



# Configuring Online Diagnostics

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## Finding Feature Information

Your software release may not support all the features documented in this module. For the latest caveats and feature information, see Bug Search Tool and the release notes for your platform and software release. To find information about the features documented in this module, and to see a list of the releases in which each feature is supported, see the feature information table at the end of this module.

Use Cisco Feature Navigator to find information about platform support and Cisco software image support. To access Cisco Feature Navigator, go to <http://www.cisco.com/go/cfn>. An account on Cisco.com is not required.

## Information About Configuring Online Diagnostics

### Online Diagnostics

With online diagnostics, you can test and verify the hardware functionality of the Switch while the Switch is connected to a live network.

The online diagnostics contain packet switching tests that check different hardware components and verify the data path and the control signals.

The online diagnostics detect problems in these areas:

- Hardware components
- Interfaces (Ethernet ports and so forth)
- Solder joints

Online diagnostics are categorized as on-demand, scheduled, or health-monitoring diagnostics. On-demand diagnostics run from the CLI; scheduled diagnostics run at user-designated intervals or at specified times

when the Switch is connected to a live network; and health-monitoring runs in the background with user-defined intervals. By default, the health-monitoring test runs for every 30 seconds.

After you configure online diagnostics, you can manually start diagnostic tests or display the test results. You can also see which tests are configured for the Switch or switch stack and the diagnostic tests that have already run.

#### Related Topics

- [Scheduling Online Diagnostics](#), on page 2
- [Examples: Schedule Diagnostic Test](#), on page 9
- [Starting Online Diagnostic Tests](#), on page 7
- [Examples: Start Diagnostic Tests](#), on page 8

# How to Configure Online Diagnostics

## Configuring Online Diagnostics

You must configure the failure threshold and the interval between tests before enabling diagnostic monitoring.

### Scheduling Online Diagnostics

You can schedule online diagnostics to run at a designated time of day or on a daily, weekly, or monthly basis for a Switch. Use the **no** form of this command to remove the scheduling.

#### SUMMARY STEPS

1. **configure terminal**
2. **diagnostic schedule switch** *number* **test** {*name* | *test-id* | *test-id-range* | **all** | **basic** | **complete** | **minimal** | **non-disruptive** | **per-port**} {**daily** | **on** *mm dd yyyy hh:mm* | **port** *inter-port-number port-number-list* | **weekly** *day-of-week hh:mm*}

#### DETAILED STEPS

	Command or Action	Purpose
Step 1	<b>configure terminal</b> <b>Example:</b> <pre>Switch# configure terminal</pre>	Enters the global configuration mode.
Step 2	<b>diagnostic schedule switch</b> <i>number</i> <b>test</b> { <i>name</i>   <i>test-id</i>   <i>test-id-range</i>   <b>all</b>   <b>basic</b>   <b>complete</b>   <b>minimal</b>   <b>non-disruptive</b>   <b>per-port</b> } { <b>daily</b>   <b>on</b> <i>mm dd yyyy hh:mm</i>   <b>port</b> <i>inter-port-number port-number-list</i>   <b>weekly</b> <i>day-of-week hh:mm</i> }	Schedules on-demand diagnostic tests for a specific day and time. The <b>switch</b> <i>number</i> keyword is supported only on stacking switches. The range is from 1 to 4. When specifying the tests to be scheduled, use these options: <ul style="list-style-type: none"> <li>• <i>name</i>—Name of the test that appears in the <b>show diagnostic content</b> command output.</li> </ul>
	<b>Example:</b> <pre>Switch(config)# diagnostic schedule switch 3 test</pre>	

