在HA中更換Catalyst 9000的Supervisor模組或堆疊成員

目錄

[簡介](#)

[必要條件](#)

- [需求](#)
- [採用元件](#)

[背景資訊](#)

[更換C9300或C9200堆疊的成員](#)

- [驗證更換前](#)
- [替換](#)
- [驗證更換後](#)

[更換C9400獨立機箱的冗餘管理引擎](#)

- [驗證更換前](#)
- [替換](#)
- [驗證更換後](#)

[更換C9400 Dual-Sup StackWise-Virtual管理引擎](#)

- [驗證更換前](#)
- [替換](#)
- [驗證更換後](#)

[更換C9500 StackWise-Virtual的成員](#)

- [驗證更換前](#)
- [替換](#)
- [驗證更換後](#)

[更換C9600 Dual-Sup獨立機箱的冗餘管理引擎](#)

- [驗證更換前](#)
- [替換](#)
- [驗證更換後](#)

[更換C9600 Dual-Sup StackWise-Virtual管理引擎](#)

- [驗證更換前](#)
- [替換](#)
- [驗證更換後](#)

[更換C9600 Quad-Sup StackWise-Virtual管理引擎](#)

- [更換和驗證](#)

簡介

本文說明如何在HA（高可用性）設定中替換Catalyst 9K交換器的監督器模組或堆疊成員。

必要條件

需求

思科建議您熟悉Catalyst 9K交換器上的堆疊、stackwise-virtual(SVL)和「套件組合」與「安裝」開機模式相關概念。

採用元件

本文中的資訊係根據以下軟體和硬體版本：

- C9200
- C9300
- C9400
- C9500
- C9600

附註：請參閱適當的組態設定指南來瞭解使用的命令，以便在其他思科平台上啟用這些功能。

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。

背景資訊

本文包括替換堆疊式交換機型別成員的過程：

- C9200/C9300堆疊成員
- 使用SVL的C9500
- C9400/C9600機箱在其各種操作模式（獨立、雙支援、SVL和四支援SVL）下的管理引擎。

更換C9300或C9200堆疊的成員

在本範例中，您會替換C9300堆疊的成員。（本示例中的交換機在「安裝」引導模式下使用switch 2）。

附註：同一過程可用於替換C9200堆疊成員。

驗證更換前

檢查當前堆疊狀態並準備進行交換。確保將交換機上的boot變數設定為指向正確的程式包文件（如果啟動模式為「安裝」）或bin檔案（捆綁包啟動模式），並啟用auto-boot功能。

<#root>

cat9K#

show boot

Switch 1

Current Boot Variables:

BOOT variable =

flash:packages.conf;

Boot Variables on next reload:

```
BOOT variable =
flash:packages.conf;

Manual Boot = no

Enable Break = yes
Boot Mode = DEVICE
iPXE Timeout = 0
```

附註：如果交換器處於「安裝」開機模式，請確認軟體自動升級是否已啟用。如果沒有，則從全域組態模式設定「software auto-upgrade enable」，以啟用該功能。

```
<#root>
C9300#
show run all | in software auto

no software auto-upgrade source url
software auto-upgrade enable
```

註意：如果堆疊處於「套件」啟動模式，則您需要一個IOS-XE .bin檔案的副本，該檔案在USB盤或本地TFTP伺服器上處於使用中狀態，該伺服器可以通過其帶外(OOB)管理埠從新交換機/成員訪問。

檢查堆疊是否以全環形連線，例如，如果關閉相關交換器成員的電源，則不會分割現有堆疊而導致堆疊合並。驗證後，請轉到後續步驟。

```
<#root>
Switch#
sh switch neighbors

Switch #  Port 1  Port 2
--------  ------  ------
1
2       3

2
3       2

3
```

1 2

註：如果需要替換active switch member，請對堆疊中的standby switch執行故障轉移，並等待它接替active角色。如果要替換堆疊的任何其他成員，請跳過此步驟。

<#root>

C9300#

redundancy force-switchover

```
System configuration has been modified. Save? [yes/no]: yes
Building configuration...
Compressed configuration from 11673 bytes to 4403 bytes[OK]Proceed with switchover to standby RP? [conf
```

替換

關閉需要更換的成員交換機的電源，斷開與其的電源堆疊和資料堆疊電纜。在電源關閉狀態下，將成員更換為新成員，重新連線資料堆疊電纜並開機。

附註：如果新裝置運行的軟體版本與現有堆疊不同，則需要匹配該版本。例如，現有堆疊正在運行17.3.1，而新裝置正在運行16.9.3。

如果堆疊處於「套件組合」開機模式，請在啟動時進入新交換器的ROMMON。藉助USB盤或OOB TFTP訪問，使用與現有堆疊相同的軟體版本手動引導新交換機。

<#root>

```
Preparing to autoboot. [Press Ctrl-C to interrupt] 3 (interrupted)
rommon 1 >

rommon 2 >
```

boot usbflash0:cat9k_iosxe.17.03.01.SPA.bin

如果堆疊處於「安裝」開機模式下，則在檢測到新成員交換器上的軟體版本或開機模式不相容時，必須啟動堆疊的當前作用中自動軟體升級。通常，此階段不需要手動干預。

附註：在軟體自動升級過程中，如果需要microcode_update，則該過程可能需要幾分鐘。請耐心並密切觀察這一過程。

<#root>

Logs from Stack Active

Sep 13 07:20:21.261 UTC: %STACKMGR-4-SWITCH_ADDED: Switch 1 R0/0: stack_mgr: Switch 2 has been added to
Sep 13 07:20:22.268 UTC: %STACKMGR-4-SWITCH_ADDED: Switch 1 R0/0: stack_mgr: Switch 2 has been added to
Sep 13 07:20:22.546 UTC: %BOOT-3-BOOTTIME_INCOMPATIBLE_SW_DETECTED: Switch 1 R0/0: issu_stack:

Incompatible software detected

.
** snip **

Sep 13 07:47:37.443 UTC: %AUTO_UPGRADE-5-AUTO_UPGRADE_INITIATED: Switch 1 R0/0: auto_upgrade_trigger:

Auto upgrade initiated for switch 2.

Sep 13 07:47:37.496 UTC: %AUTO_UPGRADE-5-AUTO_UPGRADE_SEARCH: Switch 1 R0/0: auto_upgrade_trigger: Sear
Sep 13 07:47:37.519 UTC: %AUTO_UPGRADE-5-AUTO_UPGRADE_FOUND: Switch 1 R0/0: auto_upgrade_trigger: Found
Sep 13 07:47:37.538 UTC: %AUTO_UPGRADE-5-AUTO_UPGRADE_START: Switch 1 R0/0: auto_upgrade_trigger: Upgra
Sep 13 07:47:46.769 UTC: %AUTO_UPGRADE_MODULAR-5-SMU_AUTO_UPGRADE_INITIATING: Switch 1 R0/0: auto_upgra
Sep 13 07:47:47.272 UTC: %AUTO_UPGRADE-5-AUTO_UPGRADE_FINISH: Switch 1 R0/0: auto_upgrade_trigger:

Finished installing software on switch 2.

** snip **

Sep 13 07:57:18.981 UTC: %REDUNDANCY-5-PEER_MONITOR_EVENT: Active detected a standby insertion (raw-eve
Sep 13 07:57:18.981 UTC: %REDUNDANCY-5-PEER_MONITOR_EVENT: Active detected a standby insertion (raw-eve
Sep 13 07:57:49.863 UTC: %HA_CONFIG_SYNC-6-BULK_CFGSYNC_SUCCEED:

Bulk Sync succeeded

Sep 13 07:57:50.865 UTC:

%RF-5-RF_TERMINAL_STATE: Terminal state reached for (SSO)

驗證更換後

完成SSO後，檢查交換器的狀態。此時，您可以重新連線堆疊電源線（如果適用）。

<#root>

C9300#

show switch

Switch/Stack Mac Address : 70d3.79be.6c80 - Local Mac Address
Mac persistency wait time: Indefinite
H/W Current
Switch# Role   Mac Address   Priority Version State
----
*1   Active   70d3.79be.6c80   1   V01   Ready
 2   Standby 70d3.7984.8580   2   V01   Ready

```
!
C9300#
```

show module

```
Switch Ports  Model     Serial No. MAC address     Hw Ver. Sw Ver.
------ ----- --------- ----------- -------------- ------- --------
1      41    C9300-24U FCW2125L0BH 70d3.79be.6c80   V01    17.03.01
2      41    C9300-24U FCW2125L03W 70d3.7984.8580   V01    17.03.01
```

<#root>

C9300#

show redundancy

```
Redundant System Information :
------------------------------
Available system uptime = 58 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 1
Current Software state = ACTIVE
Uptime in current state = 58 minutes
Image Version = Cisco IOS Software [Amsterdam], Catalyst L3 Switch Software (CAT9K_IOSXE), Version 17.3
Technical Support: https://www.cisco.com/c/en/us/support/index.html
Copyright (c) 1986-2020 by Cisco Systems, Inc.
Compiled Fri 07-Aug-20 21:32 by mcpre
BOOT = flash:packages.conf;flash:;
CONFIG_FILE =
Configuration register = 0x102

Peer Processor Information :
----------------------------
```

