



Upgrading to the Cisco ASR 1000 Series Routers ROMmon Image Release 12.2(33r)XND

This document contains procedures for downloading independent ROM monitor (ROMmon) software onto the Route Processors (RPs), Embedded Service Processors (ESPs), and Shared Port Adapter Interface Processors (SIPs) on a Cisco ASR 1000 Series Router. This document contains the following sections:

- [ROMmon Overview, page 1](#)
- [Compatibility Requirements, page 2](#)
- [Upgrading ROMmon, page 2](#)
- [Resolved Caveats—ROMmon Image Release 12.2\(33r\)XND, page 10](#)
- [Feature/Enhancement Caveats—ROMmon Image Release 12.2\(33r\)XND, page 11](#)

ROMmon Overview

The ROMmon Release 12.2(33r)XND image is provided to customers in cases where a ROMmon upgrade is required. A ROMmon upgrade using the ROMmon Release 12.2(33r)XND image is only necessary in cases where a system message indicates one of the ROMmon on the Cisco ASR 1000 Series Routers needs an upgrade, or a Cisco technical support representative suggests upgrading ROMmon.

A ROMmon Release 12.2(33r)XND upgrade can be applied to any of the following hardware components on a Cisco ASR 1000 Series Router:

- Integrated RP1, field-replaceable ESP, and integrated SIP10 on Cisco ASR 1002 Router (Cisco ASR1002)
- Integrated RP1, ESP, and SIP10 on Cisco ASR 1002-Fixed Router (Cisco ASR 1002-F)
- Cisco ASR 1000 Series Route Processor 1 (Cisco ASR1000-RP1)
- Cisco ASR 1000 Series Route Processor 2 (Cisco ASR1000-RP2)
- 5-Gbps Cisco ASR 1000 Series ESP (Cisco ASR1000-ESP5)
- 10-Gbps Cisco ASR 1000 Series ESP (Cisco ASR1000-ESP10)



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- Cisco ASR 1000 Embedded Services Processor 10G Non Crypto Capable (Cisco ASR1000-ESP10-N)
- 20-Gbps Cisco ASR 1000 Series ESP (Cisco ASR1000-ESP20)
- Cisco ASR 1000 Series SPA Interface Processor (SIP) (Cisco ASR1000-SIP10)

The ROMmon software for RPs, ESPs, and SIPs can be upgraded collectively or individually using the `asr1000-rommon.122-33r.XND.pkg` file.

Compatibility Requirements

The `asr1000-rommon.122-33r.XND.pkg` file can be used to upgrade RP, ESP, and SIP ROMmon as long as the privileged EXEC or diagnostic mode prompt on the router can be accessed.

All system components must be running Cisco IOS XE Release 2.4.0 or a later release before the ROMmon upgrade to ROMmon Release 12.2(33r)XND is performed.

After any system component has been upgraded to ROMmon Release 12.2(33r)XND, the user cannot run any Cisco IOS XE release earlier than Cisco IOS XE 2.3.0. If the user needs to run a Cisco IOS XE release earlier than Cisco IOS XE 2.3.0, the ROMmon version must first be downgraded to ROMmon Release 12.2(33r)XNB before attempting to boot the earlier Cisco IOS XE release.

Downgrades to supported ROMmon versions will convert the ROMVAR table to the proper smaller size. ROMmon Release 12.2(33r)XN1, ROMmon Release 12.2(33r)XN2, ROMmon Release 12.2(33r)XNB, and ROMmon Release 12.2(33r)XNC are all supported in the downgrade procedure.



Note

When the ROMVAR table is converted to a smaller size for a downgrade to ROMmon Release 12.2(33r)XN1, ROMmon Release 12.2(33r)XN2, and ROMmon Release 12.2(33r)XNB, the downgrade will stop and report an error condition if the ROMVAR table usage exceeds the supported size for the target release. The error will instruct the user to drop the system to the ROMmon prompt and clear some variable settings. Follow these instructions to continue the downgrade.

For customers requiring a FIPS 140-2 compliant environment, ROMmon Version 12.2(33r)XND is a required update.

