Upgrading Field Programmable Hardware Devices for Cisco Catalyst 9800 Series Wireless Controllers

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Document Revision History

The following table shows the changes made to this document:

Date	Change Summary
May 2026	Updated **Upgrading Field Programmable for Cisco Catalyst 9800M/H1/H2 Wireless Controllers** section for Cisco Catalyst CW9800M, CW9800H1 and CW9800H2 Wireless Controllers.
March 2026	Added the **Catalyst 9800-80 CPLD Upgrade Procedure** section.
June 2025	Updated **Audience**, **Upgrading Field Programmable Hardware Devices Overview** & **Resolved Caveats** section for Cisco Catalyst CW9800M, CW9800H1 and CW9800H2 Wireless Controllers.
April 2025	Updated **Resolved Caveats** section with ROMMON Release 17.15(2r) information. Updated **ROMMON Images** section with latest IOS-XE versions and the recommended ROMMON versions.
February 2025	Updated **Resolved Caveats** section with ROMMON Release 17.15(1r) information. Updated **ROMMON Images** section with latest IOS-XE versions and the recommended ROMMON versions.
December 2023	Updated **Resolved Caveats** section with ROMMON Release 17.12(1r) and 17.12(2r) information. Updated **ROMMON Images** section with latest IOS-XE versions and the recommended ROMMON versions.

Date	Change Summary
October 2023	Updated **Resolved Caveats** section with ROMMON Release 17.7(3r) information. Updated **ROMMON Images** section with IOS-XE versions and the recommended ROMMON versions.
March 2023	Updated **Resolved Caveats** section with ROMMON Release 17.11.01 information. The 17.11.01.pkg release is bundling the earlier released firmware only.
April 2022	Updated **Resolved Caveats** section with ROMMON Release 17.7(3r) information.
August 2021	Updated **Resolved Caveats** section with ROMMON Release 17.3(3r) information.
September 2020	Updated **Upgrading Ethernet PHY (Fiber)** section with firmware version 3.1.96.
March 2020	First version of the document.



Note The hardware programmables are released independently and is not tied to IOS-XE release trains.

Audience

This publication is for performing upgrades in the field on the ROMMON or FPGA upgrades of the following Cisco Catalyst 9800 Series Wireless Controllers.

- Cisco Catalyst 9800-80 Wireless Controller
- Cisco Catalyst 9800-40 Wireless Controller
- Cisco Catalyst 9800-L Wireless Controller
- Cisco Catalyst 9800M/H1/H2 Wireless Controllers

Conventions

Text Type	Indication
User input	Text the user should enter exactly as shown or keys a user should press appear in this font.
Document titles	Document titles appear in *this font*.
System output	Terminal sessions and information that the system displays appear in **this font**.

Text Type	Indication
CLI commands	CLI command keywords appear in **this font**. Variables in a CLI command appear in *this font*.
[ ]	Elements in square brackets are optional.
{x | y | z}	Required alternative keywords are grouped in braces and separated by vertical bars.
[x | y | z]	Optional alternative keywords are grouped in brackets and separated by vertical bars.
String	A nonquoted set of characters. Do not use quotation marks around the string or the string will include the quotation marks.
< >	Nonprinting characters such as passwords are in angle brackets.
[ ]	Default responses to system prompts are in square brackets.
! #	An exclamation point (!) or a pound sign (#) at the beginning of a line of code indicates a comment line.



Note Means *reader take note*. Notes contain helpful suggestions or references to material not covered in the document.



Tip Means *the following information will help you solve a problem*. The tips information might not be troubleshooting or even an action, but could be useful information, similar to a Timesaver.



Caution Means *reader be careful*. In this situation, you might perform an action that could result in equipment damage or loss of data.



Warning IMPORTANT SAFETY INSTRUCTIONS

This warning symbol means danger. You are in a situation that could cause bodily injury. Before you work on any equipment, be aware of the hazards involved with electrical circuitry and be familiar with standard practices for preventing accidents. Use the statement number provided at the end of each warning to locate its translation in the translated safety warnings that accompanied this device.

SAVE THESE INSTRUCTIONS

Related Documentation

See the following documentation for more information about the Cisco Catalyst 9800 Series Wireless Controllers:

- Release Notes for Cisco Catalyst 9800 Series Wireless Controller
- Cisco Catalyst 9800 Series Wireless Controller Software Configuration Guide
- Cisco Catalyst 9800 Series Wireless Controller Command Reference
- Cisco Wireless Solutions Software Compatibility Matrix

Obtaining Documentation and Submitting a Service Request

For information on obtaining documentation, using the Cisco Bug Search Tool (BST), submitting a service request, and gathering additional information, see What's New in Cisco Product Documentation.

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Upgrading Field Programmable Hardware Devices Overview

This document describes how to perform upgrades in the field on the hardware programmable firmware of the following Cisco Catalyst 9800 Series Wireless Controllers.

- Cisco Catalyst 9800-80 Wireless Controller
- Cisco Catalyst 9800-40 Wireless Controller
- Cisco Catalyst 9800-L Wireless Controller
- Cisco Catalyst 9800M/H1/H2 Wireless Controllers

If the controller contains an old version of the hardware programmable firmware, then that hardware programmable firmware may need to be upgraded. To do this upgrade, a hardware programmable package is released to the customers.

Note During hw-programmables upgrade, the controller may reboot several times and it is not advisable to power cycle the device during this period as it may lead to device failure. Remember that a typical upgrade process would take about 30 minutes to complete the cycle.

Note We recommend upgrading the ROMMON before the IOS XE image upgrade. After a successful ROMMON upgrade, proceed with the IOS XE image upgrade.

Important

- Schedule a planned maintenance window before starting the upgrade activity.
- DO NOT disturb the device or power cycle the device till the upgrade activity is complete.

ROMMON Images

A ROMMON image is a software package used by ROM Monitor (ROMMON) software on a controller. The software package is separate from the consolidated package normally used to boot the controller. An independent ROMMON image (software package) may occasionally be released and the controller can be upgraded with the new ROMMON software.

Table 1: IOS-XE Version and the recommended ROMMON Version for Cisco Catalyst 9800-80 Wireless Controller

IOS-XE Version	ROMMON Version
Cisco IOS XE Gibraltar 16.10.x, 16.11.x, 16.12.x	C9800-80-rommon.1712-2r.pkg
Cisco IOS XE Amsterdam 17.1.x, 17.2.x, 17.3.x	C9800-80-rommon.1712-2r.pkg
Cisco IOS XE Bengaluru 17.4.x, 17.5.x, 17.6.x	C9800-80-rommon.1712-2r.pkg
Cisco IOS XE Cupertino 17.7.x, 17.8.x, 17.9.x	C9800-80-rommon.1712-2r.pkg
Cisco IOS XE Dublin 17.10.x, 17.11.x, 17.12.x	C9800-80-rommon.1712-2r.pkg
Cisco IOS XE 17.13.x	C9800-80-rommon.1712-2r.pkg

Table 2: IOS-XE Version and the recommended ROMMON Version for Cisco Catalyst 9800-40 Wireless Controller

IOS-XE Version	ROMMON Version
Cisco IOS XE Gibraltar 16.10.x, 16.11.x, 16.12.x	C9800-40-rommon.1712-1r.pkg
Cisco IOS XE Amsterdam 17.1.x, 17.2.x, 17.3.x	C9800-40-rommon.1712-1r.pkg
Cisco IOS XE Bengaluru 17.4.x, 17.5.x, 17.6.x	C9800-40-rommon.1712-1r.pkg
Cisco IOS XE Cupertino 17.7.x, 17.8.x, 17.9.x	C9800-40-rommon.1712-1r.pkg
Cisco IOS XE Dublin 17.10.x, 17.11.x, 17.12.x	C9800-40-rommon.1712-1r.pkg
Cisco IOS XE 17.13.x	C9800-40-rommon.1712-1r.pkg

Table 3: IOS-XE Version and the recommended ROMMON Version for Cisco Catalyst 9800-L Wireless Controller

IOS-XE Version	ROMMON Version
Cisco IOS XE Gibraltar 16.10.x, 16.11.x, 16.12.x	C9800-L-rommon.1612-3r.pkg
Cisco IOS XE Amsterdam 17.1.x, 17.2.x, 17.3.x	C9800-L-rommon.1612-3r.pkg
Cisco IOS XE Bengaluru 17.4.x, 17.5.x, 17.6.x	C9800-L-rommon.1612-3r.pkg
Cisco IOS XE Cupertino 17.7.x, 17.8.x, 17.9.x	C9800-L-rommon.1612-3r.pkg
Cisco IOS XE Dublin 17.10.x, 17.11.x, 17.12.x	C9800-L-rommon.1612-3r.pkg
Cisco IOS XE 17.13.x	C9800-L-rommon.1612-3r.pkg

Table 4: IOS-XE Version and the recommended ROMMON Version for Cisco Catalyst CW9800M, and CW9800H1 and CW9800H2 Wireless Controllers

IOS-XE Version	ROMMON Version
Cisco IOS XE 17.14.x, 17.15.x, 17.16.x, 17.17.x, 17.18.x, 26.1.x	CW9800-rommon.1715-2r.pkg

Ethernet PHY Images

This firmware (software upgrade) is for Ethernet PHY and MAC images of the Cisco Catalyst 9800-L Wireless Controllers.

Table 5: IOS-XE Version and the recommended Hardware Programmable package for Cisco Catalyst 9800-L Wireless Controller

IOS-XE Version	Hardware Programmables
Cisco IOS XE Gibraltar 16.10.x, 16.11.x, 16.12.x	C9800-L-hw-programmables.17.11.01.pkg
Cisco IOS XE Amsterdam 17.1.x, 17.2.x, 17.3.x	C9800-L-hw-programmables.17.11.01.pkg
Cisco IOS XE Bengaluru 17.4.x, 17.5.x, 17.6.x	C9800-L-hw-programmables.17.11.01.pkg
Cisco IOS XE Cupertino 17.7.x, 17.8.x, 17.9.x	C9800-L-hw-programmables.17.11.01.pkg
Cisco IOS XE Dublin 17.10.x, 17.11.x, 17.12.x	C9800-L-hw-programmables.17.11.01.pkg
Cisco IOS XE 17.13.x	C9800-L-hw-programmables.17.11.01.pkg

Note The FPGAs in Cisco Catalyst 9800-80 and 9800-40 Wireless Controllers does not need an upgrade when the controller's version numbers are as follows.

- C9800-80: CPLD version is 19042909
- C9800-40: CPLD version is 19030712

Upgrading Field Programmable for Cisco Catalyst 9800M/H1/H2 Wireless Controllers

This section explains field programmable installation procedure for the Cisco Catalyst 9800M/H1/H2 Wireless Controller.

Before you begin

Verify the current field programmable version using the following command:

```
Device# show hw-programmable all
Slot              CPLD version              FPGA version
------------------------------------------------------------------------
R0                23050912                  00000038
F0                23050912                  N/A
0                 23050912                  23050912
```

Procedure

Step 1 Download the hardware programmable image. See the Hardware Programmable Devices (CW9800M, CW9800H1 and CW9800H2) section for the recommended FPGA Version and its corresponding software download link.

Step 2 Copy the FPGA package image to bootflash, using TFTP or USB.