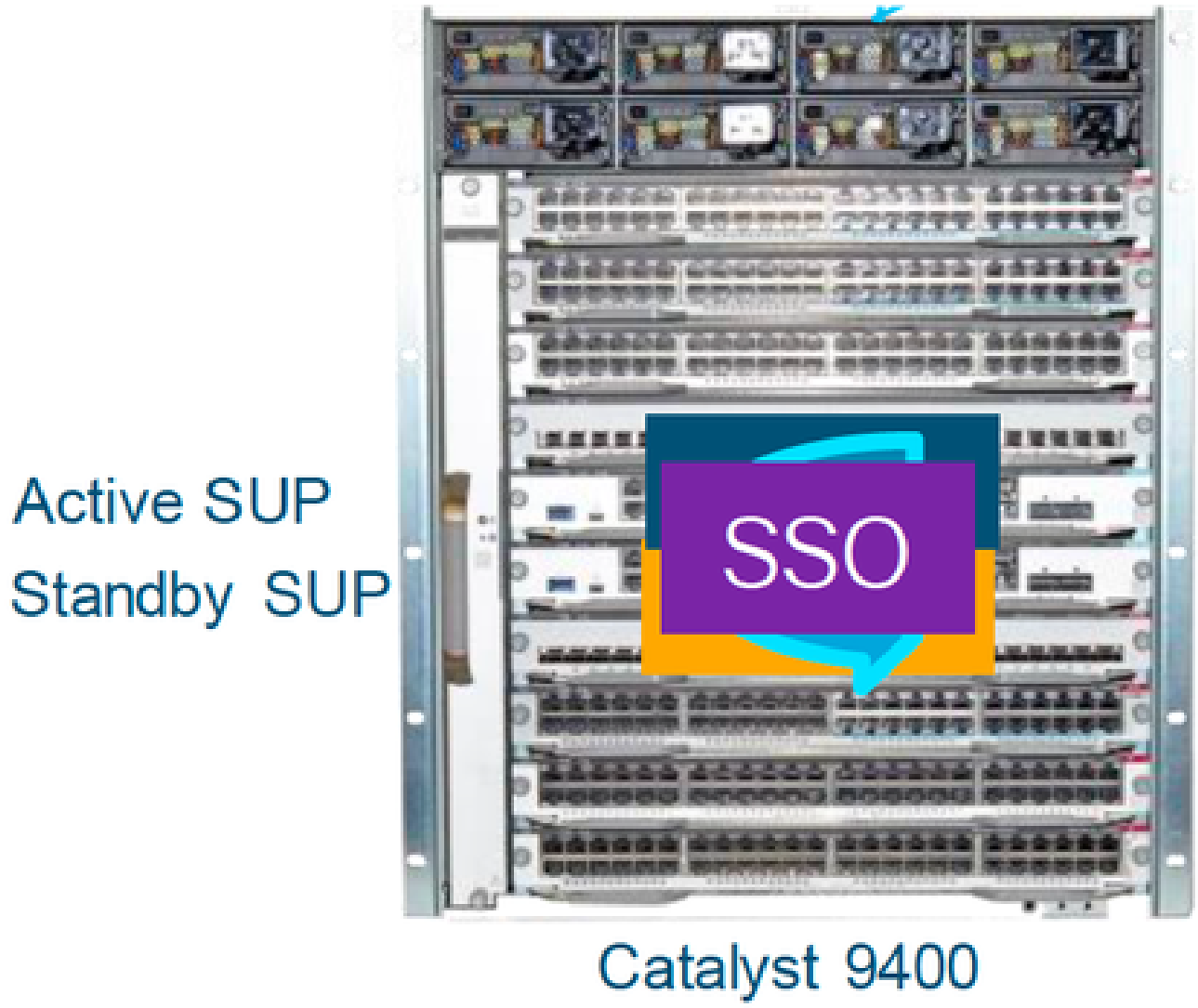
Standby Location = slot 2

Current Software state = STANDBY HOT

```
Uptime in current state = 4 minutes
Image Version = Cisco IOS Software [Amsterdam], Catalyst L3 Switch Software (CAT9K_IOSXE), Version 17.3
Technical Support: https://www.cisco.com/c/en/us/support/index.html
Copyright (c) 1986-2020 by Cisco Systems, Inc.
Compiled Fri 07-Aug-20 21:32 by mcpre
BOOT = flash:packages.conf;flash:;
CONFIG_FILE =
Configuration register = 0x102
```

更換C9400獨立機箱的冗餘管理引擎

在本示例中，您將更換C9404機箱的Active Supervisor。（本示例中的交換機在「安裝」引導模式下用於插槽3。）



驗證更換前

檢查交換器上的開機變數是否設定為指向正確的套件檔案（如果開機模式為安裝）或bin檔案（套件組合開機模式），且自動開機已啟用。

附註：如果交換器處於「安裝」開機模式，請確認是否已啟用軟體自動升級。如果沒有，則從全域組態模式設定「software auto-upgrade enable」，以啟用該功能。

<#root>

C9400#

show run all | in software auto

```
no software auto-upgrade source url
```

software auto-upgrade enable

附註：如果作用中Supervisor在「套件組合」啟動模式下運行，請將正在作用中執行的軟體檔案（.bin檔案）的副本保留在USB記憶體或本地TFTP伺服器中，您可以通過新Supervisor的帶外(OOB)管理連線埠從新Supervisor存取該檔案。

如果需要替換主用Supervisor(如本例中的示例中)，請對備用管理引擎執行故障轉移，並等待它接管主用角色。如果要替換備用管理引擎，請跳過此步驟。

<#root>

C9400#

redundancy force-switchover

```
System configuration has been modified. Save? [yes/no]: yes
Building configuration...
Compressed configuration from 11673 bytes to 4403 bytes[OK]Proceed with switchover to standby RP? [conf
```

替換

從機箱中移除有故障的Supervisor，插入新的有控制檯電纜的Supervisor。

附註：最初，如果兩個管理引擎的軟體版本不同，則需要匹配它們。例如，主用管理引擎可能運行16.9.5和新的/備用管理引擎16.9.4。

如果活動Supervisor在「捆綁」引導模式下運行，則在新Supervisor啟動時，請將其中斷到新Supervisor的ROMMON。藉助USB介面或OOB TFTP訪問，使用與您的活動Supervisor相同的軟體版本手動引導Supervisor。

<#root>

Preparing to autoboot. [

Press Ctrl-C to interrupt

] 3 (interrupted)
rommon 1 >
rommon 2 >

boot usbflash0:cat9k_iosxe.16.09.05.SPA.bin

如果您的作用中Supervisor在「安裝」引導模式下運行，則當前作用中Supervisor在檢測到不相容的軟體版本或新/備用Supervisor上的引導模式時，必須啟動自動軟體升級。通常，此階段不需要手動干預。

<#root>

```
*Jun 16 19:50:15.122: %IOSXE_OIR-6-INSSPA: SPA inserted in subslot 3/0
*Jun 16 19:50:42.374: %SPA_OIR-6-ONLINECARD: SPA (C9400-SUP-1) online in subslot 3/0
C9400#
*Jun 16 19:50:43.376: 3 0 0:Ignore this incremental sync, session not ready
C9400#
*Jun 16 19:52:10.003: %IOSXE_OIR-6-INSCARD: Card (fp) inserted in slot F1
C9400#
*Jun 16 19:51:16.469: %IOSXE-3-PLATFORM: R1/0: kernel: dplr_intrpt: Entered dplr_intrpt_module_init dpl
*Jun 16 19:51:16.472: %IOSXE-3-PLATFORM: R1/0: kernel: chr_mmap: Allocating DMA Reserve Pool ...
*Jun 16 19:52:27.950: %IOSXE_OIR-6-ONLINECARD: Card (rp) online in slot R1
*Jun 16 19:52:28.727: %AUTO_UPGRADE-5-AUTO_UPGRADE_INITIATED: R0/0: auto_upgrade_client:

Auto upgrade initiated for RP 1.


*Jun 16 19:52:28.748: %AUTO_UPGRADE-5-AUTO_UPGRADE_SEARCH: R0/0: auto_upgrade_client: Searching stack f
*Jun 16 19:52:28.760: %AUTO_UPGRADE-5-AUTO_UPGRADE_FOUND: R0/0: auto_upgrade_client:

Found donor RP 0 to auto upgrade RP 1.


*Jun 16 19:52:28.773: %AUTO_UPGRADE-5-AUTO_UPGRADE_START: R0/0: auto_upgrade_client:

Upgrading RP 1 with software from RP 0.



*Jun 16 19:52:39.655: %REDUNDANCY-5-PEER_MONITOR_EVENT: Active detected a standby insertion (raw-event=

*Jun 16 19:52:39.655: %REDUNDANCY-5-PEER_MONITOR_EVENT: Active detected a standby insertion (raw-event=

*Jun 16 19:52:39.642: %AUTO_UPGRADE_MODULAR-5-SMU_AUTO_UPGRADE_INITIATING: R0/0: auto_upgrade_client: In


*Jun 16 19:52:40.832: %AUTO_UPGRADE-5-AUTO_UPGRADE_FINISH: R0/0: auto_upgrade_client: Finished installin


*Jun 16 19:52:40.847: %AUTO_UPGRADE-5-AUTO_UPGRADE_RELOAD: R0/0: auto_upgrade_client: Reloading RP 1 to


*Jun 16 19:52:41.622: %IOSXE_OIR-6-OFFLINECARD: Card (rp) offline in slot R1

** snip **

*Jun 16 19:56:10.356: %REDUNDANCY-5-PEER_MONITOR_EVENT: Active detected a standby insertion (raw-event=

*Jun 16 19:56:10.356: %REDUNDANCY-5-PEER_MONITOR_EVENT: Active detected a standby insertion (raw-event=

** snip **

*Jun 16 19:57:33.582: %HA_CONFIG_SYNC-6-BULK_CFGSYNC_SUCCEED: Bulk Sync succeeded
*Jun 16 19:57:34.623: %RF-5-RF_TERMINAL_STATE:

 Terminal state reached for (SSO)
```

驗證更換後

完成SSO後，檢查管理引擎的狀態

<#root>

C9400#

show module

```
Chassis Type: C9404R
Mod Ports                          Card Type                     Model                Serial No.
---+--------------------+------------------------------+----------------------+--------------------
2         10                     Supervisor 1 Module           C9400-SUP-1           JAE22100647
3         10                     Supervisor 1 Module           C9400-SUP-1

Mod                    MAC addresses              Hw         Fw              Sw         Status
---+---------------------------------------+----------+--------------+--------------+------------
2         A8B4.56BF.316C to A8B4.56BF.3175       1.0       16.12.1r       16.09.05        ok
3

Mod   Redundancy Role            Operating Redundancy Mode           Configured Redundancy Mode
---+---------------------+---------------------------------------+-----------------------------------
2          Active                         sso                                   sso
3          Standby                        sso                                   sso

Chassis MAC address range: 44 addresses from a8b4.56bf.3140 to a8b4.56bf.316b
```

<#root>

C9400#

show redundancy

```
Redundant System Information :
------------------------------
Available system uptime = 10 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 2
```

```
Current Software state = ACTIVE
Uptime in current state = 10 minutes
Image Version = Cisco IOS Software [Fuji], Catalyst L3 Switch Software (CAT9K_IOSXE), Version 16.9.5, R
Technical Support: https://www.cisco.com/c/en/us/support/index.html
Copyright (c) 1986-2019 by Cisco Systems, Inc.
Compiled Thu 22-Aug-19 18:14 by mcpre
BOOT = bootflash:packages.conf;
CONFIG_FILE =
Configuration register = 0x102
Peer Processor Information :
-----------------------------
Standby Location = slot 3
Current Software state =
```

