排除NCS6K卡引导故障

目录

[简介](#)
[先决条件](#)
[要求](#)
[使用的组件](#)
[背景信息](#)
[故障排除](#)
[线路卡按预期启动](#)
[由于驱动程序错误，交换矩阵卡无法启动](#)
[卡停滞在电源关闭或当前状态](#)
[卡卡滞在POWER_ON状态](#)
[卡停滞在SW_INACTIVE状态](#)
[场景1. SW_EVENT_FAILURE:SW_EVENT_ADMIN_VM_FAILURE由shelf_mgr系统日志报告](#)
[场景2. LC停滞在故障状态，最后事件：HW_EVENT_FAILURE
fail_code=LC_POWER_MAIN_FAULT](#)
[卡停滞在未知状态](#)
[使用RCONSOLE工具](#)
[打开TAC案例前要收集的命令列表](#)

简介

本文档介绍如何排除网络融合系统6000(NCS6K)线卡引导故障。此外，它还提供可收集的数据的概述，可帮助TAC进行详细调查。

先决条件

要求

思科建议您具备XR命令行界面(CLI)的基本知识。

使用的组件

本文档是使用XR版本5.0.1、5.2.1、5.2.3和5.2.4创建的。

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。

背景信息

如果路由处理器(RP)、交换矩阵卡(FC)或线卡(LC)未在引导阶段启动并陷入停滞，则第一步应开始从Syadmin虚拟机(VM)收集**show tech ctrace**。 此show **tech提**供有关当前系统状态和不同组件之间

交互的信息。但是，系统管理员（也称为Calvados）可能未在卡上打开，并且**show tech ctrace** 将无法收集受影响卡的信息。由于无法通过安全外壳(SSH)访问卡，因此会发生这种情况。 对于此类情况，需要执行rconsole程序，以便了解在引导过程中卡卡的原因。

> **注意：**此文件通常相当大(500MB-1GB)，将存储在Sysadmin VM中。要从框中提取，必须将其复制到XR VM（相同文档后面提供的说明）。

故障排除

检查Sysadmin VM上每张卡的状态并找出其当前状态。请特别注意硬件和软件状态。请注意，显示S/w状态为N/A的卡是CPU较少的卡（FC卡、风扇托架等），基本上由RP CPU控制。处于运行状态的卡是基于CPU的卡，因此已加载软件。

```
 sysadmin-vm:0_RP0# show platform

Location  Card Type                HW State      SW State      Config State
--------------------------------------------------------------------------------
0/0       PROTO-CXP-1XPITA         OPERATIONAL   OPERATIONAL   NSHUT
 0/2       PROTO-CXP-2XPITA         POWERED_OFF   SW_INACTIVE   NSHUT
0/3       NC6-10X100G-M-K          OPERATIONAL   OPERATIONAL   NSHUT
0/RP0     NC6-RP                   OPERATIONAL   OPERATIONAL   NSHUT
 0/RP1     NC6-RP                   POWERED_ON    SW_INACTIVE   NSHUT
0/FC0     NC6-FC                   POWERED_ON    N/A           NSHUT
0/FC1     NC6-FC-MC                POWERED_ON    N/A           NSHUT
 0/FC2     UNKNOWN                  FAILED        N/A           NSHUT
0/FC3     NC6-FC                   POWERED_ON    N/A           NSHUT
0/FC4     NC6-FC-B2B               POWERED_ON    N/A           NSHUT
0/FC5     NC6-FC                   OPERATIONAL   N/A           NSHUT
0/FT0     NC6-FANTRAY              OPERATIONAL   N/A           NSHUT
0/FT1     NC6-FANTRAY              OPERATIONAL   N/A           NSHUT
0/PT0     NCS-AC-PWRTRAY           OPERATIONAL   N/A           NSHUT
0/PT1     NCS-AC-PWRTRAY           OPERATIONAL   N/A           NSHUT
0/PT2     NCS-AC-PWRTRAY           OPERATIONAL   N/A           NSHUT
```

下一步是检查卡芯片控制器(CCC)库存命令并确认卡状态。

```
 sysadmin-vm:0_RP0# show controller ccc inventory summary

CCC Inventory Summary :
                                  BP                    HW
Location Card Type                ID    Serial Number   Ver   Card State
--------------------------------------------------------------------------------
 0/RP0    NC6-RP (master)          0     SAD15270129     0.1   CARD_READY
0/RP1    NC6-RP (slave)           1     SAD1527012P     0.1   CARD_READY
0/FC0    NC6-FC                   8     SAD1618002F     0.2   WAIT_DEV_INIT
0/FC1    NC6-FC                   9     SAD153901ZT     0.2   WAIT_DEV_INIT
0/FC4    NC6-FC                   12    SAL1803KQEY     1.0   PON_POWERING_UP
0/FC5    NC6-FC                   13    SAD16180043     0.2   WAIT_DEV_INIT
0/0      NC6-10X100G-M-K          16    SAL1650UCN9     0.4   PXE_BOOTING
0/4      NC6-10X100G-M-K          20    SAD154502XU     0.1   CARD_READY
```