Upgrading ROMmon

This section covers the following topics:

- [Upgrading ROMmon Overview, page 3](#)
- [Checking the Current ROMmon Version, page 3](#)
- [Upgrading ROMmon for All RPs, ESPs, and SIPs on a Cisco ASR 1000 Series Router, page 4](#)
- [Upgrading ROMmon for a Single RP, ESP, or SIP on a Cisco ASR 1000 Series Router, page 7](#)

Upgrading ROMmon Overview

If you are unsure if a ROMmon upgrade is required or if you have installed a new RP, ESP, or SIP in your Cisco ASR 1000 Series Router or a new Cisco ASR 1002 Router that requires an upgrade, see the [“Checking the Current ROMmon Version” section on page 3](#).

Checking the Current ROMmon Version

Enter the **show rom-monitor slot** or **show platform** command to check the version of ROMmon running on any RP, ESP, or SIP in your Cisco ASR 1000 Series Router.

If the following output appears after the **show rom-monitor slot** or **show platform** command is entered, the RP, ESP, or SIP processor in the specified *slot* is already running ROMmon Release 12.2(33r)XND:

```
Router# show rom-monitor slot
System Bootstrap, Version 12.2(33r)XND, RELEASE SOFTWARE (fc1)
Technical Support: http://www.cisco.com/techsupport
Copyright (c) 2009 by cisco Systems, Inc.
```

If output indicating an earlier ROMmon version or a system message indicates one of the ROMmon on the Cisco ASR 1000 Series Routers needs an upgrade, a ROMmon upgrade may benefit the RP, ESP, or SIP:

```
Router# show platform
Chassis type: ASR1006
```

Slot	Type	State	Insert time (ago)
1	ASR1000-SIP10	ok	2d16h
1/1	SPA-1XTENGE-XFP	ok	2d16h
1/2	SPA-2XOC3-POS	ok	2d16h
1/3	SPA-2X1GE	ok	2d16h
2	ASR1000-SIP10	ok	2d16h
R0	ASR1000-RP2	ok, active	2d16h
F0	ASR1000-ESP20	ok, active	2d16h
F1	ASR1000-ESP20	ok, standby	2d16h
P0	ASR1006-PWR-AC	ps, fail	2d16h
P1	ASR1006-PWR-AC	ok	2d16h

Slot	CPLD Version	Firmware Version
1	07091401	12.2(33r)XN1
2	07091401	12.2(33r)XN1
R0	08103002	12.2(33r)XNC0
F0	07091401	12.2(33r)XN2
F1	07091401	12.2(33r)XN2

Upgrading ROMmon for All RPs, ESPs, and SIPS on a Cisco ASR 1000 Series Router

Use this procedure to upgrade ROMmon for all RPs, ESPs, and SIPS on a Cisco ASR 1000 Series Router to ROMmon Release 12.2(33r)XND:



Note

All system components must be running Cisco IOS XE Release 2.4.0 or a later release before the ROMmon upgrade to ROMmon Release 12.2(33r)XND is performed.

- Step 1** (Optional) Enter the **show platform** command or the **show rom-monitor slot** command for each RP, ESP, and SIP in the router to see the current versions of ROMmon on the hardware. See the [“Checking the Current ROMmon Version”](#) section on page 3 for information about interpreting this output.
- Step 2** If the ROMmon image has not been copied onto the router, copy the `asr1000-rommon.122-33r.XND.pkg` file that was made available as part of this release onto the bootflash: or `usb[0-1]:` file system using the **copy source-URL destination-URL** command.
- Step 3** Enter the **dir file-system** command to confirm the file was copied into the desired directory.
- Step 4** Enter the **upgrade rom-monitor filename URL all** command to begin the ROMmon image upgrade, where *URL* is the path to the ROMmon file.



Caution

Do not remove hardware, turn off power, or interrupt the router in any way during the ROMmon upgrade. Although the Cisco ASR 1000 Series Router should be able to recover from most interruptions during the ROMmon upgrade, certain scenarios may cause unpredictable problems.