STANDBY HOT

```
Uptime in current state =
```

0 minutes

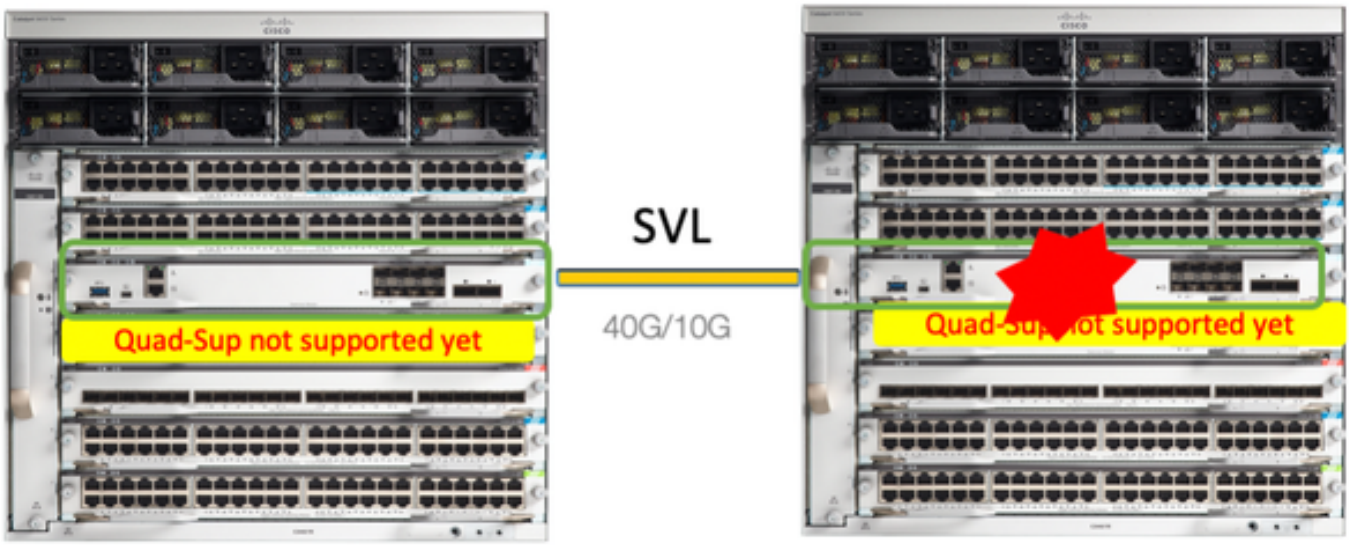
```
Image Version = Cisco IOS Software [Fuji], Catalyst L3 Switch Software (CAT9K_IOSXE),
```

Version 16.9.5

```
, RELEASE SOFTWARE (fc2)
Technical Support: https://www.cisco.com/c/en/us/support/index.html
Copyright (c) 1986-2019 by Cisco Systems, Inc.
Compiled Thu 22-Aug-19 18:14 by mcpre
BOOT = bootflash:packages.conf;
CONFIG_FILE =
Configuration register = 0x102
```

更換C9400 Dual-Sup StackWise-Virtual管理引擎

此示例適用於C9400 stackwise虛擬設定（每個機箱中有一個管理引擎），其中機箱1的管理引擎（活動交換機）已損壞，需要更換。SVL正在以「安裝」引導模式運行。



驗證更換前

檢查當前與StackWise-Virtual相關的配置和主管狀態。確保交換機上的啟動變數設定正確，指向正確的程式包檔案（如果啟動模式為「安裝」）或bin檔案（捆綁包啟動模式），並且已啟用自動啟動。

<#root>

9400-3#

show stackwise-virtual

```
Stackwise Virtual Configuration:
--------------------------------
Stackwise Virtual : Enabled
Domain Number : 100
Switch Stackwise Virtual Link Ports
------ ---------------------- ------
1             1               TenGigabitEthernet1/5/0/1 <<< switch 1 needs to be replaced here
2             1               TenGigabitEthernet2/5/0/1
```

<#root>

9400-3#

show bootvar

```
BOOT variable =
```

flash:packages.conf

```
;
Configuration Register is 0x102
```

MANUAL_BOOT variable = no

```
BAUD variable = 9600
ENABLE_BREAK variable = yes
BOOTMODE variable does not exist
IPXE_TIMEOUT variable does not exist
CONFIG_FILE variable =
```

附註：如果交換器處於「安裝」開機模式，請確認軟體自動升級是否已啟用。如果沒有，則通過從全域性配置模式配置「software auto-upgrade enable」來啟用該功能。

<#root>

9400-3#

show run all | in software auto

```
no software auto-upgrade source url
```

software auto-upgrade enable

附註：如果您的作用中Supervisor以「套件組合」開機模式執行，請將USB記憶體或本地TFTP伺服器中的執行中軟體檔案（您作用中時執行的.bin檔案）的副本保留下來，您可以透過新的Supervisor的頻外(OOB)管理連線埠從新Supervisor存取該檔案。

如果需要替換活動Supervisor(如我們的示例中)，請執行到待命Supervisor的故障轉移，並等待備用Supervisor接管活動角色。如果要替換備用Supervisor，請跳過此步驟。

<#root>

```
9400-1#
```

redundancy force-switchover

```
System configuration has been modified. Save? [yes/no]: yes
Building configuration...
Compressed configuration from 11673 bytes to 4403 bytes[OK]Proceed with switchover to standby RP? [conf
```

替換

關閉需要更換管理引擎的機箱的電源（在我們的示例中，它是chassis-1）。

從各個機箱的背板中卸下線卡（需要更換管理引擎）。 無需將線卡完全從機箱中取出，只要它們沒有連線到背板即可。這樣，當插入新的管理引擎並進行預轉移時，連線的遠端交換機（多機箱etherchannel）不會將其本地埠置於err-disabled狀態（LACP等）。

<#root>

```
9400-3#
```

show module

```
Chassis Type: C9410R

Switch Number 1
Mod Ports Card Type Model Serial No.
---+-----+--------------------------------------+--------------+--------------
Mod MAC addresses Hw Fw Sw Status
---+--------------------------------+----+------------+-----------------+--------
Mod  Redundancy Role      Operating Redundancy Mode    Configured Redundancy Mode
---+------------------+-------------------------+---------------------------

Switch Number 2
Mod Ports Card Type                                Model           Serial No.
---+-----+--------------------------------------+--------------+--------------
```

```
1    48   48-Port UPOE w/ 24p mGig 24p RJ-45     C9400-LC-48UX   JAE2138067S
2    48   48-Port UPOE 10/100/1000 (RJ-45)       C9400-LC-48U    JAE2141091P
5   10    Supervisor 1 Module                     C9400-SUP-1     JAE2220082A

Mod          MAC addresses             Hw        Fw             Sw            Status
---+--------------------------------+----+-----------+-----------------+--------
1   707D.B9CF.6D1C to 707D.B9CF.6D4B 1.0    16.12.2r     16.12.03a           ok
2   6CB2.AE42.2704 to 6CB2.AE42.2733 1.0    16.12.2r     16.12.03a           ok
5   AC3A.675B.E26C to AC3A.675B.E275 1.0    16.12.2r     16.12.03a           ok

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

將新的Supervisor插入存在故障Supervisor的同一插槽並接通電源。它必須在單機模式（非SVL）下啟動，暫時斷開Stackwise虛擬鏈路連線。

- 如果作用中Supervisor在「套件組合」開機模式下執行，請將軟體bin檔案（與SVL的目前作用中Supervisor相同）複製到新待命Supervisor的bootflash中，並相應地變更開機字串。
- 如果您的活動Supervisor在「安裝」引導模式下運行，則不需要手動軟體升級。如果新的/待命Supervisor檢測到不相容的軟體版本或引導模式，則必須由當前活動Supervisor自動升級新Supervisor的軟體和引導模式。

使用Stackwise虛擬設定配置新主管。（必須使用相同的SVL域號來匹配現有成員。）

```
<#root>

Switch#

conf t

Enter configuration commands, one per line.  End with CNTL/Z.

Switch(config)#

stackwise-virtual


Please reboot the switch for Stackwise Virtual configuration to take effect

Switch(config-stackwise-virtual)#

domain 100

Switch(config-stackwise-virtual)#

exit
```

配置SVL和DAD埠。使用故障Supervisor上使用的相同埠。

```
<#root>

9400-1(config)#
```

```
interface tenGigabitEthernet 5/0/1
```

```
9400-1(config-if)#
stackwise-virtual link 1

WARNING: All the extraneous configurations will be removed for TenGigabitEthernet5/0/1 on reboot
INFO: Upon reboot, the config will be part of running config but not part of start up config.
```

檢查SVL配置是否正確應用於新交換機。

<#root>

```
Switch#show stackwise-virtual

Stackwise Virtual Configuration:
--------------------------------
Stackwise Virtual : Disabled
Switch    Stackwise Virtual Link    Ports
------    ----------------------    ------
Stackwise Virtual Configuration After Reboot:
-------------------------------------------
Stackwise Virtual : Enabled
Domain Number :    100
Switch    Stackwise Virtual Link    Ports
------    ----------------------    ------
1        1                      TenGigabitEthernet5/0/1
```

從IOSd CLI檢查ROMMON中的SVL設定（在16.12.x或更高版本中可用）

<#root>

```
9400-1#
show romvar

ROMMON variables:
MAC_ADDR="70:0F:6A:DE:54:34"
SWITCH_NUMBER="1"
MODEL_NUM="C9400-SUP-1"
SYSTEM_SERIAL_NUM=""
MOTHERBOARD_SERIAL_NUM="JAE221703NQ"
TEMPLATE="access"
BAUD="9600"
LICENSE_BOOT_LEVEL="network-advantage+dna-advantage,all:MACALLAN-CHASSIS;"
MCP_STARTUP_TRACEFLAGS="00000000:00000000"
CALL_HOME_DEBUG="0000000000000"
D_STACK_DAD=""
CONFIG_FILE=""
BOOTLDR=""
SWITCH_IGNORE_STARTUP_CFG="0"
MANUAL_BOOT="no"
```