以下是可能发生的不同情况。 此外，此处列出了预期输出和后续故障排除步骤。

线路卡按预期启动

```
sysadmin-vm:F0_SC0# show platform detail location 0/0

Platform Information for 0/0
 PID :               NC6-10X100G-M-P
 Description :       "NCS 6000 10x100G Multi-Service CXP"
 VID/SN :            V01
 HW Oper State :     OPERATIONAL
 SW Oper State :     OPERATIONAL
 Configuration :     "NSHUT RST"
 HW Version :        1.0
 Last Event :        HW_EVENT_OK
  Last Event Reason : "Initial discovered state:BOOTED (card ok)"
```

“Last Event(上次事件)”和“Last Event Reason(上次事件原因)”的输出显示卡正常。执行show reboot history命令，以验证此特定卡在过去是否有问题，如果有问题，则验证问题出在什么位置。

```
 sysadmin-vm:F0_SC0# show reboot-history card location 0/0

Card Reboot History for 0/0
 0
  Timestamp    "Fri Oct  2 15:15:26 2015"
  Reason Code  7
  Reason       "Install Activate System Reload"
  Src Location ""
   Src Name     INSTALL
  Timestamp    "Tue Sep  8 18:56:29 2015"
  Reason Code  7
  Reason       "ADMIN CLI RELOAD ROUTER GRACEFUL"
  Src Location ""
  Src Name     "CONFD USER"
Aborted: by user
```

线路卡0/0运行正常，上次重新加载的原因是安装，这实质上意味着软件维护更新(SMU)安装或软件升级已完成。这是预期的，因此此卡没有问题。

由于驱动程序错误，交换矩阵卡无法启动

```
sysadmin-vm:0_RP0# show platform

Location  Card Type                HW State      SW State      Config State
------------------------------------------------------------------------------
 0/FC2     UNKNOWN                  FAILED        N/A           NSHUT <-

sysadmin-vm:F0_SC0# show reboot-history card location 0/FC2

 Card Reboot History for 0/FC2
 Timestamp    "Thu Oct  9 12:10:22 2014"
 Reason Code  15  <--
 "Board reload as devices not up on Fabric Card"
 Src Location 0/FC0
  Src Name     FAM_AGENT_CALV_DRIVER_SFE ß
```

在本示例中，FC卡未启动，因为sfe_driver未正确初始化。

再执行几个命令，以便从CCC的角度查看重置历史记录。reboot-history CLI可与CCC驱动程序的reset-history CLI配合使用，以确定卡重新加载的源和原因。

可以有两种选择：

板载 — 如果卡通过“热重置”（仅CPU已重新加载），则使用此选项查找信息。

Onchip — 如果卡经过冷重置（完全重新加载卡 — 硬重置），使用此选项查找信息。

例如：

```
 sysadmin-vm:F0_SC0# show controller ccc reset-history on
Possible completions:
  onboard   CCC Reset history in onboard EEPROM detail information
  onchip    On-chip reset history entries since last CCC Cold Reset
```

```
sysadmin-vm:F0_SC0# show controller ccc reset-history onchip location 0/0

************************************************
***   On Chip Reset History for location 0/0   ***
************************************************
TimeofDay    : Tue Oct 20 17:17:40 2015
Uptime       : 18 days 02:01:59 <--
Resets       : 2

    Reset           Reset        Reset
idx Source          Command      Time
--- --------------- ------------ -------------------
0   ColdRst         AssrtHR      2015/10/02 15:15:43
1   ColdRst         DeAssrtHR    2015/10/02 15:15:50 --> List reset source as "ColdRst"
```

```
 sysadmin-vm:F0_SC0# show controller ccc reset-history onboard  location 0/0

************************************************
***   On Board Reset History for location 0/0   ***
************************************************
Scratch EEPROM Magic   : PON
Scratch EEPROM Version : 0x00014000
Reset History Magic    : HIST
Number of Resets       : 102    <---

    Reset           Reset        Reset
idx Source          Command      Time
--- --------------- ------------ -------------------
0   ColdRst         AssrtHR      1970/01/01  0:00:00 <-- ColdRst
1   ColdRst         DeAssrtHR    1970/01/01  0:00:06
2   ColdRst         AssrtHR      1970/01/01  0:00:00
3   ColdRst         DeAssrtHR    1970/01/01  0:00:06
4   WarmRst         AssrtHR      1970/05/03  7:21:55 <-- WarmRst
<output omitted>

ColdRst can either be initiated by Software or Hardware. WarmRst, is only initiated through
Software. Other reset sources can be HRESET_L, SRESET_L, Wtchdog, SW_assgn or plain Rsrvd.
```

