">http://www.cisco.com/cisco/web/support/index.html</a> |

## Feature Information

Table 1 lists the release history for this functionality on the Cisco ASR 1000 Series Routers.

For information on a feature in this technology that is not documented here, see the [Cisco ASR 1000 Series Aggregation Services Routers Documentation Roadmap](#).

Use Cisco Feature Navigator to find information about platform support and software image support. Cisco Feature Navigator enables you to determine which Cisco IOS XE software images support a specific software release, feature set, or platform. To access Cisco Feature Navigator, go to <http://www.cisco.com/go/cfn>. An account on Cisco.com is not required.



### Note

Table 1 lists only the Cisco IOS XE software release that introduced support for a given feature in a given Cisco IOS XE software release train. Unless noted otherwise, subsequent releases of that Cisco IOS XE software release train also support that feature.

**Table 1**      **Feature Information for Upgrading Field Programmable Hardware Devices**

| Feature Name                                                                    | Releases            | Feature Information                                                                                                                                                                                                                                                                                                                                                                                                         |
|---------------------------------------------------------------------------------|---------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Upgrading Field Programmable Hardware Devices for Cisco ASR 1000 Series Routers | IOS XE Release 3.1S | In Cisco IOS XE Release 3.1S, support for upgrading field programmable hardware devices, specifically, the CPLD upgrade for the Cisco ASR1000-RP2 and Cisco ASR1000-SIP10, was introduced on the Cisco ASR 1000 Series Aggregation Services Routers.<br><br>The following commands are new: <b>upgrade hw-programmable, show hw-programmable, show upgrade hw-programmable progress, show upgrade hw-programmable file.</b> |

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