



## 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 Device while the Device 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 Device 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 Device or switch stack and the diagnostic tests that have already run.

# How to Configure Online Diagnostics

## Starting Online Diagnostic Tests

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

# 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 Device. 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
<b>Step 1</b>	<b>configure terminal</b>  <b>Example:</b>  Device# <b>configure terminal</b>	Enters global configuration mode.
<b>Step 2</b>	<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> }  <b>Example:</b>  Device(config)# <b>diagnostic schedule switch 3 test 1-5 on July 3 2013 23:10</b>	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> <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>

	Command or Action	Purpose
		<p>You can schedule the tests as follows:</p> <ul style="list-style-type: none"> <li>• Daily—Use the <b>daily</b> <i>hh:mm</i> parameter.</li> <li>• Specific day and time—Use the <b>on</b> <i>mm dd yyyy hh:mm</i> parameter.</li> <li>• Weekly—Use the <b>weekly</b> <i>day-of-week hh:mm</i> parameter.</li> </ul>

## Configuring Health-Monitoring Diagnostics

You can configure health-monitoring diagnostic testing on a Device while it is connected to a live network. You can configure the execution interval for each health-monitoring test, enable the Device 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 Device 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 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 running-config**
9. **copy running-config startup-config**

### DETAILED STEPS

	Command or Action	Purpose
<b>Step 1</b>	<b>enable</b>  <b>Example:</b>  <pre>Device&gt; enable</pre>	<p>Enables privileged EXEC mode.</p> <ul style="list-style-type: none"> <li>• Enter your password if prompted.</li> </ul>
<b>Step 2</b>	<b>configure terminal</b>  <b>Example:</b>	Enters global configuration mode.

	Command or Action	Purpose
	Device# <b>configure terminal</b>	
<b>Step 3</b>	<p><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></p> <p><b>Example:</b></p> <pre>Device(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. 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> <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> <li>• <i>day</i>—Monitoring interval in the number of days. The range is from 0 to 20.</li> </ul>
<b>Step 4</b>	<p><b>diagnostic monitor syslog</b></p> <p><b>Example:</b></p> <pre>Device(config)# diagnostic monitor syslog</pre>	(Optional) Configures the switch to generate a syslog message when a health-monitoring test fails.
<b>Step 5</b>	<p><b>diagnostic monitor threshold switch</b> <i>number number test</i> {<i>name</i>   <i>test-id</i>   <i>test-id-range</i>   <b>all</b>} <b>failure count</b> <i>count</i></p> <p><b>Example:</b></p> <pre>Device(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>The <b>switch</b> <i>number</i> 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> </ul>

	Command or Action	Purpose
		<ul style="list-style-type: none"> <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>
<b>Step 6</b>	<b>diagnostic monitor switch</b> <i>number</i> <b>test</b> { <i>name</i>   <i>test-id</i>   <i>test-id-range</i>   <b>all</b> } <b>Example:</b> <pre>Device(config)# diagnostic monitor switch 2 test 1</pre>	<p>Enables the specified health-monitoring tests.</p> <p>The <b>switch</b> <i>number</i> 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>
<b>Step 7</b>	<b>end</b> <b>Example:</b> <pre>Device(config)# end</pre>	Returns to privileged EXEC mode.
<b>Step 8</b>	<b>show running-config</b> <b>Example:</b> <pre>Device# show running-config</pre>	Verifies your entries.
<b>Step 9</b>	<b>copy running-config startup-config</b> <b>Example:</b> <pre>Device# copy running-config startup-config</pre>	(Optional) Saves your entries in the configuration file.

### What to do next

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.

# Monitoring and Maintaining Online Diagnostics

## Displaying Online Diagnostic Tests and Test Results

You can display the online diagnostic tests that are configured for the Device or Device 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.
<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.
<b>show diagnostic switch</b> [ <i>number</i>   <b>all</b> ] [ <b>detail</b> ]	Displays the online diagnostics test results.
<b>show diagnostic schedule switch</b> [ <i>number</i>   <b>all</b> ]	Displays the online diagnostics test schedule.
<b>show diagnostic post</b>	Displays the POST results. (The output is the same as the <b>show post</b> command output.)

## Configuration Examples for Online Diagnostic Tests

### Examples: Start Diagnostic Tests

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

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

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

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

### Example: Configure a Health Monitoring Test

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

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

## Examples: Schedule Diagnostic Test

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

```
Device(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:

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

## Examples: Displaying Online Diagnostics

This example shows how to display on demand diagnostic settings:

```
Device# show diagnostic ondemand settings
```

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

This example shows how to display diagnostic events for errors:

```
Device# 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:

```
Device# 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.

Device#

```

This example shows how to display the boot up level:

```

Device# show diagnostic bootup level

Current bootup diagnostic level: minimal

Device#

```

## Additional References for Online Diagnostics

### Related Documents

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

## Feature History and Information for Configuring Online Diagnostics

Release	Modification
Cisco IOS XE 3.2SE	This feature was introduced.