```
AUTOREBOOT_RESTORE="0"
ENABLE_BREAK="yes"
RET_2_RTS=""
AUTO_SWITCH_CONSOLE_DISABLE="0"
BOOT="flash:cat9k_iosxe.16.12.03a.SPA.bin;"
D_STACK_DISTR_STACK_LINK2=""
ABNORMAL_RESET_COUNT="1"
ROMMON_AUTOBOOT_ATTEMPT="3"
BSI="0"
RET_2_RCALTS=""
RANDOM_NUM="421133355"
```

D_STACK_DISTR_STACK_LINK1="Te5/0/1,"

D_STACK_MODE="aggregation"

D_STACK_DOMAIN_NUM="100"

儲存配置並關閉新管理引擎所在的機箱的電源。

連線兩個機箱之間的StackWise-Virtual鏈路，並希望斷開雙活動檢測鏈路（如果適用）。

開啟機箱電源，通過控制檯監控引導過程。

- 如果您的SVL在「捆綁包」引導模式下運行，請確保新的Supervisor提供的軟體版本與活動版本相同。如果沒有，請重新進入ROMMON並使用正確的軟體版本手動啟動。
- 如果SVL在「安裝」引導模式下運行，則「軟體自動升級」必須負責將正確的軟體版本和引導模式推送到新Supervisor中，無需任何手動干預。

<#root>

Active supervisor's log

```
*Sep 12 07:20:25.457: %ILPOWER-6-SET_ILPOWER: Set power allocated to POE to 4420 for slot 0
*Sep 12 07:20:30.621:
```

%BOOT-3-BOOTTIME_INCOMPATIBLE_SW_DETECTED: Chassis 2 R0/0: issu_stack: Incompatible software detected. D

***Sep 12 07:20:40.779: %AUTO_UPGRADE-5-AUTO_UPGRADE_START_CHECK: Chassis 2 R0/0: auto_upgrade_client: Aut**

***Sep 12 07:21:00.978: %AUTO_UPGRADE-5-AUTO_UPGRADE_INITIATED: Chassis 2 R0/0: auto_upgrade_client: Auto**

```
*Sep 12 07:21:01.031: %AUTO_UPGRADE-5-AUTO_UPGRADE_SEARCH: Chassis 2 R0/0: auto_upgrade_client: Searchi
*Sep 12 07:21:01.053: %AUTO_UPGRADE-5-AUTO_UPGRADE_FOUND: Chassis 2 R0/0: auto_upgrade_client: Found do
```

***Sep 12 07:21:01.074: %AUTO_UPGRADE-5-AUTO_UPGRADE_START: Chassis 2 R0/0: auto_upgrade_client: Upgrading**

<#root>

Logs from new supervisor's console

```
Waiting for remote chassis to join
########################################
Chassis number is 1
All chassis in the stack have been discovered. Accelerating discovery

Chassis 1 reloading, reason - System requested reload <<< reload is instructed by current active as part
Sep 12 07:25:23.306: %PMAN-5-EXITACTION: R0/0: pvp: Process manager is exiting: process exit with reload
```

所有運行配置都必須從活動Supervisor自動同步到新配置。等待來自活動管理引擎的這些日誌。

```
*Sep 12 07:33:39.803: %HA_CONFIG_SYNC-6-BULK_CFGSYNC_SUCCEED: Bulk Sync succeeded
*Sep 12 07:33:40.837: %RF-5-RF_TERMINAL_STATE: Terminal state reached for (SSO)
```

- 完成SSO後，繼續連線雙活動檢測(DAD)鏈路和新Supervisor上的其他網路上行鏈路埠（如果適用）。
- 將線卡推回內部，使其重新連線到底板
- 驗證所有線卡是否正常啟動、通過線上診斷測試並開啟其介面（包括埠通道繫結等）。

驗證更換後

使用以下命令檢查StackWise虛擬相關組態和交換器的狀態。

<#root>

9400-3#

sh redundancy

```
Redundant System Information :
------------------------------
Available system uptime = 1 hour, 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 = Switch 2
Current Software state = ACTIVE
Uptime in current state = 31 minutes
Image Version = Cisco IOS Software [Gibraltar], Catalyst L3 Switch Software (CAT9K_IOSXE), Version 16.1
Technical Support: https://www.cisco.com/c/en/us/support/index.html
Copyright (c) 1986-2020 by Cisco Systems, Inc.
Compiled Tue 28-Apr-20 09:37 by mcpre
BOOT = flash:packages.conf;
CONFIG_FILE =
Configuration register = 0x102

Peer Processor Information :
----------------------------
```

Standby Location = Switch 1

Current Software state = STANDBY HOT

```
Uptime in current state = 4 minutes
Image Version = Cisco IOS Software [Gibraltar], Catalyst L3 Switch Software (CAT9K_IOSXE), Version 16.1
Technical Support: https://www.cisco.com/c/en/us/support/index.html
Copyright (c) 1986-2020 by Cisco Systems, Inc.
Compiled Tue 28-Apr-20 09:37 by mcpre
BOOT = flash:packages.conf;
CONFIG_FILE =
Configuration register = 0x102
!
```

<#root>

9400-3#

sh stackwise-virtual

```
Stackwise Virtual Configuration:
--------------------------------
Stackwise Virtual : Enabled
Domain Number : 100
Switch Stackwise Virtual Link Ports
------ ---------------------- ------
1          1                    TenGigabitEthernet1/5/0/1
2          1                    TenGigabitEthernet2/5/0/1
```

<#root>

9400-3#

sh module

```
Chassis Type: C9410R
Switch Number 1

Mod Ports         Card Type                          Model          Serial No.
---+-----+-----------------------------------------+--------------+--------------
1    48     48-Port UPOE w/ 24p mGig 24p RJ-45   C9400-LC-48UX  JAE22360153
2    48     48-Port UPOE w/ 24p mGig 24p RJ-45   C9400-LC-48UX  JAE215103V7
5    10     Supervisor 1 Module                  C9400-SUP-1    JAE221703NQ

Mod    MAC addresses                    Hw      Fw           Sw                 Status
---+--------------------------------+----+------------+------------------+--------
1    00B7.71FA.D878 to 00B7.71FA.D8A7 1.0   16.12.2r     16.12.03a
```

ok

```
2    4C77.6DBF.4A94 to 4C77.6DBF.4AC3 1.0   16.12.2r     16.12.03a
```

ok

```
5    AC3A.675B.E9AC to AC3A.675B.E9B5 1.0   16.12.2r     16.12.03a
```

ok

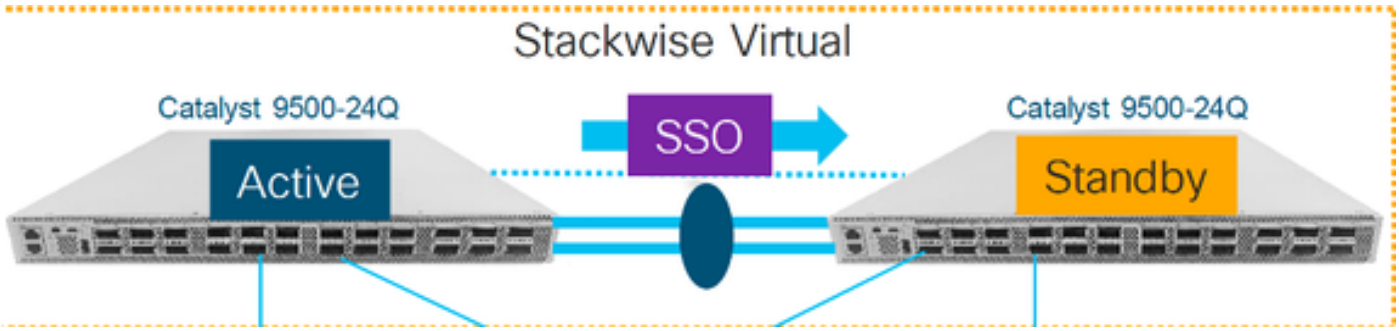
```
Mod Redundancy Role       Operating Redundancy Mode   Configured Redundancy Mode
---+------------------+-------------------------+---------------------------
5
```

Standby   sso

```
                           sso
**snip**
```

更換C9500 StackWise-Virtual的成員

在本例中，您考慮將Switch-1（活動交換機）的C9500 Stackwise虛擬設定作為需要更換的故障交換機。SVL正在安裝引導模式下運行。



驗證更換前

檢查目前的StackWise-Virtual相關組態和交換器的狀態。請確保正確設定了引導變數，指向packages.conf ，且配置暫存器設定為0x2102。

<#root>

C9500-1#

show stackwise-virtual

```
Stackwise Virtual Configuration:
--------------------------------
Stackwise Virtual : Enabled
Domain Number : 100
Switch Stackwise Virtual Link Ports
------ --------------------- ------
1            1                TwentyFiveGigE1/0/1
                              TwentyFiveGigE1/0/2
2            1                TwentyFiveGigE2/0/1
                              TwentyFiveGigE2/0/2
```

<#root>

C9500-1#

show stackwise-virtual dual-active-detection

```
Dual-Active-Detection Configuration:
------------------------------------
Switch    Dad port
------    ------------
1       TwentyFiveGigE1/0/3
2       TwentyFiveGigE2/0/3    <<<<<<<<<< Ports configured for Dual-Active Detection (DAD)
```

Note :

Configs of these DAD ports do not show up in running-config

```
!
interface TwentyFiveGigE 1/0/3
end
!
interface TwentyFiveGigE 2/0/3
end
```

C9500-1#show switch

```
Switch/Stack Mac Address : f4db.e619.0480 - Local Mac Address
Mac persistency wait time: Indefinite
H/W Current
Switch# Role      Mac Address    Priority  Version  State
-----------------------------------------------------------------------------------
*1     Active    f4db.e619.0480    15       V02     Ready
 2     Standby   f4db.e618.fa80     1       V02     Ready
```

C9500-1#

```
show redundancy
```

```
Redundant System Information :
------------------------------
Available system uptime = 4 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 1
Current Software state = ACTIVE
Uptime in current state = 4 minutes
Image Version = Cisco IOS Software [Gibraltar], Catalyst L3 Switch Software (CAT9K_IOSXE), Version 16.1
Technical Support: https://www.cisco.com/c/en/us/support/index.html
Copyright (c) 1986-2019 by Cisco Systems, Inc.
Compiled Tue 19-Nov-19 10:04 by mcpre

BOOT = flash:packages.conf

;
CONFIG_FILE =

Configuration register = 0x102



Peer Processor Information :
-----------------------------
Standby Location = slot 2
Current Software state = STANDBY HOT
Uptime in current state = 1 minute
Image Version = Cisco IOS Software [Gibraltar], Catalyst L3 Switch Software (CAT9K_IOSXE), Version 16.1
Technical Support: https://www.cisco.com/c/en/us/support/index.html
Copyright (c) 1986-2019 by Cisco Systems, Inc.
Compiled Tue 19-Nov-19 10:04 by mcpre