- Step 5** Messages regarding the upgrade will appear on the console. After these messages have stopped and the router prompt is available, enter the **reload** command to reload the router.
- Step 6** Enter the **boot filesystem:/file-url** command after the rommon prompt to boot the Cisco IOS XE Release 2.4.0 or later image, where *filesystem:/file-url* is the path to the consolidated package file. The ROMmon upgrade is not permanent for any piece of hardware until the Cisco IOS XE Release 2.4.0 or later image is booted
- Step 7** Enter the **enable** command at the user prompt to enter privileged EXEC mode after the boot is complete.
- Step 8** Enter the **show platform** command or the **show rom-monitor slot** command for each RP, ESP, and SIP in the router to confirm the ROMmon has been upgraded.



Note

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

Example

```
Router# show platform
Chassis type: ASR1004
```

Slot	Type	State	Insert time (ago)
1	ASR1000-SIP10	ok	00:56:24
1/1	SPA-2XOC3-POS	ok	00:55:08
1/3	SPA-8X1GE-V2	ok	00:55:08
R0	ASR1000-RP1*	ok, active	00:56:24

```
F0      ASR1000-ESP10*      ok, active      00:56:24
P0      TBD0000000000000000 ok                00:55:42
P1      TBD0000000000000000 ok                00:55:42
```

```
Slot    CPLD Version      Firmware Version
-----
1       07091401             12.2(33r)XNB
R0      07062111             12.2(33r)XNB
F0      07051680             12.2(33r)XNB
```

Router# **copy tftp bootflash:**

```
Address or name of remote host [172.23.16.81]?
Source filename []? auto/tftp-boot/rommon/asr1000-rommon.122-33r.XND.pkg
Destination filename [asr1000-rommon.122-33r.XND.pkg]?
Accessing tftp://172.23.16.81/auto/tftp-boot/asr1000-rommon.122-33r.XND.pkg...
Loading /auto/tftp-boot/asr1000-rommon.122-33r.XND.pkg from 172.23.16.81 (via GigabitEt
hernet0): !!!
[OK - 559308 bytes]
```

559308 bytes copied in 1.142 secs (489762 bytes/sec)

Router# **dir bootflash:**

Directory of bootflash:/

```
   11  drwx      16384   Dec 4 2007 12:32:46 +00:00  lost+found
86401 drwx      4096   Dec 4 2007 14:06:24 +00:00  .ssh
14401 drwx      4096   Jul 22 2008 01:10:38 +01:00  .rollback_timer
28801 drwx      4096   Aug 20 2008 21:53:54 +01:00  .prst_sync
43201 drwx      4096   Jul 22 2008 01:10:54 +01:00  .installer
43204 drwx      4096   Aug 20 2008 21:21:44 +01:00  210subs
72001 drwx      4096   Aug 20 2008 22:08:12 +01:00  211ioscontrolsubs
   12  -rw-     559308   Sep 10 2008 00:39:44 +01:00  asr1000-rommon.122-33r.XND.pkg
57601 drwx      4096   Aug 20 2008 21:12:02 +01:00  211subs
   13  -rw-     45977   Apr 10 2008 00:48:46 +01:00  target_support_output.tgz.tgz
```

928862208 bytes total (494886912 bytes free)

Router# **upgrade rom-monitor filename bootflash:asr1000-rommon.XND.pkg all**

Upgrade rom-monitor on Route-Processor 0

```
Target copying rom-monitor image file
Checking upgrade image...
1966080+0 records in
3840+0 records out
Upgrade image MD5 signature is 3d237999248811ea9a08705e29d2a6bf
Burning upgrade partition...
1966080+0 records in
1966080+0 records out
Checking upgrade partition...
1966080+0 records in
1966080+0 records out
Upgrade flash partition MD5 signature is 3d237999248811ea9a08705e29d2a6bf
ROMMON upgrade complete.
To make the new ROMMON permanent, you must restart the RP.
```

Upgrade rom-monitor on Embedded-Service-Processor 0

```
Target copying rom-monitor image file
Checking upgrade image...
1966080+0 records in
3840+0 records out
Upgrade image MD5 signature is 3d237999248811ea9a08705e29d2a6bf
Burning upgrade partition...
```

```

1966080+0 records in
1966080+0 records out
Checking upgrade partition...
1966080+0 records in
1966080+0 records out
Upgrade flash partition MD5 signature is 3d237999248811ea9a08705e29d2a6bf
ROMMON upgrade complete.
To make the new ROMMON permanent, you must restart the linecard.