- TFTP:

```
copy tftp://ip address of TFTP server/file path/CW9800-hw-programmables.17.18.03.SPA.pkg
 bootflash:
```

- USB:

```
copy usb0:CW9800-hw-programmables.17.18.03.SPA.pkg bootflash:
```

After the system confirms that the copy operation is successful (sample output given below), proceed to the next step.

```
Device# copy tftp://9.1.0.101/PATH/CW9800-hw-programmables.17.18.03.SPA.pkg bootflash:

Destination filename [W9800-hw-programmables.17.18.03.SPA.pkg]?
Accessing ftp://*:*@9.1.0.101/UN/CW9800-hw-programmables.17.18.03.SPA.pkg!!!!!!!!!!!!!!!!!!!
[OK - 3863556/4096 bytes]
3863556 bytes copied in 4.755 secs (812364 bytes/sec)
```

Step 3 Initiate the upgrade using the command given below and follow the instructions from the tool.

```
Device# upgrade hw-programmable fpga filename
bootflash:CW9800-hw-programmables.17.18.03.SPA.pkg chassis active r0

Start service Upgrade FPGA on Route-Processor 0 from current version 00000038 to 0000003F
 (Y)es/(N)o/(C)ontinue? [Y]
Start service This command could take up to 20 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 you will be asked to reload the chassis.  (Y)es/(N)o/(C)ontinue? [Y]

Upgrade fpga hw-programmable on Route-Processor 0
Skipping FPGA version in upgrade file. Using FPGA version of 0x3f
Max image flag setFPGA: Offset is 0x700000, FPGA: Max Image size is 0 (to be calculated)
FW: Offset is 0x280000, FW: Max Image size is 0 (to be calculated)
Initializing upgrade...
upgrading FPGA FW Image...
upgrading TAM FW Image...
committing FW update...
FPGA UPDATE is COMPLETE
Powercycling the chassis for upgrade to take effect

Chassis 1 reloading, reason - Reload command
WLC#Nov 28 00:27:41.677: %PMAN-5-EXITACTION: F0/0: pvp: Process manager is exiting:
Nov 28 00:27:41.714: %PMAN-5-EXITACTION: C0/0: pvp: Process manager is exiting:
Nov 28 00:27:42.678: %PMAN-5-EXITACTION: R0/0: pvp: Process manager is exiting: reload
action requested

Powercycling the box

Initializing Hardware ...
.
.
```

```
.
Database already initialized
FIPS: Flash Key Check : Key Not Found, FIPS Mode Not Enabled
cisco CW9800M (1WSP) processor (revision 1WSP) with 9798611K/6147K bytes of memory.
Processor board ID FLX271000AX
Router operating mode: Autonomous
1 Virtual Ethernet interface
4 Ten Gigabit Ethernet interfaces
2 TwentyFive Gigabit Ethernet interfaces
32768K bytes of non-volatile configuration memory.
67108864K bytes of physical memory.
26763263K bytes of eUSB flash at bootflash:.
468786007K bytes of SATA hard disk at harddisk:.
60088304K bytes of USB flash at usb0:.
60088304K bytes of USB flash at usb1:.
0K bytes of Cloud S3 Storage at cloudfs:.

Base Ethernet MAC Address          : C4:7E:E0:54:F3:80

Installation mode is BUNDLE

 INSECURE DYNAMIC WARNING - Module: SSH, Command: crypto key generate rsa modulus 2048 label
 CLOUDM_PKEY , Reason: An SSH hostkey has been provisioned on the device with insufficient
 key length, Remediation: Please provision an SSH RSA hostkey with minimum modulus size of
 3072 bits for enhanced security, Submode: exec, Parent CLI: Not Applicable
 INSECURE DYNAMIC WARNING - Module: IP, Command: ip forward-protocol udp tftp, Reason:
Legacy protocol poses data confidentiality and integrity risks due to lack of encryption
and authentication, Remediation: This is a legacy feature, please consider disabling it,
Submode: configure, Parent CLI: Not Applicable
 INSECURE DYNAMIC WARNING - Module: TELNET, Command: ip telnet comport enable, Reason: IP
traffic is not encrypted, Remediation: Migrate to secure SSH-based remote access, Submode:
 configure, Parent CLI: Not Applicable
 SECURITY WARNING - Module: TFTP, Command: ip tftp source-interface GigabitEthernet0 ,
Reason: Legacy protocol poses data confidentiality and integrity risks due to lack of
encryption and authentication, Description: TFTP service enabled - unencrypted file transfer
 protocol vulnerable to eavesdropping and tampering, Remediation: Transition to secure file
 transfer methods using SCP, SFTP, HTTPS protocols
 INSECURE DYNAMIC WARNING - Module: TFTP, Command: ip tftp arp-glean, Reason: Legacy protocol
 poses data confidentiality and integrity risks due to lack of encryption and authentication,
 Remediation: Transition to secure file transfer methods using SCP, SFTP, HTTPS protocols,
 Submode: configure, Parent CLI: Not Applicable
 INSECURE DYNAMIC WARNING - Module: HTTP, Command: ip http server , Reason: Legacy protocol
 poses data confidentiality and integrity risks due to lack of encryption and authentication,
 Remediation: Use http secure server to ensure secure web access, Submode: configure, Parent
 CLI: Not Applicable
 INSECURE DYNAMIC WARNING - Module: RCMD, Command: ip rcmd domain-lookup, Reason: No
encryption is configured, Remediation: This is a legacy feature, please consider disabling
 it, Submode: configure, Parent CLI: Not Applicable
 INSECURE DYNAMIC WARNING - Module: RCMD, Command: ip rcmd domain-lookup, Reason: No
encryption is configured, Remediation: This is a legacy feature, please consider disabling
 it, Submode: configure, Parent CLI: Not Applicable
 INSECURE DYNAMIC WARNING - Module: IP, Command: ip forward-protocol udp tftp, Reason:
Legacy protocol poses data confidentiality and integrity risks due to lack of encryption
and authentication, Remediation: This is a legacy feature, please consider disabling it,
Submode: configure, Parent CLI: Not Applicable
 INSECURE DYNAMIC WARNING - Module: FTP, Command: ip ftp passive, Reason: No encryption is
 configured, Remediation: Transition to secure file transfer methods using SCP, SFTP, HTTPS
 protocols, Submode: configure, Parent CLI: Not Applicable
 INSECURE DYNAMIC WARNING - Module: TELNET, Command: ip telnet comport enable, Reason: IP
traffic is not encrypted, Remediation: Migrate to secure SSH-based remote access, Submode:
 configure, Parent CLI: Not Applicable
 INSECURE DYNAMIC WARNING - Module: TELNET, Command: ip telnet tos, Reason: IP traffic is
not encrypted, Remediation: Migrate to secure SSH-based remote access, Submode: configure,
 Parent CLI: Not Applicable
```

```
 INSECURE DYNAMIC WARNING - Module: TELNET, Command: ip telnet comport disconnect delay,
Reason: IP traffic is not encrypted, Remediation: Migrate to secure SSH-based remote access,
 Submode: configure, Parent CLI: Not Applicable
 INSECURE DYNAMIC WARNING - Module: TELNET, Command: ip telnet comport flow level, Reason:
 IP traffic is not encrypted, Remediation: Migrate to secure SSH-based remote access,
Submode: configure, Parent CLI: Not Applicable
 INSECURE DYNAMIC WARNING - Module: TELNET, Command: ip telnet comport receive window,
Reason: IP traffic is not encrypted, Remediation: Migrate to secure SSH-based remote access,
 Submode: configure, Parent CLI: Not Applicable
 INSECURE DYNAMIC WARNING - Module: TFTP, Command: ip tftp arp-glean, Reason: Legacy protocol
 poses data confidentiality and integrity risks due to lack of encryption and authentication,
 Remediation: Transition to secure file transfer methods using SCP, SFTP, HTTPS protocols,
 Submode: configure, Parent CLI: Not Applicable
 INSECURE DYNAMIC WARNING - Module: TFTP, Command: ip tftp blocksize, Reason: Legacy protocol
 poses data confidentiality and integrity risks due to lack of encryption and authentication,
 Remediation: Transition to secure file transfer methods using SCP, SFTP, HTTPS protocols,
 Submode: configure, Parent CLI: Not Applicable

Press RETURN to get started!
```

Step 4 Verify the update by entering the following command:

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

Slot              CPLD version              FPGA version
------------------------------------------------------------------------
R0                25101015                  0000003f
F0                25101015                  N/A
0                 25101015                  25101015
```

Upgrading ROMMON for Cisco Catalyst 9800M/H1/H2 Wireless Controllers

This section explains the ROMMON installation procedure for the Cisco Catalyst 9800M/H1/H2 Wireless Controller.

Before you begin

Verify the current ROMMON version using the following commands:

- **Standalone Setup**

  ```
  Device# show rom-monitor chassis active r0

  ============================================================
  System Bootstrap, Version 17.15(2r), RELEASE SOFTWARE
  Copyright (c) 1994-2025 by cisco Systems, Inc.
  ```

- **High-Availability Setup**

  Run the following commands on the active controller.

  Verify the current ROMMON version for **Active** controller:

  ```
  Device# show rom-monitor chassis active r0

  ============================================================
  System Bootstrap, Version 17.15(2r), RELEASE SOFTWARE
  Copyright (c) 1994-2025 by cisco Systems, Inc.
  ```

Verify the current ROMMON version for **Standby** controller:

```
Device# show rom-monitor chassis standby r0

============================================================
System Bootstrap, Version 17.15(2r), RELEASE SOFTWARE
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```

Procedure

Step 1 Download the software image. See the ROMMON Images section for the recommended ROMMON Version and its corresponding software download link.

Step 2 Copy the ROMMON image to bootflash, using TFTP or USB.

