

Troubleshoot Hardware Failure on Catalyst 9600 Supervisors and Line Cards

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Introduction

This document describes how to identify, isolate, and troubleshoot symptoms of hardware failures on Catalyst 9600 Supervisors and Line Cards.

Prerequisites

Requirements

There are no specific requirements for this document.

Components Used

The information in this document is based on Catalyst 9600 Series Switches.

The information in this document was created from the devices in a specific lab environment. All of the devices used in this document started with a cleared (default) configuration. If your network is live, ensure that you understand the potential impact of any command.

Terminology

Term	Definition	Context
Supervisor	The Cisco Catalyst 9600 Series Supervisor Engine 1 is powered by three UADP 3.0 ASICs and one x86 CPU processor. The three ASICs are interconnected with a 3.2-	This document contains commands to isolate hardware failure on

	Tbps ASIC interconnect on each ASIC. Sup-1 provides 9.6 Tbps (4.8 Tbps full duplex). With the Cisco Catalyst 9606R chassis, each slot has 2.4 Tbps with Sup-1.	Supervisor engines.
Power On Self Test (P.O.S.T.)	After the Supervisor and Line Cards are initialized after power on, a Power On Self Test (POST) executes to ensure the hardware integrity of the modules. POST is also executed during Online Insertion & Removal (OIR) of a line card.	Show post command displays the results of these tests.
Generic Online Diagnostic Subsystems (GOLD.)	GOLD tests are run after the system is online. Some tests are run periodically as Health Monitoring tests. All the tests can be run on demand by the user.	It is used to detect module hardware failures.
Online Insertion & Removal (O.I.R.)	This feature can power-cycle a module in a given slot via the command line interface (CLI). This is useful when there is not an on-site resource that can psychically reset the module.	O.I.R. is a great feature to perform isolate hardware failure on modules.

Chassis Overview

Catalyst C9606-R

- 6 Slot - 8RU Modular Chassis
- 2 Supervisor Slots + 4 Line Card Slots



Troubleshoot

Symptoms of Module Hardware Issues

Symptom	Possible Root Cause
<ul style="list-style-type: none">• One or multiple interfaces are in down/down(notconnect) status on a given line card.• Supervisor or Linecard is not listed in C.L.I. outputs like show module or show inventory.• No console output on Supervisor.• Red or Amber L.E.D. (solid or blinking) on Supervisor or Line Card. No L.E.D. on Supervisor or Line Card.	Module is not properly installed, not initialized, or encountered hardware failure due to failing the P.O.S.T.

Verify Module Status

- It is important to first check that the chassis recognizes the module.
- The ideal status for a module is 'ok'.

Module Status	Possible Root Cause	Action
ok	N/A.	None
post-fail	Potential hardware failure.	Refer to Troubleshoot Module Status.
other	Module failed to initialize.	Refer to Troubleshoot Module Status.
Not listed in output	Not properly installed or not receiving sufficient power.	Check for available power budget. Visually inspect L.E.D. status of module.

<#root>

Cat9600#

show module

Chassis Type: C9606R

```

Mod Ports Card Type                               Model          Serial No.
-----+-----+-----+-----+-----+-----+-----+-----
1   24   24-Port 40GE/12-Port 100GE                C9600-LC-24C
2   48   48-Port 10GE / 25GE                          C9600-LC-48YL
3    0   Supervisor 1 Module                          C9600-SUP-1
4    0   Supervisor 1 Module                          C9600-SUP-1

```

```

Mod MAC addresses                               Hw   Fw           Sw           Status
-----+-----+-----+-----+-----+-----+-----+-----
1   DC8C.37A0.C880 to DC8C.37A0.C8FF 1.0  17.1.1[FC2]  16.12.03

```

post-fail

```

2   DC8C.3773.1E00 to DC8C.3773.1E7F 1.0  17.1.1[FC2]  16.12.03      ok
3   DC8C.379F.ED80 to DC8C.379F.EDFF 1.0  17.1.1[FC2]  16.12.03      ok
4   DC8C.379F.EDF1 to DC8C.379F.EDF9 1.0  17.1.1[FC2]  16.12.03      ok

```

//other example

```

Mod MAC addresses                               Hw   Fw           Sw           Status
-----+-----+-----+-----+-----+-----+-----+-----
1   DC8C.37A0.C880 to DC8C.37A0.C8FF 1.3  17.3.1r[FC2]  17.03.05

```

power-deny

```

2   DC8C.37A0.C880 to DC8C.37A0.C8FF 1.3  17.3.1r[FC2]  17.03.05

```

power-deny

```

3   DC8C.37A0.C880 to DC8C.37A0.C8FF 1.4  17.3.1r[FC2]  17.03.05      ok

```

Troubleshoot Module Status

Symptom	Action
Module not listed or status is not 'ok'.	Proceed with the next steps.

Verify Syslog

Line Card Offline

```
<#root>
```

```
%IOSXE_OIR-6-OFFLINECARD:
```

```
Card (rp) offline in slot R1
```

```
%IOSXE_OIR-6-REMSPA: SPA removed from subslot 6/0, interfaces disabled
```

```
%SPA_OIR-6-OFFLINECARD: SPA (C9600-LC-48TX) offline in subslot 6/0
```

Power-Budget Issue

<#root>

```
%CMRP_PFU-3-PWR_MGMT_LC_SHUTDOWN: R0/0: cmand: WARNING: Linecard in slot 6 with priority 0 and a power r
```

```
%CMRP_PFU-3-PWR_MGMT_ALARM: Chassis 1 R0/0: cmand: WARNING:
```

```
System does not have sufficient input power for minimum
```

```
reliable operation requiring 1161 watts. The system needs 1101 watts of additional power.
```

Diagnostic Test Failed

<#root>

```
*May 29 02:10:19.523: %PM-4-ERR_DISABLE:
```

```
diagnostics error detected
```

```
on Fo2/0/1, putting Fo2/0/1 in err-disable state
```

Check Module Uptime

- Onboard Failure Logging (OBFL) gives us insight to reload reasons such as reload command, software exception, power off, and so on.
- Check time stamps that could correlate to sudden power loss to the module or external factor contributing to the module going down.

