将Catalyst 9400双管理引擎升级到Cisco IOS®XE v16.6.2

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简介

本文档介绍Catalyst 9400双管理引擎从v16.6.1升级到Cisco IOS XE的过程。

先决条件

要求

Cisco建议您了解TFTP和FTP。

使用的组件

本文档中的信息基于以下软件和硬件版本：

- Hardware:C9410R
- 软件：cat9k_iosxe.16.06.01.SPA.bin

在本示例中，您的当前映像是cat9k_iosxe.16.06.01.SPA.bin，目标映像是cat9k_iosxe.16.06.02.SPA.bin。如果您使用C9407R机箱而不是C9410R机箱，此过程也适用。

注意：请勿同时从Cisco IOS® XE Everest 16.6.1升级到16.6.2。从16.6.1升级到16.6.2时，一次插入一个管理引擎。

本文档中的信息都是基于特定实验室环境中的设备编写的。本文档中使用的所有设备最初均采用原始（默认）配置。如果您的网络处于活动状态，请确保您了解所有命令的潜在影响。

自动启动加载器升级和CPLD升级

自动启动加载程序升级

首次从交换机上的当前Cisco IOS® XE版本升级到更高版本或更新版本时，可根据交换机的硬件版本自动升级引导加载程序。如果升级了引导加载程序，Supervisor将自动重新加载以启用新的引导加载程序。如果在此之后返回旧版本，则不会降级引导加载程序。更新的引导加载程序支持所有以前的版本。

对于后续的Cisco IOS® XE Everest 16.x.x版本，如果该版本中有新的引导加载程序，则首次使用新映像启动交换机时，可以基于交换机的硬件版本自动升级该程序。

当您从Cisco IOS® XE Everest 16.6.1升级到16.6.2时，由于通用和复杂可编程逻辑设备(CPLD)的升级，升级可能需要一段时间，而系统会重置三次。Cisco IOS® XE Everest 16.6.2支持状态切换。

启动Supervisor的不同方法

在Catalyst 9400交换机中，可以使用以下两种方法启动Supervisor:

1. 安装模式

2. 从.bin文件启动设备的传统方法

当交换机以安装模式运行时，Cisco IOS® XE软件包(.pkg)文件和调配文件(packages.conf)存储在系统主板闪存(flash:)中。 当使用.bin文件引导交换机时，引导的Cisco IOS® XE软件捆绑包(.bin)文件存储在系统主板闪存(flash:)中。

在16.6.2升级后，无论使用哪种启动方法启动当前16.6.1映像上的交换机，该过程均可正常工作。但是，此处的过程会将Supervisor引擎升级到安装模式。

主Supervisor升级步骤

步骤1.删除不需要的包

注意：请勿跳过此步骤，并确保闪存中至少有1 GB的空间来扩展新映像。清理旧的安装文件，以防空间不足。

```
Switch#install remove inactive

Cleaning up unnecessary package files
No path specified, can use booted path flash:packages.conf
Cleaning flash:
Scanning boot directory for packages ... done.
Preparing packages list to delete ...
cat9k-cc_srdriver.16.06.01.SPA.pkg
File is in use, cannot delete.
cat9k-espbase.16.06.01.SPA.pkg
File is in use, can not delete.
cat9k-rpbase.16.06.01.SPA.pkg
File is in use, cannot delete.
cat9k-rpboot.16.06.01.SPA.pkg
File is in use, will not delete.
cat9k-sipbase.16.06.01.SPA.pkg
File is in use, will not delete.
cat9k-sipspa.16.06.01.SPA.pkg
File is in use, will not delete.
cat9k-srdriver.B16.06.01.SPA.pkg
File is in use, will not delete.
cat9k-webui.16.06.01.SPA.pkg
File is in use, will not delete.
packages.conf
File is in use, will not delete.
done.
The following files will be deleted:
[R0]:
/flash/cat9k-cc_srdriver.16.06.01.SPA.pkg
/flash/cat9k-espbase.16.06.01.SPA.pkg
/flash/cat9k-rpbase.16.06.01.SPA.pkg
/flash/cat9k-rpboot.16.06.01.SPA.pkg
/flash/cat9k-sipbase.16.06.01.SPA.pkg
```

```
/flash/cat9k-sipspa.16.06.01.SPA.pkg
/flash/cat9k-srdriver.16.06.01.SPA.pkg
/flash/cat9k-webui.16.06.01.SPA.pkg
/flash/cat9k_1.bin
/flash/cat9k_1.conf
/flash/cat9k_2.1.conf
/flash/cat9k_2.bin
/flash/cat9k_2.conf
/flash/cat9k_iosxe.16.06.01.SSA.bin
/flash/packages.conf.00-

Do you want to remove the above files? [y/n]y
[R0]:
Deleting file flash:cat9k-cc_srdriver.16.06.01.SPA.pkg ... done.
Deleting file flash:cat9k-espbase.16.06.01.SPA.pkg ... done.
Deleting file
Deleting file flash:cat9k-rpbase.16.06.01.SPA.pkg ... done.
Deleting file flash:cat9k-rpboot.16.06.01.SPA.pkg ... done.
Deleting file flash:cat9k-sipbase.B16.06.01.SPA.pkg ... done.
Deleting file flash:cat9k-sipspa.16.06.01.SPA.pkg ... done.
Deleting file flash:cat9k-srdriver.16.06.01.SPA.pkg ... done.
Deleting file flash:cat9k-webui.16.06.01.SPA.pkg ... done.
Deleting file flash:cat9k_1.bin ... done.
Deleting file flash:cat9k_1.conf ... done.
Deleting file flash:cat9k_2.1.conf ... done.
Deleting file flash:cat9k_2.bin ... done.
Deleting file flash:cat9k_2.conf ... done.
Deleting file flash:cat9k_iosxe.16.06.01.SSA.bin ... done.
Deleting file flash:packages.conf.00- ... done.
SUCCESS: Files deleted.
--- Starting Post_Remove_Cleanup ---
Performing Post_Remove_Cleanup on Active/Standby
[R0] Post_Remove_Cleanup package(s) on R0
[R0] Finished Post_Remove_Cleanup on R0
Checking status of Post_Remove_Cleanup on [R0]
Post_Remove_Cleanup: Passed on [R0]
Finished Post_Remove_Cleanup

SUCCESS: install_remove Tue Jun 20 14:16:29 PDT 2017
```