- TFTP:

  ```
  copy tftp://ip address of TFTP server/file path/ CW9800-rommon.1715-2r.pkg bootflash:
  ```

- USB:

  ```
  copy usb0: CW9800-rommon.1715-2r.pkg bootflash:
  ```

After the system confirms that the copy operation is successful (sample output given below), proceed to the next step.

```
Device# copy tftp://9.1.0.101/PATH/CW9800-rommon.1715-2r.pkg bootflash:

Destination filename [CW9800-rommon.1715-2r.pkg]?
Accessing ftp://*:*@9.1.0.101/UN/pleelara/CW9800-rommon.1715-2r.pkg...!!!!!!!!!!!!!!!!!!!
[OK - 4645908/4096 bytes]
4645908 bytes copied in 5.719 secs (812364 bytes/sec)
```

Step 3 Initiate the upgrade using the command given below and follow the instructions from the tool.

```
Device# upgrade rom-monitor filename bootflash:CW9800-rommon.1715-2r.pkg chassis active r0

Verifying the code signature of the ROMMON package...
Chassis model CW9800H2 has a single rom-monitor.

Upgrade rom-monitor

Target copying rom-monitor image file

Secure update of the ROMMON image will occur after a reload.

131072+0 records in
131072+0 records out
131072 bytes (131 kB, 128 KiB) copied, 1.61893 s, 81.0 kB/s
Copying ROMMON environment
131072+0 records in
131072+0 records out
131072 bytes (131 kB, 128 KiB) copied, 0.740703 s, 177 kB/s
131072+0 records in
131072+0 records out
```

```
131072 bytes (131 kB, 128 KiB) copied, 0.737416 s, 178 kB/s
ROMMON upgrade complete.
To make the new ROMMON permanent, you must restart the RP.
```

Step 4 Reboot the controller by entering this command:

```
Device# reload

Reload command is being issued on Active unit, this will reload the whole stack
Proceed with reload? [confirm]

System integrity status: 80170200  14030116  Procyon RSM done


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Current image running: Boot ROM1
Last reset cause: LocalSoft

CW9800H2 platform with 134217728 Kbytes of main memory


Successfully initiated a secure capsule update.

The system will be reset multiple times for completing the capsule update.
Please wait till you get the prompt.

Initializing Hardware ...

System integrity status: 80170200  14030116
          Platform    Name: Idaville
            Current  Version: Idaville.05.45.47.0054
            Update   Version: Idaville.05.45.47.0054


   System integrity status: 80170200  14030116


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 Current image running: Boot ROM1
 Last reset cause: PowerCycleRequest

 CW9800H2 platform with 134217728 Kbytes of main memory

Secure capsule update was successful
  Capsule Processed : 10/14/2023  12:00 UTC
  Capsule Status    : Success
Flash upgrade reset 1 in progress
........System integrity status: 80170200  14030106
Procyon RSM done


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Current image running: *Upgrade in progress* Boot ROM0
Last reset cause: BootRomUpgrade
CW9800H2 platform with 134217728 Kbytes of main memory
```

```
rommon 1 >
rommon 1 > boot bootflash:1wsp_FanSpeed_Test.SSA.bin
File size is 0x69d72914
Located 1wsp_FanSpeed_Test.SSA.bin
Image size 1775708436 inode num 39, bks cnt 433523 blk size 8*512
################################################################################################################################################################
Boot image size = 1775708436 (0x69d72914) bytes

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

Package header rev 3 structure detected
Validating main package signatures

RSA Signed DEVELOPMENT Image Signature Verification Successful.
Validating subpackage signatures
Image validated
Both links down, not waiting for other chassis
Chassis number is 1

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Cisco IOS Software [IOSXE], CW9800 Software (C9800_IOSXE-K9), Experimental Version
17.18.20250217:093213
[BLD_POLARIS_DEV_S2C_20250216_211854-16-g531c977df09c-dirty:/nobackup/ankurath/1wsp_FanSpeed
 102]
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The default license boot level has been set to none

Database already initialized
FIPS: Flash Key Check : Key Not Found, FIPS Mode Not Enabled
cisco CW9800H2 (1WKPH) processor (revision 1WKPH) with 9802784K/6147K bytes of memory.
Processor board ID FLX271000UD
Router operating mode: Autonomous
1 Virtual Ethernet interface
8 Ten Gigabit Ethernet interfaces
2 Forty Gigabit Ethernet interfaces
32768K bytes of non-volatile configuration memory.
134217728K bytes of physical memory.
26763263K bytes of eUSB flash at bootflash:.
468786007K bytes of SATA hard disk at harddisk:.
0K bytes of Cloud S3 Storage at cloudfs:.

Base Ethernet MAC Address          : C4:7E:E0:D2:C6:00

Installation mode is BUNDLE

----------------------------------------------------
 System is booted with ASCII based startup configuration
 due to missing binary configuration or previous condition.
 Please perform "write mem" to generate binary
 configuration. System uses binary-config internally to
 reduce overall bootime significantly.
----------------------------------------------------

Warning: Address not yet configured.

 WARNING: ** NOTICE **  The H.323 protocol is no longer supported from IOS-XE release 17.6.1.
 Please consider using SIP for multimedia applications.



Press RETURN to get started!
```

Step 5 Verify the update on both active and standby controllers by entering this command:

```
Device# show rom-monitor chassis active r0
============================================================

System Bootstrap, Version 17.15(2r), RELEASE SOFTWARE
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```

Upgrading Field Programmables for Cisco Catalyst 9800-L Wireless Controller

This section explains field programmable installation procedure for Cisco Catalyst 9800-L Wireless Controller.

Upgrading ROMMON for Cisco Catalyst 9800-L Wireless Controllers

Note During ROMMON upgrade, the controller may reboot several times and it is not advisable to power cycle the device during this period as it may lead to device failure. Remember that a typical upgrade process would take about 30 minutes to complete the cycle.

Before you begin

Note To upgrade the ROMMON from 16.12(1r) or a previous version to higher versions, first upgrade ROMMON to 16.12(3r) and then to the required version. Downgrading to older ROMMON versions from release 16.12(3r) is not supported.

16.12(3r) is a mandatory requirement to upgrade to Cisco IOS-XE 17.9.x and later releases.

- **Upgrade path:** 16.12(1r) to 16.12(3r)
- **Downgrade path:** Downgrade is not supported from 16.12(3r) to previous releases.

Verify the current ROMMON version using the following commands:

- **Standalone Setup**

```
Device# show rom-monitor chassis active r0
============================================================

System Bootstrap, Version 16.12(1r), RELEASE SOFTWARE
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```

- **High-Availability Setup**

  Run the following commands on the active controller.

  Verify the current ROMMON version for **Active** controller:

```
Device# show rom-monitor chassis active r0

============================================================
System Bootstrap, Version 16.12(1r), RELEASE SOFTWARE
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```

  Verify the current ROMMON version for **Standby** controller:

```
Device# show rom-monitor chassis standby r0

============================================================
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```

If the ROMMON version is earlier than 16.12(3r) for the standalone, active, or standby controller, use the procedure given below to upgrade the ROMMON:

Note To upgrade ROMMON of the controller in an HA topology, see *Upgrading ROMMON in a High-Availability Topology* section.

Procedure

Step 1 Download the software image. See the ROMMON Images section for the recommended ROMMON Version and its corresponding software download link.

Step 2 Copy the ROMMON image to bootflash, using TFTP, SCP, FTP, or HTTP .

Note
We recommend that you use the TFTP method, though SCP, FTP, and HTTP are also supported.

```
copy tftp://ip address of TFTP server/file path/C9800-L-rommon.1612-3r.pkg bootflash:
```

After the system confirms that the copy operation is successful (sample output given below), proceed to the next step.

```
Device# $copy tftp://9.1.0.101/PATH/FILENAME bootflash:

Destination filename [C9800-L-rommon.1612-3r.pkg]?
Accessing tftp://9.1.0.101/c9800/C9800-L-rommon.1612-3r.pkg...
Loading c9800/C9800-L-rommon.1612-3r.pkg from 9.1.0.101 (via Vlan44):
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
[OK - 7805964 bytes]
7805964 bytes copied in 6.697 secs (1165591 bytes/sec)
```

Step 3 Initiate the upgrade using the command given below and follow the instructions from the tool.

```
Device# upgrade rom-monitor filename bootflash:C9800-L-rommon.1612-3r.pkg chassis active
r0

Verifying the code signature of the ROMMON package...
Chassis model C9800-L-F-K9 has a single rom-monitor.

Upgrade rom-monitor

Target copying rom-monitor image file

Secure update of the ROMMON image will occur after a reload.

8388608+0 records in
8388608+0 records out

Copying ROMMON environment 8388608+0 records in


131072 bytes (131 kB, 128 KiB) copied, 1.47571 s, 88.8 kB/s ROMMON upgrade complete.
To make the new ROMMON permanent, you must restart the RP.
```

Step 4 Reboot the controller by entering this command:

```
Device# reload
```

```
Reload command is being issued on Active unit, this will reload the whole stack Proceed
with reload? [confirm]

*Nov 27 11:06:31.648: %SYS-5-RELOAD: Reload requested by console. Reload Reason: Reload
Command.
Chassis 1 reloading, reason - Reload command
Nov 27 11:06:39.735: %PMAN-5-EXINov 27 11:06:39.755: %PMAN-5-EXITACTION: F0/0: pvp: Process
 manager is exiting:
Nov 27 11:06:40.856: %PMAN-5-EX

Initializing Hardware ...

System Bootstrap, Version 16.12(1r), RELEASE SOFTWARE Copyright (c) 1994-2019 by cisco
Systems, Inc.

Current image running: Boot ROM1
Last reset cause: LocalSoft
The values of MSR  0x198h = 00001400 and MSR 0x199h = 00001400 for C9800-L C9800-L-X-K9
platform with 16777216 Kbytes of main memory

Successfully initiated a secure capsule update.
The system will be reset multiple times for completing the capsule update. Please wait till
 you get the promp
Initializing Hardware ...

Platform Name: Grangeville-NS
Current  Version: GRNV-NS.05.22.12.0008
Update Version: GRNV-NS.05.22.12.0008
Updating Block at FEFF0000h 0%
Updating Block at FEFF1000h 0%
Updating Block at FFFFE000h 99%
Updating Block at FFFFF000h 100%

Initializing Hardware ...
˘
System Bootstrap, Version 16.12(3r), RELEASE SOFTWARE Copyright (c) 1994-2019 by Cisco
Systems, Inc.

Current image running: Boot ROM1
Last reset cause: LocalSoft

The values of MSR 0x198h = 00001400 and MSR 0x199h = 00001400 for C9800-L

C9800-L-X-K9 platform with 16777216 Kbytes of main memory

Secure capsule update was successful
Capsule Processed : 11/27/2019 11:12 UTC
Capsule Status : Success
Flash upgrade reset 1 in progress

Initializing Hardware ...

˘
System Bootstrap, Version 16.12(3r), RELEASE SOFTWARE Copyright (c) 1994-2019 by Cisco
Systems, Inc.
Current image running: *Upgrade in progress* Boot ROM0 Last reset cause: BootRomUpgrade
The values of MSR 0x198h = 00001400 and MSR 0x199h = 00001400 for C9800-L C9800-L-X-K9
platform with 16777216 Kbytes of main memory

File size is 0x38fed6b2
Located C9800-L-universalk9_wlc.16.12.02prd5.SPA.bin

Image size 956225202 inode num 21, bks cnt 233454 blk size 8*512
###############################################################################################
```

```
Boot image size = 956225202 (0x38fed6b2) bytes

ROM:RSA Self Test Passed

ROM:Sha512 Self Test Passed
Package header rev 3 structure detected Calculating SHA-1 hash...done
validate_package_cs: SHA-1 hash:
calculated ce3982a2:f0737625:72fcbb02:93ed3683:b7fe0a2e expected
ce3982a2:f0737625:72fcbb02:93ed3683:b7fe0a2e
Validating main package signatures
RSA Signed RELEASE Image Signature Verification Successful. Validating subpackage signatures
Image validated

Both links down, not waiting for other chassis Chassis number is 1
Nov 27 11:16:23.371: %PMAN-3-PROC_EMPTY_EXEC_FILE: R0/0: pvp: Empty executable used for
process dpman

Nov 27 11:16:34.902: %PMAN-3-PROC_EMPTY_EXEC_FILE: R0/0: pvp: Empty executable used for

process bt_logger

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170 West Tasman Drive
San Jose, California 95134-1706

Cisco IOS Software [Gibraltar], C9800 Software (C9800_IOSXE-K9), Version 16.12.2prd5, RELEASE
 SOFTWARE (fc1)
Technical Support: http://www.cisco.com/techsupport
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FIPS: Flash Key Check : Key Not Found, FIPS Mode Not Enabled
```

```
All TCP AO KDF Tests Pass
Cisco C9800-L-F-K9 (C9800-L) processor (revision C9800-L) with 1711451K/6147K bytes of
memory.
Processor board ID FCL234400CV
1 Virtual Ethernet interface
4 2.5 Gigabit Ethernet interfaces
2 Ten Gigabit Ethernet interfaces
32768K bytes of non-volatile configuration memory. 16777216K bytes of physical memory.
26251263K bytes of eUSB flash at bootflash:.

0K bytes of WebUI ODM Files at webui:.

Base Ethernet MAC Address : F4:BD:9E:56:5F:E0
Installation mode is BUNDLE

Press RETURN to get started!

*Nov 27 11:17:18.273: %SMART_LIC-6-EXPORT_CONTROLLED: Usage of export controlled features
is not allowed
Adding registry invocations for the WLC platform
*Nov 27 11:17:19.690: %SMART_LIC-6-AGENT_READY: Smart Agent for Licensing is initialized
*Nov 27 11:17:19.690: %SMART_LIC-6-AGENT_ENABLED: Smart Agent for Licensing is enabled

*Nov 27 11:18:00.374: %LINEPROTO-5-UPDOWN: Line protocol on Interface TenGigabitEthernet0/1/1,
 changed state to up
*Nov 27 11:18:07.446: %SMART_LIC-6-EXPORT_CONTROLLED: Usage of export controlled features
is not allowed
*Nov 27 11:18:07.446: %CALL_HOME-6-CALL_HOME_ENABLED: Call-home is enabled by Smart Agent
for Licensing.
```