此外，每执行一次重置操作都有两个唯一条目。AssrtHR操作和DeAssrtHR操作。这意味着已经断言了重置信号，然后取消断言，因此芯片将完成重置。

请注意每个操作的时间戳。此CLI可与CCC资产状态CLI结合使用，以确定何时发生重置以及卡的打开或关闭时间。

接下来，检查卡在重新加载过程中经过的CCC阶段。此处列出了不同的状态示例：

从CCC角度正确启动的卡：

```
sysadmin-vm:F0_SC0# show controller ccc event-history brief location 0/0

CCC Card Event History for: 0/0

Card Event History as seen by Master (0/RP1)
  Current State: CARD_READY

  DATE   TIME (UTC)    STATE                   EVENT
  -----  ------------  ----------------------  ------------------------------
  10/02  15:16:55.234  WAIT_BOOT_IMAGE         ev_boot_ssd_image
  10/02  15:16:54.233  BIOS_STARTED            if_wait_ssd_image_booting
  10/02  15:16:54.233  CPU_READY               if_bios_started
  10/02  15:16:54.231  OIR_INSERT_NOTIF        if_cpu_is_ready
  10/02  15:16:54.217  CCC_DRIVER_INIT         if_oir_insert_notif_not_done
  10/02  15:16:54.195  PON_POWERED_ON          to_ccc_driver_init
  10/02  15:16:54.195  CHECK_CCC_STATUS        if_pon_powered_on
  10/02  15:16:54.194  READ_IDPROM             ev_idprom_available
  10/02  15:16:53.942  GET_CCC_INFO           ev_get_ccc_info_done
  10/02  15:16:53.723  WAIT_ETH_READY          ev_eth_available
  10/02  15:16:52.560  CHECK_UBLAZE_BOOT       ev_ublaze_boot_ok
  10/02  15:16:52.539  WAIT_CCC_READY          ev_ccc_ready
  10/02  15:16:52.537  IDLE                    ev_presence_scan
```

当前处于PXE_BOOTING阶段的卡：

```
sysadmin-vm:0_RP0# show controller ccc event-history brief location 0/3

CCC Card Event History for: 0/3

Current State: PXE_BOOTING

  DATE   TIME (UTC)    STATE                   EVENT
  -----  ------------  ----------------------  ------------------------------
  08/07  19:50:40.607  BIOS_STARTED            if_internal_pxe_booting
  08/07  19:50:40.607  WAIT_BIOS_START         ev_bios_started
  08/07  19:50:18.605  CPU_READY               if_bios_not_started
  08/07  19:50:18.595  CCC_DRIVER_INIT         if_cpu_is_ready
  08/07  19:50:18.568  PON_POWERED_ON          to_ccc_driver_init
  08/07  19:50:18.568  CHECK_CCC_STATUS        if_pon_powered_on
  08/07  19:50:18.567  GET_CCC_INFO           ev_get_ccc_info_done
  08/07  19:50:18.550  WAIT_ETH_READY          ev_eth_ready
  08/07  19:50:18.550  CHECK_UBLAZE_BOOT       ev_ublaze_boot_ok
  08/07  19:50:18.517  PON_UP_WARM             ev_ccc_reset_done
  08/07  19:50:12.627  PON_DOWN_WARM           ev_pon_up_warm
  08/07  19:50:08.239  PON_DOWN_WARM           ev_warm_reset_req_ignored
  08/07  19:50:07.239  PON_DOWN_WARM           ev_warm_reset_req_ignored
  08/07  19:50:06.239  PON_DOWN_WARM           ev_warm_reset_req_ignored
  08/07  19:50:05.239  PON_DOWN_WARM           ev_warm_reset_req_ignored
  08/07  19:50:04.238  PON_DOWN_WARM           ev_warm_reset_req_ignored
```

由于GET_CCC_INFO中芯片卡卡住，卡无法启动：

```
sysadmin-vm:0_RP0# show controller ccc event-history brief location 3/6

CCC Card Event History for: 3/6

Card Event History as seen by Master (3/RP0)
  Current State: GET_CCC_INFO

  DATE   TIME (UTC)    STATE                   EVENT
  -----  ------------  ----------------------  ------------------------------
   10/26  23:43:04.559  UBLAZE_NOT_READY        ev_timer_expired
   10/26  23:42:34.559  CHECK_UBLAZE_BOOT       ev_timer_expired
  10/26  23:42:24.528  WAIT_CCC_READY          ev_ccc_ready
  10/26  23:42:21.516  RECOVERY_RESET          ev_timer_expired
  10/26  23:42:03.516  CHECK_UBLAZE_BOOT       ev_ublaze_pre_boot_failed
  10/26  23:41:52.480  WAIT_CCC_READY          ev_ccc_ready
  10/26  23:41:49.468  RECOVERY_RESET          ev_timer_expired
  10/26  23:41:32.467  WAIT_CCC_READY          ev_no_fpga_ok_signal
  10/26  23:41:29.456  RECOVERY_RESET          ev_timer_expired
  10/26  23:41:13.455  WAIT_CCC_READY          ev_no_fpga_ok_signal
  10/26  23:41:10.444  RECOVERY_RESET          ev_timer_expired
  10/26  23:40:55.444  CHECK_UBLAZE_BOOT       ev_ublaze_pre_boot_failed
  10/26  23:40:55.439  WAIT_CCC_READY          ev_ccc_ready
  10/26  23:40:52.320  IDLE                    ev_presence_scan
```