BOOT = flash:packages.conf

;
CONFIG_FILE =

Configuration register = 0x102
```

附註：如果SVL以安裝引導模式運行，請驗證是否已啟用軟體自動升級。如果沒有，則通過從全域性配置模式配置「software auto-upgrade enable」來啟用該功能。（如果SVL在套件組合開機模式下執行，請跳過此步驟）。

<#root>

C9500-1#

```
show run all | in software auto
```

```
no software auto-upgrade source url
software auto-upgrade enable
```

如果需要更換主用交換機，請執行到備用交換機的故障轉移，並等待備用交換機接管主用角色。（如果要更換備用裝置，請跳過此步驟）。

```
<#root>
C9500-1#
redundancy force-switchover
```

```
System configuration has been modified. Save? [yes/no]: yes
Building configuration...
Compressed configuration from 11673 bytes to 4403 bytes[OK]Proceed with switchover to standby RP? [conf
```

替換

關閉需要更換的交換機電源。斷開該交換機的所有電纜。

```
<#root>
C9500-1#
show switch
```

```
Switch/Stack Mac Address : f4db.e619.0480 - Foreign Mac Address
Mac persistency wait time: Indefinite
H/W Current
Switch# Role      Mac Address    Priority Version  State
-------------------------------------------------------------------------------------
 1     Member    0000.0000.0000    0        V02    Removed  << switch 1 is powered down
*2     Active    f4db.e618.fa80    1        V02    Ready
```

開啟新交換機的電源。它必須在單機模式（非SVL）下啟動。（如果當前活動SVL正在安裝引導模式下運行，請跳過此步驟）

檢查新裝置上的軟體版本。如果它與StackWise-Virtual單元的現有成員不匹配，則將其預存以與軟體版本和許可證匹配，並與SVL的現有成員進行預存。(您可以通過TFTP/FTP/SFTP或使用USB介面載入正確的軟體版本，並在新單元上匹配軟體版本和許可證後，繼續執行下一步。

```
<#root>
```

```
Cisco IOS XE Software,
Version 16.12.02

Cisco IOS Software [Gibraltar], Catalyst L3 Switch Software (CAT9K_IOSXE), Version 16.12.02, RELEASE SO
Technical Support: https://www.cisco.com/c/en/us/support/index.html
Copyright (c) 1986-2019 by Cisco Systems, Inc.
Compiled Tue 19-Nov-19 10:04 by mcpre
```

附註：如果SVL正在安裝引導模式下運行且啟用了軟體自動升級，則通常情況下，SVL的現有活動成員必須能夠自動匹配新裝置的代碼和引導模式。

在新交換器上設定StackWise Virtual。必須使用相同的SVL域號來匹配現有成員。

```
<#root>
Switch#
conf t
Enter configuration commands, one per line.  End with CNTL/Z.
Switch(config)#
stackwise-virtual

Please reboot the switch for Stackwise Virtual configuration to take effect
Switch(config-stackwise-virtual)#
domain 100
Switch(config-stackwise-virtual)#
exit
```

配置SVL和DAD埠。使用故障交換器上使用的埠。

```
<#root>
Switch(config)#
int range twe1/0/1-2
Switch(config-if-range)#
stackwise-virtual link 1
WARNING: All the extraneous configurations will be removed for TwentyFiveGigE1/0/1 on reboot
WARNING: All the extraneous configurations will be removed for TwentyFiveGigE1/0/2 on reboot
Switch(config-if-range)#exit
Switch(config)#
int twe1/0/3
```

```
Switch(config-if)#
stackwise-virtual dual-active-detectio
n
WARNING: All the extraneous configurations will be removed for TwentyFiveGigE1/0/3 on reboot.
```

檢查SVL配置是否正確應用於新交換機。

```
<#root>
Switch#
show stackwise-virtual

Stackwise Virtual Configuration:
--------------------------------
Stackwise Virtual : Disabled
Switch    Stackwise Virtual Link    Ports
------    ----------------------    ------
Stackwise Virtual Configuration After Reboot:
-------------------------------------------
Stackwise Virtual : Enabled
Domain Number :    100
Switch    Stackwise Virtual Link    Ports
------    ----------------------    ------
1        1                      TwentyFiveGigE1/0/1
                                TwentyFiveGigE1/0/2

Switch#
show stackwise-virtual dual-active-detection

Dual-Active-Detection Configuration:
------------------------------------
Switch    Dad port
------    ------------
Distributed Stack DAD Configuration After Reboot:
-------------------------------------------------
Switch    Dad port
------    --------
1        TwentyFiveGigE1/0/3
```

儲存配置並關閉新交換機的電源。

在現有SVL成員和新裝置之間連線StackWise-Virtual連結。最好斷開雙活動檢測連結。

開啟新裝置的電源。如果交換機編號存在衝突，則必須對新裝置自動重新編號。

```
Chassis is reloading, reason: Configured Switch num conflicts with peer, Changing local switch number t
Sep 10 22:41:50.738: %PMAN-3-PROCHOLDDOWN: R0/0: The process nif_mgr has been helddown (rc 69)
```

附註：如果新裝置正在運行不相容的軟體或引導模式，而現有SVL成員正在運行安裝引導模式，則軟體自動升級將啟動，使新裝置進入安裝引導模式，無需手動干預。

```
*Sep 10 22:47:05.996: %AUTO_UPGRADE-5-AUTO_UPGRADE_START_CHECK: Chassis 2 R0/0: auto_upgrade_client: Au
```

所有運行配置都會自動從活動交換機同步到New交換機。不需要其他配置。等待活動交換機的這些日誌。

```
*Sep 11 01:02:28.974: %HA_CONFIG_SYNC-6-BULK_CFGSYNC_SUCCEED: Bulk Sync succeeded
C9500-1#
*Sep 11 01:02:30.009: %RF-5-RF_TERMINAL_STATE: Terminal state reached for (SSO)
```

繼續連線雙活檢測(DAD)鏈路和其他網路埠。（完成SSO後）

驗證更換後

使用以下命令檢查StackWise虛擬相關組態和交換器的狀態。

<#root>

```
C9500-1#
```

show stackwise-virtual

```
Stackwise Virtual : Enabled
Domain Number : 100
Switch Stackwise Virtual Link    Ports
------ ----------------------    ------
1              1              TwentyFiveGigE1/0/1
                              TwentyFiveGigE1/0/2
2              1              TwentyFiveGigE2/0/1
                              TwentyFiveGigE2/0/2

C9500-1#
```

show redundancy

```
Redundant System Information :
------------------------------
Available system uptime = 14 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 2
Current Software state = ACTIVE
Uptime in current state = 14 minutes
Image Version = Cisco IOS Software [Gibraltar], Catalyst L3 Switch Software (CAT9K_IOSXE), Version 16.1
Technical Support: https://www.cisco.com/c/en/us/support/index.html
Copyright (c) 1986-2019 by Cisco Systems, Inc.
Compiled Tue 19-Nov-19 10:04 by mcpre
BOOT = flash:packages.conf;
CONFIG_FILE =
Configuration register = 0x102

Peer Processor Information :
-----------------------------
Standby Location =
```

slot 1

```
Current Software state =
```

STANDBY HOT

```
Uptime in current state = 1 minute
Image Version = Cisco IOS Software [Gibraltar], Catalyst L3 Switch Software (CAT9K_IOSXE), Version 16.1
Technical Support: https://www.cisco.com/c/en/us/support/index.html
Copyright (c) 1986-2019 by Cisco Systems, Inc.
Compiled Tue 19-Nov-19 10:04 by mcpre
BOOT = flash:packages.conf;
CONFIG_FILE =
Configuration register = 0x102
```

更換C9600 Dual-Sup獨立機箱的冗餘管理引擎

在本示例中，您正在考慮更換C9606機箱插槽3上的活動管理引擎。（交換機正在以「安裝」引導模式運行。）

驗證更換前

檢查交換器上的開機變數是否正確設定為指向正確的套件檔案（如果開機模式為安裝）或bin檔案（套件組合開機模式），且已啟用自動開機。

附註：如果交換器在「安裝」開機模式下執行，請確認軟體自動升級是否啟用。如果沒有，則通過從全域性配置模式配置「software auto-upgrade enable」來啟用該功能。

```
<#root>

C9600R-1#

show run all | in software auto


no software auto-upgrade source url
```

```
software auto-upgrade enable
```

> 附註：如果作用中Supervisor在「套件組合」啟動模式下執行，請將執行中的軟體檔案（您正在作用中時執行的.bin檔案）的副本保留在USB記憶體或本地TFTP伺服器中，您可以通過新Supervisor的帶外(OOB)管理連線埠對其進行存取。

替換

如果需要替換主用Supervisor(如本例中的)，請執行故障切換到備用Supervisor，並等待它接管主用角色。（如果您要更換備用Supervisor，請跳過此步驟）。

```
<#root>

C9600R-1#

redundancy force-switchover


System configuration has been modified. Save? [yes/no]: yes
Building configuration...
Compressed configuration from 11673 bytes to 4403 bytes[OK]Proceed with switchover to standby RP? [conf
```

從機箱中移除有故障的Supervisor，插入新的有控制檯電纜的Supervisor。

> 附註：最初，如果兩個管理引擎的軟體版本不同，則需要匹配它們。例如，主用管理引擎可能運行16.12.4和新的/備用管理引擎16.12.2。

如果活動Supervisor在「捆綁」引導模式下運行，則在新Supervisor啟動時，請將其中斷到新Supervisor的ROMMON。藉助USB介面或OOB TFTP訪問，使用與您的活動Supervisor相同的軟體版本手動引導Supervisor。稍後，新備用連線SSO後，將正在運行的軟體複製到其本地bootflash。

```
<#root>

Preparing to autoboot. [Press Ctrl-C to interrupt] 3 (interrupted)
rommon 1 >
rommon 2 >

boot disk0:cat9k_iosxe.16.12.04.SPA.bin
```

如果您的作用中Supervisor在「安裝」引導模式下運行，則當前作用中Supervisor在檢測到不相容的軟體版本或新/備用Supervisor上的引導模式時，必須啟動自動軟體升級。通常，此階段不需要手動

干預。

<#root>

```
*Sep 12 21:32:04.886: %REDUNDANCY-5-PEER_MONITOR_EVENT: Active detected a standby insertion (raw-event=
*Sep 12 21:32:04.886: %REDUNDANCY-5-PEER_MONITOR_EVENT: Active detected a standby insertion (raw-event=
*Sep 12 21:32:07.773: %REDUNDANCY-2-IPC:
```

IOS versions do not match.