步骤2.将新映像复制到闪存

在本示例中，您将映像从TFTP服务器复制到管理引擎bootflash:

```
Switch#copy tftp: bootflash:
Address or name of remote host []? 172.16.53.46
Source filename []? cat9k_iosxe.16.06.02.SPA.bin
Destination filename [cat9k_iosxe.16.06.02.SPA.bin]?

Accessing tftp://172.16.53.46//cat9k_iosxe.16.06.02.SPA.bin...
Loading /cat9k_iosxe.16.06.02.SPA.bin from 10.8.0.6 (via GigabitEthernet0/0): !!!!!!!!!!!!!!!!!!!!!!!!
[OK - 601216545 bytes]

601216545 bytes copied in 50.649 secs (11870255 bytes/sec)
```

Step 3. Use the dir flash command to confirm that the image has been successfully copied to flash.

```
Switch#dir bootflash:*.bin
Directory of bootflash:/*.bin

Directory of flash:/

434184 -rw- 601216545 Jul 26 2017 10:18:11 -07:00 cat9k_iosxe.16.06.02.SPA.bin
11353194496 bytes total (8976625664 bytes free)
```

步骤3.检查引导语句

确保在安装模式下升级到16.6.2之前，引导语句已配置为packages.conf。如果它设置为.bin文件，则必须将其更改为packages.conf:

<#root>

```
Switch#show boot
BOOT variable = bootflash:cat9k_iosxe.16.06.01.SPA.bin;
Configuration Register is 0x102
MANUAL_BOOT variable = no
BAUD variable = 9600
ENABLE_BREAK variable does not exist
CONFIG_FILE variable does not exist


Change boot variable to point to packages.conf

Switch(config)#no boot system
Switch(config)#boot system bootflash:packages.conf
*Nov 14 15:12:50.043: %SYS-5-CONFIG_I: Configured from console by consol


Please save the configuration to reflect the new boot variable.



Switch#wr mem
Building configuration...
[OK]
Switch#show boot
BOOT variable = bootflash:packages.conf;
Configuration Register is 0x102
MANUAL_BOOT variable =


no


       >>


If manual variable is set to no, it means system is set to auto boot
```

```
BAUD variable = 9600
ENABLE_BREAK variable does not exist
CONFIG_FILE variable does not exist


You can set the system to auto boot or manual boot by setting the variables:


Changing system to auto boot



Switch(config)#no boot manual



Changing system to manual boot



Switch(config)#boot manual

If your switches are configured with auto boot, then the switch will automatically boot up with the new
reloaded. If your switches are not configured with auto boot and the switch is reloaded, you will recei
where you must then manually boot the new image flash:packages.conf

Switch: boot flash:packages.conf"
```