	Command or Action	Purpose
	1-5 on July 3 2013 23:10	<ul style="list-style-type: none"> <li>• <i>test-id</i>—ID number of the test that appears in the <b>show diagnostic content</b> command output.</li> <li>• <i>test-id-range</i>—ID numbers of the tests that appear in the <b>show diagnostic content</b> command output.</li> <li>• <b>all</b>—All test IDs.</li> <li>• <b>basic</b>—Starts the basic on-demand diagnostic tests.</li> <li>• <b>complete</b>—Starts the complete test suite.</li> <li>• <b>minimal</b>—Starts the minimal bootup test suite.</li> <li>• <b>non-disruptive</b>—Starts the non-disruptive test suite.</li> <li>• <b>per-port</b>—Starts the per-port test suite.</li> </ul> <p>You can schedule the tests as follows:</p> <ul style="list-style-type: none"> <li>• <b>Daily</b>—Use the <b>daily</b> <i>hh:mm</i> parameter.</li> <li>• <b>Specific day and time</b>—Use the <b>on</b> <i>mm dd yyyy hh:mm</i> parameter.</li> <li>• <b>Weekly</b>—Use the <b>weekly</b> <i>day-of-week hh:mm</i> parameter.</li> </ul> <p>Use the <b>no diagnostic schedule switch</b> <i>number test {name   test-id   test-id-range   all   basic   non-disruptive } {daily   on mm dd yyyy hh:mm   weekly day-of-week hh:mm}</i> global configuration command to remove the scheduled tests.</p>

### Related Topics

[Online Diagnostics](#), on page 1

[Examples: Schedule Diagnostic Test](#), on page 9

## Configuring Health-Monitoring Diagnostics

You can configure health-monitoring diagnostic testing on a Switch while it is connected to a live network. You can configure the execution interval for each health-monitoring test, enable the Switch to generate a syslog message because of a test failure, and enable a specific test.

Use the **no** form of this command to disable testing.

By default, health monitoring is disabled, but the Switch generates a syslog message when a test fails.

Follow these steps to configure and enable the health-monitoring diagnostic tests:

### SUMMARY STEPS

1. **enable**
2. **configure terminal**

3. **diagnostic monitor interval switch** *number test* {*name* | *test-id* | *test-id-range* | **all**} *hh:mm:ss milliseconds day*
4. **diagnostic monitor syslog**
5. **diagnostic monitor threshold switch** *number test* {*name* | *test-id* | *test-id-range* | **all**} **failure count** *count*
6. **diagnostic monitor switch** *number test* {*name* | *test-id* | *test-id-range* | **all**}
7. **end**
8. **show diagnostic** { **content** | **post** | **result** | **schedule** | **status** | **switch** }
9. **show running-config**
10. **copy running-config startup-config**

## DETAILED STEPS

	Command or Action	Purpose
<b>Step 1</b>	<b>enable</b> <b>Example:</b> <pre>Switch&gt; enable</pre>	Enables privileged EXEC mode. Enter your password if prompted.
<b>Step 2</b>	<b>configure terminal</b> <b>Example:</b> <pre>Switch# configure terminal</pre>	Enters the global configuration mode.
<b>Step 3</b>	<b>diagnostic monitor interval switch</b> <i>number test</i> { <i>name</i>   <i>test-id</i>   <i>test-id-range</i>   <b>all</b> } <i>hh:mm:ss milliseconds day</i> <b>Example:</b> <pre>Switch(config)# diagnostic monitor interval switch 2 test 1 12:30:00 750 5</pre>	<p>Configures the health-monitoring interval of the specified tests.</p> <p>The <b>switch</b> <i>number</i> keyword is supported only on stacking switches.</p> <p>When specifying the tests, use one of these parameters:</p> <ul style="list-style-type: none"> <li>• <i>name</i>—Name of the test that appears in the <b>show diagnostic content</b> command output.</li> <li>• <i>test-id</i>—ID number of the test that appears in the <b>show diagnostic content</b> command output.</li> <li>• <i>test-id-range</i>—ID numbers of the tests that appear in the <b>show diagnostic content</b> command output.</li> <li>• <b>all</b>—All of the diagnostic tests.</li> </ul> <p>When specifying the interval, set these parameters:</p> <ul style="list-style-type: none"> <li>• <i>hh:mm:ss</i>—Monitoring interval in hours, minutes, and seconds. The range for <i>hh</i> is 0 to 24, and the range for <i>mm</i> and <i>ss</i> is 0 to 60.</li> <li>• <i>milliseconds</i>—Monitoring interval in milliseconds (ms). The range is from 0 to 999.</li> </ul>