Step 5 Verify the update on the active controller by entering this command:

```
Device# show rom-monitor chassis active r0
============================================================

System Bootstrap, Version 16.12(3r), RELEASE SOFTWARE
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```

Step 6 Verify the update on the standby controller by entering this command:

```
Device# show rom-monitor chassis standby r0
============================================================

System Bootstrap, Version 16.12(3r), RELEASE SOFTWARE
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```

Upgrading Ethernet PHY (Fiber)

Before you begin

This Ethernet PHY upgrade procedure applies only to Fiber SKU (C9800-L-F-K9) model of the Cisco Catalyst 9800-L Wireless Controller.

Use the following command identify the models.

```
Device# show inventory

NAME: "Chassis 2", DESCR: "Cisco C9800-L-F-K9 Chassis"
PID: C9800-L-F-K9 , VID: 01 , SN: FCW2328H00A
```

Verify the current Ethernet PHY version on the standalone, active, or standby controllers using the following **show** commands:

- **Standalone Setup**

```
Device# show platform hardware chassis active qfp datapath pmd ifdev | i FW

============================================================

FFW Version     : 0x80000757
FW MDIO        : 9.1.2 ID: 43503 vers: 37230
FW Version     : 0x80000757
FW MDIO        : 9.1.2 ID: 43503 vers: 37230
FW Version     : 0x80000756
FW MDIO        : 9.1.2 ID: 43503 vers: 37230
FW Version     : 0x80000756
FW MDIO        : 9.1.2 ID: 43503 vers: 37230
FW Version     : 3.1.121
FW Version     : 3.1.121
```

- **High-Availability Setup**

  Run the following commands only on the active controller.

  Verify the current Ethernet PHY version for **Active** controller.

```
Device# show platform hardware chassis active qfp datapath pmd ifdev | i FW

============================================================

FW Version     : 0x80000757
FW MDIO        : 9.1.2 ID: 43503 vers: 37230
FW Version     : 0x80000757
FW MDIO        : 9.1.2 ID: 43503 vers: 37230
FW Version     : 0x80000756
FW MDIO        : 9.1.2 ID: 43503 vers: 37230
FW Version     : 0x80000756
FW MDIO        : 9.1.2 ID: 43503 vers: 37230
FW Version     : 3.1.121
FW Version     : 3.1.121
```

  Verify the current Ethernet PHY version for **Standby** controller.

```
Device# show platform hardware chassis standby qfp datapath pmd ifdev | i FW

============================================================

FW Version     : 0x80000757
FW MDIO        : 9.1.2 ID: 43503 vers: 37230
FW Version     : 0x80000757
FW MDIO        : 9.1.2 ID: 43503 vers: 37230
FW Version     : 0x80000756
FW MDIO        : 9.1.2 ID: 43503 vers: 37230
FW Version     : 0x80000756
FW MDIO        : 9.1.2 ID: 43503 vers: 37230
FW Version     : 3.1.121
FW Version     : 3.1.121
```

If any of the Ethernet PHY firmware (FW or MDIO) versions are earlier than the firmware version given in the **show** command output for the standalone, active, or standby controller, use the procedure given below to upgrade the Ethernet PHY firmware:

Note To upgrade the Ethernet PHY of the controller in a High Availability topology, see Upgrading Ethernet PHY in a High-Availability Topology, on page 42.

Procedure

Step 1 Download the software image. See the Ethernet PHY Images section for the recommended Hardware Programmable package and its corresponding software download link.

Step 2 Copy the Ethernet PHY image to bootflash: using TFTP or USB.

- TFTP:

```
copy tftp://ip address of TFTP server/file path/
C9800-L-hw-programmables.17.03.02.pkg bootflash:
```

- USB:

```
copy usb0: C9800-L-hw-programmables.17.03.02.pkg bootflash:
```

After the system confirms that the copy operation is successful (sample output given below), proceed to the next step.

```
Device# $copy tftp://9.1.0.101/PATH/FILENAME bootflash:

Destination filename [C9800-L-hw-programmables.17.03.02.pkg ]?
Accessing tftp://9.1.0.101/c9800/C9800-L-hw-programmables.17.03.02.pkg
Loading c9800/ C9800-L-hw-programmables.17.03.02.pkg from 9.1.0.101 (via Vlan44):
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
[OK - 2106376 bytes]
```

Step 3 Initiate the upgrade using the command given below and follow the instructions from the tool.

```
Device# upgrade hw-programmable phy filename bootflash: C9800-L-hw-programmables.17.03.02.pkg

Update PHY firmware on C9800-L platform.
Upgrade Ver for AQR412 is 9.1.2.1385
Upgrade Ver for AQC100 is 3.1.106

PHY upgrade pending for Reboot. Please reboot to upgrade the firmware.
```

Step 4 Reboot the controller by entering this command:

```
Device# reload

Reload command is being issued on Active unit, this will reload the whole stack Proceed
with reload? [confirm]

*Mar  6 04:25:52.650: %SYS-5-RELOAD: Reload requested by new on console. Reload Reason:
Reload Command.

Validating subpackage signatures
Image validated
Tue Mar 6 04:28:37 UTC 2018 Calling Aquantia Firmware upgrade process
Tue Mar 6 04:29:34 UTC 2018 file: /bootflash/aq_phy_upgrade_info deleted
```

```
Tue Mar 6 04:29:34 UTC 2018 Updating Phy firmware from pakage file =
/bootflash/C9800-L-hw-programmables.17.03.02.pkg
Tue Mar 6 04:29:35 UTC 2018 Bay0: Firmware:
/tmp/hwprg_upgrade_pub/hwprog/RP/KATAR/PHY/AQR412/upgrade_phy.cld
Tue Mar 6 04:29:35 UTC 2018 Bay0: Firmware Version: 9.1.2.1385

Tue Mar 6 04:29:35 UTC 2018 Bay1: Firmware:
/tmp/hwprg_upgrade_pub/hwprog/RP/KATAR/PHY/AQC100/upgrade_phy.clx
Tue Mar 6 04:29:35 UTC 2018 Bay1: Firmware Version: 3.1.106

Tue Mar 6 04:29:35 UTC 2018 /bootflash/C9800-L-hw-programmables.17.03.02.pkg is code signed

Tue Mar 6 04:29:35 UTC 2018 ####################################################################

Tue Mar 6 04:29:35 UTC 2018 # Please make sure POWER SUPPLY is always ON during this period.
 #
Tue Mar 6 04:29:35 UTC 2018 # Loss of POWER will completely kill this unit and make it #

Tue Mar 6 04:29:36 UTC 2018 # unrecoverable #

Tue Mar 6 04:29:36 UTC 2018 ####################################################################

Tue Mar 6 04:29:36 UTC 2018 ####################################################################

Tue Mar 6 04:29:36 UTC 2018 Aquantia Bay-0 upgrade firmware:
/tmp/hwprg_upgrade_pub/hwprog/RP/KATAR/PHY/AQR412/upgrade_phy.cld found
Tue Mar 6 04:29:36 UTC 2018 Aquantia firmware upgrade for Bay-0 started. Please wait.

Tue Mar 6 04:29:36 UTC 2018 ####################################################################

Tue Mar 6 04:29:37 UTC 2018 Current version of Bay-0 firmware: 9.1.2.1385 upgrade version:
 9.1.2.1385
Tue Mar 6 04:31:38 UTC 2018 Aquantia firmware upgrade succeeded for Bay-0
################################################################
################################################################
Tue Mar 6 04:31:38 UTC 2018 Aquantia Bay-1 upgrade firmware:
/tmp/hwprg_upgrade_pub/hwprog/RP/KATAR/PHY/AQC100/upgrade_phy.clx found
Tue Mar 6 04:31:38 UTC 2018 Aquantia firmware upgrade for Bay-1 port-1 started
################################################################
Tue Mar 6 04:31:39 UTC 2018 Current version of Bay-1 port-1 firmware: 3.1.96 upgrade version:
 3.1.106
Tue Mar 6 04:31:59 UTC 2018 Aquantia firmware upgrade succeeded for Bay-1 port-1
Tue Mar 6 04:31:59 UTC 2018 ####################################################################
Tue Mar 6 04:31:59 UTC 2018 ####################################################################
Tue Mar 6 04:31:59 UTC 2018 Aquantia firmware upgrade for Bay-1 port-2 started
Tue Mar 6 04:31:59 UTC 2018 ####################################################################
Tue Mar 6 04:31:59 UTC 2018 Current version of Bay-1 port-1 firmware: 3.1.96 upgrade version:
 3.1.106
Tue Mar 6 04:32:18 UTC 2018 Aquantia firmware upgrade succeeded for Bay-1 port-2
Tue Mar 6 04:32:18 UTC 2018 ####################################################################
Tue Mar 6 04:32:18 UTC 2018 Aquantia firmware upgrade completed successfully!!!
Tue Mar 6 04:32:18 UTC 2018 Rebooting box

Initializing Hardware ...
```

Step 5 After the upgrade is complete, device power cycles automatically, and IOS prompt is displayed.

Step 6 Verify the update on the controller by entering this command:

```
Device# show platform hardware chassis active qfp datapath pmd ifdev | i FW

============================================================
FW Version     : 0x80000757
FW MDIO        : 9.1.2 ID: 43503 vers: 37230
FW Version     : 0x80000757
```

```
FW MDIO        : 9.1.2 ID: 43503 vers: 37230
FW Version     : 0x80000756
FW MDIO        : 9.1.2 ID: 43503 vers: 37230
FW Version     : 0x80000756
FW MDIO        : 9.1.2 ID: 43503 vers: 37230
FW Version     : 3.1.121
FW Version     : 3.1.121
```

Upgrading Ethernet PHY (Copper)

This procedure upgrades the Ethernet PHY version of your controller.

Before you begin

This Ethernet PHY upgrade procedure applies only to Copper SKU (C9800-L-C-K9) model of the Cisco Catalyst 9800-L Wireless Controller.

