

Contents

[Troubleshooting Some Line Card \(LC\) issues on NCS4016](#)

[Introduction](#)

[Background Information](#)

[Before You Begin:](#)

[State-1: HW FAILED](#)

[State-2: POWERED ON](#)

[State-3: PRESENT](#)

[State-4: UNKNOWN](#)

[State-5: SW INACTIVE](#)

[Related Cisco Support Community Discussions](#)

Troubleshooting Some Line Card (LC) issues on NCS4016

Introduction

This document describes how to troubleshoot Line card issues, faulty states under which line card gets stuck, possible reasons and recovery actions on a Cisco 4000 Series Network Convergence System (NCS4016).

Background Information

NCS4016 is a 16 LC(0-15 slots) Chassis and each LC capacity of 200G. Below are few basics sequence of events while LC is booted up on NCS4016 Chassis.

1. LC has been divided in to 9 power zones i.e. 0 to 8. All these power zones are controlled by CCC (Card controller Chip).
2. First zone to come up is Zone 0 which would bring up the CPU complex and boots up the basic logic for a LC.
3. Once the zone 0 powered ON. CCC executes power-on interpreter and configure the basic devices before bring the CPU out of RESET state. (If the CPU is power OFF it remains in RESET state).
4. Above are basic functions which are performed during the LC bootup. Have there been any issues in Zone 1 to 8 only slice corresponding to them would not get power ON. However if there is some issues in Zone 0 the whole LC would be power off.

Before You Begin:

Before you start the troubleshooting, it is suggested to keep a note of below commands.

1. Attach (or login) to sysadmin(Calvados) VM since the card which failed to boot would not be shown in XR VM the status and reason for failure can only be seen in sysadmin VM.
2. Only cards which have CPU on them would be expected to have Software state operational. Else state would be N/A (Not applicable) but their hardware should be "operational"

With all LC & RP operational you should be able to see output as below.

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

Tue Aug 18 19:57:02.631 UTC

Location	Card Type	HW State	SW State	Config State
0/0	NCS4K-2H-O-K	OPERATIONAL	N/A	NSHUT
0/5	NCS4K-24LR-O-S	OPERATIONAL	N/A	NSHUT
0/6	NCS4K-20T-O-S	OPERATIONAL	N/A	NSHUT
0/8	NCS4K-2H-O-K	OPERATIONAL	N/A	NSHUT
0/RP0	NCS4K-RP	OPERATIONAL	OPERATIONAL	NSHUT
0/FC1	NCS4016-FC-M	OPERATIONAL	N/A	NSHUT
0/CI0	NCS4K-CRAFT	OPERATIONAL	N/A	NSHUT
0/FT0	NCS4K-FTA	OPERATIONAL	N/A	NSHUT
0/FT1	NCS4K-FTA	OPERATIONAL	N/A	NSHUT
0/PT0	NCS4K-AC-PEM	OPERATIONAL	N/A	NSHUT
0/PT1	NCS4K-AC-PEM	OPERATIONAL	N/A	NSHUT
0/EC0	NCS4K-ECU	OPERATIONAL	N/A	NSHUT

sysadmin-vm:0_RP0#

Below are few common faulty HW & SW States in which LC could be stuck and their reasons.

State-1: HW FAILED

This state suggests that card failed to boot due to some power issues or the CCC power-on interpreter prevented the completion of power up sequence.

Recommended actions:

Check the output of below command.

```
# sysadmin-vm:0_RP1# show platform detail location <location of card>
```

In above command look for "Last Event" and "Last Event Reason:" this will tell us the reason of failure.

```
sysadmin-vm:0_RP1# show platform detail location 0/fc1
```

Sat Jul 4 13:52:14.782 UTC

Platform Information for 0/FC1

PID : NCS4016-FC-M

Description : "NCS 4016 Agnostic Cross Connect - Multichassis "

VID/SN : V01

HW Oper State : OPERATIONAL

SW Oper State : N/A

Configuration : "NSHUT RST"

HW Version : 1.0

Last Event : HW_EVENT_FAILURE

Last Event Reason : "Intial discovery FAIL EXIT0 , power request on, but not finish ccc-pon startup power_control 0x00000001"

For the above failure state you could also check the status of CCC controller for particular location. You should be checking the status of power zone which is "SET". Since different LC uses different power zone to boot up.