	Command or Action	Purpose
		<ul style="list-style-type: none"> <li><i>day</i>—Monitoring interval in the number of days. The range is from 0 to 20.</li> </ul>
Step 4	<p><b>diagnostic monitor syslog</b></p> <p><b>Example:</b></p> <pre>Switch(config)# diagnostic monitor syslog</pre>	(Optional) Configures the switch to generate a syslog message when a health-monitoring test fails.
Step 5	<p><b>diagnostic monitor threshold switch <i>number</i> test {<i>name</i>   <i>test-id</i>   <i>test-id-range</i>   all} failure count <i>count</i></b></p> <p><b>Example:</b></p> <pre>Switch(config)# diagnostic monitor threshold switch 2 test 1 failure count 20</pre>	<p>(Optional) Sets the failure threshold for the health-monitoring tests.</p> <p>When specifying the tests, use one of these parameters:</p> <ul style="list-style-type: none"> <li><i>name</i>—Name of the test that appears in the <b>show diagnostic content</b> command output.</li> <li><i>test-id</i>—ID number of the test that appears in the <b>show diagnostic content</b> command output.</li> <li><i>test-id-range</i>—ID numbers of the tests that appear in the <b>show diagnostic content</b> command output.</li> <li><b>all</b>—All of the diagnostic tests.</li> </ul> <p>The range for the failure threshold <i>count</i> is 0 to 99.</p>
Step 6	<p><b>diagnostic monitor switch <i>number</i> test {<i>name</i>   <i>test-id</i>   <i>test-id-range</i>   all}</b></p> <p><b>Example:</b></p> <pre>Switch(config)# diagnostic monitor switch 2 test 1</pre>	<p>Enables the specified health-monitoring tests.</p> <p>The <b>switch <i>number</i></b> keyword is supported only on stacking switches. The range is from 1 to 9.</p> <p>When specifying the tests, use one of these parameters:</p> <ul style="list-style-type: none"> <li><i>name</i>—Name of the test that appears in the <b>show diagnostic content</b> command output.</li> <li><i>test-id</i>—ID number of the test that appears in the <b>show diagnostic content</b> command output.</li> <li><i>test-id-range</i>—ID numbers of the tests that appear in the <b>show diagnostic content</b> command output.</li> <li><b>all</b>—All of the diagnostic tests.</li> </ul>
Step 7	<p><b>end</b></p> <p><b>Example:</b></p> <pre>Switch(config)# end</pre>	Returns to privileged EXEC mode.
Step 8	<p><b>show diagnostic { content   post   result   schedule   status   switch }</b></p>	Display the online diagnostic test results and the supported test suites.

	Command or Action	Purpose
Step 9	<b>show running-config</b> <b>Example:</b> <pre>Switch# show running-config</pre>	Verifies your entries.
Step 10	<b>copy running-config startup-config</b> <b>Example:</b> <pre>Switch# copy running-config startup-config</pre>	(Optional) Saves your entries in the configuration file.

### What to do next

To disable diagnostic testing and return to the default settings, use these commands:

- To disable online diagnostic testing, use the **no diagnostic monitor switch***number* **test** {*name* | *test-id* | *test-id-range* | **all**} global configuration command.
- To return to the default health-monitoring interval, use the **no diagnostic monitor interval switch***number* **test** {*name* | *test-id* | *test-id-range* | **all**} global configuration command.
- To configure the switch to not generate a syslog message when the health-monitoring test fails, use the **no diagnostic monitor syslog** global configuration command.
- To return to the default failure threshold, use the **no diagnostic monitor threshold switch***number* **test** {*name* | *test-id* | *test-id-range* | **all**} **failure count***count* global configuration command.



**Note** The Switch number keyword is supported only on Catalyst 3750-E Catalyst 3750-X switches.

Use the **no diagnostic monitor interval test***test-id* | *test-id-range* } global configuration command to change the interval to the default value or to zero. Use the **no diagnostic monitor syslog** command to disable generation of syslog messages when a health-monitoring test fails. Use the **diagnostic monitor threshold test***test-id* | *test-id-range* } **failure count** command to remove the failure threshold.

### Related Topics

[Example: Configure a Health Monitoring Test](#), on page 8

## Running Online Diagnostic Tests

After you configure online diagnostics, you can manually start diagnostic tests or display the test results. You can also see which tests are configured for the switch or switch stack and the diagnostic tests that have already run.

These sections describe how to run online diagnostic tests after they have been configured:

- Starting Online Diagnostic Tests
- Displaying Online Diagnostic Tests and Test Results

## Starting Online Diagnostic Tests

After you configure diagnostic tests to run on the Switch, use the **diagnostic start** privileged EXEC command to begin diagnostic testing.