Use the **show inventory** command identify the model.

```
Device# show inventory

NAME: "Chassis 2", DESCR: "Cisco C9800-L-C-K9 Chassis"
PID: C9800-L-C-K9 , VID: 01 , SN: FCW2328H00A
```

Verify the current Ethernet PHY version on the standalone, active, or standby controllers using the following **show** commands:

- **Standalone Setup**

  ```
  Device# show platform hardware chassis active qfp datapath pmd ifdev | i FW

  ============================================================

  FW Version     : 0x80000757
  FW MDIO        : 9.1.2 ID: 43503 vers: 1376
  FW Version     : 0x80000757
  FW MDIO        : 9.1.2 ID: 43503 vers: 1376
  FW Version     : 0x80000756
  FW MDIO        : 9.1.2 ID: 43503 vers: 1376
  FW Version     : 0x80000756
  FW MDIO        : 9.1.2 ID: 43503 vers: 1376
  FW Version     : 3.1.76
  FW Version     : 3.1.76
  ```

- **High-Availability Setup**

  Run the following command on the active controller.

  Verify the current Ethernet PHY version for **Active** controller.

  ```
  Device# show platform hardware chassis active qfp datapath pmd ifdev | i FW

  ============================================================

  FW Version     : 0x80000757
  FW MDIO        : 9.1.2 ID: 43503 vers: 1376
  FW Version     : 0x80000757
  FW MDIO        : 9.1.2 ID: 43503 vers: 1376
  FW Version     : 0x80000756
  FW MDIO        : 9.1.2 ID: 43503 vers: 1376
  ```

```
FW Version     : 0x80000756
FW MDIO        : 9.1.2 ID: 43503 vers: 1376
FW Version     : 3.1.76
FW Version     : 3.1.76
```

Verify the current Ethernet PHY version for **Standby** controller.

```
Device# show platform hardware chassis standby qfp datapath pmd ifdev | i FW

============================================================

FW Version     : 0x80000757
FW MDIO        : 9.1.2 ID: 43503 vers: 1376
FW Version     : 0x80000757
FW MDIO        : 9.1.2 ID: 43503 vers: 1376
FW Version     : 0x80000756
FW MDIO        : 9.1.2 ID: 43503 vers: 1376
FW Version     : 0x80000756
FW MDIO        : 9.1.2 ID: 43503 vers: 1376
FW Version     : 3.1.76
FW Version     : 3.1.76
```

If any of the Ethernet PHY firmware (FW or MDIO) versions is earlier than the firmware version given in the **show** command output for the standalone, active, or standby controller, use the procedure given below to upgrade the Ethernet PHY firmware:

Note To upgrade the Ethernet PHY of the controller in a High Availability topology, see Upgrading Ethernet PHY in a High-Availability Topology, on page 42.

Procedure

Step 1 Download the software image. See the Ethernet PHY Images section for the recommended Hardware Programmable package and its corresponding software download link.

Step 2 Copy the Ethernet PHY image to bootflash: using TFTP or USB.

- TFTP:

  ```
  copy tftp://ip address of TFTP server/file path/C9800-L-hw-programmables.17.03.02.pkg
  bootflash:
  ```

- USB:

  ```
  copy usb0: C9800-L-hw-programmables.17.03.02.pkg bootflash:
  ```

After the system confirms that the copy operation is successful (sample output given below), proceed to the next step.

```
Device# $copy tftp://9.1.0.101/PATH/FILENAME bootflash:

Destination filename [C9800-L-hw-programmables.17.03.02.pkg ]?
Accessing tftp://9.1.0.101/c9800/C9800-L-hw-programmables.17.03.02.pkg
Loading c9800/C9800-L-hw-programmables.17.03.02.pkg from 9.1.0.101 (via Vlan44):
```

```
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
[OK - 7805964 bytes]
7805964 bytes copied in 6.697 secs (1165591 bytes/sec)
```

Step 3 Initiate the upgrade using the command given below and follow the instructions from the tool.

```
Device# upgrade hw-programmable phy filename bootflash:C9800-L-hw-programmables.17.03.02.pkg

Update PHY firmware on C9800-L platform.
Upgrade Ver for AQR412 is 9.1.2.1385
Upgrade Ver for AQC107 is 3.1.76

PHY upgrade pending for Reboot. Please reboot to upgrade the firmware.
```

Step 4 Reboot the controller by entering this command:

```
Device# reload

Reload command is being issued on Active unit, this will reload the whole stack Proceed
with reload? [confirm]
Chassis 1 reloading, reason - Reload command

System Bootstrap, Version 17.03, RELEASE SOFTWARE Copyright (c) 1994-2019 by cisco
Systems, Inc.
Current image running: Boot ROM0
Last reset cause: LocalSoft
The values of MSR 0x198h = 00001400 and MSR 0x199h = 00001400 for C9800-L C9800-L-X-K9
platform with 16777216 Kbytes of main memory
File size is 0x38fed6b2
Located C9800-L-hw-programmables.17.03.02.pkg
Image size 956225202 inode num 21, bks cnt 233454 blk size 8*512
###############################################################################################################
Boot image size = 956225202 (0x38fed6b2) bytes
ROM:RSA Self Test Passed
ROM:Sha512 Self Test Passed
Package header rev 3 structure detected Calculating SHA-1 hash...done
validate_package_cs: SHA-1 hash:
calculated ce3982a2:f0737625:72fcbb02:93ed3683:b7fe0a2e expected
ce3982a2:f0737625:72fcbb02:93ed3683:b7fe0a2e Validating main package signatures
RSA Signed RELEASE Image Signature Verification Successful. Validating subpackage signatures
Image validated

Tue Feb 18 07:06:47 UTC 2020 Calling Aquantia Firmware upgrade process
Tue Feb 18 07:07:40 UTC 2020 file: /bootflash/aq_phy_upgrade_info deleted
Tue Feb 18 07:07:41 UTC 2020 Updating Phy firmware from pakage file =
/bootflash/C9800-L-hw-programmables.17.03.02.pkg
Tue Feb 18 07:07:41 UTC 2020 Bay0: Firmware:
/tmp/hwprg_upgrade_pub/hwprog/RP/C9800-L/PHY/AQR412/upgrade_phy.cld
Tue Feb 18 07:07:41 UTC 2020 Bay0: Firmware Version: 9.1.2.1385

Tue Feb 18 07:07:41 UTC 2020 Bay1: Firmware:
/tmp/hwprg_upgrade_pub/hwprog/RP/C9800-L/PHY/AQC107/upgrade_phy.clx
Tue Feb 18 07:07:41 UTC 2020 Bay1: Firmware Version: 3.1.76

Tue Feb 18 07:07:41 UTC 2020 /bootflash/C9800-L-hw-programmables.17.03.02.pkg is code signed

Tue Feb 18 07:07:41 UTC 2020
################################################################
Tue Feb 18 07:07:41 UTC 2020 # Please make sure POWER SUPPLY is always ON during this period.
 #
Tue Feb 18 07:07:42 UTC 2020 # Loss of POWER will completely kill this unit and make it #

Tue Feb 18 07:07:42 UTC 2020 # unrecoverable #
```

```
Tue Feb 18 07:07:42 UTC 2020
################################################################
Tue Feb 18 07:07:42 UTC 2020 ##################################################################

Tue Feb 18 07:07:42 UTC 2020 Aquantia Bay-0 upgrade
firmware:/tmp/hwprg_upgrade_pub/hwprog/RP/C9800-L/PHY/AQR412/
upgrade_phy.cld found

Tue Feb 18 07:07:42 UTC 2020 Aquantia firmware upgrade for Bay-0 started. Please wait.

Tue Feb 18 07:07:42 UTC 2020 ##################################################################

Tue Feb 18 07:07:43 UTC 2020 Current version of Bay-0 firmware: 9.1.0.1275 upgrade version:
 9.1.2.1385
Tue Feb 18 07:09:43 UTC 2020 Aquantia firmware upgrade succeeded for Bay-0

Tue Feb 18 07:09:43 UTC 2020
################################################################
Tue Feb 18 07:09:44 UTC 2020 ##################################################################

Tue Feb 18 07:09:44 UTC 2020 Aquantia Bay-1 upgrade
firmware:/tmp/hwprg_upgrade_pub/hwprog/RP/C9800-L/PHY/AQC107/
upgrade_phy.clx found

Tue Feb 18 07:09:44 UTC 2020 Aquantia firmware upgrade for Bay-1 port-1 started

Tue Feb 18 07:09:44 UTC 2020 ##################################################################

Tue Feb 18 07:09:44 UTC 2020 Current version of Bay-1 port-1 firmware: 3.1.76 upgrade
version: 3.1.76
Tue Feb 18 07:09:44 UTC 2020 Aquantia Bay-1 port-1 firmware version: 3.1.76 same as upgrade
 version file: 3.1.76
Tue Feb 18 07:09:44 UTC 2020 Skipping upgrade for Bay-1 port-1.

Tue Feb 18 07:09:44 UTC 2020 ##################################################################

Tue Feb 18 07:09:44 UTC 2020 Aquantia firmware upgrade for Bay-1 port-2 started

Tue Feb 18 07:09:45 UTC 2020 ##################################################################

Tue Feb 18 07:09:45 UTC 2020 Current version of Bay-1 port-1 firmware: 3.1.76 upgrade
version: 3.1.76
Tue Feb 18 07:09:45 UTC 2020 Aquantia Bay-1 port-2 firmware version: 3.1.76 same as upgrade
 version file: 3.1.76
Tue Feb 18 07:09:45 UTC 2020 Skipping upgrade for Bay-1 port-2.

Tue Feb 18 07:09:45 UTC 2020 Aquantia firmware upgrade completed successfully!!!

Tue Feb 18 07:09:45 UTC 2020 Rebooting box



Initializing Hardware ...
Initializing Hardware ...
System Bootstrap, Version 16.12(3r), RELEASE SOFTWARE Copyright (c) 1994-2019 by cisco
Systems, Inc.
Current image running: Boot ROM0
Last reset cause: PowerOn
The values of MSR 0x198h = 00001400 and MSR 0x199h = 00001400 for C9800-L C9800-L-X-K9
platform with 16777216 Kbytes of main memory
Warning: filesystem is not clean
File size is 0x38fed6b2
Located C9800-L-universalk9_wlc.16.12.02prd5.SPA.bin
```

```
Image size 956225202 inode num 21, bks cnt 233454 blk size 8*512
################################################################################################################
Boot image size = 956225202 (0x38fed6b2) bytes
ROM:RSA Self Test Passed
ROM:Sha512 Self Test Passed
Package header rev 3 structure detected Calculating SHA-1 hash...done
validate_package_cs: SHA-1 hash:
calculated ce3982a2:f0737625:72fcbb02:93ed3683:b7fe0a2e expected
ce3982a2:f0737625:72fcbb02:93ed3683:b7fe0a2e Validating main package signatures
RSA Signed RELEASE Image Signature Verification Successful. Validating subpackage signatures
Image validated
Both links down, not waiting for other chassis Chassis number is 1
```

Step 5 After the upgrade is complete, device power cycles automatically, and IOS prompt is displayed.