```
*Sep 12 21:32:07.823: %SMART_LIC-5-EVAL_START: Entering evaluation period
*Sep 12 21:32:28.980: %AUTO_UPGRADE_MODULAR-5-SMU_AUTO_UPGRADE_INITIATING: R1/0:
```

auto_upgrade_client: Initiating SMU autoupgrade for RP 0

```
*Sep 12 21:32:30.867: %AUTO_UPGRADE-5-AUTO_UPGRADE_FINISH: R1/0: auto_upgrade_client:
```

Finished installing software on RP 0.

```
*Sep 12 21:32:30.908: %AUTO_UPGRADE-5-AUTO_UPGRADE_RELOAD: R1/0: auto_upgrade_client:
```

Reloading RP 0 to complete the auto upgrade.

```
** snip **

*Jun 16 19:56:10.356: %REDUNDANCY-5-PEER_MONITOR_EVENT: Active detected a standby insertion (raw-event=

*Jun 16 19:56:10.356: %REDUNDANCY-5-PEER_MONITOR_EVENT: Active detected a standby insertion (raw-event=

** snip **
*Sep 12 21:36:37.786: %REDUNDANCY-5-PEER_MONITOR_EVENT: Active detected a standby insertion (raw-event=
*Sep 12 21:36:37.786: %REDUNDANCY-5-PEER_MONITOR_EVENT: Active detected a standby insertion (raw-event=
**snip**
*Sep 12 21:39:24.085: %HA_CONFIG_SYNC-6-BULK_CFGSYNC_SUCCEED: Bulk Sync succeeded
*Sep 12 21:39:25.124: %RF-5-RF_TERMINAL_STATE:
```

Terminal state reached for (SSO)

驗證更換後

完成SSO後，檢查管理引擎的狀態

<#root>

```
C9606R-1#
```

show mod

```
Chassis Type: C9606R

Mod  Ports  Card Type                                Model        Serial No.
---+-----+----------------------------------------+--------------+--------------
```

```
1    24    24-Port 40GE/12-Port 100GE             C9600-LC-24C   CAT2313L2WQ
2    48    48-Port 10GE / 25GE                    C9600-LC-48YL  CAT2314L36W
3    0     Supervisor 1 Module                    C9600-SUP-1    CAT2310L5C1
4    0     Supervisor 1 Module                    C9600-SUP-1    CAT2311L4DQ
5    48    48-Port 10GE / 25GE                    C9600-LC-48YL  CAT2310L57N

Mod       MAC addresses                Hw      Fw         Sw                Status
---+--------------------------------+----+------------+------------------+--------
1   DC8C.37C9.AC00 to DC8C.37C9.AC7F  1.0  17.1.1[FC2]  16.12.04           ok
2   DC8C.37C9.FD00 to DC8C.37C9.FD7F  1.0  17.1.1[FC2]  16.12.04           ok
3   DC8C.3772.C780 to DC8C.3772.C7FF  1.0  17.1.1[FC2]  16.12.04           ok
4   DC8C.3772.E580 to DC8C.3772.E5FF  1.0  17.1.1[FC2]  16.12.04           ok
5   DC8C.3773.0280 to DC8C.3773.02FF  1.0  17.1.1[FC2]  16.12.04           ok

Mod  Redundancy Role      Operating Redundancy Mode Configured Redundancy Mode
---+------------------+-------------------------+---------------------------
3     Standby                     sso                       sso
4     Active                      sso                       sso
Chassis MAC address range: 64 addresses from 6cb2.ae4a.9680 to 6cb2.ae4a.96bf
```

<#root>

C9606R-1#

show redundancy

```
Redundant System Information :
------------------------------
Available system uptime = 1 day, 11 hours, 32 minutes
Switchovers system experienced = 1
Standby failures = 1
Last switchover reason = user forced
Hardware Mode = Duplex
Configured Redundancy Mode = sso
Operating Redundancy Mode = sso
Maintenance Mode = Disabled
Communications = Up

Current Processor Information :
------------------------------
Active Location = slot 4
Current Software state = ACTIVE
Uptime in current state = 35 minutes
Image Version = Cisco IOS Software [Gibraltar], Catalyst L3 Switch Software (CAT9K_IOSXE), Version 16.1
Technical Support: http://www.cisco.com/techsupport
Copyright (c) 1986-2020 by Cisco Systems, Inc.
Compiled Thu 09-Jul-20 21:49 by mcpre
BOOT =
CONFIG_FILE =

Peer Processor Information :
----------------------------
Standby Location = slot 3
Current Software state =
```

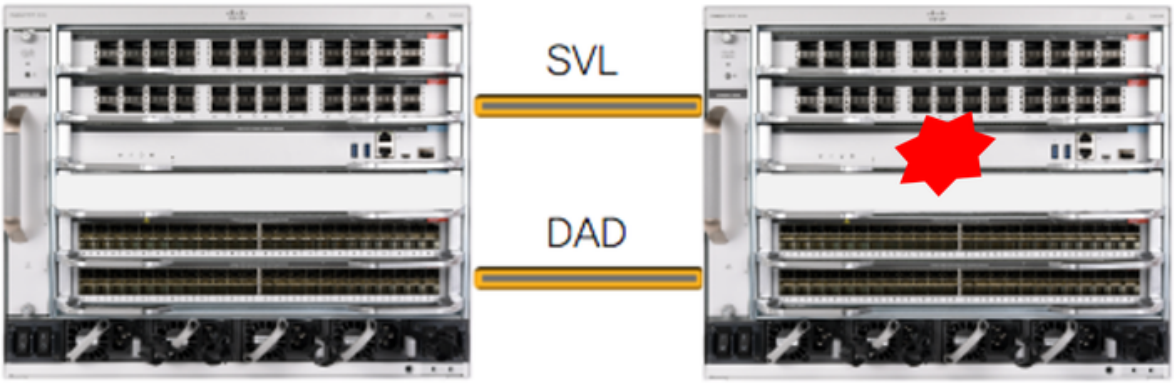
STANDBY HOT

```
Uptime in current state = 3 minutes
Image Version = Cisco IOS Software [Gibraltar], Catalyst L3 Switch Software (CAT9K_IOSXE), Version 16.1
```

```
Technical Support: http://www.cisco.com/techsupport
Copyright (c) 1986-2020 by Cisco Systems, Inc.
Compiled Thu 09-Jul-20 21:49 by mcpre
BOOT =
CONFIG_FILE =
```

更換C9600 Dual-Sup StackWise-Virtual管理引擎

在本示例中，您考慮的是C9600 stackwise虛擬設定（每個機箱一個管理引擎），其中機箱1的管理引擎（活動交換機）已損壞，需要更換。SVL正在以「安裝」引導模式運行。



驗證更換前

檢查當前與StackWise-Virtual相關的配置和主管狀態。確保交換機上的啟動變數設定正確，指向正確的程式包檔案（如果啟動模式為「安裝」）或bin檔案（捆綁包啟動模式），並且已啟用自動啟動。

<#root>

C9600_SVL#

sh stackwise-virtual

```
Stackwise Virtual Configuration:
--------------------------------
Stackwise Virtual : Enabled
Domain Number : 100

Switch Stackwise Virtual Link Ports
------ --------------------- ------
2           1                FortyGigabitEthernet2/1/0/1
                             FortyGigabitEthernet2/1/0/2
1           1                FortyGigabitEthernet1/1/0/1  << supervisor of SW1 needs to be replaced
                             FortyGigabitEthernet1/1/0/2
```

<#root>

```
C9600_SVL#
show bootvar

BOOT variable =
bootflash:packages.conf
;
MANUAL_BOOT variable = no

BAUD variable = 9600
ENABLE_BREAK variable = yes
BOOTMODE variable does not exist
IPXE_TIMEOUT variable does not exist
CONFIG_FILE variable =
```

附註：如果SVL處於「安裝」開機模式，請確認是否已啟用軟體自動升級。如果沒有，則通過從全域性配置模式配置「software auto-upgrade enable」來啟用該功能。

<#root>

```
C9600_SVL#
show run all | in software auto

no software auto-upgrade source url
software auto-upgrade enable
```

如果作用中Supervisor在「套件組合」啟動模式下執行，請將執行中的軟體檔案（您正在作用中時執行的.bin檔案）的副本保留在USB記憶體或本地TFTP伺服器中，您可以通過新Supervisor的帶外(OOB)管理連線埠對其進行存取。

- 如果需要替換活動Supervisor(如我們的示例中)，請執行到待命Supervisor的故障轉移，並等待備用Supervisor接管活動角色。如果要替換備用Supervisor，請跳過此步驟。

<#root>

```
C9600_SVL#
redundancy force-switchover

System configuration has been modified. Save? [yes/no]: yes
Building configuration...
Compressed configuration from 11673 bytes to 4403 bytes[OK]Proceed with switchover to standby RP? [conf
```

替換

關閉需要更換管理引擎的機箱的電源。在我們的示例中，它是chassis-1。

從各自機箱的背板中卸下線卡（需要更換管理引擎），StackWise虛擬鏈路(SVL)所連線的線卡除外。對於配置了SVL的線卡，請刪除除SVL本身以外的所有連線。這樣，當插入新的管理引擎並進行預轉移時，連線的遠端交換機（多機箱etherchannel）不會將其本地埠置於err-disabled狀態（LACP等）。

<#root>

C9600_SVL#

show module

```
Chassis Type: C9606R
Switch Number 1
Mod  Ports        Card Type                          Model           Serial No.
---+-----+-----------------------------------------+--------------+--------------

Mod     MAC addresses                 Hw      Fw            Sw            Status
---+--------------------------------+----+-----------+-----------------+--------

Mod  Redundancy Role    Operating Redundancy Mode  Configured Redundancy Mode
---+------------------+-------------------------+---------------------------

Switch Number 2
Mod Ports           Card Type                           Model          Serial No.
---+-----+-----------------------------------------+--------------+--------------
1    24    24-Port 40GE/12-Port 100GE               C9600-LC-24C   CAT2310L4DW
2    48    48-Port 10GE / 25GE                      C9600-LC-48YL  CAT2310L59S
3    0     Supervisor 1 Module                      C9600-SUP-1    CAT2340L40Q
5    24    24-Port 40GE/12-Port 100GE               C9600-LC-24C   CAT2313L2W1