```

Upgrade rom-monitor on SPA-Inter-Processor 1

```

Target copying rom-monitor image file
Checking upgrade image...
1966080+0 records in
3840+0 records out
Upgrade image MD5 signature is 3d237999248811ea9a08705e29d2a6bf
Burning upgrade partition...
1966080+0 records in
1966080+0 records out
Checking upgrade partition...
1966080+0 records in
1966080+0 records out
Upgrade flash partition MD5 signature is 3d237999248811ea9a08705e29d2a6bf
ROMMON upgrade complete.
To make the new ROMMON permanent, you must restart the linecard.

```

```

Router# reload
Proceed with reload? [confirm]

```

<reload bootup output removed for brevity>

Rommon 1# **boot bootflash:asr1000rp1-advipservicesk9.02.04.00.122-33.XND.bin**

```

      IP_ADDRESS: 172.27.55.179
      IP_SUBNET_MASK: 255.255.255.128
      DEFAULT_GATEWAY: 172.27.55.129
      TFTP_SERVER: 172.27.53.102
      TFTP_FILE: asr1000rp1-advipservicesk9.02.04.00.122-33.XND.bin
Using midplane macaddr
      TFTP_MACADDR: 00:1a:30:44:7f:ff
      TFTP_VERBOSE: Progress
      TFTP_RETRY_COUNT: 18
      TFTP_TIMEOUT: 7200
      TFTP_CHECKSUM: Yes
      ETHER_PORT: 3
      ETHER_SPEED_MODE: Auto Detect
link up 1000Mbps/FD

```

<boot output removed for brevity>

Press RETURN to get started!

```

Router> enable

```

```
Router# show platform
Chassis type: ASR1004
```

Slot	Type	State	Insert time (ago)
1	ASR1000-SIP10	ok	00:02:35
1/1	SPA-2XOC3-POS	ok	00:01:04
1/3	SPA-8X1GE-V2	ok	00:01:04
R0	ASR1000-RP1*	ok, active	00:02:35
F0	ASR1000-ESP10*	ok, active	00:02:35
P0	TBD0000000000000000	ok	00:01:37
P1	TBD0000000000000000	ok	00:01:37

Slot	CPLD Version	Firmware Version
1	07091401	12.2(33r)XND
R0	07062111	12.2(33r)XND
F0	07051680	12.2(33r)XND

Upgrading ROMmon for a Single RP, ESP, or SIP on a Cisco ASR 1000 Series Router

Use this procedure to upgrade ROMmon for a single RP, ESP, or SIP on a Cisco ASR 1000 Series Router to ROMmon Release 12.2(33r)XND:



Note

All system components must be running Cisco IOS XE Release 2.4.0 or a later release before the ROMmon upgrade to ROMmon Release 12.2(33r)XND is performed.

- Step 1** (Optional) Enter the **show platform** command or the **show rom-monitor slot** command for each RP, ESP, and SIP in the router to see the current versions of ROMmon on the hardware. See the [“Checking the Current ROMmon Version”](#) section on page 3 for information about interpreting this output.
- Step 2** If the ROMmon image has not been copied onto the router, copy the `asr1000-rommon.122-33r.XND.pkg` file that was made available as part of this release onto the bootflash: or `usb[0-1]:` file system using the **copy source-URL destination-URL** command.
- Step 3** Enter the **dir file-system** command to confirm the file was copied into the desired directory.
- Step 4** Enter the **upgrade rom-monitor filename URL slot** command to begin the ROMmon image upgrade, where *URL* is the path to the ROMmon file and *slot* specifies the hardware that will receive the ROMmon upgrade.