Step 6 Use the following **show** commands to verify the update on a standalone controller.

```
Device# show platform hardware chassis active qfp datapath pmd ifdev | i FW

============================================================
FW Version  : 0x80000757
FW MDIO     : 9.1.2 ID: 43503 vers: 1385
FW Version  : 0x80000757
FW MDIO     : 9.1.2 ID: 43503 vers: 1385
FW Version  : 0x80000756
FW MDIO     : 9.1.2 ID: 43503 vers: 1385
FW Version  : 0x80000756
FW MDIO     : 9.1.2 ID: 43503 vers: 1385
FW Version  : 3.1.76
FW Version  : 3.1.76
```

Step 7 Use the following **show** commands to verify the update on a HA setup.

a) To get the current Ethernet PHY version for active controller, use the following command:

```
Device# show platform hardware chassis active qfp datapath pmd ifdev | i FW

============================================================
FW Version  : 0x80000757
FW MDIO     : 9.1.2 ID: 43503 vers: 1385
FW Version  : 0x80000757
FW MDIO     : 9.1.2 ID: 43503 vers: 1385
FW Version  : 0x80000756
FW MDIO     : 9.1.2 ID: 43503 vers: 1385
FW Version  : 0x80000756
FW MDIO     : 9.1.2 ID: 43503 vers: 1385
FW Version  : 3.1.76
FW Version  : 3.1.76
```

b) To get the current Ethernet PHY version for standby controller, use the following command:

```
Device# show platform hardware chassis standby qfp datapath pmd ifdev | i FW

============================================================
FW Version  : 0x80000757
FW MDIO     : 9.1.2 ID: 43503 vers: 1385
FW Version  : 0x80000757
FW MDIO     : 9.1.2 ID: 43503 vers: 1385
FW Version  : 0x80000756
FW MDIO     : 9.1.2 ID: 43503 vers: 1385
FW Version  : 0x80000756
FW MDIO     : 9.1.2 ID: 43503 vers: 1385
FW Version  : 3.1.76
```

```
FW Version  : 3.1.76
```

Upgrading Field Programmable for Cisco Catalyst 9800-80 Wireless Controller

This section explains field programmable installation procedure for the Cisco Catalyst 9800-80 Wireless Controller.

Before you begin

Note To upgrade the ROMMON from 16.12(5r) or a previous version to higher versions, first upgrade ROMMON to 17.3(3r) and then to the required version.

17.3(3r) is a mandatory requirement to upgrade to Cisco IOS-XE 17.9.x and later releases.

- **Upgrade path:** 16.12(5r) to 17.3(3r)
- **Downgrade path:** ROMMON downgrade is not supported.

Note When upgrading the ROMMON to version 17.3(3r), we recommend that you run the upgrade process twice (to 17.3(3r) version).

Verify the current ROMMON version using the following commands:

- **Standalone Setup**

```
Device# show rom-monitor chassis active r0
============================================================

System Bootstrap, Version 16.10(6r), RELEASE SOFTWARE
Copyright (c) 1994-2019 by Cisco Systems, Inc.
```

- **High-Availability Setup**

  Run the following command on the active controller.

  Verify the current ROMMON version for **Active** controller:

```
Device# show rom-monitor chassis active r0

System Bootstrap, Version 16.10(6r), RELEASE SOFTWARE
Copyright (c) 1994-2019  by Cisco Systems, Inc.
```

  Verify the current ROMMON version for **Standby** controller:

```
Device# show rom-monitor chassis standby r0

============================================================
System Bootstrap, Version 16.10(6r), RELEASE SOFTWARE
```

```
Copyright (c) 1994-2019  by cisco Systems, Inc.
```

If you ROMMON version is earlier than 16.12(5r) for the standalone, active, or standby controller, use the procedure given below:



Note To upgrade ROMMON of the controller in an HA topology, see *Upgrading ROMMON in a High-Availability Topology* section.

Procedure

Step 1 Download the software image. See the ROMMON Images section for the recommended ROMMON version and its corresponding software download link.

Step 2 Copy the ROMMON image to bootflash, using TFTP or USB.

- TFTP:

  copy tftp://ip address of TFTP server/file path/ C9800-80-rommon.1612-5r.pkg bootflash:

- USB:

  copy usb0: C9800-80-rommon.1612-5r.pkg bootflash:

After the system confirms that the copy operation is successful (sample output given below), proceed to the next step.

```
Device# $copy tftp://9.1.0.101/PATH/FILENAME bootflash:

Destination filename [C9800-80-rommon.1612-5r.pkg]?
Accessing tftp://9.1.0.101/c9800/C9800-80-rommon.1612-5r.pkg...
Loading c9800/ C9800-80-rommon.1612-5r.pkg from 9.1.0.101 (via Vlan44):
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
[OK - 7805964 bytes]
7805964 bytes copied in 6.697 secs (1165591 bytes/sec)
```

Step 3 Initiate the upgrade using the command given below and follow the instructions from the tool.

```
Device# upgrade rom-monitor filename bootflash:C9800-80-rommon.1612-5r.pkg chassis active
r0

Verifying the code signature of the ROMMON package...
Chassis model C9800-80-K9 has a single rom-monitor.

Upgrade rom-monitor

Target copying rom-monitor image file

Secure update of the ROMMON image will occur after a reload.

131072+0 records in
131072+0 records out
```

```
131072 bytes (131 kB, 128 KiB) copied, 0.461893 s, 284 kB/s
Copying ROMMON environment
131072+0 records in
131072+0 records out
131072 bytes (131 kB, 128 KiB) copied, 0.80982 s, 162 kB/s
131072+0 records in
131072+0 records out
131072 bytes (131 kB, 128 KiB) copied, 0.801238 s, 164 kB/s
ROMMON upgrade complete.
To make the new ROMMON permanent, you must restart the RP.
```

Step 4 Reboot the controller by entering this command:

```
Device# reload

Reload command is being issued on Active unit, this will reload the whole stack
Proceed with reload? [confirm]

*Feb 12 05:43:27.912: %SYS-5-RELOAD: Reload requested by console. Reload Reason: Reload
Command.
Chassis 1 reloading, reason - Reload command
Feb 12 05:43:33.012: %PMAN-5-EXITACTION: F0/0: pvp: Process manager is exiting:
Feb 12 05:43:33.028: %PMAN-5-EXITACTION: C0/0: pvp: Process manager is exiting:
Feb 12 05:43:34.210:

Initializing Hardware ...

System integrity status: 90170200 12030107

System Bootstrap, Version 16.10(6r), RELEASE SOFTWARE
Copyright (c) 1994-2018  by cisco Systems, Inc.

Current image running: Boot ROM0

Last reset cause: LocalSoft

C9800-80-K9 platform with 67108864 Kbytes of main memory

Successfully initiated a secure capsule update.

The system will be reset multiple times for completing the capsule update.

Please wait till you get the prompt.

Initializing Hardware ...

System integrity status: 90170200 12030107

          Insyde H2OFFT (Flash Firmware Tool) Version (SEG) 100.00.09.02
         Copyright (C) 2018 Insyde Software Corp. All Rights Reserved.

        Platform    Name: Purley
        Current  Version: Purley.05.21.51.0058
        Update   Version: Purley.05.21.51.0058

         Updating Block at FDFF0000h    0%
         Updating Block at FE042000h    1%
         Updating Block at FF005000h   50%
         Updating Block at FFFFE000h   99%
         Updating Block at FFFFF000h  100%
        Updating Block at FFFFF000h  100%
```

```
Initializing Hardware ...

System integrity status: 90170200 12030107

System Bootstrap, Version 16.10(6r), RELEASE SOFTWARE
Copyright (c) 1994-2018  by cisco Systems, Inc.
Current image running: Boot ROM0
Last reset cause: PowerCycleRequest

C9800-80-K9 platform with 67108864 Kbytes of main memory
Secure capsule update was successful

  Capsule Processed : 02/12/2020  05:51 UTC
  Capsule Status    : Success

Flash upgrade reset 1 in progress
........

Initializing Hardware ...

System integrity status: 90170200 12030107

System Bootstrap, Version 16.10(6r), RELEASE SOFTWARE
Copyright (c) 1994-2018  by cisco Systems, Inc.
Current image running: Boot ROM0
Last reset cause: PowerCycleRequest

C9800-80-K9 platform with 67108864 Kbytes of main memory

Secure capsule update was successful

  Capsule Processed : 02/12/2020  05:51 UTC
  Capsule Status    : Success

Flash upgrade reset 2 in progress

........

Initializing Hardware ...

System integrity status: 90170200 12030117

System Bootstrap, Version 16.12(5r), RELEASE SOFTWARE
Copyright (c) 1994-2019  by cisco Systems, Inc.
Current image running: *Upgrade in progress* Boot ROM1

Last reset cause: BootRomUpgrade

C9800-80-K9 platform with 67108864 Kbytes of main memory

File size is 0x392a32f3

Located C9800-80-universalk9_wlc.16.12.01t.SPA.bin

Image size 959066867 inode num 12, bks cnt 234148 blk size 8*512
###############################################################################################################

Boot image size = 959066867 (0x392a32f3) bytes

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


Package header rev 3 structure detected
```

```
Calculating SHA-1 hash...done

validate_package_cs: SHA-1 hash:

 calculated 026dcd56:56c756c1:68aaf4a2:cd5208af:b2412efe
 expected   026dcd56:56c756c1:68aaf4a2:cd5208af:b2412efe

Validating main package signatures

RSA Signed RELEASE Image Signature Verification Successful.

Validating subpackage signatures

Image validated

Both links down, not waiting for other chassis
Chassis number is 1
Feb 12 05:57:59.083: %PMAN-3-PROC_EMPTY_EXEC_FILE: R0/0: pvp: Empty executable used for
process bt_logger
Feb 12 05:58:00.630: %PMAN-3-PROC_EMPTY_EXEC_FILE: R0/0: pvp: Empty executable used for
process bt_logger
Feb 12 05:58:01.972: %PMAN-3-PROC_EMPTY_EXEC_FILE: R0/0: pvp: Empty executable used for
process bt_logger
Feb 12 05:58:08.654: %PMAN-3-PROC_EMPTY_EXEC_FILE: R0/0: pvp: Empty executable used for
process bt_logger
Feb 12 05:58:10.459: %PMAN-3-PROC_EMPTY_EXEC_FILE: R0/0: pvp: Empty executable used for
process bt_logger
Feb 12 05:58:12.889: %PMAN-3-PROC_EMPTY_EXEC_FILE: R0/0: pvp: Empty executable used for
process bt_logger


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           Cisco Systems, Inc.
           170 West Tasman Drive
           San Jose, California 95134-1706

Cisco IOS Software [Gibraltar], C9800 Software (C9800_IOSXE-K9), Version 16.12.1t, RELEASE
 SOFTWARE (fc1)
Technical Support: http://www.cisco.com/techsupport
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Software feature.

FIPS: Flash Key Check : Key Not Found, FIPS Mode Not Enabled

All TCP AO KDF Tests Pass
cisco C9800-80-K9 (2DA) processor (revision 2DA) with 9903871K/6147K bytes of memory.
Processor board ID FXS2312Q2U5
1 Virtual Ethernet interface
18 Ten Gigabit Ethernet interfaces
32768K bytes of non-volatile configuration memory.
67108864K bytes of physical memory.
26255359K bytes of eUSB flash at bootflash:.
234365527K bytes of SATA hard disk at harddisk:.
0K bytes of WebUI ODM Files at webui:.

Base Ethernet MAC Address          : 10:B3:D5:A5:84:00

Installation mode is BUNDLE

Press RETURN to get started!

*Nov 27 11:17:18.273: %SMART_LIC-6-EXPORT_CONTROLLED: Usage of export controlled features
is not allowed
Adding registry invocations for the WLC platform
*Nov 27 11:17:19.690: %SMART_LIC-6-AGENT_READY: Smart Agent for Licensing is initialized
*Nov 27 11:17:19.690: %SMART_LIC-6-AGENT_ENABLED: Smart Agent for Licensing is enabled


*Nov 27 11:18:00.374: %LINEPROTO-5-UPDOWN: Line protocol on Interface TenGigabitEthernet0/1/1,
 changed state to up
*Nov 27 11:18:07.446: %SMART_LIC-6-EXPORT_CONTROLLED: Usage of export controlled features
is not allowed
*Nov 27 11:18:07.446: %CALL_HOME-6-CALL_HOME_ENABLED: Call-home is enabled by Smart Agent
for Licensing.
```

Step 5 Verify the update on both active and standby controllers by entering this command:

```
Device# show rom-monitor chassis active r0
============================================================

System Bootstrap, Version 16.12(5r), RELEASE SOFTWARE
Copyright (c) 1994-2019 by cisco Systems, Inc.
```

CPLD Upgrade Procedure for Catalyst 9800-80 Series Controllers

This document describes the prerequisites and procedures required to upgrade the CPLD component of the hardware-programmable elements in 9800-80 controller models.