<#root>

```
Cat9600#
```

```
show logging onboard rp (active|standby) uptime detail
```

```
-----  
UPTIME SUMMARY INFORMATION  
-----
```

```
First customer power on : 08/28/2021 13:08:41
```

```
Total uptime           : 0 years 41 weeks 2 days 15 hours 10 minutes <-- Total Uptime
```

```
Total downtime         : 0 years 7 weeks 6 days 7 hours 11 minutes
```

```
Number of resets        : 14 <-- Total number of resets
```

```
Number of slot changes  : 0
```

```
Current reset reason    : PowerOn <-- Last reload reason
```

```
Current reset timestamp : 11/06/2021 17:25:29
```

```
Current slot            : 3
```

```
Chassis type            : 55
```

```
Current uptime          : 0 years 39 weeks 1 days 18 hours 5 minutes <-- Current Uptime
```


UPTIME CONTINUOUS INFORMATION

Time Stamp |

Reset

MM/DD/YYYY HH:MM:SS | Uptime

Reason

| years weeks days hours minutes

08/28/2021 13:08:41	PowerOn	0	0	0	0	0
08/28/2021 13:16:29	Reload	0	0	0	0	0
08/28/2021 13:29:28	Reload	0	0	0	0	5
08/28/2021 13:42:30	Reload	0	0	0	0	5
08/28/2021 13:55:14	Image Install	0	0	0	0	5

<-- Reset history by reason

<#root>

Cat9600#

show logging onboard slot (1|2|4|5|6|7) uptime detail

UPTIME SUMMARY INFORMATION

First customer power on : 08/08/2018 09:30:33
Total uptime : 0 years 11 weeks 1 days 10 hours 40 minutes
Total downtime : 4 years 32 weeks 1 days 23 hours 25 minutes
Number of resets : 81
Number of slot changes : 5
Current reset reason : CP_RESET_CPU_GOT_RESET
Current reset timestamp : 05/24/2023 19:35:58
Current slot : 1
Chassis type : 30

Current uptime : 0 years 2 weeks 0 days 0 hours 0 minutes

UPTIME CONTINUOUS INFORMATION

Time Stamp | Reset | Uptime
MM/DD/YYYY HH:MM:SS | Reason | years weeks days hours minutes

04/26/2021 21:39:45	CP_RESET_CPU_GOT_RESET	0	0	0	0	0
04/27/2021 14:12:04	CP_RESET_POWER_ON	0	0	0	6	0
04/28/2021 14:39:30	CP_RESET_POWER_ON	0	0	0	14	0
04/30/2021 12:46:59	CP_RESET_POWER_ON	0	0	0	13	0

Verify POST

Failed POST example

```
<#root>
```

```
Cat9600#
```

```
show post
```

```
Stored system POST messages:
```

```
Switch C9606R
```

```
-----
```

```
Fri May 29 02:10:18 2020 POST: Module: 1 Mac Loopback Begin
```

```
Fri May 29 02:10:18 2020 POST: Module: 1 Mac Loopback: loopback Test: End, Status Passed
```

```
Fri May 29 02:10:18 2020 POST: Module: 2 Mac Loopback Begin
```

```
Fri May 29 02:10:18 2020 POST: Mac Loopback:
```

```
Failed
```

```
For Interface :
```

```
TwentyFiveGigE2/2/0/38
```

```
Fri May 29 02:10:18 2020 POST: Mac Loopback:
```

```
Failed
```

```
For Interface :
```

```
TwentyFiveGigE2/2/0/39
```

```
Fri May 29 02:10:18 2020 POST: Mac Loopback:
```

```
Failed
```

```
For Interface :
```

```
TwentyFiveGigE2/2/0/40
```

```
Fri May 29 02:10:18 2020 POST: Module: 2 Mac Loopback: loopback Test: End,
```

```
Status Failed
```

POST passed example

```
<#root>
```

```
Cat9600#
```

show post

Stored system POST messages:

Switch C9606R

POST: MBIST Tests : Begin

POST: MBIST Tests : End, Status Passed

POST: Module: 3 PHY Loopback: loopback Test: Begin

POST: Module: 3 PHY Loopback: loopback Test: End, Status Passed

POST: Module: 2 PHY Loopback: loopback Test: Begin

POST: Module: 2 PHY Loopback: loopback Test: End, Status Passed

POST: Module: 1 PHY Loopback: loopback Test: Begin

POST: Module: 1 PHY Loopback: loopback Test: End, Status Passed

POST: Module: 5 PHY Loopback: loopback Test: Begin

POST: Module: 5 PHY Loopback: loopback Test: End, Status Passed

<#root>

Cat9600#

show platform

Chassis type: C9606R

Slot	Type	State	Type	Insert time (ago)
1	C9600-LC-24C	ok		02:45:09
1/0	C9600-LC-24C	ok		02:43:15
2	C9600-LC-48YL			

faulty

				02:45:09
2/0	C9600-LC-48YL	ok		02:43:14
3	C9600-SUP-1	ok		02:45:09
3/0	C9600-SUP-1	ok		02:43:14
4	C9600-SUP-1	ok		02:45:09
4/0	C9600-SUP-1	ok		02:43:14
R0	C9600-SUP-1	ok, active		02:45:09
R1	C9600-SUP-1	init, standby		02:45:09
P1	C9600-PWR-2KWAC	ok		02:44:21
P2	C9600-PWR-2KWAC	ok		02:44:21
P3	C9600-PWR-2KWAC	ps, f0, f1, fail		02:44:21
P4	C9600-PWR-2KWAC	ps, f0, f1, fail		02:44:21
P5	C9606-FAN	ok		02:44:21

Slot	CPLD Version	Firmware Version
1	19070619	17.1.1[FC2]
2	19070619	17.1.1[FC2]
3	19041620	17.1.1[FC2]
4	19041620	17.1.1[FC2]

GOLD Tests

- If module has failed P.O.S.T or listed as 'faulty' then diagnostics to get the failure reason must be collected.
- Run hardware diagnostics to quickly identify potential hardware failure within the line cards or Supervisors.

Types of diagnostic tests:

- Health monitoring tests - Enabled by default and it runs in background for every few minutes. These tests are non disruptive.
- On demand tests - Run by the user with a CLI. Some of these tests are disruptive.