After starting the tests, you cannot stop the testing process.

Use this privileged EXEC command to manually start online diagnostic testing:

### SUMMARY STEPS

1. **diagnostic start switch** *number* **test** {*name* | *test-id* | *test-id-range* | **all** | **basic** | **complete** | **minimal** | **non-disruptive** | **per-port**}

### DETAILED STEPS

	Command or Action	Purpose
Step 1	<p><b>diagnostic start switch</b> <i>number</i> <b>test</b> {<i>name</i>   <i>test-id</i>   <i>test-id-range</i>   <b>all</b>   <b>basic</b>   <b>complete</b>   <b>minimal</b>   <b>non-disruptive</b>   <b>per-port</b>}</p> <p><b>Example:</b></p> <pre>Switch# diagnostic start switch 2 test basic</pre>	<p>Starts the diagnostic tests.</p> <p>The <b>switch</b> <i>number</i> keyword is supported only on stacking Switch. The range is from 1 to 4.</p> <p>You can specify the tests by using one of these options:</p> <ul style="list-style-type: none"> <li>• <i>name</i>—Enters the name of the test.</li> <li>• <i>test-id</i>—Enters the ID number of the test.</li> <li>• <i>test-id-range</i>—Enters the range of test IDs by using integers separated by a comma and a hyphen.</li> <li>• <b>all</b>—Starts all of the tests.</li> <li>• <b>basic</b>— Starts the basic test suite.</li> <li>• <b>complete</b>—Starts the complete test suite.</li> <li>• <b>minimal</b>—Starts the minimal bootup test suite.</li> <li>• <b>non-disruptive</b>—Starts the non-disruptive test suite.</li> <li>• <b>per-port</b>—Starts the per-port test suite.</li> </ul>

#### Related Topics

[Online Diagnostics](#), on page 1

[Examples: Start Diagnostic Tests](#), on page 8

## Displaying Online Diagnostic Tests and Test Results

You can display the online diagnostic tests that are configured for the Switch or Switch stack and check the test results by using the privileged EXEC **show** commands in this table:

Table 1: Commands for Diagnostic Test Configuration and Results

Command	Purpose
<b>show diagnostic content switch</b> [ <i>number</i>   <b>all</b> ]	Displays the online diagnostics configured for a switch. The <b>switch</b> [ <i>number</i>   <b>all</b> ] parameter is supported only on stacking switches.
<b>show diagnostic status</b>	Displays the currently running diagnostic tests.
<b>show diagnostic result switch</b> [ <i>number</i>   <b>all</b> ] [ <b>detail</b>   <b>test</b> { <i>name</i>   <i>test-id</i>   <i>test-id-range</i>   <b>all</b> } [ <b>detail</b> ]]	Displays the online diagnostics test results. The <b>switch</b> [ <i>number</i>   <b>all</b> ] parameter is supported only on stacking switches.
<b>show diagnostic switch</b> [ <i>number</i>   <b>all</b> ] [ <b>detail</b> ]	Displays the online diagnostics test results. The <b>switch</b> [ <i>number</i>   <b>all</b> ] parameter is supported only on stacking switches.
<b>show diagnostic schedule switch</b> [ <i>number</i>   <b>all</b> ]	Displays the online diagnostics test schedule. The <b>switch</b> [ <i>number</i>   <b>all</b> ] parameter is supported only on stacking switches.
<b>show diagnostic post</b>	Displays the POST results. (The output is the same as the <b>show post</b> command output.)

## Examples: Start Diagnostic Tests

This example shows how to start a diagnostic test by using the test name:

```
Switch# diagnostic start switch 2 test TestInlinePwrCtrlr
```

This example shows how to start all of the basic diagnostic tests:

```
Switch# diagnostic start switch 1 test all
```

### Related Topics

[Starting Online Diagnostic Tests](#), on page 7

[Online Diagnostics](#), on page 1

## Example: Configure a Health Monitoring Test

This example shows how to configure a health-monitoring test:

```
Switch(config)# diagnostic monitor threshold switch 1 test 1 failure count 50
Switch(config)# diagnostic monitor interval switch 1 test TestPortAsicStackPortLoopback
```