由于POWER_UP_FAILED状态，卡无法启动：

```
sysadmin-vm:0_RP0# show controller ccc event-history brief location 0/2

CCC Card Event History for: 0/2

Current State: POWER_UP_FAILED

  DATE   TIME (UTC)    STATE                   EVENT
  -----  ------------  ----------------------  ------------------------------
   08/05  14:55:17.449  POWER_UP_FAILED         ev_wdog_timeout
   08/05  14:45:31.265  CCC_DRIVER_INIT         if_pwr_up_failed
   08/05  14:45:31.260  CHECK_CCC_STATUS        if_pwr_up_failed_again
  08/05  14:45:31.258  GET_CCC_INFO            ev_get_ccc_info_done
  08/05  14:45:31.223  WAIT_ETH_READY          ev_eth_ready
  08/05  14:45:31.157  CHECK_UBLAZE_BOOT       ev_ublaze_boot_ok
  08/05  14:45:31.124  PON_UP_WARM             ev_ccc_reset_done
  08/05  14:45:17.489  CCC_IN_RESET           ev_pon_up_warm
  08/05  14:45:08.921  POWER_UP_FAILED         ev_pon_down_warm
  08/05  14:35:07.152  POWER_UP_FAILED         ev_wdog_timeout
  08/05  14:25:20.946  CCC_DRIVER_INIT         if_pwr_up_failed
  08/05  14:25:20.941  CHECK_CCC_STATUS        if_pwr_up_failed_again
  08/05  14:25:20.939  GET_CCC_INFO            ev_get_ccc_info_done
  08/05  14:25:20.923  WAIT_ETH_READY          ev_eth_ready
  08/05  14:25:20.887  CHECK_UBLAZE_BOOT       ev_ublaze_boot_ok
  08/05  14:25:20.830  PON_UP_WARM             ev_ccc_reset_done
Aborted: by user
```

如果将此命令与**brief**选项一起使用，则它不会提供与问题根本原因相关的完整数据。对于该信息，请将brief关**键字**替换为**detail**。

注意：当故障排除卡在CCC级别上无法启动时，这是最重要的CLI。

重点介绍**事件描述**和**失败原因**，以便更好地解释失败。

```
sysadmin-vm:F0_SC0# show controller ccc event-history detail location 0/0

CCC Card Event History for: 0/0

Card Event History as seen by Master (0/RP1)
  Event buffer info:
        Total number of events recorded: 13
        Number of events available for display: 13

  Current State: CARD_READY

     EVENT #: 12 (record index = 12)
   TIMESTAMP: 2015/10/02 15:16:55.234814 UTC
       STATE: WAIT_BOOT_IMAGE
       EVENT: ev_boot_ssd_image
  EVENT DESC: SSD image is booting

     EVENT #: 11 (record index = 11)
   TIMESTAMP: 2015/10/02 15:16:54.233898 UTC
       STATE: BIOS_STARTED
       EVENT: if_wait_ssd_image_booting

     EVENT #: 10 (record index = 10)
   TIMESTAMP: 2015/10/02 15:16:54.233855 UTC
       STATE: CPU_READY
       EVENT: if_bios_started

     EVENT #: 9 (record index = 9)
   TIMESTAMP: 2015/10/02 15:16:54.231426 UTC
       STATE: OIR_INSERT_NOTIF
       EVENT: if_cpu_is_ready

     EVENT #: 8 (record index = 8)
   TIMESTAMP: 2015/10/02 15:16:54.217351 UTC
       STATE: CCC_DRIVER_INIT
       EVENT: if_oir_insert_notif_not_done

     EVENT #: 7 (record index = 7)
   TIMESTAMP: 2015/10/02 15:16:54.195808 UTC
       STATE: PON_POWERED_ON
       EVENT: to_ccc_driver_init

     EVENT #: 6 (record index = 6)
   TIMESTAMP: 2015/10/02 15:16:54.195786 UTC
       STATE: CHECK_CCC_STATUS
```

以下是不同场景的输出示例。

由于电源问题而未启动并卡在POWER_UP_FAILED中的卡：

请注意ERROR_INFO以获取有关故障的详细信息。

```
 sysadmin-vm:0_RP0# show controller ccc event-history detail location 0/2

CCC Card Event History for: 0/2
  Event buffer info:
        Total number of events recorded: 692
        Number of events available for display: 255
```

```
  Current State: POWER_UP_FAILED

     EVENT #: 691 (record index = 179)
   TIMESTAMP: 2014/08/05 14:55:17.449979 UTC
       STATE: POWER_UP_FAILED
       EVENT: ev_wdog_timeout
   EVENT DESC: CCC watchdog timeout event
   ERROR INFO: wdog__0 SysAdmin VM Watchdog stage1:0

<output omitted>
```