Caution

Do not remove hardware, turn off power, or interrupt the router in any way during the ROMmon upgrade. Although the Cisco ASR 1000 Series Router should be able to recover from most interruptions during the ROMmon upgrade, certain scenarios may cause unpredictable problems.

Step 5 Messages regarding the upgrade will appear on the console. After these messages have stopped and the router prompt is available, enter the **hw-module slot slot reload** command to reload the hardware that was upgraded.



Note

The **hw-module slot slot reload** command cannot be used to reload an active RP. If you must reload an active RP to complete a ROMmon upgrade, reload the RP using one of the following methods:

- Enter **reload** to reload the entire router.
- Force a switchover using the **redundancy force-switchover** command, and then enter the **hw-module slot slot reload** command on the RP after it has become the standby RP.



Note

The ROMmon upgrade is not permanent for any piece of hardware until the Cisco IOS XE Release 2.4.0 or later image is booted. If ROMmon is configured to manually boot on your system, you must manually execute the **boot** command to boot the Cisco IOS XE Release 2.4.0 or later image to make the upgrade permanent.

Step 6 Enter the **show platform** command or the **show rom-monitor slot** command for each RP, ESP, and SIP in the router to confirm the ROMmon has been upgraded.



Note

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

Example

```
Router# show platform
Chassis type: ASR1006
```

Slot	Type	State	Insert time (ago)
0	ASR1000-SIP10	ok	2w6d
0/0	SPA-5X1GE-V2	ok	2w6d
0/1	SPA-8X1FE-TX-V2	ok	2w6d
0/2	SPA-2XCT3/DS0	ok	2w6d
1	ASR1000-SIP10	ok	2w6d
1/0	SPA-2XOC3-POS	ok	2w6d
1/1	SPA-8XCHT1/E1	ok	2w6d
1/2	SPA-2XT3/E3	ok	2w6d
R0	ASR1000-RP1	ok, active	2w6d
F0	ASR1000-ESP10	ok, active	2w6d
P0	ASR1006-PWR-AC	ok	2w6d
P1	ASR1006-FAN	ok	2w6d

Slot	CPLD Version	Firmware Version
0	06120701	12.2(33r)XN2
1	06120701	12.2(33r)XN2
R0	07082312	12.2(33r)XN2
F0	07051680	12.2(33r)XN2

```
Router# copy tftp bootflash:
Address or name of remote host [172.23.16.81]?
Source filename []? auto/tftp-boot/rommon/asr1000-rommon.122-33r.XND.pkg
Destination filename [asr1000-rommon.122-33r.XND.pkg]?
Accessing tftp://172.23.16.81/auto/tftp-boot/asr1000-rommon.122-33r.XND.pkg...
Loading /auto/tftp-boot/asr1000-rommon.122-33r.XND.pkg from 172.23.16.81 (via
GigabitEthernet0): !!!
```


[OK - 559308 bytes]

559308 bytes copied in 1.142 secs (489762 bytes/sec)

Router# **dir bootflash:**

Directory of bootflash:/

```

  11  drwx      16384   Dec 4 2007 12:32:46 +00:00  lost+found
86401 drwx      4096   Dec 4 2007 14:06:24 +00:00  .ssh
14401 drwx      4096   Jul 22 2008 01:10:38 +01:00  .rollback_timer
28801 drwx      4096   Aug 20 2008 21:53:54 +01:00  .prst_sync
43201 drwx      4096   Jul 22 2008 01:10:54 +01:00  .installer
43204 drwx      4096   Aug 20 2008 21:21:44 +01:00  210subs
72001 drwx      4096   Aug 20 2008 22:08:12 +01:00  211ioscontrolsubs
   12  -rw-     559308   Sep 10 2008 00:39:44 +01:00  asr1000-rommon.122-33r.XND.pkg
57601 drwx      4096   Aug 20 2008 21:12:02 +01:00  211subs
   13  -rw-     45977   Apr 10 2008 00:48:46 +01:00  target_support_output.tgz.tgz

```

928862208 bytes total (494886912 bytes free)

Router# **upgrade rom-monitor filename bootflash:asr1000-rommon.122-33r.XND.pkg 0**

Upgrade rom-monitor on SPA-Inter-Processor 0

Target copying rom-monitor image file

Checking upgrade image...