步骤4.将软件安装映像到闪存

使用install add file activate commit命令将目标映像安装到闪存。如果已将源映像复制到闪存，可以指向TFTP服务器上的源映像或引导闪存中的源映像。在本示例中，您已将该映像复制到闪存。

<#root>

```
Switch#install add file bootflash:cat9k_iosxe.16.06.02.SPA.bin activate commit install_add_activate_comm

This operation requires a reload of the system. Do you want to proceed?
Please confirm you have changed boot config to flash:packages.conf [y/n]y

--- Starting Add ---
Performing Add on Active/Standby
[R0] Add package(s) on R0
[R0] Finished Add on R0
Checking status of Add on [R0]
Add: Passed on [R0]
Finished Add

install_add_activate_commit: Activating PACKAGE
```

```
*Nov 13 22:37:09.730: %IOSXE-4-PLATFORM: R0/0: kernel: ISOFS: Unable to identify CD-ROM format.Followin
/flash/cat9k-wlc.16.06.02.SPA.pkg
/flash/cat9k-webui.16.06.02.SPA.pkg
/flash/cat9k-srdriver.16.06.02.SPA.pkg
/flash/cat9k-sipspa.16.06.02.SPA.pkg
/flash/cat9k-sipbase.16.06.02.SPA.pkg
/flash/cat9k-rpboot.16.06.02.SPA.pkg
/flash/cat9k-rpbase.16.06.02.SPA.pkg
/flash/cat9k-guestshell.16.06.02.SPA.pkg
/flash/cat9k-espbase.16.06.02.SPA.pkg
/flash/cat9k-cc_srdriver.16.06.02.SPA.pkg


This operation requires a reload of the system. Do you want to proceed? [y/n]y
--- Starting Activate ---
Performing Activate on Active/Standby
[R0] Finished Activate on R0
Checking status of Activate on [R0]
Activate: Passed on [R0]
Finished Activate

--- Starting Commit ---
Performing Commit on Active/Standby

*Nov 13 22:38:40.654: %IOSXE-5-PLATFORM: R0/0: Nov 13 22:38:40 rollback_timer.sh: %INSTALL-5-INSTALL_AU
[R0] Finished Commit on R0
Checking status of Commit on [R0]
Commit: Passed on [R0]
Finished Commit


Install will reload the system now!


SUCCESS: install_add_activate_commit Mon Nov 13 22:39:07 UTC 2017

*Nov 13 22:39:07.715: %IOSXE-5-PLATFORM: R0/0: Nov 13 22:39:07 install_engine.sh: %INSTALL-5-INSTALL_CO

Initializing Hardware...

System Bootstrap, Version 16.6.1r [FC2], RELEASE SOFTWARE (P)
Compiled Sat 07/15/2017 10:06:12.23 by rel

Current image running:
Primary Rommon Image

Last reset cause: SoftwareResetTrig
C9400-SUP-1 platform with 16777216 Kbytes of main memory

Preparing to autoboot. [Press Ctrl-C to interrupt] 0
attempting to boot from [bootflash:packages.conf]

Located file packages.conf
#
################################################################################################

Validate packages: SHA-1 hash:
calculated 550C9730:667B2788:DD6F6B06:D0FFA819:01A315DA
expected 550C9730:667B2788:DD6F6B06:D0FFA819:01A315DA
Warning: ignoring ROMMON var "USER_BOOT_PARAM"
```

%IOSXEBOOT-4-BOOTLOADER_UPGRADE: (rp/0): ### Mon Nov 13 22:42:05 Universal 2017 PLEASE DO NOT POWER CYCL

%IOSXEBOOT-4-BOOTLOADER_UPGRADE: (rp/0): boot loader upgrade successful <<< Bootloader upgrade done

%IOSXEBOOT-4-BOOTLOADER_UPGRADE: (rp/0): Reloading the Supervisor to enable the New BOOTLOADER

Initializing Hardware...

Initializing Hardware...

Initializing Hardware...