未启动并卡在CCC_NOT_READY（芯片问题）中的卡：

```
 sysadmin-vm:0_RP0# show controller ccc event-history detail location 0/FC2

CCC Card Event History for: 0/FC2
  Event buffer info:
        Total number of events recorded: 2
        Number of events available for display: 2

  Current State: CCC_NOT_READY

     EVENT #: 1 (record index = 1)
   TIMESTAMP: 2014/08/04 14:10:49.891845 UTC
       STATE: WAIT_CCC_READY
       EVENT: ev_ccc_ready_timeout
   EVENT DESC: Timeout waiting for CCC to be ready
   ERROR INFO: CCC READY Timeout - CLOCK_OK signal not being asserted (I/O Expander port0=0xf0,
port1=0xff) ß

<output omitted>
```

有些情况下，需要移除/重新插入卡。为此，CCC组件为给定机架跟踪卡的插入/拆卸提供OIR-History。请注意，使用**关键字**slave。这将提供有关备用RP的信息。

```
 sysadmin-vm:0_RP0# show controller ccc oir-history rack 0

Cards OIR History of rack: 0

OIR Events as seen by Master (0/RP0)-  View from the Active RP
  DATE   TIME (UTC)     EVENT        LOC     CARD TYPE            SERIAL NO
  -----  ------------   ----------   -----   ------------------   -----------
  10/09  16:59:14.280   INSERTED     0/0     NC6-10X100G-M-K     SAL1650UCN9
  10/09  16:58:49.064   REMOVED      0/0     NC6-10X100G-M-K     SAL1650UCN9

<output omitted>

 sysadmin-vm:0_RP1# show controller ccc slave oir-history rack 0

Cards OIR History of rack: 0

OIR Events as seen by Slave (0/RP1)- <-- View from the standby RP
  DATE   TIME (UTC)     EVENT        LOC     CARD TYPE            SERIAL NO
  -----  ------------   ----------   -----   ------------------   -----------
  11/06  05:54:31.374   DISCOVERED   0/2     NC6-10X100G-M-K     SAD161300XK
  11/06  05:53:37.442   DISCOVERED   0/6     NC6-10X100G-M-K      SAL1649TN46
```

```
<output omitted>
```
从两个RP角度来看，信息必须相同。

使用此命令组合有助于确定交换矩阵卡无法启动的根本原因。

卡停滞在电源关闭或当前状态

如果卡停滞在POWEROFF/PRESENT状态，则很可能它经历了多次重置，并且由shelf_mgr**关闭**。

发出以下命令以确定问题的根本原因：

1. 从Sysadmin **VM收集**show tech ctrace
2. **show platform detail location <>**
3. **show reboot-history card location <>**（了解它通过RESET过程的次数）
4. **show controller ccc event-history detail location <>**
5. **show controller ccc reset-history onboard location <>**

使用hw-module reset命令可以重置卡，使用本文档后面介绍的rconsole过程可以观察引导过程。

```
sysadmin-vm:F0_SC0# hw-module location 0/0 reload
Reload hardware module ? [no,yes] Yes
```

卡卡滞在POWER_ON状态

如果卡卡卡在POWERED_ON中，这意味着CCC已打开其他驱动程序开始工作所需的基本电源区。将卡移至运行状态是各驱动程序的责任。

SFE驱动程序在检测并初始化该卡上的所有内部设备（也称为ASIC）后，将FC移至运行状态。

ESD驱动程序将SC-SW卡和Scapa的LC移至运行状态（几乎立即，与SFE驱动程序不同，无需检查/初始化）。

如果卡卡卡在POWERED_ON状态，则意味着上述驱动程序之一无法将卡移到“Operational（运行）”状态。在无CPU卡上更常出现问题。例如：交换矩阵卡或SC的交换机卡(SC-SW)。

第一步是检查ccc event-history命令：

```
sysadmin-vm:F0_SC0# show controller ccc event-history detail location 0/0

CCC Card Event History for: 0/0

Card Event History as seen by Master (0/RP1)
  Event buffer info:
        Total number of events recorded: 13
        Number of events available for display: 13
<output ommited>

     EVENT #: 7 (record index = 7)
   TIMESTAMP: 2015/10/02 15:16:54.195808 UTC
       STATE: PON_POWERED_ON
        EVENT: to_ccc_driver_init
```
接下来，验证所需的基本电源区：

```
 sysadmin-vm:0_RP0# show controller ccc register location 0/RP0 offset 0x4c

Register    Register
Address     Value
------------------------
0x4C        0x3           - zones 0 and 1 OK

 sysadmin-vm:0_RP0# show controller ccc register location 0/RP0 offset 0x50

Register    Register
Address     Value
------------------------
0x50        0x3           - zone 0 and 1 Enabled



 sysadmin-vm:0_RP0# show controller ccc power detail location 0/RP0

Power detail : Zone information for 0/RP0:
-----------------------------------------------------------
| Power Zone | Power Status | Power Contrl | Power Fault |
-----------------------------------------------------------
|   0        |   OK         |   SET        |   --        |  - Power Status OK
|   1        |   OK         |   SET        |   --        |  - Power Status OK

 sysadmin-vm:F0_SC0# show controller ccc i2c-dev ioexpander location 0/0

  CCC IO Expander information for location: 0/0
  -----------------------------------------------------
  Port 0: 0x3e
   Port Bit I/O Val Bit Name
   -------------------------------------
   P0   0   O   0   Power Cycle
   P0   1   I   1   FPGA OK
   P0   2   I   1   uBlaze OK
   P0   3   I   1   Clock OK
   P0   4   I   1   Core Volt OK
   P0   5   I   1   OTH Volt0 OK
   P0   6   I   0   OTH Volt1 NOT OK
   P0   7   I   0   OTH Volt2 NOT OK

  Port 1: 0x3
   Port Bit I/O Val Bit Name
   -------------------------------------
   P1   0   I   1   FPGA INIT OK
```