Diagnostic Test	What is it testing? Context? Impact?
TestGoldPktLoopback	This test is very similar to the Macloopback test.
TestOBFL	Verifies the on-board failure logging capabilities. This test prints a diagnostic message and is logged onto the OBFL.
TestThermal	Verifies the temperature value from the sensor does not exceed the threshold. It is a non-disruptive test and can be run as a health monitor test.
TestPortTxMonitoring	This test monitors the TX counters of a connected interface. This test verifies if the connected port is able to send the packets or not. It is a non-disruptive test and can be run as a health monitoring test.
TestFanTray	This test verifies if the fan tray has been inserted and works properly on the board. It is a non-disruptive test and can be run as a health monitoring test.
TestScratchRegister	The Scratch Register test monitors the health of application-specific integrated circuits (ASICs) it writes values into registers and reads back the values from these registers. It is a non-disruptive test and can be run as a health monitoring test.
TestConsistencyCheckMcast	This test monitors to check if Mcast programming is correct. This test checks with Forwarding object manger to identify incomplete entries or long pending configurations to hardware.

Run an on-demand diagnostic test on a module.

```
<#root>
```

```
Cat9600#
```

```
diagnostic start switch module 3 test ?
```

Diagnostics test suite attributes:

- M/C/* - Minimal bootup level test / Complete bootup level test / NA
- B/* - Basic ondemand test / NA
- P/V/* - Per port test / Per device test / NA
- D/N/* - Disruptive test / Non-disruptive test / NA
- S/* - Only applicable to standby unit / NA
- X/* - Not a health monitoring test / NA
- F/* - Fixed monitoring interval test / NA
- E/* - Always enabled monitoring test / NA
- A/I - Monitoring is active / Monitoring is inactive

Test Interval Thre-

ID Test Name Attributes day hh:mm:ss.ms shold

==== =====

- 1) TestOBFL -----> *B*N*X**I not configured n/a
- 2) TestFantray -----> *B*N****A 000 00:01:40.00 1
- 3) TestThermal -----> *B*N****A 000 00:01:30.00 1
- 4) TestScratchRegister -----> *B*N****A 000 00:01:30.00 5
- 5) TestConsistencyCheck -----> *B*N****A 000 00:01:30.00 1

WORD Test ID list (e.g. 1,3-6) or Test Name

Cat9600#

diagnostic start switch 1 module 3 test 2

//syslog prints upon start and finish of diagnostic test.

*Mar 24 21:48:47.968: %DIAG-6-TEST_RUNNING: switch 1 module 3: Running TestFantray{ID=2} ...
 *Mar 24 21:48:47.969: %DIAG-6-TEST_OK: switch 1 module 3: TestFantray{ID=2} has completed successfully

<-- Passed

Symptom	Action
Module failed diagnostic test.	Perform an O.I.R. of the module.

Run on-demand OIR on a module

<#root>

Cat9600#

hw-module subslot 1/0 oir power-cycle

Proceed with power cycle of module? [confirm]