System Bootstrap, Version 16.6.2r[FC1], RELEASE SOFTWARE (P)
Compiled Tue 10/31/2017 11:38:44.98 by rel

Current image running:
Primary Rommon Image

Last reset cause: SoftwareResetTrig
C9400-SUP-1 platform with 16777216 Kbytes of main memory

Preparing to autoboot. [Press Ctrl-C to interrupt] 0
attempting to boot from [bootflash:packages.conf]

Located file packages.conf
#
##

Validate packages: SHA-1 hash:
calculated 550C9730:667B2788:DD6F6B06:D0FFA819:01A315DA
expected 550C9730:667B2788:DD6F6B06:D0FFA819:01A315DA
Warning: ignoring ROMMON var "USER_BOOT_PARAM"

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步骤5.升级后检验新软件包和映像

成功安装软件后，验证闪存分区是否具有新的.pkg文件。示例输出：

```
Switch#dir bootflash:*.pkg
Directory of bootflash:/*.pkg

Directory of bootflash:/

405607 -rw- 5186504 Nov 13 2017 22:36:25 +00:00 cat9k-cc_srdriver.16.06.02.SPA.pkg
405608 -rw- 76649412 Nov 13 2017 22:36:27 +00:00 cat9k-espbase.16.06.02.SPA.pkg
405609 -rw- 1536964 Nov 13 2017 22:36:27 +00:00 cat9k-guestshell.16.06.02.SPA.pkg
405610 -rw- 380625856 Nov 13 2017 22:36:38 +00:00 cat9k-rpbase.16.06.02.SPA.pkg
405616 -rw- 29580684 Nov 13 2017 22:36:48 +00:00 cat9k-rpboot.16.06.02.SPA.pkg
405611 -rw- 27612100 Nov 13 2017 22:36:39 +00:00 cat9k-sipbase.16.06.02.SPA.pkg
405614 -rw- 12268480 Nov 13 2017 22:36:41 +00:00 cat9k-webui.16.06.02.SPA.pkg
405612 -rw- 54981568 Nov 13 2017 22:36:40 +00:00 cat9k-sipspa.16.06.02.SPA.pkg
405613 -rw- 6521796 Nov 13 2017 22:36:40 +00:00 cat9k-srdriver.16.06.02.SPA.pkg
405615 -rw- 1536960 Nov 13 2017 22:36:41 +00:00 cat9k-wlc.16.06.02.SPA.pkg
11250098176 bytes total (8812113920 bytes free)
```

步骤6.检查版本和新引导加载程序

启动新映像时，请使用show version命令验证新映像的版本：

 注意：当您启动新映像时，启动加载器会自动升级。

<#root>

```
Switch#show version
Cisco IOS® XE Software, Version

16.06.02

Cisco IOS® Software [Everest], Catalyst L3 Switch Software (CAT9K_IOSXE),

 Version 16.6.2

, RELEASE SOFTWARE (fc2)
Technical Support: http://www.cisco.com/techsupport
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```

Compiled Wed 01-Nov-17 07:26 by mcpre

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GPL code under the terms of GPL Version 2.0. For more details, see the
documentation or "License Notice" file accompanying the IOS-XE software,
or the applicable URL provided on the flyer accompanying the IOS-XE
software.

ROM: IOS-XE ROMMON
BOOTLDR: System Bootstrap, Version 16.6.2r[FC1], RELEASE SOFTWARE (P)

Switch uptime is 20 minutes
Uptime for this control processor is 22 minutes
System returned to ROM by reload
System image file is "bootflash:packages.conf"
Last reload reason: EHSA standby down

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If you require further assistance please contact us by sending email to
export@cisco.com.

Technology Package License Information:

Technology-package Current	Type	Technology-package Next reboot
network-advantage	Permanent	network-advantage

cisco C9410R (X86) processor (revision V01) with 869104K/6147K bytes of memory.
Processor board ID FXS2130Q28F
2 Virtual Ethernet interfaces
192 Gigabit Ethernet interfaces
16 Ten Gigabit Ethernet interfaces
4 Forty Gigabit Ethernet interfaces
32768K bytes of non-volatile configuration memory.
15958488K bytes of physical memory.
11161600K bytes of Bootflash at bootflash:.
1638400K bytes of Crash Files at crashinfo:.
0K bytes of WebUI ODM Files at webui:.

```
Configuration register is 0x2

Switch#show module
Chassis Type: C9410R

Mod Ports Card Type                                  Model          Serial No.
---+-----+--------------------------------------+--------------+--------------
1 48 48-Port 10/100/1000 (RJ-45)                  C9400-LC-48T   JAE212409NQ
2 48 48-Port 10/100/1000 (RJ-45)                  C9400-LC-48T   JAE212409N2
3 48 48-Port UPOE 10/100/1000 (RJ-45)             C9400-LC-48U   JAE21270C1R
4 48 48-Port UPOE 10/100/1000 (RJ-45)             C9400-LC-48U   JAE21270C1C
5 10 Supervisor 1 Module                          C9400-SUP-1    JAE2124023Z