如果此验证未导致根本原因，则下一步是打开TAC服务请求。

卡停滞在SW_INACTIVE状态

```
sysadmin-vm:0_RP0# show platform

Location  Card Type                HW State      SW State      Config State
------------------------------------------------------------------------ -------
0/1       P-L-10X100G-F-P          POWERED_OFF   SW_INACTIVE   SHUT
0/RP0     P-L-RP                   OPERATIONAL   OPERATIONAL   NSHUT
0/RP1     P-L-RP                   OPERATIONAL   OPERATIONAL   NSHUT
0/FC0     P-L-FC-S                 OPERATIONAL   N/A           NSHUT
0/FC1     P-L-FC-S                 OPERATIONAL   N/A           NSHUT
0/FT0     PANINI-SIM-FT            OPERATIONAL   N/A           NSHUT
```

```
0/FT1     PANINI-SIM-FT           OPERATIONAL   N/A           NSHUT
```

可能的故障原因包括：

- 由于SSD访问问题，主机操作系统无法启动
- 由于硬件问题，主机操作系统启动停滞
- SysAdmin VM无法生成
- 控制以太网连接问题
- 由于软件故障，卡MAC/IP未编程
- 以太网交换机未通过CCC加电解释程序正确编程
- ESD彩色交换机映像无法在CCC SPI闪存中编程

场景1. SW_EVENT_FAILURE:SW_EVENT_ADMIN_VM_FAILURE由shelf_mgr系统日志报告

```
sysadmin-vm:0_RP0# show platform

Location  Card Type                HW State      SW State      Config State
------------------------------------------------------------------------------
0/1       PROTO-CXP-2XPITA         OPERATIONAL   OPERATIONAL   NSHUT
0/RP0     NC6-RP                   OPERATIONAL   OPERATIONAL   NSHUT
 0/RP1     NC6-RP                   OPERATIONAL   SW_INACTIVE   NSHUT
0/FC0     NC6-FC-MC                OPERATIONAL   N/A           NSHUT
0/CI0     P-L-CRFT                 OPERATIONAL   N/A           NSHUT
0/FT0     P-L-FANTRAY              OPERATIONAL   N/A           NSHUT
0/FT1     P-L-FANTRAY              OPERATIONAL   N/A           NSHUT
```

RP1无法启动的原因可能有多种不同。找到问题的最简单方法是在RP上执行rconsole并检查登录（请参阅本文档底部的rconsole过程）。

场景2. LC停滞在故障状态，最后事件：HW_EVENT_FAILURE fail_code=LC_POWER_MAIN_FAULT

确保HW状态显示FAILED，SW状态显示SW_INACTIVE:

```
sysadmin-vm:0_RP0# show platform location 0/1

Location  Card Type                HW State      SW State      Config State
------------------------------------------------------------------------------
0/1       NC6-60X10GE-M-S          FAILED        SW_INACTIVE   NSHUT
```

执行此命令并选中“Last Even Reason:(最后偶数原因)”:

```
sysadmin-vm:0_RP0# show platform detail location 0/1

Platform Information for 0/1
```

```
 PID :               NC6-60X10GE-M-S
 Description :       "NCS 6000 60x10G Multi-Service SFP+"
 VID/SN :            V01
 HW Oper State :     FAILED
 SW Oper State :     SW_INACTIVE
 Configuration :     "NSHUT RST"
 HW Version :        0.6
 Last Event :        HW_EVENT_FAILURE
  Last Event Reason : "pon exit  <-- UP_WARM_RESET cnt=123  fail_code=LC_POWER_MAIN_FAULT"
sysadmin-vm:0_RP0#
```