*Jun 9 20:39:14.686: %IOSXE_OIR-6-REMSPA: SPA removed from subslot 1/0, interfaces disabled
 *Jun 9 20:39:14.721: %SPA_OIR-6-OFFLINECARD: SPA (C9600-LC-24C) offline in subslot 1/0

```

*Jun 9 20:39:16.686: %LINK-3-UPDOWN: Interface FortyGigabitEthernet1/0/1, changed state to down
*Jun 9 20:39:16.686: %LINK-3-UPDOWN: Interface FortyGigabitEthernet1/0/2, changed state to down
*Jun 9 20:39:16.687: %LINK-3-UPDOWN: Interface FortyGigabitEthernet1/0/3, changed state to down
*Jun 9 20:39:16.687: %LINK-3-UPDOWN: Interface FortyGigabitEthernet1/0/4, changed state to down
*Jun 9 20:39:16.689: %LINK-3-UPDOWN: Interface FortyGigabitEthernet1/0/5, changed state to down
*Jun 9 20:39:16.690: %LINK-3-UPDOWN: Interface FortyGigabitEthernet1/0/6, changed state to down
*Jun 9 20:39:16.690: %LINK-3-UPDOWN: Interface FortyGigabitEthernet1/0/7, changed state to down
*Jun 9 20:39:16.690: %LINK-3-UPDOWN: Interface FortyGigabitEthernet1/0/8, changed state to down
*Jun 9 20:39:16.690: %LINK-3-UPDOWN: Interface FortyGigabitEthernet1/0/9, changed state to down
*Jun 9 20:39:16.691: %LINK-3-UPDOWN: Interface FortyGigabitEthernet1/0/10, changed state to down
*Jun 9 20:39:16.691: %LINK-3-UPDOWN: Interface FortyGigabitEthernet1/0/11, changed state to down
*Jun 9 20:39:16.693: %LINK-3-UPDOWN: Interface FortyGigabitEthernet1/0/12, changed state to down
*Jun 9 20:39:16.693: %LINK-3-UPDOWN: Interface FortyGigabitEthernet1/0/13, changed state to down
*Jun 9 20:39:16.694: %LINK-3-UPDOWN: Interface FortyGigabitEthernet1/0/14, changed state to down
*Jun 9 20:39:16.694: %LINK-3-UPDOWN: Interface FortyGigabitEthernet1/0/15, changed state to down
*Jun 9 20:39:16.694: %LINK-3-UPDOWN: Interface FortyGigabitEthernet1/0/16, changed state to down
*Jun 9 20:39:16.694: %LINK-3-UPDOWN: Interface FortyGigabitEthernet1/0/17, changed state to down
*Jun 9 20:39:16.695: %LINK-3-UPDOWN: Interface FortyGigabitEthernet1/0/18, changed state to down
*Jun 9 20:39:16.695: %LINK-3-UPDOWN: Interface FortyGigabitEthernet1/0/19, changed state to down
*Jun 9 20:39:16.697: %LINK-3-UPDOWN: Interface FortyGigabitEthernet1/0/20, changed state to down
*Jun 9 20:39:16.697: %LINK-3-UPDOWN: Interface FortyGigabitEthernet1/0/21, changed state to down
*Jun 9 20:39:16.698: %LINK-3-UPDOWN: Interface FortyGigabitEthernet1/0/22, changed state to down
*Jun 9 20:39:16.698: %LINK-3-UPDOWN: Interface FortyGigabitEthernet1/0/23, changed state to down
*Jun 9 20:39:16.698: %LINK-3-UPDOWN: Interface FortyGigabitEthernet1/0/24, changed state to down
*Jun 9 20:39:16.698: %LINK-3-UPDOWN: Interface HundredGigE1/0/25, changed state to down
*Jun 9 20:39:16.699: %LINK-3-UPDOWN: Interface HundredGigE1/0/26, changed state to down
*Jun 9 20:39:16.699: %LINK-3-UPDOWN: Interface HundredGigE1/0/27, changed state to down
*Jun 9 20:39:16.701: %LINK-3-UPDOWN: Interface HundredGigE1/0/28, changed state to down
*Jun 9 20:39:16.701: %LINK-3-UPDOWN: Interface HundredGigE1/0/29, changed state to down
*Jun 9 20:39:16.702: %LINK-3-UPDOWN: Interface HundredGigE1/0/30, changed state to down
*Jun 9 20:39:16.702: %LINK-3-UPDOWN: Interface HundredGigE1/0/31, changed state to down
*Jun 9 20:39:16.702: %LINK-3-UPDOWN: Interface HundredGigE1/0/32, changed state to down
*Jun 9 20:39:16.702: %LINK-3-UPDOWN: Interface HundredGigE1/0/33, changed state to down
*Jun 9 20:39:16.703: %LINK-3-UPDOWN: Interface HundredGigE1/0/34, changed state to down
*Jun 9 20:39:16.703: %LINK-3-UPDOWN: Interface HundredGigE1/0/35, changed state to down
*Jun 9 20:39:16.704: %LINK-3-UPDOWN: Interface HundredGigE1/0/36, changed state to down
*Jun 9 20:39:16.704: %LINK-3-UPDOWN: Interface HundredGigE1/0/37, changed state to down
*Jun 9 20:39:16.705: %LINK-3-UPDOWN: Interface HundredGigE1/0/38, changed state to down
*Jun 9 20:39:16.705: %LINK-3-UPDOWN: Interface HundredGigE1/0/39, changed state to down
*Jun 9 20:39:16.713: %LINK-3-UPDOWN: Interface HundredGigE1/0/40, changed state to down
*Jun 9 20:39:16.713: %LINK-3-UPDOWN: Interface HundredGigE1/0/41, changed state to down
*Jun 9 20:39:16.713: %LINK-3-UPDOWN: Interface HundredGigE1/0/42, changed state to down
*Jun 9 20:39:16.713: %LINK-3-UPDOWN: Interface HundredGigE1/0/43, changed state to down
*Jun 9 20:39:16.713: %LINK-3-UPDOWN: Interface HundredGigE1/0/44, changed state to down
*Jun 9 20:39:16.713: %LINK-3-UPDOWN: Interface HundredGigE1/0/45, changed state to down
*Jun 9 20:39:16.713: %LINK-3-UPDOWN: Interface HundredGigE1/0/46, changed state to down
*Jun 9 20:39:16.713: %LINK-3-UPDOWN: Interface HundredGigE1/0/47, changed state to down
*Jun 9 20:39:16.713: %LINK-3-UPDOWN: Interface HundredGigE1/0/48, changed state to down
*Jun 9 20:39:44.717: %IOSXE_OIR-6-INSSPA: SPA inserted in subslot 1/0
*Jun 9 20:40:15.052: %SPA_OIR-6-ONLINECARD: SPA (C9600-LC-24C) online in subslot 1/0
*interfaces come up again*

```

Symptom	Action
Module still fails P.O.S.T or module not listed in show module or show inventory command output.	<ul style="list-style-type: none"> • Visually confirm and document the L.E.D. status of the module; blinking or solid amber or red lights could further indicate hardware issue.

- Physically reseal the module.
- Install a spare module or module from another slot in the chassis to isolate failure to the module or chassis slot.

Reseat module (Similar syslogs are printed when the chassis recognizes the module and the module initializes).

```
*May 24 19:32:53.084: %IOSXE_OIR-6-INSCARD: Card (fp) inserted in slot F0
*May 24 19:32:53.084: %IOSXE_OIR-6-INSCARD: Card (cc) inserted in slot 1
*May 24 19:32:53.084: %IOSXE_OIR-6-ONLINECARD: Card (cc) online in slot 1
*May 24 19:32:53.151: %IOSXE_OIR-6-INSSPA: SPA inserted in subslot 1/0
```

Verify the module Power State is accepted.

```
<#root>
```

```
Cat9600#
```

```
show power module
```

```
Power Budget Mode          : Dual Sup
```

```
Power
```

```

                                Out of In
Mod  Model No
State
      Budget Instantaneous Peak  Reset  Reset
-----
1    C9600-LC-48YL
accepted
      230      0              0      230      10
2    C9600-LC-24C      accepted 200      0          0      200      10
3    C9600-SUP-1      accepted 775      0          0      775      202
4    C9600-SUP-1      accepted 775      0          0      775      202
FM1  C9606-FAN          accepted 450      --         --      450      --
-----
Total allocated power: 2430
Total required power: 2430
```

Verify if there are any failed power supplies.

```
<#root>
```

```
Cat9600#
```

show power detail

Power Supply	Model No	Type	Capacity	Status	Fan States	
					1	2
PS1	C9600-PWR-2KWAC	ac	1050 W	active	good	good
PS2	C9600-PWR-2KWAC	ac	2000 W	active	good	good
PS3	C9600-PWR-2KWAC	ac	n.a.			
fail	bad	bad				
PS4	C9600-PWR-2KWAC	ac	n.a.			
fail	bad	bad				

PS Current Configuration Mode : none
PS Current Operating State : none

Power supplies currently active : 2
Power supplies currently available : 4

Power Summary (in Watts)	Used	Maximum Available
System Power	2905	2990
Total	2905	2990