Mod        MAC addresses               Hw    Fw             Sw               Status
---+-------------------------------+----+-----------+-----------------+--------
1   DC8C.379F.DB80 to DC8C.379F.DBFF  1.0  17.3.1r[FC2]  17.03.01           ok
2   DC8C.3772.FD80 to DC8C.3772.FDFF  1.0  17.3.1r[FC2]  17.03.01           ok
3   7C21.0E5D.0800 to 7C21.0E5D.087F  1.0  17.3.1r[FC2]  17.03.01           ok
5   DC8C.37A0.D180 to DC8C.37A0.D1FF  1.0  17.3.1r[FC2]  17.03.01           ok

Mod    Redundancy Role  Operating Redundancy Mode Configured Redundancy Mode
---+------------------+-------------------------+---------------------------
3       Active               non-redundant                sso

Chassis 2 MAC address range: 64 addresses from 2c4f.523b.bd00 to 2c4f.523b.bd3f
```

將新的Supervisor插入存在故障Supervisor的同一插槽並接通電源。它必須在單機模式（非SVL）下啟動，暫時保持Stackwise虛擬連結和DAD連結斷開連線。

如果作用中Supervisor在「套件組合」開機模式下執行，請將軟體bin檔案（與SVL的目前作用中Supervisor相同）複製到新待命Supervisor的bootflash中，並相應地變更bootstring。

如果您的活動Supervisor在「安裝」引導模式下運行，則不需要手動軟體升級。如果新的/待命Supervisor檢測到不相容的軟體版本或引導模式，則必須由當前活動Supervisor自動升級新Supervisor的軟體和引導模式。

使用Stackwise虛擬設定配置新主管。（必須使用相同的SVL域號來匹配現有成員）。

```
<#root>

Switch#

conf t

Enter configuration commands, one per line.  End with CNTL/Z.

Switch(config)#

stackwise-virtual


Please reboot the switch for Stackwise Virtual configuration to take effect
Switch(config-stackwise-virtual)#

domain 100

Switch(config-stackwise-virtual)#

exit
```

配置SVL和DAD埠。使用故障Supervisor上使用的埠。

```
<#root>

Switch(config)#

int range fortyGigabitEthernet 1/0/1 -2


Switch(config-if-range)#

stackwise-virtual link 1



Switch(config)#int range twentyFiveGigE 2/0/25 -26
Switch(config-if-range)#

stackwise-virtual dual-active-detection
```

檢查SVL配置是否正確應用於新交換機。

```
<#root>

Switch#

show stackwise-virtual
```

```
Stackwise Virtual Configuration:
--------------------------------
Stackwise Virtual Configuration After Reboot:
---------------------------------------------
Stackwise Virtual : Enabled
```

Domain Number : 100

```
Switch Stackwise Virtual Link  Ports
------ ----------------------  ------
1          1                   FortyGigabitEthernet1/0/1
                               FortyGigabitEthernet1/0/2

Switch#
```

show stackwise-virtual dual-active-detection

```
In dual-active recovery mode: No
Dual-Active-Detection Configuration:
------------------------------------
Switch Dad port Status
------ ------------ ---------
Distributed Stack DAD Configuration After Reboot:
-------------------------------------------------
Switch     Dad port            Status
------      --------          ------
1      TwentyFiveGigE2/0/25   down
       TwentyFiveGigE2/0/26   down
```

如果軟體版本為16.12.x或更高版本，則可以從IOSd CLI檢查ROMMON中的SVL設定。

<#root>

```
Switch#
```

show romvar

```
ROMMON variables:
BOARDID="38"
ETHER_PORT="2"
PS1="rommon ! >"
MAC_ADDR="7C:21:0E:5D:04:00"
DOPPLER_E_WA="1"
RETRY="0"
MODEL_NUM="C9600-SUP-1"
SYSTEM_SERIAL_NUM="CAT2340L3Y5"
MOTHERBOARD_SERIAL_NUM="CAT2340L3Y5"
TEMPLATE="core"
BAUD="9600"
AUTO_SWITCH_CONSOLE_DISABLE="0"
PSEUDO_OIR_REMOVE_SET="1"
CALL_HOME_DEBUG="0000000000000"
ENABLE_BREAK="yes"
RET_2_RTS=""
CRASHINFO="bootflash:crashinfo_RP_00_00_20200225-024401-UTC"
MCP_STARTUP_TRACEFLAGS="00000000:00000000"
CONFIG_FILE=""
```

```
BOOTLDR=""
RECOVERY_RELOAD_DISABLE=""
SWITCH_PRIORITY="1"
SWITCH_NUMBER="1"
SWITCH_IGNORE_STARTUP_CFG="0"
D_STACK_DISTR_STACK_LINK2=""
MANUAL_BOOT="no"
AUTOREBOOT_RESTORE="0"
ABNORMAL_RESET_COUNT="0"
ROMMON_AUTOBOOT_ATTEMPT="3"
BSI="0"
RET_2_RCALTS=""
RANDOM_NUM="1430571596"
BOOT="bootflash:cat9k_iosxe.16.12.02.SPA.bin;"
```

D_STACK_DISTR_STACK_LINK1="Fo1/0/1,Fo1/0/2,"

D_STACK_DAD="Twe2/0/25,Twe2/0/26,"

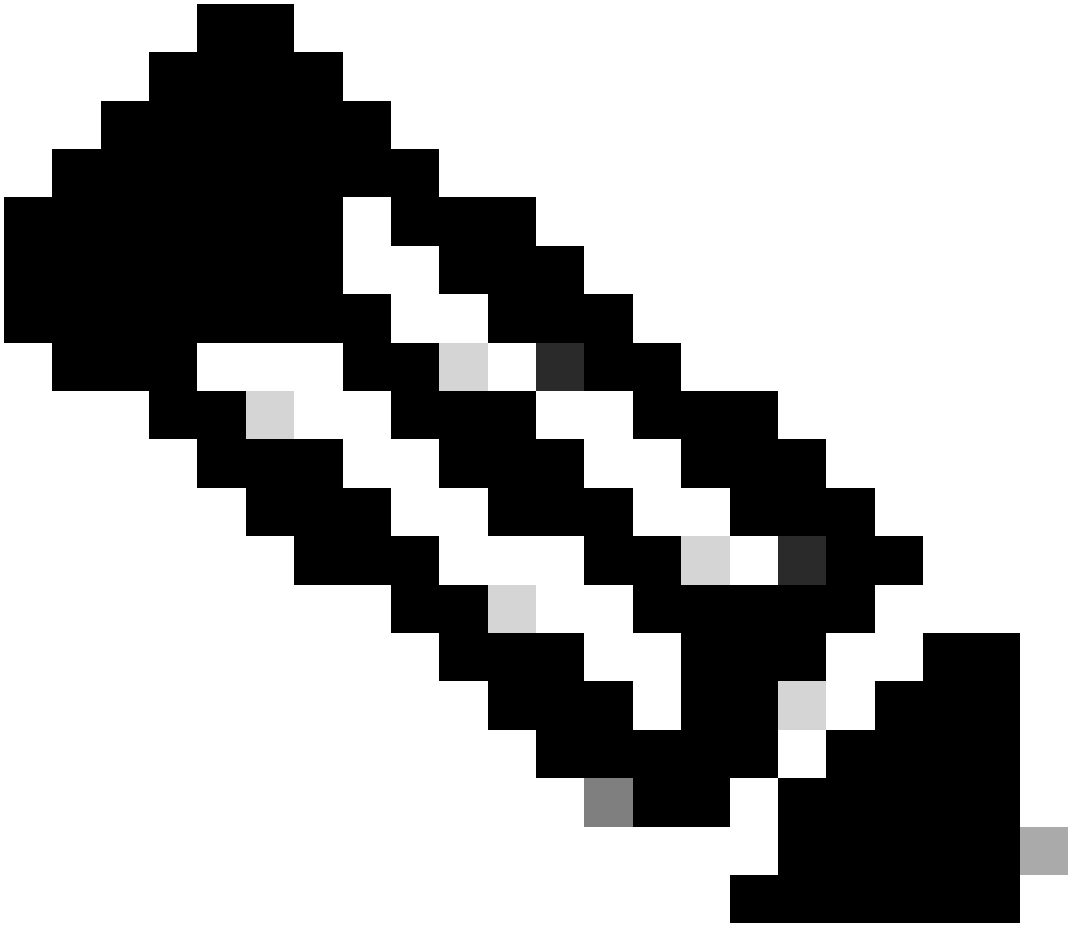
D_STACK_MODE="aggregation"

D_STACK_DOMAIN_NUM="100"

儲存配置並關閉新管理引擎所在的機箱。

連線兩個機箱之間的StackWise-Virtual鏈路，並且首選斷開雙活動檢測鏈路（如果適用）。

開啟機箱電源，通過控制檯監控引導過程。



附註：如果您的SVL在「捆綁」引導模式下運行，請確保新的Supervisor提供的軟體版本與活動版本相同。如果沒有，請重新進入ROMMON並使用正確的軟體版本手動啟動。

附註：如果SVL處於「安裝」開機模式，請確認是否已啟用軟體自動升級。如果沒有，則從全域組態模式設定「software auto-upgrade enable」，以啟用該功能。

<#root>

```
Active supervisor's log-

*Sep 13 00:59:49.367: %STACKMGR-6-CHASSIS_ADDED: Chassis 1 R0/0: stack_mgr: Chassis 1 has been added to

*Sep 13 00:59:51.988: %STACKMGR-6-CHASSIS_ADDED: Chassis 1 R0/0: stack_mgr: Chassis 1 has been added to

*Sep 13 00:59:52.135: %BOOT-3-BOOTTIME_INCOMPATIBLE_SW_DETECTED: Chassis 2 R0/0: issu_stack: Incompatibl
```

```
*Sep 13 00:59:52.297: %AUTO_UPGRADE-5-AUTO_UPGRADE_START_CHECK: Chassis 2 R0/0: auto_upgrade_client: Aut


*Sep 13 00:59:53.311: %AUTO_UPGRADE-5-AUTO_UPGRADE_INITIATED: Chassis 2 R0/0: auto_upgrade_client: Auto
*Sep 13 00:59:53.368: %AUTO_UPGRADE-5-AUTO_UPGRADE_SEARCH: Chassis 2 R0/0: auto_upgrade_client: Searchi