This procedure will perform multiple reloads of the device, as part of the upgrade procedures.

If you need assistance, contact Cisco TAC for more information.

Prerequisites for CPLD Upgrade for Catalyst 9800-80 Series Wireless Controllers

These are the prerequisites for CPLD upgrade procedure for Catalyst 9800-80 controllers:

- Use the console connection as out-of-band-management during this process.
- IOS-XE image version must either be 17.12.6a, 17.15.4d, 17.18.1 or later. If the image version is older than the mentioned releases, we recommend that you upgrade to the latest.

  Follow procedure mentioned in section - Upgrading the Controller Software.
- Controller install mode must be INSTALL.

```
Device# show version | i Install
Installation mode is INSTALL
```

  In case the controller is on BUNDLE mode, perform the steps in this document: Change Installation Modes on Catalyst 9800 Wireless Controller.
- Rommon version has to be 17.12(2r) or later:

```
Device# show rom-monitor chassis active r0
=====================================================
System Bootstrap, Version 17.12(12r), RELEASE SOFTWARE
Copyright (c) 1994-2023 by cisco Systems, Inc.
```

  In case it is an older version, upgrade ROMMON to 17.12(2r) or later as per steps mentioned in Upgrading Field Programmable for Cisco Catalyst 9800-80 Wireless Controller section.

Note To upgrade the ROMMON from 16.12(5r) or a previous version to higher versions, first upgrade ROMMON to 17.3(3r) and then to the required version.

When upgrading to ROMMON version 17.3(3r), it is required to run the ROMMON upgrade procedure twice.

Once the upgrade is done, check the ROMMON version. Now it must reflect 17.12(2r) or later.

Upgrade Hardware Programmable - CPLD

The purpose of this task is to ensure your hardware programmable device (CPLD) is running the correct version for optimal performance and reliability.

Ensure that these steps are performed when upgrading the hardware programmable:

- CPLD version check
- CPLD upgrade from releases prior to 19042909 version
- Upgrade CPDL version 19042909 to 22110716

Procedure

Step 1 **CPLD version check**: Verify the current hardware programmable (CPLD) version using the show hw-programmable all command. Check CPLD version in the **CPLD version** column.

Example:

```
Device# show hw-programmable all
Hw-programmable versions
Slot              CPLD version              FPGA version
------------------------------------------------------------------------
R0                18101706                  18050810
F0                18101706                  N/A
0                 xxxxxxxx                  18050810
```

- If the CPLD version is less than 19042909, then proceed with Step 2.
- If the CPLD version is 19042909 or higher, then proceed with Step 3.

Step 2 **CPLD upgrade from releases prior to 19042909 version**: Only perform this process if required by your CPDL version as indicated on Step 1. You must connect a console cable to perform this procedure. You need ROMMON access and you must change the boot parameters to complete this step.

a) Download the CPLD image from Software Download. Check for the hardware programmable section. Link: C9800-80_fpga_prog.16.0.0.xe.bin.

b) Copy the image to bootflash using TFTP or USB.

Example:

```
TFTP:
copy tftp://ip address of TFTP server/file path/<C9800-80_fpga_prog.16.0.0.xe.bin>
bootflash:

USB:
copy usb0:C9800-80_fpga_prog.16.0.0.xe.bin  bootflash:
```

c) Reload the device while you are connected through the console.

d) Fall back to ROMMON as mentioned in Password Recovery Procedure for Appliance via ROMMON section.

Example:

```
Send break key when you see ##### printed on the console for the system that loads the
image.
Then, the system breaks the bootup process and goes to the ROMMON prompt. You can either
 do this when
you press break or ctrl+break on the keyboard. You can also send the break from terminal
 program (
for example, Putty Special Command > Break, Teraterm Control > Send Break).
```

e) From the ROMMON prompt, change the configuration register. Change **Boot Characteristics** and **Reset** the device.

Example:

```
rommon 2 > confreg
           Configuration Summary
(Virtual Configuration Register: 0x2002)
enabled are:
[ 0 ] load rom after netboot fails
[ 1 ] break/abort has effect
```

```
[ 2 ] console baud: 9600
boot: ...... image specified by the boot system commands or default to:
cisco2-C9800-80-K9
do you wish to change the configuration? y/n  [n]:  y
enable  "diagnostic mode"? y/n  [n]:  n
enable  "use net in IP bcast address"? y/n  [n]:  n
disable "load rom after netboot fails"? y/n  [n]:  n
enable  "use all zero broadcast"? y/n  [n]:  n
disable "break/abort has effect"? y/n  [n]:  n
enable  "ignore system config info"? y/n  [n]:  n
change console baud rate? y/n  [n]:  n
change the boot characteristics? y/n  [n]:  y
enter to boot:
0 = ROM Monitor
1 = the boot helper image
2-15 = boot system
[2]:  0
           Configuration Summary
  (Virtual Configuration Register: 0x2000)
enabled are:
[ 0 ] load rom after netboot fails
[ 1 ] break/abort has effect
[ 2 ] console baud: 9600
boot: ...... the ROM Monitor
do you wish to change the configuration? y/n  [n]:  n
You must reset or power cycle for new config to take effect
rommon 3 > reset

The device will Reset and boot into Rommon prompt.
```

f) Boot the PSIRT updater image (copied in Step5 (b)) from Rommon prompt using **boot bootflash:**C9800-80_fpga_prog.16.0.0.xe.bin.

g) To proceed with the upgrade, enter ‘y’ or ‘Y’. Enter any other key to cancel the upgrade.

h) Press **Enter** to power cycle the device.
The device will upgrade and then Power cycle and boot to Rommon prompt. It will take approximately 1min for the upgrade to take place.

i) Change the configuration register back, as shown in the example below. Change only **Boot Characteristics**.

Example:

```
rommon 2 > confreg
         Configuration Summary
(Virtual Configuration Register: 0x2000)
enabled are:
[ 0 ] load rom after netboot fails
[ 1 ] break/abort has effect
[ 2 ] console baud: 9600
boot: ...... the ROM Monitor
do you wish to change the configuration? y/n  [n]:  y
enable  "diagnostic mode"? y/n  [n]:  n
enable  "use net in IP bcast address"? y/n  [n]:  n
disable "load rom after netboot fails"? y/n  [n]:  n
enable  "use all zero broadcast"? y/n  [n]:  n
disable "break/abort has effect"? y/n  [n]:  n
enable  "ignore system config info"? y/n  [n]:  n
change console baud rate? y/n  [n]:  n

change the boot characteristics? y/n  [n]:  y
enter to boot:
0 = ROM Monitor
1 = the boot helper image
2-15 = boot system
[2]:  2
```

```
           Configuration Summary
(Virtual Configuration Register: 0x2002)
enabled are:
[ 0 ] load rom after netboot fails
[ 1 ] break/abort has effect
[ 2 ] console baud: 9600
boot: ...... image specified by the boot system commands or default to:
cisco2-C9800-80-K9
do you wish to change the configuration? y/n  [n]:  n
You must reset or power cycle for new config to take effect
rommon 3 > reset

The device will Reset and boot into IOSXE prompt.
```

j) Check the hardware programmable CPLD version using the **show hw-programmable all** command. This must reflect **19042909** as the version number.

Step 3 Upgrade CPDL version 19042909 to 22110716.

a) Download the hardware programmable file from Software Download. Check the Hardware Programmable section. Link: C9800-hw-programmables.17.12.06.SPA.pkg.

b) Copy the image to bootflash, using TFTP or USB.

Example:

```
TFTP:
copy tftp://ip address of TFTP server/file path/C9800-hw-programmables.17.12.06.SPA.pkg
 bootflash:
    OR
USB:
copy usb0:C9800-hw-programmables.17.12.06.SPA.pkg  bootflash:
```

c) Initiate the CPLD upgrade using this command.

Example:

```
upgrade hw-programmable cpld filename
bootflash:C9800-hw-programmables.17.12.06.SPA.pkg chassis active R0
```

d) Perform reload of the device using **reload** command from IOS prompt.
The device completes the CPLD programmable upgrade after it reloads.

e) Once the upgrade is done, the device will power cycle automatically and new programmable will take effect.

f) Check the hardware programmable CPLD version using the **show hw-programmable all** command. This must reflect **22110716** as the version number.

Resolved Caveats

Caveat ID	Description
CSCvn77163	Cisco Secure Boot Hardware Tampering Vulnerability
CSCvy53719	Cisco Catalyst 9800-80 controller displays stale, non-impacting "mce: [Hardware Error]" messages during IOS-XE 17.x boot-up

Upgrading Field Programmable for Cisco Catalyst 9800-40 Wireless Controllers

This section explains field programmable installation procedure for the Cisco Catalyst 9800-40 Wireless Controller.

Before you begin

Note To upgrade the ROMMON from 16.10(2r) or a previous version to higher versions, first upgrade ROMMON to 17.7(3r) and then to the required version. Downgrading to older ROMMON versions from release 17.7(3r) is not supported.

17.7(3r) is a mandatory requirement to upgrade to Cisco IOS-XE 17.9.x and later releases.

- **Upgrade path:** 16.10(2r) to 17.7(3r)
- **Downgrade path:** ROMMON downgrade is not supported.

Verify the current ROMMON version using the following commands:

- **Standalone Setup**

```
Device# show rom-monitor chassis active r0
============================================================

System Bootstrap, Version 17.7(3r), RELEASE SOFTWARE
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```

- **High-Availability Setup**

  Run the following commands on the active controller.

  Verify the current ROMMON version for **Active** controller:

```
Device# show rom-monitor chassis active r0

============================================================
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```

  Verify the current ROMMON version for **Standby** controller:

```
Device# show rom-monitor chassis standby r0

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```

If the ROMMON version is earlier than 17.7(3r) for the standalone, active, or standby controller, use the procedure given below:

Note To upgrade ROMMON of the controller in an HA topology, see *Upgrading ROMMON in a High-Availability Topology* section.

Procedure

Step 1 Download the software image. See the ROMMON Images section for the recommended ROMMON Version and its corresponding software download link.

Step 2 Copy the ROMMON image to bootflash, using TFTP or USB.

- TFTP:

```
copy tftp://ip address of TFTP server/file path/ qwlc-rommon.177-3r.pkg bootflash:
```

- USB:

```
copy usb0: qwlc-rommon.177-3r.pkg bootflash:
```

After the system confirms that the copy operation is successful (sample output given below), proceed to the next step.