Mod MAC addresses                   Hw    Fw       Sw    Status
---+--------------------------------+----+-----------+-----------------+--------
1 E4AA.5D59.8420 to E4AA.5D59.844F 1.0 16.6.2r[FC1 16.06.02 ok
2 E4AA.5D59.85AC to E4AA.5D59.85DB 1.0 16.6.2r[FC1 16.06.02 ok
3 E4AA.5D59.BC0C to E4AA.5D59.BC3B 1.0 16.6.2r[FC1 16.06.02 ok
4 E4AA.5D59.B72C to E4AA.5D59.B75B 1.0 16.6.2r[FC1 16.06.02 ok
5 2C5A.0F1C.4F2C to 2C5A.0F1C.4F35 0.6 16.6.2r[FC1 16.06.02 ok


Mod Redundancy Role Operating Redundancy Mode Configured Redundancy Mode
---+------------------+-------------------------+---------------------------
5 Active                 active                    sso
```

辅助管理引擎的升级步骤

从插槽5中卸下Supervisor（在前面的步骤中已升级），并将备用Supervisor插入机箱的插槽6中。移除第一个管理引擎非常重要，因为两个管理引擎均插入机箱时，需要升级两个管理引擎；如前所述，不支持此功能。您可以重复上述升级步骤，升级新插入的Supervisor。

步骤1.删除不需要的包

注意：请勿跳过此步骤。确保闪存中至少有1 GB的空间来扩展新映像。清理旧的安装文件，以防空间不足。

```
Switch#install remove inactive

Cleaning up unnecessary package files
No path specified, will use booted path flash:packages.conf
Cleaning flash:
Scanning boot directory for packages ... done.
Preparing packages list to delete ...
cat9k-cc_srdriver.16.06.01.SPA.pkg
File is in use, will not delete.
cat9k-espbase.16.06.01.SPA.pkg
File is in use, will not delete.
```

```
cat9k-rpbase.16.06.01.SPA.pkg
File is in use, will not delete.
cat9k-rpboot.16.06.01.SPA.pkg
File is in use, will not delete.
cat9k-sipbase.16.06.01.SPA.pkg
File is in use, will not delete.
cat9k-sipspa.16.06.01.SPA.pkg
File is in use, will not delete.
cat9k-srdriver.B16.06.01.SPA.pkg
File is in use, will not delete.
cat9k-webui.16.06.01.SPA.pkg
File is in use, will not delete.
packages.conf
File is in use, will not delete.
done.
The following files will be deleted:
[R0]:
/flash/cat9k-cc_srdriver.16.06.01.SPA.pkg
/flash/cat9k-espbase.16.06.01.SPA.pkg
/flash/cat9k-rpbase.16.06.01.SPA.pkg
/flash/cat9k-rpboot.16.06.01.SPA.pkg
/flash/cat9k-sipbase.16.06.01.SPA.pkg
/flash/cat9k-sipspa.16.06.01.SPA.pkg
/flash/cat9k-srdriver.16.06.01.SPA.pkg
/flash/cat9k-webui.16.06.01.SPA.pkg
/flash/cat9k_1.bin
/flash/cat9k_1.conf
/flash/cat9k_2.1.conf
/flash/cat9k_2.bin
/flash/cat9k_2.conf
/flash/cat9k_iosxe.16.06.01.SSA.bin
/flash/packages.conf.00-

Do you want to remove the above files? [y/n]y
[R0]:
Deleting file flash:cat9k-cc_srdriver.16.06.01.SPA.pkg ... done.
Deleting file flash:cat9k-espbase.16.06.01.SPA.pkg ... done.
Deleting file
Deleting file flash:cat9k-rpbase.16.06.01.SPA.pkg ... done.
Deleting file flash:cat9k-rpboot.16.06.01.SPA.pkg ... done.
Deleting file flash:cat9k-sipbase.B16.06.01.SPA.pkg ... done.
Deleting file flash:cat9k-sipspa.16.06.01.SPA.pkg ... done.
Deleting file flash:cat9k-srdriver.16.06.01.SPA.pkg ... done.
Deleting file flash:cat9k-webui.16.06.01.SPA.pkg ... done.
Deleting file flash:cat9k_1.bin ... done.
Deleting file flash:cat9k_1.conf ... done.
Deleting file flash:cat9k_2.1.conf ... done.
Deleting file flash:cat9k_2.bin ... done.
Deleting file flash:cat9k_2.conf ... done.
Deleting file flash:cat9k_iosxe.16.06.01.SSA.bin ... done.
Deleting file flash:packages.conf.00- ... done.
SUCCESS: Files deleted.
--- Starting Post_Remove_Cleanup ---
Performing Post_Remove_Cleanup on Active/Standby
[R0] Post_Remove_Cleanup package(s) on R0
[R0] Finished Post_Remove_Cleanup on R0
Checking status of Post_Remove_Cleanup on [R0]
Post_Remove_Cleanup: Passed on [R0]
Finished Post_Remove_Cleanup

SUCCESS: install_remove Tue Jun 20 14:16:29 PDT 2017
```

步骤2.将新映像复制到闪存

在本示例中，您将镜像从TFTP服务器复制到管理引擎闪存。

```
Switch#copy tftp: bootflash:
Address or name of remote host []? 172.16.53.46
Source filename []? cat9k_iosxe.16.06.02.SPA.bin
Destination filename [cat9k_iosxe.16.06.02.SPA.bin]?