*Sep 13 00:59:53.397: %AUTO_UPGRADE-5-AUTO_UPGRADE_FOUND: Chassis 2 R0/0: auto_upgrade_client: Found dor


*Sep 13 00:59:53.423: %AUTO_UPGRADE-5-AUTO_UPGRADE_START: Chassis 2 R0/0: auto_upgrade_client: Upgrading
```

```
Logs from new supervisor's console-

Waiting for remote chassis to join
################################################################################
Chassis number is 1
All chassis in the stack have been discovered. Accelerating discovery
Chassis 1 reloading, reason - System requested reload <<< reload is instructed by current active as part
```

所有運行配置都將自動從活動Supervisor同步到新配置。等待來自活動管理引擎的這些日誌。

```
*Sep 13 01:14:18.552: %HA_CONFIG_SYNC-6-BULK_CFGSYNC_SUCCEED: Bulk Sync succeeded
*Sep 13 01:14:18.577: %RF-5-RF_TERMINAL_STATE: Terminal state reached for (SSO)
```

完成SSO後，請繼續連線雙活動檢測(DAD)鏈路。

- 將線卡推回到內部(對於更換了管理引擎的機箱)，以便將這些線卡重新連線到底板。現在，重新連線電纜。
- 驗證所有線卡是否引導正常、通過線上診斷測試並開啟其介面（包括埠通道繫結等）。

驗證更換後

使用以下命令檢查StackWise虛擬相關組態和交換器的狀態。

```
<#root>

C9600_SVL#

show redundancy


Redundant System Information :
------------------------------
Available system uptime = 1 hour, 27 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 = Switch 2
Current Software state = ACTIVE
Uptime in current state = 1 hour, 27 minutes
Image Version = Cisco IOS Software [Amsterdam], Catalyst L3 Switch Software (CAT9K_IOSXE), Version 17.3
Technical Support: https://www.cisco.com/c/en/us/support/index.html
Copyright (c) 1986-2020 by Cisco Systems, Inc.
Compiled Fri 07-Aug-20 21:32 by mcpre
BOOT = bootflash:packages.conf;
CONFIG_FILE =

Peer Processor Information :
----------------------------
Standby Location = Switch 1
```

Current Software state = STANDBY HOT

Uptime in current state = 0 minutes

```
Image Version = Cisco IOS Software [Amsterdam], Catalyst L3 Switch Software (CAT9K_IOSXE), Version 17.3
Technical Support: https://www.cisco.com/c/en/us/support/index.html
Copyright (c) 1986-2020 by Cisco Systems, Inc.
Compiled Fri 07-Aug-20 21:32 by mcpre
BOOT = bootflash:packages.conf;
CONFIG_FILE =
```

<#root>

C9600_SVL#

show stackwise-virtual

```
Stackwise Virtual Configuration:
--------------------------------
Stackwise Virtual : Enabled
Domain Number : 100
Switch Stackwise Virtual Link Ports
------ ---------------------- ------
1          1                    FortyGigabitEthernet1/1/0/1
                                FortyGigabitEthernet1/1/0/2
2          1                    FortyGigabitEthernet2/1/0/1
                                FortyGigabitEthernet2/1/0/2

C9600_SVL#
```

show stackwise-virtual dual-active-detection

```
In dual-active recovery mode: No
Recovery Reload: Enabled
```

```
Dual-Active-Detection Configuration:
-------------------------------------
Switch   Dad port             Status
------  ------------          ---------
1      TwentyFiveGigE1/2/0/25  up
       TwentyFiveGigE1/2/0/26  up
2      TwentyFiveGigE2/2/0/25  up
       TwentyFiveGigE2/2/0/26  up
```

<#root>

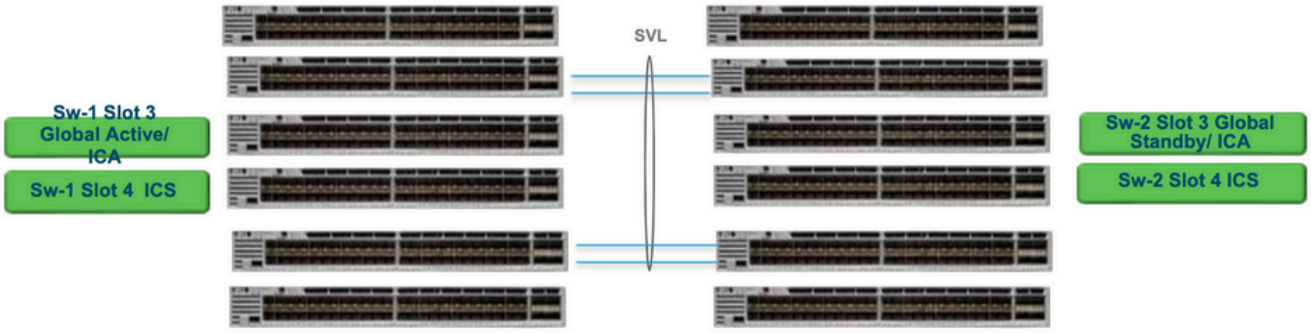
C9600_SVL#

show module

```
Chassis Type: C9606R

Switch Number 1

Mod Ports       Card Type                                  Model       Serial No.
---+-----+--------------------------------------+--------------+--------------
1   24     24-Port 40GE/12-Port 100GE             C9600-LC-24C   CAT2252L0PR
2   48     48-Port 10GE / 25GE                    C9600-LC-48YL  CAT2334L0BA
3   0      Supervisor 1 Module                    C9600-SUP-1    CAT2340L3Y5
5   48     48-Port 10GE / 25GE                    C9600-LC-48YL  CAT2337L509

Mod   MAC addresses                     Hw  Fw              Sw               Status
---+--------------------------------+----+------------+------------------+--------
1    70B3.175A.8100 to 70B3.175A.817F 1.0  17.3.1r[FC2]  17.03.01            ok
2    10B3.D652.9900 to 10B3.D652.997F 1.0  17.3.1r[FC2]  17.03.01            ok

3    7C21.0E5D.0400 to 7C21.0E5D.047F 1.0  17.3.1r[FC2]  17.03.01            ok


5    4C71.0D7C.8400 to 4C71.0D7C.847F 1.0  17.3.1r[FC2]  17.03.01            ok

Mod  Redundancy Role     Operating Redundancy Mode  Configured Redundancy Mode
---+------------------+-------------------------+---------------------------
3

Standby                sso

                        sso

Switch Number 2
**snip**
```

更換C9600 Quad-Sup StackWise-Virtual管理引擎

在本示例中，您考慮採用C9600 Quad Sup Stackwise虛擬機器設定（每個機箱中有兩個管理引擎），其中管理引擎已損壞，需要更換。SVL正在以「安裝」引導模式運行。



更換和驗證

拔出有故障的主管

- 如果要更換的Supervisor是Global Active Supervisor（圖中所示為Sw-1 Slot 3），請執行故障切換，以便全域性備用（圖中所示為Sw-2 Slot 3）接管Active。等待新的全域性備用並完成SSO。（在本例中，Sw-1插槽4將成為新的全域性備用插槽）。
- 如果要更換的Supervisor是Global Standby Supervisor（圖中所示為Sw-2插槽3），請將Supervisor拉出。等待新的全域性備用並完成SSO。（在本例中，Sw-2插槽4將成為新的全域性備用插槽）
- 如果要更換的Supervisor是ICS Supervisor（圖中所示的Sw-1 Slot 4或Sw-2 Slot 4），請拔出Supervisor。

插入新主管

- 如果新管理引擎運行的是17.x代碼,則這些步驟是直接向前執行的。只需插入新的管理引擎。如果ICS管理引擎具有17.x映像，它們將自動啟動並成為Quad-sup的一部分。即使它運行的17.x代碼與生產設定中正在運行的17.x代碼不同，軟體自動升級也會自動負責在安裝模式下使用相同的17.x代碼升級ICS監控器。
- 如果新Supervisor運行的是16.x代碼，或者您不確定它運行的代碼，請嘗試將Supervisor插入備用機箱中，然後將其升級到17.x代碼。如果沒有要升級的備用機箱，則必須採取這些步驟。
- 此步驟非常重要。插入ICS管理引擎並使用Ctrl+C將其中斷為rommon。如果您無法進入ROMMON模式，且主管在16.x代碼上啟動，則可能會拆下插入主管的整個機箱

查詢任何與SVL相關的rommon變數。這些變數以D_STACK開頭。通常新主管沒有設定這些變數。

```
D_STACK_DISTR_STACK_LINK2=""
D_STACK_DAD="Fo1/0/13,Fo1/0/15,"
D_STACK_MODE="aggregation"
D_STACK_DOMAIN_NUM="255"
D_STACK_DISTR_STACK_LINK1="Fo1/0/10,Fo1/0/15,Fo1/0/16,Fo1/0/17,Fo1/0/3,Fo1/0/6,"
```

取消設置先前顯示的所有變數

<#root>

```
rommon 1 >
unset D_STACK_DAD

rommon 1 >
unset D_STACK_DISTR_STACK_LINK1

rommon 1 >
unset D_STACK_DOMAIN_NUM
rommon 1 >
unset D_STACK_MODE
```

尋找變數「SWITCH_NUMBER=1」。 如果交換機編號為2，則將變數設定為1。如果變數已經為1，請轉至下一步。

```
<#root>
rommon 1 >
SWITCH_NUMBER=1
```

設定為手動啟動Supervisor。

```
<#root>
rommon 1 >
MANUAL_BOOT=YES
```

使用USB/TFTP在17.x代碼上手動引導套件組合模式中的ICS監控器。請勿在rommon中更改引導變數。只需從rommon手動啟動。

- 當Supervisor在SVL模式中檢測現有ICS時，它會重置，因此它從獨立模式轉換到stackwise虛擬模式。由於自動引導被禁用，它可能會再次回到rommon中。

取消設置手動引導以啟用自動引導。

```
<#root>
rommon 1 >
unset MANUAL_BOOT
```

使用USB/TFTP在17.x代碼上手動引導套件組合模式中的ICS監控器。請勿在rommon中更改引導變數。只需從rommon手動啟動。此步驟在套件組合模式下啟動ICS。

附註：軟體自動升級旨在自動完成在安裝模式下用17.x代碼升級ICS管理引擎並重新載入ICS支援以在RPR中啟動。如果禁用自動升級，則還可以從活動Supervisor運行「安裝自動升級」命令。

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）。