<-- total power budget consumed vs maximum available

Power Budget Mode : Dual Sup

Mod	Model No	Power State	Budget	Instantaneous	Peak	Out of Reset	In Reset
1	C9600-LC-48TX	accepted	315	0	0	315	10
2	C9600-LC-48S	accepted	160	0	0	160	10
3	C9600-SUP-1	accepted	775	0	0	775	202
4	C9600-SUP-1	---	775	--	--	775	0
5	C9600-LC-48YL	accepted	230	0	0	230	10
6	C9600-LC-24C	accepted	200	0	0	200	10
FM1	C9606-FAN	accepted	450	--	--	450	--
Total allocated power:			2905				
Total required power:			2905				

Software and Firmware Mismatch

- Supervisors on different software or firmware versions fail to synchronize in High Availability Active/Standby roles.
- Line cards on a newer firmware version than compared to a Supervisor firmware version might fail to initialize.
- Instructions included in 'Upgrading the switch software' section in Release Notes of every major software train such as 16.12.X, 17.3.X, and 17.6.X
- Manually upgrade the firmware/bootldr of the Supervisor.

Note: Please review the [Release Notes for Catalyst 9600 Series Switches Cisco IOS XE Amsterdam 17.3.X](#) for more detailed information about how to manually upgrade the firmware/boot loader of the Supervisor.

<#root>

Cat9600#

show firmware version all

Current

Slot	Device Name / Model	Bundled
------	---------------------	---------

Firmware Version

Firmware Version

Mismatch

3 Supervisor Rommon (Active)

17.3.1r[FC2]

N/A

N/A

<-- Firmware versions are the same

4 Supervisor Rommon (Standby)

17.3.1r[FC2]

N/A

N/A

<-- Firmware versions are the same

-	Eth Lan Spi	0x800005d3	N/A	N/A
PS5	Fantray	18101008	N/A	N/A
3	Supervisor CPLD			
	IO FPGA	19041620	19041620	No
	Flash FPGA	190308b9	190308b9	No
4	Supervisor CPLD			
	IO FPGA	19041620	19041620	No
	Flash FPGA	190308b9	190308b9	No
1	Line Card / C9600-LC-24C			
	IO FPGA	19070619	19070619	No
	PMFPGA	122515	N/A	N/A
	Phy Firmware	1.56.1772	1.56.2270	

Yes

2 Line Card / C9600-LC-48YL

IO FPGA

19070619

19070619

No

PMFPGA

122515

N/A

N/A

Phy Firmware

1.56.1772

1.56.2270

Yes

5	Line Card / C9600-LC-48YL			
	IO FPGA	19070619	19070619	No
	PMFPGA	122515	N/A	N/A
	Phy Firmware	1.56.1772	1.56.2270	

Yes

6	Line Card / C9600-LC-24C			
	IO FPGA	19070619	19070619	No
	PMFPGA	122515	N/A	N/A
	Phy Firmware	1.56.1772	1.56.2270	

Yes

Slot	Device Name / Model	Firmware Version
PS1	Power Supply (PS_PRI, PS_SEC, PS_I2C)	(N/A, N/A, N/A)
PS2	Power Supply (PS_PRI, PS_SEC, PS_I2C)	(N/A, N/A, N/A)
PS3	Power Supply (PS_PRI, PS_SEC, PS_I2C)	(N/A, N/A, N/A)
PS4	Power Supply (PS_PRI, PS_SEC, PS_I2C)	(61.08.03, 61.02.0, N/A)

Additional Troubleshooting

Note: hardware authentication status runs only at reload of switch. It does not run after physical reset of line card at same or different slot, and this does not necessarily indicate an issue.

If authentication status **NOT pass** for a line card that is present, then execute these suggested steps:

1. **Collect** the [trace archive](#), review IOSRP, CMCC, platform_mgr and IOMD files for relevant information about this issue type.
2. **Physical OIR** of affected component OR reload of switch can be tried to see if that recovers.
3. If issue persists, open a TAC case.

```
<#root>
```

```
Cat9600#
```

```
show platform hardware authentication status
```

```
Fan Tray Authentication:
```

```
pass
```

```
Line Card:1 Authentication:
```

```
pass
```

```
Line Card:2 Authentication:
```

```
pass
```

SUP0 Authentication:

pass

SUP1 Authentication:

pass

Line Card:5 Authentication: Not Available
Line Card:6 Authentication: Not Available

<#root>

Cat9600#

show hw-module subslot 1/0 oir internal

IOMD for supervisor slot does not appear
WARNING: This command is not intended for production use
and should only be used under the supervision of
Cisco Systems technical support personnel.

sm(spa_oir_tsm subslot 1/0 TSM), running yes, state ready
Admin Status: admin enabled, Operational Status: ok(1)
Last reset Reason: power up
TSM Context:
configured_spa_type 0xD9A

<-- IDPROM is accessible

soft remove fail code 0x0(none)
last_fail_code 0x0(none)
timed_fail_count 0, failed_spa_type 0x0
flags 0x10)

Subslot:

spa type 0xD9A, active spa type 0xD9A
subslot flags 0x0, plugin flags 0x0

TSM Parameters:

wait_psm_ready_timeout 540000 ms, init_timeout 300000 ms
remove_timeout 120000 ms, recovery_delay 5000 ms
fail_time_period 1200000 ms, max_fail_count 5
does not support pre-configuration

<#root>

Cat9600#

show platform software iomd redundancy

Configured Redundancy Mode = sso
Operating Redundancy Mode = sso
Local RF state = ACTIVE
Peer RF state = STANDBY HOT

slot	PSM STATE	SPA INTF	HA_STATE	HA_ACTIVE
1	ready	started	ready	00:05:54
2	ready			

idle

<-- potential issue

```
3    ready    started    ready    00:05:37 ***active RP
4    ready    started    ready    00:05:37
```