Accessing tftp://172.16.53.46//cat9k_iosxe.16.06.02.SPA.bin...
Loading /cat9k_iosxe.16.06.02.SPA.bin from 10.8.0.6 (via GigabitEthernet0/0):
!!!
```

步骤4.将软件安装映像到闪存

使用install add file activate commit命令将目标映像安装到闪存。如果已将源映像复制到闪存，可以指向TFTP服务器上的源映像，也可以指向bootflash中的源映像。在本示例中，您已将该映像复制到闪存。

```
Switch#install add file bootflash:cat9k_iosxe.16.06.02.SPA.bin activate commit
install_add_activate_commit: START Mon Nov 13 23:24:02 UTC 2017

System configuration has been modified.
Press Yes(y) to save the configuration and proceed.
Press No(n) for proceeding without saving the configuration.
Press Quit(q) to exit, you can save configuration and re-enter the command. [y/n/q]y
Building configuration...
[OK]Modified configuration has been saved

*Nov 13 23:24:09.935: %SYS-2-PRIVCFG_ENCRYPT: Successfully encrypted private config file
*Nov 13 23:24:11.314: %IOSXE-5-PLATFORM:  R1/0: Nov 13 23:24:11 install_engine.sh: %INSTALL-5-INSTALL_S

This operation requires a reload of the system. Do you want to proceed?
Please confirm you have changed boot config to flash:packages.conf [y/n]y

--- Starting Add ---
Performing Add on Active/Standby
  [R1] Add package(s) on R1
  [R1] Finished Add on R1
Checking status of Add on [R1]
Add: Passed on [R1]
Finished Add

install_add_activate_commit: Activating PACKAGE

*Nov 13 23:25:28.589: %IOSXE-4-PLATFORM:  R1/0: kernel: ISOFS: Unable to identify CD-ROM format.Followi
/flash/cat9k-wlc.16.06.02.SPA.pkg
/flash/cat9k-webui.16.06.02.SPA.pkg
/flash/cat9k-srdriver.16.06.02.SPA.pkg
/flash/cat9k-sipspa.16.06.02.SPA.pkg
/flash/cat9k-sipbase.16.06.02.SPA.pkg
/flash/cat9k-rpboot.16.06.02.SPA.pkg
/flash/cat9k-rpbase.16.06.02.SPA.pkg
/flash/cat9k-guestshell.16.06.02.SPA.pkg
/flash/cat9k-espbase.16.06.02.SPA.pkg
/flash/cat9k-cc_srdriver.16.06.02.SPA.pkg

This operation requires a reload of the system. Do you want to proceed? [y/n]y
--- Starting Activate ---
Performing Activate on Active/Standby
  [R1] Activate package(s) on R1
head: invalid number of lines: '/tmp/Activate.rp-1-1-1.20171113232845.out.log'
  [R1] Finished Activate on R1
Checking status of Activate on [R1]
Activate: Passed on [R1]
Finished Activate

--- Starting Commit ---
Performing Commit on Active/Standby
```

```
*Nov 13 23:28:47.521: %IOSXE-5-PLATFORM:  R1/0: Nov 13 23:28:47 rollback_timer.sh: %INSTALL-5-INSTALL_AU
  [R1] Finished Commit on R1
Checking status of Commit on [R1]
Commit: Passed on [R1]
Finished Commit

Install will reload the system now!
SUCCESS: install_add_activate_commit  Mon Nov 13 23:29:14 UTC 2017

Switch#
*Nov 13 23:29:14.578: %IOSXE-5-PLATFORM:  R1/0: Nov 13 23:29:14 install_engine.sh: %INSTALL-5-INSTALL_CO

Initializing Hardware...