过滤受影响卡的系统日志以检查日志消息：

```
 0/RP0/ADMIN0:Jun 21 00:33:13.487 : cm[1795]: %ROUTING-TOPO-5-OIR_ACTION : OIR card failed
having serial number: SAD173501R7.
0/RP0/ADMIN0:Jun 21 00:33:13.528 : shelf_mgr[1818]: %INFRA-SHELF_MGR-5-CARD_INSERTION :
Location: 0/1, Serial #: SAD173501R7
0/RP0/ADMIN0:Jun 21 00:33:13.528 : shelf_mgr[1818]: %INFRA-SHELF_MGR-6-HW_EVENT : Rcvd HW event
HW_EVENT_FAILURE, event_reason_str 'Initial discovery FAIL: EXIT0, power request on , but not
finish ccc-pon startup. power_control 0x00000001' for card 0/1
0/RP0/ADMIN0:Jun 21 00:33:13.530 : shelf_mgr[1818]: %INFRA-SHELF_MGR-3-CARD_HW_FAILED : Card:
0/1 hardware state going to FAILED
0/RP0/ADMIN0:Jun 21 00:34:06.734 : shelf_mgr[1818]: %INFRA-SHELF_MGR-6-HW_EVENT : Rcvd HW event
HW_EVENT_RESET, event_reason_str 'pon enter --> DOWN_WARM_RESET cnt=3! ' for card 0/1
0/RP0/ADMIN0:Jun 21 00:34:15.987 : shelf_mgr[1818]: %INFRA-SHELF_MGR-6-HW_EVENT : Rcvd HW event
HW_EVENT_POWERED_OFF, event_reason_str 'CCC Warm Reset #8' for card 0/1
0/RP0/ADMIN0:Jun 21 00:34:21.419 : cm[1795]: %ROUTING-TOPO-5-OIR_ACTION : OIR card failed having
serial number: SAD173501R7.
0/RP0/ADMIN0:Jun 21 00:34:21.459 : shelf_mgr[1818]: %INFRA-SHELF_MGR-3-CARD_HW_FAILED : Card:
0/1 hardware state going to FAILED
0/RP0/ADMIN0:Jun 21 00:34:21.459 : shelf_mgr[1818]: %INFRA-SHELF_MGR-6-HW_EVENT : Rcvd HW event
HW_EVENT_FAILURE, event_reason_str 'pon exit  <-- UP_WARM_RESET cnt=4
fail_code=LC_POWER_MAIN_FAULT' for card 0/1
```

执行**show reboot history**命令，并验证AssrtHR和DeAssrtHR消息之间是否存在巨大的时间差。这可能是因为虚拟机之间存在内部连接问题。

```
sysadmin-vm:0_RP0#show reboot-history card location 0/1

Reset history example: every 20 mins for 2 hours before it recovered:

33  0    WarmRst      DeAssrtHR    0x00000F32 0x53A4D367 Sat Jun 21 00:35:51 2014
34  0    WarmRst      AssrtHR      0x00000F10 0x53A4D81D Sat Jun 21 00:55:57 2014

35  0    WarmRst      DeAssrtHR    0x00000F32 0x53A4D821 Sat Jun 21 00:56:01 2014
36  0    WarmRst      AssrtHR      0x00000F10 0x53A4DCD7 Sat Jun 21 01:16:07 2014
```

卡停滞在未知状态

当卡将Admin状态报告为UNKNOWN时，CCC很可能无法从主板读取IDPROM，因此，卡将无法完成引导。对于此类情况，请在给定位置执行以下命令：

```
RP/0/RP0/CPU0:A41-PE1#show platform
```

```
Node name         Node type             Node state       Admin state   Config state
-------------------------------------------------------------------------------------
0/RP1             NC6-RP                OPERATIONAL      UNKNOWN
0/FC1             NC6-FC                OPERATIONAL      UNKNOWN
```

```
 sysadmin-vm:F0_SC0# show controller ccc event-history brief location 0/0

CCC Card Event History for: 0/0

Card Event History as seen by Master (0/RP1)
  Current State: CARD_READY

  DATE   TIME (UTC)    STATE                   EVENT
  -----  ------------  ----------------------  -------------------------------

  10/02  15:16:54.194  READ_IDPROM             ev_idprom_available
  10/02  15:16:53.942  GET_CCC_INFO            ev_get_ccc_info_done
  10/02  15:16:53.723  WAIT_ETH_READY          ev_eth_available
  10/02  15:16:52.560  CHECK_UBLAZE_BOOT       ev_ublaze_boot_ok
  10/02  15:16:52.539  WAIT_CCC_READY          ev_ccc_ready
  10/02  15:16:52.537  IDLE                    ev_presence_scan
```

下一步是使用rconsole验证CCC在启动过程时是否在LC上运行：

1.收集SysadminVM中的进程ID:

```
sysadmin-vm:F0_SC0# show processes ccc_driver location 0/0

------------------------------------------------------------------------
                    PID: 2525
         Executable path: /opt/cisco/calvados/packages/ncs6k-sysadmin-boot-5.2.4.CSCut24295
.all-1.0.0/sbin/ccc_driver
              Instance #: 0
                 Respawn: ON
           Respawn count: 1
  Max. spawns per 4 mins: 4
            Last started: 10/02/2015 15:17:23.000
           Process state: Run
            startup_path: /opt/cisco/calvados/packages/ncs6k-sysadmin-boot-5.2.4.CSCut24295
.all-1.0.0/etc/startup/ccc_driver.startup
                   Ready: 5s
```