<#root>

Cat9600#

show idprom module 1 eeprom detail

Slot 1 EEPROM data:

```
EEPROM version          : 4
Compatible Type         : 0xFF
Controller Type        : 3482
Hardware Revision      : 1.0
PCB Part Number       : 73-19545-02
Board Revision        : A0
Deviation Number      : 0
Fab Version           : 02
PCB Serial Number     : CAT2313L2VP
RMA Test History      : 00
RMA Number            : 0-0-0-0
RMA History           : 00
Top Assy. Part Number : 068-102161-01
Top Assy. Revision    : A0
CLEI Code             : COUIBGRCAA
Product Identifier (PID) : C9600-LC-24C
Version Identifier (VID) : V01
Base MAC Address      : DC 8C 37 A0 C8 80
MAC Address block size : 128
Environment Monitor Data : 06 00 00 00 0C 80 C8 00
                        A6
Environment Monitor Data : 00 06 00 FA
Manufacturing Test Data : 00 00 00 00 00 00 00 00
Field Diagnostics Data : 00 00 00 00 00 00 00 00
Platform features      : 00 00 00 00 00 00 00 00
                        00 00 00 00 00 00 00 00
                        00 00 00 00 00 00 00 00

Environment Monitor Data :
Description             : InltFrnt
Shutdown threshold     : 060
Critical threshold     : 055
Major threshold        : 050
Minor threshold        : 045
Environment Monitor Data :
Description             : InltRear
Shutdown threshold     : 060
Critical threshold     : 055
Major threshold        : 050
Minor threshold        : 045
Environment Monitor Data :
Description             : OtltFrnt
Shutdown threshold     : 090
Critical threshold     : 085
Major threshold        : 080
Minor threshold        : 075
```

```

Environment Monitor Data :
Description                : OtlRear
Shutdown threshold         : 090
Critical threshold         : 085
Major threshold            : 080
Minor threshold            : 075

```

Use the `lc-portmap` command to obtain information on the linecard interfaces mapping to the ASIC/Core in the Supervisor.

```
<#root>
```

```
Cat9600#
```

```
show platform hardware iomd 1/0 lc-portmap detail
```

```
IOMD SUMMARY
```

```
=====
```

```

spa_type: 0xd9a
my_slot: 1
active-slot: 0
is_active: 1
bulk_sync_done: 1
bulk_sync_in_progress: 0
bulk_sync_received: 0
is_plugin_start_done: 1
Num_ports: 48 num_UDAP 3s: 3

```

```
PSM SUMMARY
```

```
=====
```

```

PSM state: ready
ha_state:
is_spa_ok: 0
is_power_ok: 0
psm_flags: 0x0
bay_flags: 0x0
plugin_flags: 0x0

```

Port	fp	asic	core	mac	cntx	asic port	speed	xcvr-pres	xcvr-type	run-speed	phy-num	i2c-ctrl	xcvr-sm	if-state	SerTune-Status	Fal
0	1	0	0	0	0	0	40G	no	0	unk	0	0	0	0	NOTS	no
1	2	0	0	2	1	8	40G	no	0	unk	0	0	0	0	NOTS	no
2	3	0	0	16	0	16	40G	no	0	unk	1	0	0	0	NOTS	no
3	4	0	0	18	1	24	40G	no	0	unk	1	0	0	0	NOTS	no
4	5	0	1	14	1	8	40G	no	0	unk	2	0	0	0	NOTS	no
5	6	0	1	12	0	0	40G	no	0	unk	2	0	0	0	NOTS	no
6	7	0	1	30	1	24	40G	no	0	unk	3	0	0	0	NOTS	no
7	8	0	1	28	0	16	40G	no	0	unk	3	0	0	0	NOTS	no
8	9	1	0	0	0	0	40G	no	0	unk	4	0	0	0	NOTS	no
9	10	1	0	2	1	8	40G	no	0	unk	4	0	0	0	NOTS	no
10	11	1	0	16	0	16	40G	no	0	unk	5	0	0	0	NOTS	no
11	12	1	0	18	1	24	40G	no	0	unk	5	0	0	0	NOTS	no
12	13	1	1	14	1	8	40G	no	0	unk	6	0	0	0	NOTS	no
13	14	1	1	12	0	0	40G	no	0	unk	6	0	0	0	NOTS	no
14	15	1	1	30	1	24	40G	no	0	unk	7	0	0	0	NOTS	no
15	16	1	1	28	0	16	40G	no	0	unk	7	0	0	0	NOTS	no
16	17	2	0	0	0	0	40G	no	0	unk	8	1	0	0	NOTS	no
17	18	2	0	2	1	8	40G	no	0	unk	8	1	0	0	NOTS	no

18	19	2	0	16	0	16	40G	no	0	unk	9	1	0	0	NOTS	no
19	20	2	0	18	1	24	40G	no	0	unk	9	1	0	0	NOTS	no
20	21	2	1	14	1	8	40G	no	0	unk	10	1	0	0	NOTS	no
21	22	2	1	12	0	0	40G	no	0	unk	10	1	0	0	NOTS	no
22	23	2	1	30	1	24	40G	no	0	unk	11	1	0	0	NOTS	no
23	24	2	1	28	0	16	40G	no	0	unk	11	1	0	0	NOTS	no
24	25	0	0	0	0	0	100G	no	0	unk	0	0	0	0	NOTS	no
25	26	0	0	0	0	0	100G	no	0	unk	0	0	0	0	NOTS	no
26	27	0	0	16	0	16	100G	no	0	unk	1	0	0	0	NOTS	no
27	28	0	0	16	0	16	100G	no	0	unk	1	0	0	0	NOTS	no
28	29	0	1	12	0	0	100G	no	0	unk	2	0	0	0	NOTS	no
29	30	0	1	12	0	0	100G	no	0	unk	2	0	0	0	NOTS	no
30	31	0	1	28	0	16	100G	no	0	unk	3	0	0	0	NOTS	no
31	32	0	1	28	0	16	100G	no	0	unk	3	0	0	0	NOTS	no
32	33	1	0	0	0	0	100G	no	0	unk	4	0	0	0	NOTS	no
33	34	1	0	0	0	0	100G	no	0	unk	4	0	0	0	NOTS	no
34	35	1	0	16	0	16	100G	no	0	unk	5	0	0	0	NOTS	no
35	36	1	0	16	0	16	100G	no	0	unk	5	0	0	0	NOTS	no
36	37	1	1	12	0	0	100G	no	0	unk	6	0	0	0	NOTS	no
37	38	1	1	12	0	0	100G	no	0	unk	6	0	0	0	NOTS	no
38	39	1	1	28	0	16	100G	no	0	unk	7	0	0	0	NOTS	no
39	40	1	1	28	0	16	100G	no	0	unk	7	0	0	0	NOTS	no
40	41	2	0	0	0	0	100G	no	0	unk	8	1	0	0	NOTS	no
41	42	2	0	0	0	0	100G	no	0	unk	8	1	0	0	NOTS	no
42	43	2	0	16	0	16	100G	no	0	unk	9	1	0	0	NOTS	no
43	44	2	0	16	0	16	100G	no	0	unk	9	1	0	0	NOTS	no
44	45	2	1	12	0	0	100G	no	0	unk	10	1	0	0	NOTS	no
45	46	2	1	12	0	0	100G	no	0	unk	10	1	0	0	NOTS	no
46	47	2	1	28	0	16	100G	no	0	unk	11	1	0	0	NOTS	no
47	48	2	1	28	0	16	100G	no	0	unk	11	1	0	0	NOTS	no

