在运行CatOS (混合)的Catalyst 6500系列交换机上替换失败的冗余Supervisor模块

目录

简介

本文档显示如何更换 Catalyst 6500 系列交换机中出现故障的冗余 Supervisor 模块。本文档说明的步骤适用于在混合 OS 中运行的 Supervisor 模块。

先决条件

要求

Cisco 建议您了解以下主题：

- [配置冗余](#)
- [配置 NSF 的 SSO MSFC 冗余](#)

使用的组件

本文档中的信息基于以下软件和硬件版本：

- Cisco Catalyst 6500 系列交换机

- Supervisor 模块：WS-SUP32-GE-3B
- 混合 OS：Catalyst OS (CatOS) 8.5(8)MSFC IOS® 12.2(18)SXF7

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。如果您使用的是真实网络，请确保您已经了解所有命令的潜在影响。

相关产品

本文档也可用于以下硬件和软件版本：

- 运行混合 OS 的 Supervisor 720
- 运行混合 OS 的 Supervisor 2

规则

有关文档规则的详细信息，请参阅 Cisco 技术提示规则。

背景信息

下面是与冗余 Supervisor 模块相关的一些要点：

- 在备用 Supervisor 引擎上，控制台端口处于非活动状态，模块状态显示为"备用"，上行链路端口的状态正常显示。
- 为使您能够分别控制每个 Supervisor 引擎的引导，Supervisor 引擎之间的配置寄存器未同步。
- 如果两个 Supervisor 引擎的软件版本不同，或两个 Supervisor 引擎的 NVRAM 配置不同，活动 Supervisor 引擎会自动将其软件镜像和配置下载到备用 Supervisor 引擎。
- Supervisor 引擎使用以下两个闪存镜像：引导镜像和运行时镜像。在 BOOT 环境变量中指定的引导镜像文件名存储在 NVRAM 中。运行时镜像是 ROM 监视器用于引导 Supervisor 引擎的引导镜像。系统启动后，运行时镜像驻留在动态 RAM (DRAM) 中。
- 冗余 Supervisor 引擎与同型号的特性卡必须具有相同类型。同样不带策略特性卡 (PFC) 的 WS-X6K-SUP1-2GE 和 WS-X6K-SUP1A-2GE 具有冗余兼容性。对于带有 PFC 的 Supervisor 引擎，PFC 必须相同（两个 PFC、两个 PFC2、两个 PFC3A、两个 PFC3B 或两个 PFC3BXL）才能实现冗余。

更换 Supervisor 模块的详细步骤 - 同一混合 OS

本部分提供更换 Catalyst 6500 系列交换机中的 Supervisor 模块 32 的详细步骤。本示例使用Cisco Catalyst 6509交换机，该交换机在插槽5和6中有两个管理引擎模块。插槽6中的管理引擎模块出现故障。假定已将插槽 6 中发生故障的 Supervisor 模块从机箱中卸除。您将看到将新的 Supervisor 模块添加到插槽 6 中的步骤。

如果另外还有一台 Cisco Catalyst 6500 系列交换机，则可以将新的 Supervisor 连接到该交换机，然后将混合 OS 升级或降级为生产交换机插槽 5 中 Supervisor 的级别。如果新的 Supervisor 模块中使用同样的混合 OS，则不需要对新的 Supervisor 模块进行任何配置。当您将 Supervisor 模块添加到插槽 6 中时，活动 Supervisor 引擎会自动进行配置同步。本部分介绍更换 Supervisor 过程中的详细步骤和核对清单。

下面是更换 Catalyst 6500 系列交换机中的 Supervisor 模块 32 的详细步骤：

1. 将 Supervisor 模块添加到插槽 6 中。如果与插槽 6 中的 Supervisor 有控制台连接，则应看到以下输出：

!--- Supervisor module at slot 6 System Bootstrap, Version 12.2(18r)SX2, RELEASE SOFTWARE (fc1) Technical Support: http://www.cisco.com/techsupport Copyright (c) 2004 by cisco Systems, Inc. Cat6k-Sup32 platform with 524288 Kbytes of main memory Autoboot executing command: "boot bootdisk:cat6000-sup32pfc3k8.8-5-8.bin" Self decompressing the image : ##
##
##
##
##
##
##
##
##
##
##
[OK] System Power On Diagnostics DRAM Size ....512 MB Testing DRAM ....Passed Verifying Text Segment ....Passed NVRAM Size ....2048 KB Level2 Cache ....Present Level3 Cache ....Absent System Power On Diagnostics Complete Currently running ROMMON from S (Gold) region Boot image: bootdisk:cat6000-sup32pfc3k8.8-5-8.bin Firmware compiled 01-Dec-06 12:57 by integ Build [100] **This module is now in standby mode.**
Console is disabled for standby supervisor.

以下输出显示插槽 5 中活动 Supervisor 的控制台：
Access2> (enable)
Access2> (enable)
Access2> (enable) 2007 May 22 19:17:48 %SYS-5-MOD_INSERT:Module
6 has been inserted

Access2> (enable)
Access2> (enable)
Access2> (enable)
%SYS-5-SUP_MODSBY:Module 6 is in standby mode

%SYS-5-SUP_IMGSYNC:File synchronization process will start in 120 seconds

%DIAG-6-RUN_MINIMUM:Module 6: Running Minimal Diagnostics...