1966080+0 records in

3840+0 records out

Upgrade image MD5 signature is 3d237999248811ea9a08705e29d2a6bf

Burning upgrade partition...

1966080+0 records in

1966080+0 records out

Checking upgrade partition...

1966080+0 records in

1966080+0 records out

Upgrade flash partition MD5 signature is 3d237999248811ea9a08705e29d2a6bf

ROMMON upgrade complete.

To make the new ROMMON permanent, you must restart the linecard.

Router# **hw-module slot 0 reload**

<reload bootup output removed for brevity>

Router# **show platform**

Chassis type: ASR1006

Slot	Type	State	Insert time (ago)
0	ASR1000-SIP10	ok	2w6d
0/0	SPA-5X1GE-V2	ok	00:00:35
0/1	SPA-8X1FE-TX-V2	ok	00:00:35
0/2	SPA-2XCT3/DS0	ok	00:00:35
1	ASR1000-SIP10	ok	2w6d
1/0	SPA-2XOC3-POS	ok	2w6d
1/1	SPA-8XCHT1/E1	ok	2w6d
1/2	SPA-2XT3/E3	ok	2w6d
R0	ASR1000-RP1	ok, active	2w6d
F0	ASR1000-ESP10	ok, active	2w6d
P0	ASR1006-PWR-AC	ok	2w6d
P1	ASR1006-FAN	ok	2w6d

Slot	CPLD Version	Firmware Version
0	06120701	12.2(33r)XND
1	06120701	12.2(33r)XN2
R0	07082312	12.2(33r)XN2
F0	07051680	12.2(33r)XN2

```
Router# show rom-monitor 0
```

```
System Bootstrap, Version 12.2(33r)XND, RELEASE SOFTWARE (fc1)
Technical Support: http://www.cisco.com/techsupport
Copyright (c) 2009 by cisco Systems, Inc.
```

Resolved Caveats—ROMmon Image Release 12.2(33r)XND

- CSCs110906
ROMmon upgrade gets stuck in “upgrading ROMMON” loop.
- CSCsq89671
System hangs at “Now booting the IOS-XE kernel” message.
- CSCsu84088
RP2 ROMmon upgrade gets stuck in “upgrading ROMMON” loop.
- CSCsv00093
RP2 ROMmon reports MALLOC failure when booting invalid/corrupted image.
- CSCsw53115
RP2 ROMmon image boot up hangs if BOOT_PARAM variable not set.
- CSCsx01992
Unable to upgrade ROMmon on RP in slot R1 if it is the Active RP.
- CSCsx02870
RP2 ROMmon upgrade does not clean up files after failed upgrade attempt.
- CSCsx56279
The RP2 ROMmon only prints “Initializing Hardware” message at 9600 baud.
- CSCsx58858
RP2 ROMmon does not respond to Break key consistently.
- CSCsx60530
RP2 ROMmon BIOS data structures corrupted by loading image from FAT-32 formatted volume.
- CSCsy46949
ROMmon `tsec` command causes CPU exception.
- CSCsy90467
ROMmon needs more robust checking of filesystem super-blocks.
- CSCsy91441
ROMmon should give more information when a corrupted nvflash block is discovered.

Feature/Enhancement Caveats—ROMmon Image Release 12.2(33r)XND

- CSCsr71232
Added CLI to verify SHA-1 algorithm to RP1 ROMmon for FIPS 140-2 compliance.
- CSCsu09031
Added ROMmon validation using CRC-32 to RP1 ROMmon for FIPS 140-2 compliance.
- CSCsu84074
Added CLI to verify SHA-1 algorithm to RP2 ROMmon for FIPS 140-2 compliance.
- CSCsu87619
Added BIOS/ROMmon validation using CRC-32 to RP2 ROMmon for FIPS 140-2 compliance.

