Configuring Online Diagnostics

This chapter contains the following sections:

Information About Online Diagnostics

Online diagnostics provide verification of hardware components during switch bootup or reset, and they monitor the health of the hardware during normal switch operation.

Cisco Nexus Series switches support bootup diagnostics and runtime diagnostics. Bootup diagnostics include disruptive tests and nondisruptive tests that run during system bootup and system reset.

Runtime diagnostics (also known as health monitoring diagnostics) include nondisruptive tests that run in the background during normal operation of the switch.

Bootup Diagnostics

Bootup diagnostics detect faulty hardware before bringing the switch online. Bootup diagnostics also check the data path and control path connectivity between the supervisor and the ASICs. The following table describes the diagnostics that are run only during switch bootup or reset.

Table 1: Bootup Diagnostics

Diagnostic	Description
PCIe	Tests PCI express (PCIe) access.
NVRAM	Verifies the integrity of the NVRAM.

Diagnostic	Description
In band port	Tests connectivity of the inband port to the supervisor.
Management port	Tests the management port.
Memory	Verifies the integrity of the DRAM.

Bootup diagnostics also include a set of tests that are common with health monitoring diagnostics.

Bootup diagnostics log any failures to the onboard failure logging (OBFL) system. Failures also trigger an LED display to indicate diagnostic test states (on, off, pass, or fail).

You can configure Cisco Nexus device to either bypass the bootup diagnostics or run the complete set of bootup diagnostics.

Health Monitoring Diagnostics

Health monitoring diagnostics provide information about the health of the switch. They detect runtime hardware errors, memory errors, software faults, and resource exhaustion.

Health monitoring diagnostics are nondisruptive and run in the background to ensure the health of a switch that is processing live network traffic.

The following table describes the health monitoring diagnostics for the switch.

Table 2: Health Monitoring Diagnostics Tests

Diagnostic	Description
LED	Monitors port and system status LEDs.
Power Supply	Monitors the power supply health state.
Temperature Sensor	Monitors temperature sensor readings.
Test Fan	Monitors the fan speed and fan control.

Note   When the switch reaches the intake temperature threshold and does not go within the limits in 120 seconds, the switch will power off and the power supplies will have to be re-seated to recover the switch

The following table describes the health monitoring diagnostics that also run during system boot or system reset.

Table 3: Health Monitoring and Bootup Diagnostics Tests

Diagnostic	Description
SPROM	Verifies the integrity of backplane and supervisor SPROMs.
Fabric engine	Tests the switch fabric ASICs.
Fabric port	Tests the ports on the switch fabric ASIC.
Forwarding engine	Tests the forwarding engine ASICs.
Forwarding engine port	Tests the ports on the forwarding engine ASICs.
Front port	Tests the components (such as PHY and MAC) on the front ports.

Note When the switch exceeds the intake temperature threshold of 40 degrees Celsius and does not decrease to within the threshold limits in 120 seconds, the switch powers off and the power supplies must be re-seated to recover the switch.

Expansion Module Diagnostics

During the switch bootup or reset, the bootup diagnostics include tests for the in-service expansion modules in the switch.

When you insert an expansion module into a running switch, a set of diagnostics tests are run. The following table describes the bootup diagnostics for an expansion module. These tests are common with the bootup diagnostics. If the bootup diagnostics fail, the expansion module is not placed into service.

Table 4: Expansion Module Bootup and Health Monitoring Diagnostics

Diagnostic	Description
SPROM	Verifies the integrity of backplane and supervisor SPROMs.
Fabric engine	Tests the switch fabric ASICs.
Fabric port	Tests the ports on the switch fabric ASIC.
Forwarding engine	Tests the forwarding engine ASICs.
Forwarding engine port	Tests the ports on the forwarding engine ASICs.

Diagnostic	Description
Front port	Tests the components (such as PHY and MAC) on the front ports.

Health monitoring diagnostics are run on in-service expansion modules. The following table describes the additional tests that are specific to health monitoring diagnostics for expansion modules.

Table 5: Expansion Module Health Monitoring Diagnostics

Diagnostic	Description
LED	Monitors port and system status LEDs.
Temperature Sensor	Monitors temperature sensor readings.

Configuring Online Diagnostics

You can configure the bootup diagnostics to run the complete set of tests, or you can bypass all bootup diagnostic tests for a faster module boot up time.

Note We recommend that you set the bootup online diagnostics level to complete. We do not recommend bypassing the bootup online diagnostics.

Procedure

	Command or Action	Purpose
Step 1	switch# **configure terminal**	Enters global configuration mode.
Step 2	switch(config)# **diagnostic bootup level** [**complete** | **bypass**]	Configures the bootup diagnostic level to trigger diagnostics when the device boots, as follows: • **complete**—Performs all bootup diagnostics. This is the default value. • **bypass**—Does not perform any bootup diagnostics.
Step 3	switch# **show diagnostic bootup level**	(Optional) Displays the bootup diagnostic level (bypass or complete) that is currently in place on the switch.

The following example shows how to configure the bootup diagnostics level to trigger the complete diagnostics:

```
switch# configure terminal
switch(config)# diagnostic bootup level complete
```

Verifying the Online Diagnostics Configuration

Use the following commands to verify online diagnostics configuration information:

Command	Purpose
show diagnostic bootup level	Displays the bootup diagnostics level.
show diagnostic result module *slot*	Displays the results of the diagnostics tests.

Default Settings for Online Diagnostics

The following table lists the default settings for online diagnostics parameters.

Table 6: Default Online Diagnostics Parameters

Parameters	Default
Bootup diagnostics level	complete

Parity Error Diagnostics

Clearing Parity Errors

You can clear a corresponding Layer 2 or Layer 3 table entry (with 0s) when a parity error is detected by using the **hardware profile parity-error {l2-table | l3-table} clear** command. This command is effective when it is present in the running configuration and the system is booting up. In addition, the command must be enabled and after the configuration is saved, the system should be rebooted for the command to take effect.

The following guidelines apply:

- When the command is used for an l2_entry table, the cleared entry should be relearned due to the traffic pattern.

- When the command is used for an l3_entry_only (host) table, the cleared entry is not be relearned.

The command is useful in the following customer configurations:

- L2_Entry table, with no static L2_entry table entries

If the L2_Entry table entry is cleared, the entry should be dynamically learned through the traffic pattern. It should not be learned through IGMP or multicast.

• L3_Entry_only (host) table

Customers should not use the host table. The **hardware profile unicast enable-host-ecmp** command should be enabled. In this case, the customer node does not have any valid entries in the L3_Entry_only table, so clearing the L3_Entry_only entry table should not have any impact.

Procedure

	Command or Action	**Purpose**
Step 1	switch# **configure terminal**	Enters global configuration mode.
Step 2	switch(config)# **hardware profile parity-error l2-table clear**	Clears parity error entries in a Layer 2 table.
Step 3	switch(config)# **hardware profile parity-error l3-table clear**	Clears parity error entries in a Layer 3 table.

This example shows how to clear parity errors in a Layer 2 table:

```
switch# configure terminal
switch(config)# hardware profile parity-error l2-table clear
switch(config)# copy running-config startup-config
switch(config)# reload
```

This example shows how to clear parity errors in a Layer 3 table:

```
switch# configure terminal
switch(config)# hardware profile parity-error l3-table clear
switch(config)# copy running-config startup-config
switch(config)# reload
```