%DIAG-6-DIAG_OK:Module 6: Passed Online Diagnostics

%SYS-3-TRANSCEIVER_NOTSUPP: Transceiver on port 6/1 is not supported

%SYS-3-TRANSCEIVER_NOTSUPP: Transceiver on port 6/2 is not supported

%SYS-5-PORT_SSUPOK:Ports on standby supervisor (module 6) are up

%SYS-3-MOD_PORTINTFINSYNC:Port Interface in sync for Module 6

%DIAG-6-RUN_MINIMUM:Module 16: Running Minimal Diagnostics...

%DIAG-6-DIAG_OK:Module 16: Passed Online Diagnostics

%SYS-5-MOD_OK:Module 16(WS-F6K-MSFC2A,SAL1018LQ3C) is online

%MGMT-5-SYS_CONFIG_START_MOD_FAIL:Unable to start system configuration for module 6

%MGMT-5-SYS_CONFIG_START_MOD_FAIL:Unable to start system configuration for

```
    module 16

    %SYS-5-SUP_IMGSYNCSTART:Active supervisor is synchronizing bootdisk:
    cat6000-sup32pfc3k8.8-5-8.bin

    %SYS-5-SUP_IMGSYNCFINISH:Active supervisor has synchronized bootdisk:
    cat6000-sup32pfc3k8.8-5-8.bin

    Access2> (enable)
```

2. 验证 Supervisor 冗余状态：

```
Access2> (enable) show system highavailability
Highavailability: enabled
Highavailability versioning: disabled
Highavailability Operational-status: ON
Access2> (enable)
```

3. 验证 MSFC 冗余状态：

```
Access2> (enable) session 15
Trying Router-15...
Connected to Router-15.
Escape character is '^]'.

LAB-Router>enable
LAB-Router#show redundancy
Redundant System Information :
------------------------------
       Available system uptime = 10 minutes
Switchovers system experienced = 0
             Standby failures = 0
       Last switchover reason = unsupported


                 Hardware Mode = Duplex
    Configured Redundancy Mode = Stateful SwitchOver - SSO
     Operating Redundancy Mode = Stateful SwitchOver - SSO
              Maintenance Mode = Disabled
                Communications = Up

Current Processor Information :
------------------------------
               Active Location = slot 5
        Current Software state = ACTIVE
       Uptime in current state = 10 minutes
                 Image Version = Cisco Internetwork Operating System Software
IOS (tm) MSFC2A Software (C6MSFC2A-ADVENTERPRISEK9_WAN-M),
Version 12.2(18)SXF7, RELEASE SOFTWARE (fc1)
Technical Support: http://www.cisco.com/techsupport
Copyright (c) 1986-2006 by cisco Systems, Inc.
Compiled Thu 23-Nov-06 01:03 by kellythw
                          BOOT =
                   CONFIG_FILE =
                       BOOTLDR =
        Configuration register = 0x2102

Peer Processor Information :
----------------------------
              Standby Location = slot 6
        Current Software state = STANDBY HOT
       Uptime in current state = 2 minutes
                 Image Version = Cisco Internetwork Operating System Software
IOS (tm) MSFC2A Software (C6MSFC2A-ADVENTERPRISEK9_WAN-M),
Version 12.2(18)SXF7, RELEASE SOFTWARE (fc1)
Technical Support: http://www.cisco.com/techsupport
Copyright (c) 1986-2006 by cisco Systems, Inc.
Compiled Thu 23-Nov-06 01:03 by kellythw
```

```
                       BOOT =
               CONFIG_FILE =
                   BOOTLDR =
       Configuration register = 0x2102


   LAB-Router#
```

4. 强制执行 Supervisor 故障切换并进行测试：

```
!--- Supervisor in slot 5 Access2> (enable) switch supervisor
This command will force a switch-over to the standby Supervisor module.
Do you want to continue (y/n) [n]? y
2007 May 21 20:40:37 %SYS-5-MOD_RESET:Module 5 reset from Console//
Access2> (enable)
System Bootstrap, Version 12.2(18r)SX2, RELEASE SOFTWARE (fc1)
Technical Support: http://www.cisco.com/techsupport
Copyright (c) 2004 by cisco Systems, Inc.
Cat6k-Sup32 platform with 262144 Kbytes of main memory

Autoboot executing command: "boot bootdisk:cat6000-sup32pfc3k8.8-5-8.bin"
Self decompressing the image : ##########################################
###########################################################################
###########################################################################
###########################################################################
###########################################################################
###########################################################################
###########################################################################
###########################################################################
###########################################################################
###########################################################################
###########################################################################
################################################## [OK]



System Power On Diagnostics
DRAM Size .........................256 MB
Testing DRAM ......................Passed
Verifying Text Segment ............Passed
NVRAM Size ........................2048 KB
Level2 Cache ......................Present
Level3 Cache ......................Absent
System Power On Diagnostics Complete

Currently running ROMMON from S (Gold) region
Boot image: bootdisk:cat6000-sup32pfc3k8.8-5-8.bin



Firmware compiled 01-Dec-06 12:57 by integ Build [100]

This module is now in standby mode.
Console is disabled for standby supervisor
```