```
Device# copy tftp://9.1.0.101/PATH/FILENAME bootflash:

Destination filename [qwlc-rommon.177-3r.pkg]?
Accessing ftp://*:*@9.1.0.101/UN/pleelara/qwlc-rommon.177-3r.pkg...!!!!!!!!!!!!!!!!!!!
[OK - 4645908/4096 bytes]
4645908 bytes copied in 5.719 secs (812364 bytes/sec)
```

Step 3 Initiate the upgrade using the command given below and follow the instructions from the tool.

```
Device# upgrade rom-monitor filename bootflash:qwlc-rommon.177-3r.pkg chassis active r0

Verifying the code signature of the ROMMON package...
Chassis model C9800-40-K9 has a single rom-monitor.

Upgrade rom-monitor

Target copying rom-monitor image file

Secure update of the ROMMON image will occur after a reload.

131072+0 records in
131072+0 records out
131072 bytes (131 kB, 128 KiB) copied, 0.888236 s, 148 kB/s
Copying ROMMON environment
131072+0 records in
131072+0 records out
131072 bytes (131 kB, 128 KiB) copied, 0.796147 s, 165 kB/s
131072+0 records in
131072+0 records out
131072 bytes (131 kB, 128 KiB) copied, 0.798177 s, 164 kB/s
ROMMON upgrade complete.
To make the new ROMMON permanent, you must restart the RP.
```

Step 4 Reboot the controller by entering this command:

```
Device# reload

Reload command is being issued on Active unit, this will reload the whole stack
Proceed with reload? [confirm]

System integrity status: 90170200 12030117


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Current image running: Boot ROM1
Last reset cause: LocalSoft

C9800-40-K9 platform with 33554432 Kbytes of main memory


Successfully initiated a secure capsule update.

The system will be reset multiple times for completing the capsule update.
Please wait till you get the prompt.System integrity status: 90170200 12030117
          Platform    Name: Grangeville
            Current  Version: GRNV.05.05.15.0021
            Update   Version: GRNV.05.05.15.0021

Updating Block at FFFFF000h  100%

        System integrity status: 90170200 12030117
   System integrity status: 90170200 12030117


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 Current image running: Boot ROM1
 Last reset cause: PowerCycleRequest

 C9800-40-K9 platform with 33554432 Kbytes of main memory

Secure capsule update was successful
  Capsule Processed : 10/18/2022  16:19 UTC
  Capsule Status    : Success
Flash upgrade reset 1 in progress
........System integrity status: 90170200 12030107
System integrity status: 90170200 12030107


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Current image running: *Upgrade in progress* Boot ROM0
Last reset cause: BootRomUpgrade

C9800-40-K9 platform with 33554432 Kbytes of main memory
rommon 1 >
rommon 1 > boot bootflash:wsma_gladius.SSA.bin
File size is 0x54cd7b92
Located wsma_gladius.SSA.bin
Image size 1422752658 inode num 33, bks cnt 347352 blk size 8*512
################################################################################################################################################################
Boot image size = 1422752658 (0x54cd7b92) bytes

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

```
Package header rev 3 structure detected
Validating main package signatures

RSA Signed DEVELOPMENT Image Signature Verification Successful.
Validating subpackage signatures
Image validated
Both links down, not waiting for other chassis
Chassis number is 1

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           170 West Tasman Drive
           San Jose, California 95134-1706



Cisco IOS Software [Dublin], C9800 Software (C9800_IOSXE-K9), Experimental Version
17.11.20220928:115219
[BLD_POLARIS_DEV_S2C_20220927_143721-dirty:/nobackup/srimoort/wsma-gladius/polaris 102]
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The default license boot level has been set to none

Database already initialized
FIPS: Flash Key Check : Key Not Found, FIPS Mode Not Enabled
cisco C9800-40-K9 (1GL) processor (revision 1GL) with 3681607K/6147K bytes of memory.
```

```
Processor board ID TTM22480QTM
Router operating mode: Autonomous
1 Virtual Ethernet interface
4 Ten Gigabit Ethernet interfaces
32768K bytes of non-volatile configuration memory.
33554432K bytes of physical memory.
26255359K bytes of eUSB flash at bootflash:.
234365527K bytes of SATA hard disk at harddisk:.

Base Ethernet MAC Address          : D4:C9:3C:0A:DF:E0

Installation mode is BUNDLE

----------------------------------------------------
 System is booted with ASCII based startup configuration
 due to missing binary configuration or previous condition.
 Please perform "write mem" to generate binary
 configuration. System uses binary-config internally to
 reduce overall bootime significantly.
----------------------------------------------------


 WARNING: ** NOTICE **  The H.323 protocol is no longer supported from IOS-XE release 17.6.1.
 Please consider using SIP for multimedia applications.



Press RETURN to get started!
```

Step 5 Verify the update on both active and standby controllers by entering this command:

```
Device# show rom-monitor chassis active r0
============================================================

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```

Upgrading ROMMON in a High-Availability Topology

This procedure helps to upgrade ROMMON of the controller in an High Availability (HA) topology. This procecure is applicable to all the versions of the Cisco Catalyst 9800 Series Wireless Controllers.

Follow the steps given for upgrading your controller until the upgrade step (Step 3) and then continue with this procedure.

Procedure

Step 1 Run the upgrade command on the active device.

```
Device# upgrade rom-monitor filename bootflash:rommonfile.pkg chassis active r0
```

The ROMMON gets upgraded and requires a reboot.

Step 2 Run the following command on the current active to complete the upgrade.

```
Device# redundancy force-switchover
```

After running this command, wait for the controller to join the HA pair and proceed to the next step.

Step 3 Run the upgrade command on the standby device.

```
Device# upgrade rom-monitor filename bootflash:rommonfile.pkg chassis active r0
```

The ROMMON gets upgraded and requires a reboot.

Step 4 Run the following command on the standby device to complete the upgrade.

```
Device# redundancy force-switchover
```

After running this command, wait for the controller to join the HA pair.

Step 5 Use the following **show** commands to verify the updates on the HA setup.

```
Device# show rom-monitor chassis active r0
```

This verifies the ROMMON version on the active device.

```
Device# show rom-monitor chassis standby r0
```

This verifies the ROMMON version on the standby device.

Upgrading Ethernet PHY in a High-Availability Topology

This procedure helps to upgrade PHY of the controller in an High Availability (HA) topology. This procedure is applicable to all the versions of the Cisco Catalyst 9800 Series Wireless Controllers.

Note This procedure results in zero downtime.

Procedure

Step 1 Check PHY versions in both the active and standby units of HA.

```
Device#
show platform hardware chassis active qfp datapath pmd ifdev | i FW
show platform hardware chassis standby qfp datapath pmd ifdev | i FW
```

Step 2 Transfer the Ethernet PHY image to the bootflash of the active controller.

```
Device# copy tftp://a.b.c.d/CC9800-L-hw-programmables.17.11.01.pkg bootflash:
```

Step 3 Execute the upgrade command in the active device.

```
Device# upgrade hw-programmable phy filename bootflash:C9800-L-hw-programmables.17.11.01.pkg
```

Step 4 Initiate a switchover

```
Device# redundancy force-switchover
```

After running this command, wait till the rebooting unit is UP and HA is synced.

Step 5 Use the following **show** command to verify the the redundancy states.

```
Device# show redundancy states
```

Note
Repeat **Steps 2, 3, and 4** to upgrade in the active unit after the switchover. This activates the upgrade in the standby unit.

Step 6 Use the following **show** commands to verify the updates in the HA setup.

```
Device# show platform hardware chassis active qfp datapath pmd ifdev | i FW
```

This verifies the PHY version in the active device.

```
Device# show platform hardware chassis standby qfp datapath pmd ifdev | i FW
```

This verifies the PHY version in the standby device.

Resolved Caveats

Cisco Catalyst 9800-L Wireless Controller

Note The most recent release includes fixes from all preceding releases.

Table 6: Ethernet PHY Release C9800-L-hw-programmables 17.11.01

Caveat ID	Description
CSCwb65534	9800-L: CRC error is observed on bay-0 ports bundled in port-channel.

Table 7: Ethernet PHY Release C9800-L-hw-programmables 17.03.02

Caveat ID	Description
CSCvz23067	9800-L-C: WLC RX counters stop on TenGigabitEthernet uplink ports.

Table 8: Ethernet PHY Release C9800-L-hw-programmables 17.03.01

Caveat ID	Description
CSCvq48018	9800-L: MAC congested @Low PPS, drops/TX_XOFF in Bay 0-Tune settings and pause frames in mgig ports.
CSCvq70386	9800-L-F: The **show hw-module subslot 0/1 transceiver 0 idprom brief** command failed to display output.
CSCvs15116	9800L-F: Bay-1 Onegig and TenGigabitEthernet0/1/0 are not coming up when Bay-1 firmware is upgraded to 3.1.96

Table 9: ROMMON Release 16.12(3r)

Caveat ID	Description
CSCvq88840	9800-L: Fan always runs at maximum speed and is very loud.
CSCvr72052	9800-L: Default config register disables breaking into ROMMON; preventing password recovery.

Cisco Catalyst 9800-80 Wireless Controller

Note The most recent release includes fixes from all preceding releases.

Table 10: ROMMON Release 17.12(2r)

Caveat ID	Description
CSCvz25229	Interfaces are going down after upgrading ROMMON to 17.4.1r.
CSCvx23605	Insyde flash tool should ignore product name while upgrading bios.
CSCvx80281	Revert bios's name from "Purley-R" to "Purley".
CSCvy73224	ConfigRegister set to 0X0 does not land on ROMMON prompt.
CSCwd69343	KGV test failure PCR0.

Table 11: ROMMON Release 17.3(3r)

Caveat ID	Description
This release addresses only internal bug fixes.	

Table 12: ROMMON Release 16.12(5r)

Caveat ID	Description
CSCvp25150	Support booting of higher size images.

Cisco Catalyst 9800-40 Wireless Controller

Note The most recent release includes fixes from all preceding releases.

Table 13: ROMMON Release 17.12(1r)

Caveat ID	Description
CSCwd69343	KGV test failure PCR0.

Table 14: ROMMON Release 17.7(3r)

Caveat ID	Description
CSCvp25150	Support booting of higher size images.
CSCvy08919	Data ports are failing during boot. ROMMON: DS31408 fails to lock to APLL 2.
CSCvz25229	Cisco Catalyst 9800-80/40 controller interfaces are going down after upgrading ROMMON to 17.4.1r.

Cisco Catalyst CW9800M, and CW9800H1 and CW9800H2 Wireless Controllers



Note The most recent release includes fixes from all preceding releases.

Table 15: ROMMON Release 17.15(2r)

Caveat ID	Description
This release addresses only internal bug fixes.	

Table 16: ROMMON Release 17.15(1r)

Caveat ID	Description
This release addresses only internal bug fixes.	

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