

# 將Catalyst 9400雙管理引擎升級到Cisco IOS® XE 16.6.2版

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## 簡介

本檔案介紹從16.6.1版到16.6.2版的升級程式。

## 必要條件

### 需求

思科建議您瞭解TFTP和FTP。

### 採用元件

本文中的資訊係根據以下軟體和硬體版本：

- 硬體：C9410R

- 軟體：cat9k\_iosxe.16.06.01.SPA.bin

在本示例中，當前映像是cat9k\_iosxe.16.06.01.SPA.bin，目標映像是cat9k\_iosxe.16.06.02.SPA.bin。如果您使用的是C9407R機箱而不是C9410R機箱，此過程也可以工作。

---

 註：請勿將雙管理引擎同時從Cisco IOS® XE Everest 16.6.1升級到16.6.2。從16.6.1升級到16.6.2時，一次插入一個Supervisor。

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本文中的資訊是根據特定實驗室環境內的裝置所建立。文中使用到的所有裝置皆從已清除（預設）的組態來啟動。如果您的網路運作中，請確保您瞭解任何指令可能造成的影響。

## 自動啟動載入器升級和CPLD升級

### 自動開機載入器升級

從交換器上目前的Cisco IOS® XE版本首次升級為更高或更新版本時，可以根據該交換器的硬體版本自動升級開機載入器。如果升級了引導載入程式，Supervisor將自動重新載入以啟用新的引導載入程式。如果在此之後返回舊版本，則不會降級啟動載入器。更新的啟動載入程式支援所有以前的版本。

對於後續的Cisco IOS® XE Everest 16.x.x版本，如果該版本中有新的引導載入程式，則在首次使用新映像啟動交換機時，可以基於交換機的硬體版本自動升級該程式。

當您從Cisco IOS® XE Everest 16.6.1升級到16.6.2時，由於普通和複雜可程式設計邏輯裝置(CPLD)的升級，升級可能需要一段時間，同時系統會重設三次。Cisco IOS® XE Everest 16.6.2支援狀態切換。

## 引導Supervisor的不同方法

在Catalyst 9400交換器上，您可以使用兩種方法啟動Supervisor：

- 安裝模式
- 從.bin檔案啟動裝置的傳統方法。


當交換器以安裝模式執行時，Cisco IOS® XE封包(.pkg)檔案和布建檔案(packages.conf)會儲存在系統主機板的快閃記憶體(flash:)中。使用.bin檔案啟動交換器時，啟動的Cisco IOS® XE軟體套件組合(.bin)檔案會儲存在系統主機板的快閃記憶體(flash:)中。

16.6.2升級後，無論使用哪種引導方法引導當前16.6.1映像上的交換機，該過程均可以工作。但是，此處的過程會將Supervisor引擎升級到安裝模式。

## 主管理引擎的升級步驟

步驟 1. 刪除不需要的包

---

 註：請勿跳過此步驟。確保快閃記憶體中至少有1GB的空間用於擴展新映像。在空間不足的情況下清理舊安裝檔案。

---

```
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-sipspace.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-sipspace.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-sipspace.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
```

## 步驟 2. 將新映像複製到快閃記憶體

在本例中，您將映像從TFTP伺服器複製到Supervisor的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)
```

## 步驟 3. 檢查引導語句

在安裝模式下升級16.6.2之前，請確保將啟動語句配置為packages.conf。如果它設定為.bin檔案，則必須將其更改為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 console
```

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

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

步驟 4. 軟體將映像安裝到快閃記憶體

使用install add file activate commit命令將目標映像安裝到快閃記憶體。如果您將映像複製到快閃記憶體中，可以指向TFTP伺服器上的來源映像，也可以指向啟動快閃記憶體中的來源映像。在本範例中，您已經將映像複製到快閃記憶體中。

```
<#root>
```

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

```
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-sipspace.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-espace.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 re1

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 CYCLE

%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 re1

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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## 步驟 5.升級後驗證新軟體包和映像

成功安裝軟體後，驗證快閃記憶體分割槽是否具有新的.pkg檔案。您可以在此處檢視示例輸出。

```
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-sipsa.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)
```

## 步驟 6.檢查版本和新引導載入程式

啟動新映像後，使用show version命令驗證新映像的版本：

---

 註：啟動新映像時，啟動載入程式會自動升級。

---

<#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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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

This product contains cryptographic features and is subject to United States and local country laws governing import, export, transfer and use. Delivery of Cisco cryptographic products does not imply third-party authority to import, export, distribute or use encryption. Importers, exporters, distributors and users are responsible for compliance with U.S. and local country laws. By using this product you agree to comply with applicable laws and regulations. If you are unable to comply with U.S. and local laws, return this product immediately.

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If you require further assistance please contact us by sending email to [export@cisco.com](mailto: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	ssu

## 輔助Supervisor升級步驟

從先前步驟中升級的插槽5中卸下Supervisor，並將備用Supervisor插入機箱的插槽6中。刪除第一個管理引擎非常重要，因為不支援升級兩個管理引擎，而這兩個管理引擎均插入機箱中。您可以重複此處所述的相同升級步驟，升級新插入的Supervisor。

### 步驟 1.刪除不需要的包

 註：請勿跳過此步驟。確保快閃記憶體中至少有1GB的空間用於擴展新映像。在空間不足的情況下清理舊安裝檔案。