5. 通过控制台连接到 Supervisor 6 并验证 Supervisor 和 MSFC 配置。

更换 Supervisor 模块的详细步骤 - 不同混合 OS

本部分介绍更换 Catalyst 6500 系列交换机中的 Supervisor 模块 32 的详细步骤。本示例使用Cisco Catalyst 6509交换机，该交换机在插槽5和6中有两个管理引擎模块。插槽6中的管理引擎模块出现故障。假定已将插槽 6 中发生故障的 Supervisor 模块从机箱中卸除。您将看到将新的 Supervisor 模块添加到插槽 6 中的步骤。

如果没有将新 Supervisor 的混合 OS 升级为活动 Supervisor 版本的选项，则可以执行下列步骤，添加 Supervisor 模块并实现混合 OS 和交换机配置的同步。其中大部分步骤是自动进行的。本文档显示要在 Supervisor 更换过程中执行的详细步骤和核对清单。

在添加新的 Supervisor 模块之前进行验证

本部分显示插槽 6 中没有 Supervisor 的交换机的显示输出。

- Show module
- show version
- 引导变量

1. Show module 输出：

```
Access2> (enable) show module
Mod Slot Ports Module-Type              Model              Sub Status
--- ---- ----- ------------------------ ------------------ --- --------
1   1    0     1000BaseX Ethernet                          no  power-down
2   2    48    10/100BaseTX Ethernet    WS-X6248-RJ-45     no  ok
3   3    48    10/100BaseTX Ethernet    WS-X6348-RJ-45     yes ok
4   4    48    10/100BaseTX Ethernet    WS-X6348-RJ-45     yes ok
5   5    9     1000BaseX Supervisor     WS-SUP32-GE-3B     yes ok
15  5    1     Multilayer Switch Feature WS-F6K-MSFC2A     no  ok
7   7    5     Communication Media Mod.  WS-SVC-CMM         no  ok
8   8    0     FXS                                         no  power-down
9   9    0     10/100BaseTX Ethernet                       no  power-down
```

!--- Output suppressed Mod Sub-Type Sub-Model Sub-Serial Sub-Hw Sub-Sw --- ----------------------- ------------------ ----------- ------ ------ 3 Inline Power Module WS-F6K-VPWR 1.0 1.1(1) 4 Inline Power Module WS-F6K-VPWR 1.0 1.1(1) **5   L3 Switching Engine III WS-F6K-PFC3B   SAL1012GREU 2.1**

```
Access2> (enable)
```

2. Show version 输出：

```
Access2> (enable) show version
```
WS-C6509 Software, Version NmpSW: **8.5(8)**
```
Copyright (c) 1995-2006 by Cisco Systems
NMP S/W compiled on Dec  1 2006, 23:03:43

System Bootstrap Version: 12.2
System Boot Image File is 'bootdisk:cat6000-sup32pfc3k8.8-5-8.bin'
System Configuration register is 0x2102

Hardware Version: 2.0  Model: WS-C6509  Serial #: SCA034500F5

PS1  Module: WS-CAC-6000W   Serial #: AZS10130G7T

Mod Port Model               Serial #    Versions
--- ---- ------------------- ----------- -------------------------------------
2   48   WS-X6248-RJ-45      SAD03431007 Hw : 1.1
                                         Fw : 4.2(0.24)VAI78
                                         Sw : 8.5(8)
3   48   WS-X6348-RJ-45      SAD04150A2T Hw : 1.1
                                         Fw : 5.3(1)
                                         Sw : 8.5(8)
         WS-F6K-VPWR                     Hw : 1.0
                                         Sw : 1.1(1)
4   48   WS-X6348-RJ-45      SAD05070CNX Hw : 2.0
                                         Fw : 5.4(2)
                                         Sw : 8.5(8)
         WS-F6K-VPWR                     Hw : 1.0
                                         Sw : 1.1(1)
```

```
5    9    WS-SUP32-GE-3B        SAL1010F8KG Hw : 4.2
                                            Fw : 12.2
                                            Fw1: 8.5(8)
                                            Sw : 8.5(8)
                                            Sw1: 8.5(8)
          WS-F6K-PFC3B          SAL1012GREU Hw : 2.1
                                            Sw :
7    5    WS-SVC-CMM            SAD100707YJ Hw : 2.8
                                            Fw : 12.4(7a),
                                            Sw : 12.4(7a),
15   1    WS-F6K-MSFC2A         SAL1012GG1X Hw : 3.0
                                            Fw : 12.2(18)SXF7
                                            Sw : 12.2(18)SXF7


        DRAM                       FLASH                       NVRAM
Module Total   Used    Free    Total   Used    Free    Total Used  Free
------ ------- ------- ------- ------- ------- ------- ----- ----- -----
5      262144K 124421K 137723K 249772K  9796K 239976K 2048K  366K 1682K


Uptime is 0 day, 0 hour, 3 minutes
Access2> (enable)
```

3. 引导变量：

```
!--- Current working directory Access2> (enable) pwd bootdisk !--- Files in the bootdisk
Access2> (enable) dir 2 -rw- 10029260 Dec 13 2006 15:37:08 cat6000-sup32pfc3k8.8-5-8.bin
245735424 bytes available (10031104 bytes used) !--- Boot variable Access2> (enable) show
boot
BOOT variable = bootdisk:cat6000-sup32pfc3k8.8-5-8.bin,1;
CONFIG_FILE variable = bootflash:switch.cfg

Configuration register is 0x2102
ignore-config: disabled
auto-config: non-recurring, overwrite, sync disabled
ROMMON console baud: 9600
boot: image specified by the boot system commands

Image auto sync is enabled
Image auto sync timer is 120 seconds
Access2> (enable)
```