<#root>

Cat9600#

show platform software fed [active | standby] ifm mappings

Interface	IF_ID	Inst	Asic	Core	Port	SubPort	Mac	Cntx	LPN	GPN	Type	Active
TwentyFiveGigE1/0/1	0x9	0	0	0	0	0	0	0	1	101	NIF	Y
TwentyFiveGigE1/0/2	0xa	0	0	0	4	0	1	1	2	102	NIF	Y
TwentyFiveGigE1/0/3	0xb	0	0	0	8	0	2	2	3	103	NIF	Y
TwentyFiveGigE1/0/4	0xc	0	0	0	12	0	3	3	4	104	NIF	Y
TwentyFiveGigE1/0/5	0xd	0	0	0	16	0	16	0	5	105	NIF	Y
TwentyFiveGigE1/0/6	0xe	0	0	0	20	0	17	1	6	106	NIF	Y
TwentyFiveGigE1/0/7	0xf	0	0	0	24	0	18	2	7	107	NIF	Y
TwentyFiveGigE1/0/8	0x10	0	0	0	28	0	19	3	8	108	NIF	Y
TwentyFiveGigE1/0/9	0x11	1	0	1	12	0	15	3	9	109	NIF	Y
TwentyFiveGigE1/0/10	0x12	1	0	1	8	0	14	2	10	110	NIF	Y
TwentyFiveGigE1/0/11	0x13	1	0	1	4	0	13	1	11	111	NIF	Y
TwentyFiveGigE1/0/12	0x14	1	0	1	0	0	12	0	12	112	NIF	Y
TwentyFiveGigE1/0/13	0x15	1	0	1	28	0	31	3	13	113	NIF	Y
TwentyFiveGigE1/0/14	0x16	1	0	1	24	0	30	2	14	114	NIF	Y
TwentyFiveGigE1/0/15	0x17	1	0	1	20	0	29	1	15	115	NIF	Y
TwentyFiveGigE1/0/16	0x18	1	0	1	16	0	28	0	16	116	NIF	Y
TwentyFiveGigE1/0/17	0x19	2	1	0	0	0	0	0	17	117	NIF	Y
TwentyFiveGigE1/0/18	0x1a	2	1	0	4	0	1	1	18	118	NIF	Y
TwentyFiveGigE1/0/19	0x1b	2	1	0	8	0	2	2	19	119	NIF	Y
TwentyFiveGigE1/0/20	0x1c	2	1	0	12	0	3	3	20	120	NIF	Y
TwentyFiveGigE1/0/21	0x1d	2	1	0	16	0	16	0	21	121	NIF	Y
TwentyFiveGigE1/0/22	0x1e	2	1	0	20	0	17	1	22	122	NIF	Y
TwentyFiveGigE1/0/23	0x1f	2	1	0	24	0	18	2	23	123	NIF	Y