**Related Topics**

[Configuring Health-Monitoring Diagnostics](#), on page 3

## Examples: Schedule Diagnostic Test

This example shows how to schedule diagnostic testing for a specific day and time on a specific switch:

```
Switch(config)# diagnostic schedule test DiagThermalTest on June 3 2013 22:25
```

This example shows how to schedule diagnostic testing to occur weekly at a certain time on a specific switch:

```
Switch(config)# diagnostic schedule switch 1 test 1,2,4-6 weekly saturday 10:30
```

**Related Topics**

[Scheduling Online Diagnostics](#), on page 2

[Online Diagnostics](#), on page 1

## Examples: Displaying Online Diagnostics

This example shows how to display on demand diagnostic settings:

```
Switch# show diagnostic ondemand settings
```

```
Test iterations = 1
Action on test failure = continue
```

This example shows how to display diagnostic events for errors:

```
Switch# show diagnostic events event-type error
```

```
Diagnostic events (storage for 500 events, 0 events recorded)
Number of events matching above criteria = 0
```

```
No diagnostic log entry exists.
```

This example shows how to display the description for a diagnostic test:

```
Switch# show diagnostic description switch 1 test all
```

```
DiagGoldPktTest :
  The GOLD packet Loopback test verifies the MAC level loopback
  functionality. In this test, a GOLD packet, for which doppler
  provides the support in hardware, is sent. The packet loops back
  at MAC level and is matched against the stored packet. It is a non-
  -disruptive test.
```

```
DiagThermalTest :
  This test verifies the temperature reading from the sensor is below the yellow
  temperature threshold. It is a non-disruptive test and can be run as a health
  monitoring test.
```

```
DiagFanTest :
```

This test verifies all fan modules have been inserted and working properly on the board

It is a non-disruptive test and can be run as a health monitoring test.

DiagPhyLoopbackTest :

The PHY Loopback test verifies the PHY level loopback functionality. In this test, a packet is sent which loops back at PHY level and is matched against the stored packet. It is a disruptive test and cannot be run as a health monitoring test.

DiagScratchRegisterTest :

The Scratch Register test monitors the health of application-specific integrated circuits (ASICs) by writing values into registers and reading back the values from these registers. It is a non-disruptive test and can be run as a health monitoring test.

DiagPoETest :

This test checks the PoE controller functionality. This is a disruptive test and should not be performed during normal switch operation.

DiagStackCableTest :

This test verifies the stack ring loopback functionality in the stacking environment. It is a disruptive test and cannot be run as a health monitoring test.

DiagMemoryTest :

This test runs the exhaustive ASIC memory test during normal switch operation. NG3K utilizes mbist for this test. Memory test is very disruptive in nature and requires switch reboot after the test.

Switch#

This example shows how to display the boot up level:

```
Switch# show diagnostic bootup level
```

```
Current bootup diagnostic level: minimal
```

```
Switch#
```

## Additional References for Online Diagnostics

### Related Documents

Related Topic	Document Title
System management commands	
Platform-independent command reference	<i>Configuration Fundamentals Command Reference, Cisco IOS XE Release 3S (Catalyst 3850 Switches)</i>

Related Topic	Document Title
Platform-independent configuration information	<i>Configuration Fundamentals Configuration Guide, Cisco IOS XE Release 3S (Catalyst 3850 Switches)</i>

**Standards and RFCs**

Standard/RFC	Title
None	—

**MIBs**

MIB	MIBs Link
All supported MIBs for this release.	To locate and download MIBs for selected platforms, Cisco IOS releases, and feature sets, use Cisco MIB Locator found at the following URL: <a href="http://www.cisco.com/go/mibs">http://www.cisco.com/go/mibs</a>

**Technical Assistance**

Description	Link
<p>The Cisco Support website provides extensive online resources, including documentation and tools for troubleshooting and resolving technical issues with Cisco products and technologies.</p> <p>To receive security and technical information about your products, you can subscribe to various services, such as the Product Alert Tool (accessed from Field Notices), the Cisco Technical Services Newsletter, and Really Simple Syndication (RSS) Feeds.</p> <p>Access to most tools on the Cisco Support website requires a Cisco.com user ID and password.</p>	<a href="http://www.cisco.com/support">http://www.cisco.com/support</a>