添加新的 Supervisor 模块

Supervisor模块插入插槽6。将新的备用Supervisor模块添加到交换机时，主用和备用Supervisor模块的控制台输出如下所示：

1. 将新的 Supervisor 模块插入插槽 6 中。此时活动 Supervisor 模块中显示以下日志消息：

```
Access2> (enable) 2007 May 21 20:21:14 %SYS-5-MOD_INSERT:Module 6 has been
inserted
```

如果已通过控制台连接到插槽 6 中的备用 Supervisor，则会看到以下引导过程：

```
System Bootstrap, Version 12.2(18r)SX2, RELEASE SOFTWARE (fc1)
Technical Support: http://www.cisco.com/techsupport
Copyright (c) 2004 by cisco Systems, Inc.
Cat6k-Sup32 platform with 524288 Kbytes of main memory

Autoboot executing command: "boot bootdisk:cat6000-sup32pfc3k8.8-4-5.bin"
Self decompressing the image : ########################################
################################################################
################################################################
################################################################
################################################################
################################################################
```

```
###################################################################
###################################################################
###################################################################
###################################################################
################################################################# [OK]


System Power On Diagnostics
DRAM Size .........................512 MB
Testing DRAM ......................Passed
Verifying Text Segment ............Passed
NVRAM Size ........................2048 KB
Level2 Cache ......................Present
Level3 Cache ......................Absent
System Power On Diagnostics Complete


Currently running ROMMON from S (Gold) region
Boot image: bootdisk:cat6000-sup32pfc3k8.8-4-5.bin



Firmware compiled 02-Aug-05 16:08 by integ Build [100]



This module is now in standby mode.
Console is disabled for standby supervisor
```

2. 可以通过插槽 5 中的活动 Supervisor 模块验证冗余状态。
```
Access2> (enable) 2007 May 21 20:23:09 %SYS-5-SUP_MODSBY:Module 6 is in standby
mode
2007 May 21 20:23:11 %SYS-5-SUP_IMGSYNCSTART:Active supervisor is synchronizing
bootdisk:cat6000-sup32pfc3k8.8-5-8.bin


Access2> (enable) show system highavailability
Highavailability: enabled
Highavailability versioning: disabled
Highavailability Operational-status: OFF(standby-supervisor-image-incompatible)
```

活动 Supervisor 模块将 CatOS 复制到备用 Supervisor 模块。它还为新的 CatOS 配置备用 Supervisor 引擎的引导变量。
```
Access2> (enable)
2007 May 21 20:24:23 %SYS-5-SUP_IMGSYNCFINISH:Active superviso
r has synchronized bootdisk:cat6000-sup32pfc3k8.8-5-8.bin
```
将 CatOS 镜像复制到备用 Supervisor 后，备用模块 6 会自动使用新镜像重新载入。
```
This module is now in standby mode.
Console is disabled for standby supervisor

System Bootstrap, Version 12.2(18r)SX2, RELEASE SOFTWARE (fc1)
Technical Support: http://www.cisco.com/techsupport
Copyright (c) 2004 by cisco Systems, Inc.
Cat6k-Sup32 platform with 524288 Kbytes of main memory

Autoboot executing command: "boot bootdisk:RTSYNC_cat6000-sup32pfc3k8.8-5-8.bin"
Self decompressing the image : ########################################
###################################################################
###################################################################
###################################################################
###################################################################
###################################################################
###################################################################
###################################################################
###################################################################
###################################################################
```

```
################################################################################
################################################# [OK]


System Power On Diagnostics
DRAM Size ........................512 MB
Testing DRAM ....................Passed
Verifying Text Segment ..........Passed
NVRAM Size ......................2048 KB
Level2 Cache ....................Present
Level3 Cache ....................Absent
System Power On Diagnostics Complete


Currently running ROMMON from S (Gold) region
Boot image: bootdisk:RTSYNC_cat6000-sup32pfc3k8.8-5-8.bin



Firmware compiled 01-Dec-06 12:57 by integ Build [100]


This module is now in standby mode.
Console is disabled for standby supervisor
```