2.使用以下命令将控制台重新连接到LC:

```
sysadmin-vm:F0_SC0# attach location 0/RP0

[sysadmin-vm:0_RP0:~]$ exec chvrf 2 bash
[sysadmin-vm:0_RP0:~]$ chvrf 0 bash
[sysadmin-vm:0_RP0:~]$ /opt/cisco/calvados/sbin/rconsole -l 0/0
Connecting to location 0/0 (backplane-slotid 16, console 0)
Escape sequence is "end"
Waiting for card info from CCC-driver for slot 16
Got card info from CCC-driver for slot 16
IOS Build Date : 04/22/2015 by lchinnad
System Memory Speed : 1334 MHz
Processor Type : Intel(R) Xeon(R) CPU E5-2418L @ 2.00GHz

Press F12 to goto Boot Manager..
```

```
Booting System Host OS..
Waiting For CCC Valid Time of Day..
Waiting For CCC Valid Time of Day..
CCC Time: Fri Oct 2 15:16:54 2015

GNU GRUB version 2.00
Press F2 to goto grub Menu..
Booting from Disk..
Loading Kernel..
Loading initrd..
[    1.949229] i8042: No controller found
Starting udev: [  OK  ]
Switching to new root and running init.
Starting udev: [  OK  ]
Actual changes:
large-receive-offload: off [requested on]
ntuple-filters: on
Setting hostname host:  [  OK  ]
Checking filesystems:[  OK  ]
Entering non-interactive startup
Bringing up loopback interface:  [  OK  ]
Bringing up interface eth0:  Device eth0 does not seem to be present, delaying initialization.
[FAILED]
Starting system logger: [  OK  ]
Starting kernel logger: [  OK  ]
Starting kdump:[  OK  ]
Starting system message bus: [  OK  ]
Starting smartd: [  OK  ]
Generating SSH1 RSA host key: [  OK  ]
Generating SSH2 RSA host key: [  OK  ]
Generating SSH2 DSA host key: [  OK  ]
Starting sshd: [  OK  ]
Starting xinetd: [  OK  ]
Starting crond: [  OK  ]
Starting libvirtd daemon: [  OK  ]
Starting NCS6k programs for LC on hostos: [  OK  ]
mcelog start/running, process 2637
Creating default host password file
serial (/dev/ttyserial (/dev/ttyS1) start/running, process 2649

host login: root
Password:
[host:~]$
[host:~]$
[host:~]$ telnet 0 50001 <-- to get to Calvados
Trying 0.0.0.0...
Connected to 0.
Escape character is '^]'.

sysadmin-vm:0_0 login:
sysadmin-vm:0_0 login: root
Password:

[sysadmin-vm:0_0:~]$ pgrep ccc  <- use pgrep to check if the process is running
2525
[sysadmin-vm:0_0:~]$ exit
logout
```

使用RCONSOLE工具

当卡无法启动时，NCS6008提供内置功能，该功能可在卡上执行远程控制台，并查看卡卡卡卡和无法启动的原因。此功能称为RCONSOLE，下面是其使用示例。

在特定LC上重新控制台的步骤：

1. 导航至SysadminVM
2. 连接到活动RP。
3. 更改为全局VRF chvrf 0 bash
4. 执行/opt/cisco/calvados/sbin/rconsole -l（线卡）

示例：

```
RP/1/RP1/CPU0:6008-B#admin
sysadmin-vm:F0_SC0#
 sysadmin-vm:F0_SC0# attach location 0/RP0 <-- You must be connected to the RP's to be able to
rconsole
 Tue Oct  20 18:23:54.740 UTC
 [sysadmin-vm:0_RP0:~]$ exec chvrf 2 bash
[sysadmin-vm:0_RP0:~]$ chvrf 0 bash
[sysadmin-vm:0_RP0:~]$ /opt/cisco/calvados/sbin/rconsole -l 0/0 ß This is LC 0/0
 Connecting to location 0/0 (backplane-slotid 16, console 0)
 Escape sequence is "end"
 Waiting for card info from CCC-driver for slot 16
```

TAC广泛使用此程序来确定卡的当前状态并检查卡卡在何处卡住。

打开TAC案例前要收集的命令列表

XR虚拟机：

显示平台
show install active
show version
显示重新启动历史记录位置0/0/cpu0
dir misc/disk1
显示cli历史详细信息
show log
show tech-support npu

SysAdmin VM:

show platform detail
show platform slices
show install active
show sdr default-sdr reboot-history
show reboot-history card location <>
show controller ccc reset-history onbo loc <>
show controller ccc reset-history onch loc <>
show controller ccc event-history detail location <>
show tech-support ccc
show tech-support Hbloss
show tech-support slice_manager
show tech-support ctrace(show tech-support ctrace)
show tech-support sdr_mgr

show log