System Bootstrap, Version 16.6.1r [FC2], RELEASE SOFTWARE (P)
Compiled Sat 07/15/2017 10:06:12.23 by rel

Current image running:
Primary Rommon Image

Last reset cause: SoftwareResetTrig
C9400-SUP-1 platform with 16777216 Kbytes of main memory

Preparing to autoboot. [Press Ctrl-C to interrupt]  0
attempting to boot from [bootflash:packages.conf]

Located file packages.conf
#
################################################################################################

Validate packages: SHA-1 hash:
    calculated 550C9730:667B2788:DD6F6B06:D0FFA819:01A315DA
    expected   550C9730:667B2788:DD6F6B06:D0FFA819:01A315DA
%IOSXEBOOT-4-BOOTLOADER_UPGRADE: (rp/1): ### Mon Nov 13 23:32:20 Universal 2017 PLEASE DO NOT POWER CYC
%IOSXEBOOT-4-BOOTLOADER_UPGRADE: (rp/1): boot loader upgrade successful  << Bootloader upgrade done
%IOSXEBOOT-4-BOOTLOADER_UPGRADE: (rp/1): Reloading the Supervisor to enable the New BOOTLOADER

Initializing Hardware...

Initializing Hardware...

Initializing Hardware...

System Bootstrap, Version 16.6.2r[FC1], RELEASE SOFTWARE (P)
Compiled Tue 10/31/2017 11:38:44.98 by rel

Current image running:
Primary Rommon Image

Last reset cause: SoftwareResetTrig
C9400-SUP-1 platform with 16777216 Kbytes of main memory

Preparing to autoboot. [Press Ctrl-C to interrupt]  0
attempting to boot from [bootflash:packages.conf]

Located file packages.conf
#
################################################################################################

Validate packages: SHA-1 hash:
    calculated 550C9730:667B2788:DD6F6B06:D0FFA819:01A315DA
    expected   550C9730:667B2788:DD6F6B06:D0FFA819:01A315DA
```

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



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```

步骤5.升级后检验新软件包和映像

成功安装软件后，验证闪存分区是否具有新的.pkg文件。示例输出：

```
Switch#dir bootflash:*.pkg
Directory of bootflash:/*.pkg

Directory of bootflash:/

405607 -rw- 5186504 Nov 13 2017 22:36:25 +00:00 cat9k-cc_srdriver.16.06.02.SPA.pkg
405608 -rw- 76649412 Nov 13 2017 22:36:27 +00:00 cat9k-espbase.16.06.02.SPA.pkg
405609 -rw- 1536964 Nov 13 2017 22:36:27 +00:00 cat9k-guestshell.16.06.02.SPA.pkg
405610 -rw- 380625856 Nov 13 2017 22:36:38 +00:00 cat9k-rpbase.16.06.02.SPA.pkg
405616 -rw- 29580684 Nov 13 2017 22:36:48 +00:00 cat9k-rpboot.16.06.02.SPA.pkg
405611 -rw- 27612100 Nov 13 2017 22:36:39 +00:00 cat9k-sipbase.16.06.02.SPA.pkg
405614 -rw- 12268480 Nov 13 2017 22:36:41 +00:00 cat9k-webui.16.06.02.SPA.pkg
405612 -rw- 54981568 Nov 13 2017 22:36:40 +00:00 cat9k-sipspa.16.06.02.SPA.pkg
405613 -rw- 6521796 Nov 13 2017 22:36:40 +00:00 cat9k-srdriver.16.06.02.SPA.pkg
405615 -rw- 1536960 Nov 13 2017 22:36:41 +00:00 cat9k-wlc.16.06.02.SPA.pkg
11250098176 bytes total (8812113920 bytes free)
```

由于两个管理引擎都是单独升级的，请将第一个管理引擎插入插槽5中，因为它必须作为备用管理引擎加入：

```
Checking module status with both supervisors inserted Switch#show module
Chassis Type: C9410R
```

```
Mod Ports Card Type                                  Model          Serial No.
---+-----+--------------------------------------+--------------+--------------
1   48   48-Port 10/100/1000 (RJ-45)               C9400-LC-48T   JAE212409NQ
2   48   48-Port 10/100/1000 (RJ-45)               C9400-LC-48T   JAE212409N2
3   48   48-Port UPOE 10/100/1000 (RJ-45)          C9400-LC-48U   JAE21270C1R
4   48   48-Port UPOE 10/100/1000 (RJ-45)          C9400-LC-48U   JAE21270C1C
5   10   Supervisor 1 Module                       C9400-SUP-1    JAE21240235
6   10   Supervisor 1 Module                       C9400-SUP-1    JAE21240235