3. 备用模块启动后，便可以验证通过活动 Supervisor 模块验证冗余状态。

```
Access2> (enable) 2007 May 21 20:26:22 %SYS-5-SUP_MODSBY:Module 6 is in standby
mode
2007 May 21 20:26:23 %SYS-5-SUP_IMGSYNC:File synchronization process will start
in 120 seconds
2007 May 21 20:27:08 %SYS-1-SYS_LCPERR1:Module 16: RP requested reset of peer RP
: MSFC on module 16 will be reset
2007 May 21 20:27:24 %DIAG-6-RUN_MINIMUM:Module 6: Running Minimal Diagnostics..
.
2007 May 21 20:27:24 %DIAG-6-DIAG_OK:Module 6: Passed Online Diagnostics
2007 May 21 20:27:25 %SYS-3-TRANSCEIVER_NOTSUPP: Transceiver on port 6/1 is not
supported
2007 May 21 20:27:25 %SYS-3-TRANSCEIVER_NOTSUPP: Transceiver on port 6/2 is not
supported
2007 May 21 20:27:25 %SYS-5-PORT_SSUPOK:Ports on standby supervisor (module 6) a
re up
2007 May 21 20:27:25 %SYS-3-MOD_PORTINTFINSYNC:Port Interface in sync for Module
 6
2007 May 21 20:28:24 %SYS-5-SUP_IMGSYNCSTART:Active supervisor
 is synchronizing bootdisk:cat6000-sup32pfc3k8.8-5-8.bin
2007 May 21 20:28:25 %SYS-5-SUP_IMGSYNCFINISH:Active supervisor has synchronized
 bootdisk:cat6000-sup32pfc3k8.8-5-8.bin

Access2> (enable)


Access2> (enable) dir
     2  -rw-  10029260    Dec 13 2006 15:37:08 cat6000-sup32pfc3k8.8-5-8.bin


245735424 bytes available (10031104 bytes used)
Access2> (enable) dir 6/
     2  -rw-   9356096    May 11 2006 19:04:09 cat6000-sup32pfc3k8.8-4-5.bin
  2287  -rw-  10029260    May 21 2007 20:24:10 RTSYNC_cat6000-sup32pfc3k8.8-5-
8.bin
```
*!--- You can see the copied CatOS name starts with RTSYNC_* 236900352 bytes available
(19390464 bytes used) Access2> (enable) **show system highavailability**
```
Highavailability: enabled
Highavailability versioning: disabled
Highavailability Operational-status: ON
```


在添加新的 Supervisor 模块之后验证 Supervisor 模块

请执行以下步骤：

1. Show module 输出：

```
Access2> (enable) show module
Mod Slot Ports Module-Type              Model              Sub Status
--- ---- ----- ------------------------ ------------------ --- --------
1   1    0     1000BaseX Ethernet                          no  power-down
2   2    48    10/100BaseTX Ethernet    WS-X6248-RJ-45     no  ok
3   3    48    10/100BaseTX Ethernet    WS-X6348-RJ-45     yes ok
4   4    48    10/100BaseTX Ethernet    WS-X6348-RJ-45     yes ok
5   5    9     1000BaseX Supervisor     WS-SUP32-GE-3B     yes ok
15  5    1     Multilayer Switch Feature WS-F6K-MSFC2A     no  ok
6   6    9     1000BaseX Supervisor     WS-SUP32-GE-3B     yes standby
7   7    5     Communication Media Mod. WS-SVC-CMM         no  ok
8   8    0     FXS                                         no  power-down
9   9    0     10/100BaseTX Ethernet                       no  power-down

!--- Output suppressed Mod Sub-Type Sub-Model Sub-Serial Sub-Hw Sub-Sw --- ----------------
------- ------------------ ----------- ------ ------ 3 Inline Power Module WS-F6K-VPWR 1.0
1.1(1) 4 Inline Power Module WS-F6K-VPWR 1.0 1.1(1) 5   L3 Switching Engine III WS-F6K-
PFC3B         SAL1012GREU 2.1
6   L3 Switching Engine III WS-F6K-PFC3B         SAL1017L9WJ 2.1
```

2. 验证冗余历史：

```
Access2> (enable) show system redundancy-history
   Maximum entries of switchover history table = 10
   System cold start due to switchover failure = 4
   Standby available time (secs*100)         = 33291

   Redundant History Switchover Table:
```

验证 MSFC IOS

在 SYNC 进程运行过程中会自动复制 CatOS。但不会自动复制 MSFC 的 IOS。

1. 验证 MSFC 的 IOS 和冗余：

```
!--- 1. Connect to MSFC Access2> (enable) session 15
Trying Router-15...
Connected to Router-15.
Escape character is '^]'.

LAB-Router>enable

 !--- 2. Verify the IOS file in the bootflash LAB-Router#dir
Directory of bootflash:/

    1  -rwx    17966324  Dec 13 2006 15:12:29 +00:00  c6msfc2a-adventerprisek9_w
an-mz.122-18.SXF7.bin

65536000 bytes total (47569548 bytes free)

!--- 3. Show version output LAB-Router#show version
Cisco Internetwork Operating System Software
IOS (tm) MSFC2A Software (C6MSFC2A-ADVENTERPRISEK9_WAN-M), Version 12.2(18)SXF7,
 RELEASE SOFTWARE (fc1)
Technical Support: http://www.cisco.com/techsupport
Copyright (c) 1986-2006 by cisco Systems, Inc.
Compiled Thu 23-Nov-06 01:03 by kellythw
Image text-base: 0x40101040, data-base: 0x42638000
```

```
ROM: System Bootstrap, Version 12.2(17r)SX3, RELEASE SOFTWARE (fc1)
BOOTLDR: MSFC2A Software (C6MSFC2A-ADVENTERPRISEK9_WAN-M), Version 12.2(18)SXF7,
 RELEASE SOFTWARE (fc1)

LAB-Router uptime is 26 minutes
System returned to ROM by power-on
System image file is "bootflash:c6msfc2a-adventerprisek9_wan-mz.122-18.SXF7.bin"

 !--- 4. MSFC redundancy status LAB-Router#show redundancy
Redundant System Information :
------------------------------
        Available system uptime = 4 minutes
Switchovers system experienced = 0
              Standby failures = 0
         Last switchover reason = unsupported

                   Hardware Mode = Duplex
     Configured Redundancy Mode = Stateful SwitchOver - SSO
      Operating Redundancy Mode = Route Processor Redundancy
!--- It is running in the RPR mode because the standby MSFC !--- is running different
version of IOS. Maintenance Mode = Disabled Communications = Up Current Processor
Information : ----------------------------- Active Location = slot 5
        Current Software state = ACTIVE
       Uptime in current state = 4 minutes
                 Image Version = Cisco Internetwork Operating System Software
IOS (tm) MSFC2A Software (C6MSFC2A-ADVENTERPRISEK9_WAN-M),
Version 12.2(18)SXF7, RELEASE SOFTWARE (fc1)
Technical Support: http://www.cisco.com/techsupport
Copyright (c) 1986-2006 by cisco Systems, Inc.
Compiled Thu 23-Nov-06 01:03 by kellythw
                          BOOT =
                    CONFIG_FILE =
                       BOOTLDR =
        Configuration register = 0x2102

Peer Processor Information :
----------------------------
               Standby Location = slot 6
        Current Software state = STANDBY COLD
       Uptime in current state = 2 minutes
                 Image Version = Cisco Internetwork Operating System Software
IOS (tm) MSFC2A Software (C6MSFC2A-IPBASE_WAN-M),
Version 12.2(18)SXF4, RELEASE SOFTWARE (fc1)
Technical Support: http://www.cisco.com/techsupport
Copyright (c) 1986-2006 by cisco Systems, Inc.
Compiled Thu 23-Mar-06 14:53 by tinhuang
                          BOOT =
                    CONFIG_FILE =
                       BOOTLDR =
        Configuration register = 0x2102
!--- Note that the boot variable is blank. The MSFC boots the !--- first IOS image in the
bootflash: LAB-Router# LAB-Router#exit
Access2> (enable)
```