```
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-sipspace.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-sipspace.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-sipspace.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

## 步驟 2.將新映像複製到快閃記憶體

在本例中，您將映像從TFTP伺服器複製到Supervisor的快閃記憶體中。

```
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)
```

## 步驟 3.檢查引導語句

在安裝模式下升級16.6.2之前，請確保將啟動語句配置為packages.conf。如果將其設定為.bin檔案，則必須將其變更為packages.conf。

```
Switch#show boot
BOOT variable = bootflash:packages.conf;
Configuration Register is 0x2
MANUAL_BOOT variable = no
BAUD variable = 9600
ENABLE_BREAK variable =
BOOTMODE variable does not exist
IPXE_TIMEOUT variable does not exist
CONFIG_FILE variable =
```

If your switches are configured with auto boot, then the switch automatically boots up with the new image.  
If not, you can manually boot flash:packages.conf  
Switch: boot flash:packages.conf

## 步驟 4.軟體將映像安裝到快閃記憶體

使用install add file activate commit命令將目標映像安裝到快閃記憶體中。如果您將映像複製到快閃記憶體，可以指向TFTP伺服器上的來源映像，也可以指向bootflash中的來源映像。在本範例中，您已經將映像複製到快閃記憶體中。

```
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_A
  [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\_C

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.  
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San Jose, California 95134-1706

Cisco IOS® Software [Everest], Catalyst L3 Switch Software (CAT9K\_IOSXE), Version 16.6.2, RELEASE SOFTWARE  
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Compiled Wed 01-Nov-17 07:26 by mcpre

### 步驟 5.升級後驗證新軟體包和映像

成功安裝軟體後，驗證快閃記憶體分割槽是否具有新的.pkg檔案。您可以在此處檢視示例輸出。

```
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-sipspace.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)
```

由於兩個管理引擎均單獨升級，請將第一個管理引擎插入插槽5中。它必須作為備用管理引擎加入。

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

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

## 檢查冗餘

Catalyst 9400 (硬體) 中的管理引擎模組支援冗餘。Cisco IOS® XE Everest 16.6.2 支援軟體冗餘。在 16.6.2 軟體版本中，路由處理器備援(RPR)功能不受支援。使用 `show redundancy` 和 `show platform software iomd redundancy` 命令可以確保狀態切換(SSO)已形成，並且 IOMD 已就緒，然後再進行任何切換。

### RPR 備援

當備用 Supervisor 引擎在 RPR 模式下運行時，它以部分初始化的狀態啟動，並與活動 Supervisor 引擎的永久配置同步。當前版本 16.6.2 不支援 RPR。

在 Supervisor 引擎切換時，流量會中斷，因為在 RPR 模式下，所有物理埠都會重新啟動，因為 Supervisor 引擎之間沒有維護與模組型別和狀態相關的狀態。切換時，當備用 Supervisor 引擎完成初始化時，它將直接從模組讀取硬體資訊並成為活動 Supervisor 引擎。

### SSO 備援

當備用 Supervisor Engine 在 SSO 模式下運行時，備用 Supervisor Engine 在完全初始化的狀態下啟動，並與活動 Supervisor Engine 的永久配置和運行配置同步。隨後它將保持此處所列協定上的狀態，並且支援狀態切換功能的所有硬體和軟體狀態更改將保持同步。

因此，它在冗餘 Supervisor Engine 配置中為第 2 層會話提供零中斷。

由於備用 Supervisor Engine 可識別每個鏈路的硬體鏈路狀態，因此在切換之前處於活動狀態的埠（包括上行鏈路埠）將保持活動狀態。但是，由於上行鏈路埠物理上位於 Supervisor 引擎上，因此如果刪除 Supervisor 引擎，它們可能會斷開。

如果主用 Supervisor 引擎發生故障，備用的 Supervisor 引擎將變為主用。此新啟動的 Supervisor 引擎使用現有的第 2 層交換資訊繼續轉發流量。



<#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
RELEASE SOFTWARE (fc2)
Technical Support: http://www.cisco.com/techsupport
Copyright (c) 1986-2017 by Cisco Systems, Inc.
Compiled Wed 01-Nov-17 07:26 by mcpre
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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Compiled Wed 01-Nov-17 07:26 by mcpre
BOOT = bootflash:packages.conf;
CONFIG_FILE =
Configuration register = 0x2
```

## 關於此翻譯

思科已使用電腦和人工技術翻譯本文件，讓全世界的使用者能夠以自己的語言理解支援內容。請注意，即使是最佳機器翻譯，也不如專業譯者翻譯的內容準確。Cisco Systems, Inc. 對這些翻譯的準確度概不負責，並建議一律查看原始英文文件（提供連結）。