TwentyFiveGigE1/0/24	0x20	2	1	0	28	0	19	3	24	124	NIF	Y
TwentyFiveGigE1/0/25	0x21	3	1	1	12	0	15	3	25	125	NIF	Y
TwentyFiveGigE1/0/26	0x22	3	1	1	8	0	14	2	26	126	NIF	Y
TwentyFiveGigE1/0/27	0x23	3	1	1	4	0	13	1	27	127	NIF	Y
TwentyFiveGigE1/0/28	0x24	3	1	1	0	0	12	0	28	128	NIF	Y
TwentyFiveGigE1/0/29	0x25	3	1	1	28	0	31	3	29	129	NIF	Y
TwentyFiveGigE1/0/30	0x26	3	1	1	24	0	30	2	30	130	NIF	Y
TwentyFiveGigE1/0/31	0x27	3	1	1	20	0	29	1	31	131	NIF	Y
TwentyFiveGigE1/0/32	0x28	3	1	1	16	0	28	0	32	132	NIF	Y
TwentyFiveGigE1/0/33	0x29	4	2	0	0	0	0	0	33	133	NIF	Y
TwentyFiveGigE1/0/34	0x2a	4	2	0	4	0	1	1	34	134	NIF	Y
TwentyFiveGigE1/0/35	0x2b	4	2	0	8	0	2	2	35	135	NIF	Y
TwentyFiveGigE1/0/36	0x2c	4	2	0	12	0	3	3	36	136	NIF	Y
TwentyFiveGigE1/0/37	0x2d	4	2	0	16	0	16	0	37	137	NIF	Y
TwentyFiveGigE1/0/38	0x2e	4	2	0	20	0	17	1	38	138	NIF	Y
TwentyFiveGigE1/0/39	0x2f	4	2	0	24	0	18	2	39	139	NIF	Y
TwentyFiveGigE1/0/40	0x30	4	2	0	28	0	19	3	40	140	NIF	Y
TwentyFiveGigE1/0/41	0x31	5	2	1	12	0	15	3	41	141	NIF	Y
TwentyFiveGigE1/0/42	0x32	5	2	1	8	0	14	2	42	142	NIF	Y
TwentyFiveGigE1/0/43	0x33	5	2	1	4	0	13	1	43	143	NIF	Y
TwentyFiveGigE1/0/44	0x34	5	2	1	0	0	12	0	44	144	NIF	Y
TwentyFiveGigE1/0/45	0x35	5	2	1	28	0	31	3	45	145	NIF	Y
TwentyFiveGigE1/0/46	0x36	5	2	1	24	0	30	2	46	146	NIF	Y
TwentyFiveGigE1/0/47	0x37	5	2	1	20	0	29	1	47	147	NIF	Y
TwentyFiveGigE1/0/48	0x38	5	2	1	16	0	28	0	48	148	NIF	Y
TwentyFiveGigE2/0/2	0x3a	0	0	0	9	0	9	9	2	202	NIF	Y
TwentyFiveGigE2/0/3	0x3b	0	0	0	10	0	10	10	3	203	NIF	Y
TwentyFiveGigE2/0/4	0x3c	0	0	0	11	0	11	11	4	204	NIF	Y
TwentyFiveGigE2/0/5	0x3d	0	0	0	18	0	24	8	5	205	NIF	Y
TwentyFiveGigE2/0/6	0x3e	0	0	0	25	0	25	9	6	206	NIF	Y
TwentyFiveGigE2/0/7	0x3f	0	0	0	26	0	26	10	7	207	NIF	Y
TwentyFiveGigE2/0/8	0x40	0	0	0	27	0	27	11	8	208	NIF	Y
TwentyFiveGigE2/0/9	0x41	1	0	1	7	0	7	7	9	209	NIF	Y
TwentyFiveGigE2/0/10	0x42	1	0	1	6	0	6	6	10	210	NIF	Y
TwentyFiveGigE2/0/11	0x43	1	0	1	5	0	5	5	11	211	NIF	Y
TwentyFiveGigE2/0/12	0x44	1	0	1	1	0	4	4	12	212	NIF	Y
TwentyFiveGigE2/0/13	0x45	1	0	1	23	0	23	7	13	213	NIF	Y
TwentyFiveGigE2/0/14	0x46	1	0	1	22	0	22	6	14	214	NIF	Y
TwentyFiveGigE2/0/15	0x47	1	0	1	21	0	21	5	15	215	NIF	Y
TwentyFiveGigE2/0/16	0x48	1	0	1	17	0	20	4	16	216	NIF	Y
TwentyFiveGigE2/0/17	0x49	2	1	0	2	0	8	8	17	217	NIF	Y
TwentyFiveGigE2/0/18	0x4a	2	1	0	9	0	9	9	18	218	NIF	Y
TwentyFiveGigE2/0/19	0x4b	2	1	0	10	0	10	10	19	219	NIF	Y
TwentyFiveGigE2/0/20	0x4c	2	1	0	11	0	11	11	20	220	NIF	Y
TwentyFiveGigE2/0/21	0x4d	2	1	0	18	0	24	8	21	221	NIF	Y
TwentyFiveGigE2/0/22	0x4e	2	1	0	25	0	25	9	22	222	NIF	Y
TwentyFiveGigE2/0/23	0x4f	2	1	0	26	0	26	10	23	223	NIF	Y
TwentyFiveGigE2/0/24	0x50	2	1	0	27	0	27	11	24	224	NIF	Y
TwentyFiveGigE2/0/25	0x51	3	1	1	7	0	7	7	25	225	NIF	Y
TwentyFiveGigE2/0/26	0x52	3	1	1	6	0	6	6	26	226	NIF	Y
TwentyFiveGigE2/0/27	0x53	3	1	1	5	0	5	5	27	227	NIF	Y
TwentyFiveGigE2/0/28	0x54	3	1	1	1	0	4	4	28	228	NIF	Y
TwentyFiveGigE2/0/29	0x55	3	1	1	23	0	23	7	29	229	NIF	Y
TwentyFiveGigE2/0/30	0x56	3	1	1	22	0	22	6	30	230	NIF	Y
TwentyFiveGigE2/0/31	0x57	3	1	1	21	0	21	5	31	231	NIF	Y
TwentyFiveGigE2/0/32	0x58	3	1	1	17	0	20	4	32	232	NIF	Y
TwentyFiveGigE2/0/33	0x59	4	2	0	2	0	8	8	33	233	NIF	Y
TwentyFiveGigE2/0/34	0x5a	4	2	0	9	0	9	9	34	234	NIF	Y
TwentyFiveGigE2/0/35	0x5b	4	2	0	10	0	10	10	35	235	NIF	Y
TwentyFiveGigE2/0/36	0x5c	4	2	0	11	0	11	11	36	236	NIF	Y
TwentyFiveGigE2/0/37	0x5d	4	2	0	18	0	24	8	37	237	NIF	Y
TwentyFiveGigE2/0/38	0x5e	4	2	0	25	0	25	9	38	238	NIF	Y

TwentyFiveGigE2/0/39	0x5f	4	2	0	26	0	26	10	39	239	NIF	Y
TwentyFiveGigE2/0/40	0x60	4	2	0	27	0	27	11	40	240	NIF	Y
TwentyFiveGigE2/0/41	0x61	5	2	1	7	0	7	7	41	241	NIF	Y
TwentyFiveGigE2/0/42	0x62	5	2	1	6	0	6	6	42	242	NIF	Y
TwentyFiveGigE2/0/43	0x63	5	2	1	5	0	5	5	43	243	NIF	Y
TwentyFiveGigE2/0/44	0x64	5	2	1	1	0	4	4	44	244	NIF	Y
TwentyFiveGigE2/0/45	0x65	5	2	1	23	0	23	7	45	245	NIF	Y
TwentyFiveGigE2/0/46	0x66	5	2	1	22	0	22	6	46	246	NIF	Y
TwentyFiveGigE2/0/47	0x67	5	2	1	21	0	21	5	47	247	NIF	Y
TwentyFiveGigE2/0/48	0x68	5	2	1	17	0	20	4	48	248	NIF	Y

Commands to Collect for TAC

The most common hardware issues and validation commands are covered in this guide, with appropriate remediation steps. However, in the event that this guide did not resolve your issue please collect the command list shown and attach them to your TAC service request.

```
<#root>
```

```
show tech-support
show post
show platform hardware authentication status
show platform hardware chassis fantray detail
show platform software iomd redundancy
```

```
request platform software trace archive
service internal
```

(for the standby command 'service internal' needs to be enabled first)

```
request platform software trace slot rp standby archive target stby-bootflash
```