2. 升级备用 MSFC 上的 IOS。将 IOS 镜像复制到备用 MSFC：

```
LAB-Router#copy c6msfc2a-adventerprisek9_wan-mz.122-18.SXF7.bin slavebootflash:/
Destination filename [c6msfc2a-adventerprisek9_wan-mz.122-18.SXF7.bin]?
Copy in progress...CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
17966324 bytes copied in 44.180 secs (406662 bytes/sec)
LAB-Router#
```

!--- Delete the old IOS image. Because the boot variable is blank !--- and the MSFC boots the first IOS image in the bootflash: LAB-Router#**cd slavebootflash:**

LAB-Router#**delete c6msfc2a-ipbase_wan-mz.122-18.SXF4.bin**
Delete filename [c6msfc2a-ipbase_wan-mz.122-18.SXF4.bin]?
Delete slavebootflash:c6msfc2a-ipbase_wan-mz.122-18.SXF4.bin? [confirm]
LAB-Router#

重新载入备用 Supervisor 模块：

LAB-Router#**exit**

Access2> (enable) **reset 6**
This command will reset module 6.
Do you want to continue (y/n) [n]? y
2007 May 21 21:14:03 %SYS-5-MOD_RESET:Module 6 reset from Console//
Resetting module 6...

Access2> (enable) **show system highavailability**
Highavailability: enabled
Highavailability versioning: disabled
Highavailability **Operational-status: OFF(standby-supervisor-not-present)**
Access2> (enable)

2007 May 21 21:16:01 %SYS-5-SUP_MODSBY:Module 6 is in standby
mode
2007 May 21 21:16:02 %SYS-5-SUP_IMGSYNC:File synchronization
process will start
in 120 seconds
2007 May 21 21:16:03 %DIAG-6-RUN_MINIMUM:Module 6: Running Minimal
Diagnostics..
.
2007 May 21 21:16:05 %DIAG-6-DIAG_OK:Module 6: Passed Online Diagnostics
2007 May 21 21:16:06 %SYS-3-TRANSCEIVER_NOTSUPP:
Transceiver on port 6/1 is not supported
2007 May 21 21:16:06 %SYS-3-TRANSCEIVER_NOTSUPP:
Transceiver on port 6/2 is not supported
2007 May 21 21:16:06 %SYS-5-PORT_SSUPOK:Ports on standby supervisor
(module 6) are up
2007 May 21 21:16:07 %SYS-3-MOD_PORTINTFINSYNC:Port Interface in
sync for Module
 6
2007 May 21 21:16:49 %SYS-1-SYS_LCPERR1:Module 16: RP requeste
d reset of peer RP: MSFC on module 16 will be reset

Access2> (enable) **show system highavailability**
Highavailability: enabled
Highavailability versioning: disabled
Highavailability **Operational-status: ON**
Access2> (enable)

3. 在升级后验证 MSFC IOS：

Access2> (enable) session 15
Trying Router-15...
Connected to Router-15.
Escape character is '^]'.