Mod MAC addresses                     Hw   Fw           Sw                  Status
---+--------------------------------+----+------------+-------------------+--------
1   E4AA.5D59.8420 to E4AA.5D59.844F 1.0  16.6.2r[FC1 16.06.02              ok
2   E4AA.5D59.85AC to E4AA.5D59.85DB 1.0  16.6.2r[FC1 16.06.02              ok
3   E4AA.5D59.BC0C to E4AA.5D59.BC3B 1.0  16.6.2r[FC1 16.06.02              ok
4   E4AA.5D59.B72C to E4AA.5D59.B75B 1.0  16.6.2r[FC1 16.06.02              ok
5   2C5A.0F1C.4F2C to 2C5A.0F1C.4F35 0.6  16.6.2r[FC1 16.06.02              ok
6   2C5A.0F1C.4F36 to 2C5A.0F1C.4F3F 0.6  16.6.2r[FC1 16.06.02              ok

Mod Redundancy Role     Operating Redundancy Mode Configured Redundancy Mode
---+------------------+-------------------------+---------------------------
5   Standby             standby hot               sso
6   Active              active                    sso
```

检查冗余

Catalyst 9400（硬件）中的管理引擎模块支持冗余。Cisco IOS ® XE Everest 16.6.2支持软件冗余。在16.6.2软件版本中，不支持路由处理器冗余(RPR)功能。使用show redundancy和show platform software iomd redundancy命令确保在完成任何切换之前，已形成状态切换(SSO)且IOMD已就绪。

RPR冗余

当备用Supervisor引擎在RPR模式下运行时，它以部分初始化状态启动，并与活动Supervisor引擎的永久配置同步。16.6.2不支持RPR。

在Supervisor引擎切换时，流量会中断，因为在RPR模式下，所有物理端口都会重新启动，因为Supervisor引擎之间没有维护与模块类型和状态相关的状态。切换时，当备用Supervisor引擎完成其初始化时，它将直接从模块读取硬件信息并成为活动Supervisor引擎。

SSO冗余

当备用Supervisor引擎在SSO模式下运行时，备用Supervisor引擎在完全初始化状态下启动，并与

主用Supervisor引擎的永久配置和运行配置同步。它随后会保持此处列出的协议状态，支持状态切换功能的所有硬件和软件状态更改将保持同步。

因此，它不会干扰冗余 Supervisor 引擎配置中的第 2 层会话。

由于备用Supervisor引擎识别每条链路的硬件链路状态，在切换之前处于活动状态的端口（包括上行链路端口）将保持活动状态。但是，由于上行链路端口实际位于Supervisor引擎上，因此如果删除Supervisor引擎，它们可能会断开。

如果主用Supervisor引擎发生故障，备用Supervisor引擎将变为主用。此新主用管理引擎使用现有的第2层交换信息继续转发流量。

<#root>

IOMD is Input Output Module Driver software process. Check if IOMds are ready and have initialized Softw

```
Switch# show platform software iomd redundancy
    Configured Redundancy Mode = sso
     Operating Redundancy Mode = sso
                Local RF state = ACTIVE
                 Peer RF state = STANDBY HOT

slot PSM STATE   SPA INTF   HA_STATE HA_ACTIVE
   1     ready   started     ready    00:10:49
   2     ready   started     ready    00:10:49
   3     ready   started     ready    00:10:48
   4     ready   started     ready    00:10:49
   5     ready   started     ready    00:10:54
   6     ready   started     ready    00:10:53 ***active RP


Switch#show redundancy
Redundant System Information :
------------------------------
 Available system uptime = 31 minutes
Switchovers system experienced = 0
 Standby failures = 0
 Last switchover reason = none

 Hardware Mode = Duplex
 Configured Redundancy Mode = sso
 Operating Redundancy Mode = sso
 Maintenance Mode = Disabled
 Communications = Up

Current Processor Information :
------------------------------
 Active Location = slot 6
 Current Software state = ACTIVE
 Uptime in current state = 31 minutes
 Image Version = Cisco IOS ®Software [Everest], Catalyst L3 Switch Software (CAT9K_IOSXE), Version 16.6
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```

```
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 BOOT = bootflash:packages.conf;
 CONFIG_FILE =
 Configuration register = 0x2

Peer Processor Information :
----------------------------
 Standby Location = slot 5
 Current Software state = STANDBY HOT
 Uptime in current state = 26 minutes
 Image Version = Cisco IOS ®Software [Everest], Catalyst L3 Switch Software (CAT9K_IOSXE), Version 16.6
 RELEASE SOFTWARE (fc2)
Technical Support: http://www.cisco.com/techsupport
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 BOOT = bootflash:packages.conf;
 CONFIG_FILE =
 Configuration register = 0x2
```

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