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

Tue Aug 18 18:33:30.245 UTC

Power detail : Zone information for 0/RP0:

| Power Zone | Power Status | Power Contrl | Power Fault |

0	OK	SET	--	
1	OK	--	--	
2	OK	SET	--	
3	OK	--	--	
4	OK	SET	--	
5	--	--	--	
6	OK	--	--	
7	--	--	--	
8	OK	SET	--	

sysadmin-vm:0_RP0#

Recovery Actions:

1. Try to soft reset the LC by executing the below command.

```
# sysadmin-vm:0_RP1# hw-module location <location of card> reload
```

1. If soft reset doesn't helps in resolving the issue a physical Online Insertion and Removal (OIR) of the card should be done.

State-2: POWERED_ON

This state is seen on the LC which is CPU less and all LC cards in NCS4k are CPU less.

Recommended actions:

```
sysadmin-vm:0_RP1# show platform
```

0/FC0	NC4K-FC	OPERATIONAL	N/A	NSHUT
0/FC1	NC4K-FC	POWERED_ON	N/A	NSHUT
0/FC2	NC4K-FC	OPERATIONAL	N/A	NSHUT

In this case the fabric driver will try to recover the card on its own but if it cannot detect the ASIC in 3 minutes, failed then the card will land up in POWERED_ON state.

Check below output which shows all present cards in chassis are powered on successfully.

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

Tue Aug 18 19:09:37.575 UTC

CCC Power Summary :

Location	Card Type	Power State
----------	-----------	-------------

```
-----
```

0/0	NCS4K-2H-O-K	ON
0/FC1	NCS4016-FC-M	ON
0/5	NCS4K-24LR-O-S	ON
0/6	NCS4K-20T-O-S	ON
0/RP0	NCS4K-RP	ON
0/8	NCS4K-2H-O-K	ON

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

Recovery Actions:

1. Try to soft reset the LC by executing the below command if state-2(POWERED_ON) continue exist for any LC/FC.

```
# sysadmin-vm:0_RP1# hw-module location <location of card> reload
```

1. If soft reset doesn't help in resolving the issue a physical OIR of the card should be done.

State-3: PRESENT

This means that card has been detected and is in power off state. This could be the valid state when the card has been configured to power OFF in configuration. Card might have been forced to shutdown due to environmental alarm, failure in CCC driver in detecting the card due to I2C

failures.

Recommended actions:

sysadmin-vm:0_RP1# show platform detail location <location of card>

In above output please check “Last Event :” and “Last Event Reason :”.

To confirm the alarms you could also execute below command if the card has been shutdown due to any alarm conditions. Below output showing alarm condition for respective card location.

sysadmin-vm:0_RP0# show alarms

Tue Aug 18 18:03:35.421 UTC

Active Alarms

Location	Severity	Group	Set time	Description

0/PT0-PM0 (PM_NO_INPUT_DETECTED).	major	environ	05/22/70 04:56:45	Power Module Error
0/PT0-PM0 (PM_OUTPUT_EN_PIN_HI).	major	environ	05/22/70 04:56:45	Power Module Output Disabled
0/PT0-PM2 (PM_NO_INPUT_DETECTED).	major	environ	05/22/70 04:56:45	Power Module Error
0/PT0-PM2 (PM_OUTPUT_EN_PIN_HI).	major	environ	05/22/70 04:56:45	Power Module Output Disabled
0/PT0-PM3 (PM_NO_INPUT_DETECTED).	major	environ	05/22/70 04:56:45	Power Module Error
0/PT0-PM3 (PM_OUTPUT_EN_PIN_HI).	major	environ	05/22/70 04:56:45	Power Module Output Disabled
0/PT1-PM1 (PM_NO_INPUT_DETECTED).	major	environ	05/22/70 04:56:45	Power Module Error

You can also run the same command to check the output for respective location of the card.

sysadmin-vm:0_RP1# show alarms brief card location < location of card>

Recovery Actions:

1. Please try to soft reset the LC by executing the below command.

```
# sysadmin-vm:0_RP1# hw-module location <location of card> reload
```

1. If soft reset doesn't helps in resolving the issue a physical OIR of the card should be done

State-4: UNKNOWN

The most common reason for this state is CCC driver failing to read the IDPROM from the card or CCC driver detected the IDPROM corruption that failed the card to be detected.

```
sysadmin-vm:0_RP1# show platform
```

```
Sat Jul 4 15:27:50.478 UTC
```

```
Location Card Type          HW State   SW State   Config State
```

```
-----  
0/1   UNKNOWN                POWERED_ON OPERATIONAL NSHUT
```

Recovery Actions

1. Please try to soft reset the LC by executing the below command.

```
# sysadmin-vm:0_RP1# hw-module location <location of card> reload
```

1. If soft reset doesn't helps in resolving the issue a physical OIR of the card should be done
2. If physical OIR doesn't help then RMA of the card is suggested.

State-5: SW_INACTIVE

Please note for card to get in SW_INACTIVE state it has to be get operational in HW state. A common reason for card getting in to this state is HOST OS not able to access SSD.

Recommended actions:

Check if the card has control Ethernet connection.

```
sysadmin-vm:0_RP1# show controller switch reachable
```

```
Sat Jul 4 16:31:33.690 UTC
```

```
Rack Card Switch
```

```
-----  
0   RP0  RP-SW
```

```
0   RP1  RP-SW
```

```
0   LC0  LC-SW
```

```
0   LC1  LC-SW
```

0 LC2 LC-SW

0 LC4 LC-SW

If the card doesn't have the control Ethernet connection then execute below command to check Ethernet protocol state to the card. The state of the protocol should be either "Active" or "Standby" any other state seen would indicate the connection issue.

sysadmin-vm:0_RP0# show controller switch mlap location 0/RP0/RP-SW

Tue Aug 18 18:08:22.343 UTC

Rack Card Switch Rack Serial Number

0 RP0 RP-SW SAL19058RDF

	Phys	Admin	Protocol	Forward	Protocol	
Port	State	State	State	State	Type	Connects To

0	Down	Up	Down	-	Internal	LC15
1	Down	Up	Down	-	Internal	LC7
2	Down	Up	Down	-	Internal	LC13
3	Down	Up	Down	-	Internal	LC12
4	Down	Up	Down	-	Internal	LC14
5	Down	Up	Down	-	Internal	LC11
6	Up	Up	Active	Forwarding	Internal	LC6
7	Up	Up	Active	Forwarding	Internal	LC5
8	Down	Up	Down	-	Internal	LC1
9	Down	Up	Down	-	Internal	LC4
10	Down	Up	Down	-	Internal	LC3
11	Down	Up	Down	-	Internal	LC10
16	Up	Up	Active	Forwarding	Internal	LC0
17	Up	Up	Active	Forwarding	Internal	LC8
26	Down	Up	Down	-	Internal	LC2

27	Down	Up	Down	-	Internal LC9
32	Down	Up	Down	-	Internal MATESC (RP0 Ctrl)
33	Down	Up	Down	-	Internal MATESC (RP1 Ctrl)
36	Up	Up	Active	Forwarding	Internal CCC (RP0 Ctrl)
37	Up	Up	Rem Managed	Forwarding	Internal CCC (RP1 Ctrl)
52	Down	Up	Down	-	External SFP+ 1
54	Down	Up	Down	-	External SFP+ 0

Recovery Actions:

If you have confirmed that port is down then you can also try to access the card CPU console and check if card is responsive or not. Upon access card will throw messages suggesting why it went to SW_INACTIVE state.

```
sysadmin-vm:0_RP1# attach location <location of card>
```

Last hop of resort should be re-imaging the card.

#reimage_chassis -s <slot id> but prior to this step consult with technical expert.

Related Links:

http://www.cisco.com/c/en/us/products/collateral/optical-networking/network-convergence-system-4000-series/data_sheet_c78-729222.html#

http://www.cisco.com/c/en/us/td/docs/routers/ncs4000/software/install/guide/b_sysadmin-ig-ncs4k/b_sysadmin-ig-ncs4k_chapter_010.html