LAB-Router>enable

LAB-Router#**show redundancy**
Redundant System Information :

        Available system uptime = 17 minutes
Switchovers system experienced = 0

```
                 Standby failures = 1
         Last switchover reason = unsupported


                   Hardware Mode = Duplex
     Configured Redundancy Mode = Stateful SwitchOver - SSO
      Operating Redundancy Mode = Stateful SwitchOver - SSO
                Maintenance Mode = Disabled
                  Communications = Up


  Current Processor Information :
  ------------------------------
                 Active Location = slot 5
          Current Software state = ACTIVE
       Uptime in current state = 17 minutes
                   Image Version = Cisco Internetwork Operating System Software
IOS (tm) MSFC2A Software (C6MSFC2A-ADVENTERPRISEK9_WAN-M),
Version 12.2(18)SXF7, RELEASE SOFTWARE (fc1)
Technical Support: http://www.cisco.com/techsupport
Copyright (c) 1986-2006 by cisco Systems, Inc.
Compiled Thu 23-Nov-06 01:03 by kellythw
                            BOOT =
                     CONFIG_FILE =
                         BOOTLDR =
          Configuration register = 0x2102


  Peer Processor Information :
  ---------------------------
                Standby Location = slot 6
          Current Software state = STANDBY HOT
       Uptime in current state = 0 minutes
                   Image Version = Cisco Internetwork Operating System Software
IOS (tm) MSFC2A Software (C6MSFC2A-ADVENTERPRISEK9_WAN-M),
Version 12.2(18)SXF7, RELEASE SOFTWARE (fc1)
Technical Support: http://www.cisco.com/techsupport
Copyright (c) 1986-2006 by cisco Systems, Inc.
Compiled Thu 23-Nov-06 01:03 by kellythw
                            BOOT =
                     CONFIG_FILE =
                         BOOTLDR =
          Configuration register = 0x2102



   LAB-Router#
```

故障切换至备用 Supervisor 并进行验证

现在，您可以将 Supervisor 模块故障切换至新添加的备用 Supervisor 模块并对其进行测试。

1. 对 Supervisor 模块进行故障切换：
```
Access2> (enable) switch supervisor
This command will force a switch-over to the standby Supervisor module.
Do you want to continue (y/n) [n]? y
2007 May 21 20:40:37 %SYS-5-MOD_RESET:Module 5 reset from Console//
Access2> (enable)
System Bootstrap, Version 12.2(18r)SX2, RELEASE SOFTWARE (fc1)
Technical Support: http://www.cisco.com/techsupport
Copyright (c) 2004 by cisco Systems, Inc.
Cat6k-Sup32 platform with 262144 Kbytes of main memory

Autoboot executing command: "boot bootdisk:cat6000-sup32pfc3k8.8-5-8.bin"
Self decompressing the image : ###########################################
###############################################################################
```

```
###################################################################
###################################################################
###################################################################
###################################################################
###################################################################
###################################################################
###################################################################
###################################################################
###################################################################
################################################## [OK]


System Power On Diagnostics
DRAM Size .........................256 MB
Testing DRAM ......................Passed
Verifying Text Segment ............Passed
NVRAM Size ........................2048 KB
Level2 Cache ......................Present
Level3 Cache ......................Absent
System Power On Diagnostics Complete


Currently running ROMMON from S (Gold) region
Boot image: bootdisk:cat6000-sup32pfc3k8.8-5-8.bin


Firmware compiled 01-Dec-06 12:57 by integ Build [100]

This module is now in standby mode.
Console is disabled for standby supervisor
```

2. 通过控制台连接到当前的活动模块 Supervisor 6。冗余状态：

```
Access2> (enable) show system highavailability
Highavailability: enabled
Highavailability versioning: disabled
Highavailability Operational-status: ON

Access2> (enable) show system redundancy-history
   Maximum entries of switchover history table = 10
   System cold start due to switchover failure = 4
   Standby available time (secs*100)        = 98984

   Redundant History Switchover Table:
      Index: 1
      Previous active supervisor module: 5
      Current active supervisor module : 6
      Switchover reason               : user initiated
      Switchover time                 : Mon May 21 2007, 20:40:37
```

Show version :

```
Access2> (enable) show version
WS-C6509 Software, Version NmpSW: 8.5(8)
Copyright (c) 1995-2006 by Cisco Systems
NMP S/W compiled on Dec  1 2006, 23:03:43

System Bootstrap Version: 12.2
System Boot Image File is 'bootdisk:RTSYNC_cat6000-sup32pfc3k8.8-5-8.bin'
System Configuration register is 0x2102
```

引导变量：

```
Access2> (enable) show boot
BOOT variable = bootdisk:RTSYNC_cat6000-sup32pfc3k8.8-5-8.bin,1;bootdisk:cat6000
-sup32pfc3k8.8-4-5.bin,1;
CONFIG_FILE variable = bootdisk:switch.cfg
```

```
Configuration register is 0x2102
ignore-config: disabled
auto-config: non-recurring, overwrite, sync disabled
ROMMON console baud: 9600
boot: image specified by the boot system commands

Image auto sync is enabled
Image auto sync timer is 120 seconds
```

Show module :

```
Access2> (enable) show module
Mod Slot Ports Module-Type              Model              Sub Status
--- ---- ----- ------------------------ ------------------ --- --------
1   1          Unknown Card                                    power-down
2   2    48    10/100BaseTX Ethernet    WS-X6248-RJ-45     no  ok
3   3    48    10/100BaseTX Ethernet    WS-X6348-RJ-45     yes ok
4   4    48    10/100BaseTX Ethernet    WS-X6348-RJ-45     yes ok
5   5    9     1000BaseX Supervisor     WS-SUP32-GE-3B     yes standby
6   6    9     1000BaseX Supervisor     WS-SUP32-GE-3B     yes ok
16  6    1     Multilayer Switch Feature WS-F6K-MSFC2A     no  ok
7   7    5     Communication Media Mod.  WS-SVC-CMM        no  ok
8   8    0     FXS                                         no  power-down
9   9          Unknown Card                                    power-down
```

!--- Output suppressed Mod Sub-Type Sub-Model Sub-Serial Sub-Hw Sub-Sw --- ----------------
------- ------------------ ----------- ------ ------ 3 Inline Power Module WS-F6K-VPWR 1.0
1.1(1) 4 Inline Power Module WS-F6K-VPWR 1.0 1.1(1) **5   L3 Switching Engine III WS-F6K-
PFC3B   SAL1012GREU 2.1**
6   L3 Switching Engine III WS-F6K-PFC3B   SAL1017L9WJ 2.1
```
Access2> (enable)
```

3. 验证 MSFC :

```
Access2> (enable) session 16
Trying Router-16...
Connected to Router-16.
Escape character is '^]'.


LAB-Router>enable

LAB-Router#show version
Cisco Internetwork Operating System Software
IOS (tm) MSFC2A Software (C6MSFC2A-ADVENTERPRISEK9_WAN-M),
Version 12.2(18)SXF7, RELEASE SOFTWARE (fc1)
Technical Support: http://www.cisco.com/techsupport
Copyright (c) 1986-2006 by cisco Systems, Inc.
Compiled Thu 23-Nov-06 01:03 by kellythw
Image text-base: 0x40101040, data-base: 0x42638000

ROM: System Bootstrap, Version 12.2(17r)SX3, RELEASE SOFTWARE (fc1)
BOOTLDR: MSFC2A Software (C6MSFC2A-ADVENTERPRISEK9_WAN-M), Version 12.2(18)SXF7,
 RELEASE SOFTWARE (fc1)

LAB-Router uptime is 7 minutes
System returned to ROM by Stateful Switchover
System image file is "bootflash:c6msfc2a-adventerprisek9_wan-mz.122-18.SXF7.bin"


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.
```

A summary of U.S. laws governing Cisco cryptographic products may be found at:
http://www.cisco.com/wwl/export/crypto/tool/stqrg.html

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

cisco MSFC2A (R7000) processor (revision MSFC2A) with 458752K/65536K bytes of me
mory.
Processor board ID MSFC2A
R7000 CPU at 300Mhz, Implementation 0x27, Rev 3.3, 256KB L2, 1024KB L3 Cache
Last reset from power-on
SuperLAT software (copyright 1990 by Meridian Technology Corp).
X.25 software, Version 3.0.0.
Bridging software.
TN3270 Emulation software.
29 Virtual Ethernet/IEEE 802.3 interfaces
509K bytes of non-volatile configuration memory.

65536K bytes of Flash internal SIMM (Sector size 512K).
Configuration register is 0x2102

重命名 Catalyst OS

可以看到更换的 Supervisor 模块中的 CatOS 名称以 RTSYNC 开头。可以使系统保持原样运行。您
也可以更改该文件名并将其保留为标准名称，如下所示：

Access2> (enable) **rename RTSYNC_cat6000-sup32pfc3k8.8-5-8.bin**
cat6000-sup32pfc3k 8.8-5-8.bin
Access2> (enable) dir
    2287   -rw-   10029260   May 21 2007 21:40:01 cat6000-sup32pfc3k8.8-5-8.bin

236900352 bytes available (19390464 bytes used)
Access2> (enable)

重命名文件后，必须更改引导变量。

!--- Verify boot variable Access2> (enable) **show boot**
BOOT variable = **bootdisk:RTSYNC_cat6000-sup32pfc3k8.8-5-8.bin,1;bootdisk:cat6000**
-sup32pfc3k8.8-4-5.bin,1;
CONFIG_FILE variable = bootdisk:switch.cfg

Configuration register is 0x2102
ignore-config: disabled
auto-config: non-recurring, overwrite, sync disabled
ROMMON console baud: 9600
boot: image specified by the boot system commands

Image auto sync is enabled
Image auto sync timer is 120 seconds

!--- Clear all the boot variables Access2> (enable) **clear boot system all**
BOOT variable =
Access2> (enable) 2007 May 21 21:41:56 %SYS-5-SUP_IMGSYNC:File synchronization p
rocess will start in 120 seconds

!--- Configure the boot variable Access2> (enable) **set boot system flash bootdisk:cat6000-**
sup32pfc3k8.8-5-8.bin
BOOT variable = bootdisk:cat6000-sup32pfc3k8.8-5-8.bin,1;

```
Access2> (enable) 2007 May 21 21:42:14 %SYS-5-SUP_IMGSYNC:File synchronization p
rocess will start in 120 seconds

 !--- Verify the boot variable Access2> (enable) show boot
BOOT variable = bootdisk:cat6000-sup32pfc3k8.8-5-8.bin,1;
CONFIG_FILE variable = bootdisk:switch.cfg

Configuration register is 0x2102
ignore-config: disabled
auto-config: non-recurring, overwrite, sync disabled
ROMMON console baud: 9600
boot: image specified by the boot system commands

Image auto sync is enabled
Image auto sync timer is 120 seconds
```

相关信息

- 带有冗余 Supervisor 引擎的 Catalyst 6000/6500 系列交换机的软件镜像升级配置示例
- Cisco Catalyst 6500 系列交换机 - 支持文档
- LAN 产品支持页
- LAN 交换技术支持页
- 技术支持和文档 - Cisco Systems