



# Configuring Online Diagnostics

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## 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.

# How to Configure Online Diagnostics

## 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.

### Procedure

	Command or Action	Purpose
<b>Step 1</b>	<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>non-disruptive</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 switches. The range is from 1 to 8.</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>non-disruptive</b>—Starts the non-disruptive 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 switch. Use the **no** form of this command to remove the scheduling.

**Procedure**

	<b>Command or Action</b>	<b>Purpose</b>
<b>Step 1</b>	<p><b>configure terminal</b></p> <p><b>Example:</b></p> <pre>Switch# configure terminal</pre>	<p>Enters global configuration mode.</p>
<b>Step 2</b>	<p><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>non-disruptive</b>  } {<b>daily</b>   <b>on</b> <i>mm dd yyyy hh:mm</i>   <b>weekly</b> <i>day-of-week hh:mm</i>}</p> <p><b>Example:</b></p> <pre>Switch(config)# diagnostic schedule switch 1 test 1-5 on July 3 2013 23:10</pre>	<p>Schedules on-demand diagnostic tests for a specific day and time.</p> <p>The <b>switch</b> <i>number</i> keyword is supported only on stacking switches. The range is from 1 to 8.</p> <p>When specifying the tests to be scheduled, use these options:</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 test IDs.</li> <li>• <b>basic</b>—Starts the basic on-demand diagnostic tests.</li> <li>• <b>non-disruptive</b>—Starts the non-disruptive test suite.</li> </ul> <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 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:

### Procedure

	Command or Action	Purpose
<b>Step 1</b>	<p><b>enable</b></p> <p><b>Example:</b></p> <pre>Switch&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>	<p><b>configure terminal</b></p> <p><b>Example:</b></p> <pre>Switch# configure terminal</pre>	<p>Enters global configuration mode.</p>
<b>Step 3</b>	<p><b>diagnostic monitor interval switch <i>number</i></b>  <b>test {<i>name</i>   <i>test-id</i>   <i>test-id-range</i>   <b>all</b>}</b>  <i>hh:mm:ss milliseconds day</i></p> <p><b>Example:</b></p> <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>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>

	Command or Action	Purpose
Step 4	<p><b>diagnostic monitor syslog</b></p> <p><b>Example:</b></p> <pre>Switch(config)# diagnostic monitor syslog</pre>	<p>(Optional) Configures the switch to generate a syslog message when a health-monitoring test fails.</p>
Step 5	<p><b>diagnostic monitor threshold switch</b> <i>number</i> <i>number</i> <b>test</b> {<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>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>The <b>switch</b> <i>number</i> keyword is supported only on stacking switches. The range is from 1 to 8.</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</b> <i>number</i> <b>test</b> {<i>name</i>   <i>test-id</i>   <i>test-id-range</i>   <b>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</b> <i>number</i> keyword is supported only on stacking switches. The range is from 1 to 8.</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>

	Command or Action	Purpose
Step 7	<b>end</b> <b>Example:</b> <pre>Switch(config)# end</pre>	Returns to privileged EXEC mode.
Step 8	<b>show running-config</b> <b>Example:</b> <pre>Switch# show running-config</pre>	Verifies your entries.
Step 9	<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

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 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.
<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.

Command	Purpose
<code>show diagnostic post</code>	Displays the POST results. (The output is the same as the <code>show post</code> command output.)

## Configuration Examples for Online Diagnostic Tests

### 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.

#### Procedure

	Command or Action	Purpose
<b>Step 1</b>	<p><code>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>non-disruptive</b> }</code></p> <p><b>Example:</b></p> <pre>Switch# diagnostic start switch 2 test basic</pre>	<p>Starts the diagnostic tests.</p> <p>The <code>switch <i>number</i></code> keyword is supported only on stacking switches. The range is from 1 to 8.</p> <p>You can specify the tests by using one of these options:</p> <ul style="list-style-type: none"> <li>• <code><i>name</i></code>—Enters the name of the test.</li> <li>• <code><i>test-id</i></code>—Enters the ID number of the test.</li> <li>• <code><i>test-id-range</i></code>—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>non-disruptive</b>—Starts the non-disruptive test suite.</li> </ul>

### 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
```

## 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
```

## Displaying Online Diagnostics: Examples

This example shows how to display the online diagnostic detailed information on a specific switch:

```
Switch# show diagnostic switch 1 detail
```

```
Switch 1: SerialNo :
```

```
Overall Diagnostic Result for Switch 1 : UNTESTED
```

```
Test results: (. = Pass, F = Fail, U = Untested)
```

---

```
1) TestPortAsicStackPortLoopback ---> U
```

```
Error code -----> 3 (DIAG_SKIPPED)
Total run count -----> 0
Last test testing type -----> n/a
Last test execution time ----> n/a
First test failure time -----> n/a
Last test failure time -----> n/a
Last test pass time -----> n/a
Total failure count -----> 0
Consecutive failure count ---> 0
```

---

```
2) TestPortAsicLoopback -----> U
```

```
Error code -----> 3 (DIAG_SKIPPED)
Total run count -----> 0
Last test testing type -----> n/a
Last test execution time ----> n/a
First test failure time -----> n/a
Last test failure time -----> n/a
Last test pass time -----> n/a
Total failure count -----> 0
Consecutive failure count ---> 0
```

---

```
3) TestPortAsicCam -----> U
```

```
Error code -----> 3 (DIAG_SKIPPED)
Total run count -----> 0
Last test testing type -----> n/a
Last test execution time ----> n/a
First test failure time -----> n/a
Last test failure time -----> n/a
Last test pass time -----> n/a
```



```

Total failure count -----> 0
Consecutive failure count ---> 0

-----

4) TestPortAsicMem -----> U

Error code -----> 3 (DIAG_SKIPPED)
Total run count -----> 0
Last test testing type -----> n/a
Last test execution time ----> n/a
First test failure time -----> n/a
Last test failure time -----> n/a
Last test pass time -----> n/a
Total failure count -----> 0
Consecutive failure count ---> 0

-----

5) TestInlinePwrCtrl -----> U

Error code -----> 3 (DIAG_SKIPPED)
Total run count -----> 0
Last test testing type -----> n/a
Last test execution time ----> n/a
First test failure time -----> n/a
Last test failure time -----> n/a
Last test pass time -----> n/a
Total failure count -----> 0
Consecutive failure count ---> 0
    
```

This example shows how to display the online diagnostics that are configured on a specific switch:

```
Switch# show diagnostic content switch 3
```

```

Switch 1:
Diagnostics test suite attributes:
  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
  R/* - Switch will reload after test list completion / NA
  P/* - will partition stack / NA
    
```

ID	Test Name	Attributes	Test Interval	Thre- day hh:mm:ss.ms	shold
1)	TestPortAsicStackPortLoopback	---> B*N***I**	not configured		n/a
2)	TestPortAsicLoopback	-----> B*D*X**IR*	not configured		n/a
3)	TestPortAsicCam	-----> B*D*X**IR*	not configured		n/a
4)	TestPortAsicRingLoopback	-----> B*D*X**IR*	not configured		n/a
5)	TestMicRingLoopback	-----> B*D*X**IR*	not configured		n/a
6)	TestPortAsicMem	-----> B*D*X**IR*	not configured		n/a

This example shows how to display the online diagnostic results for a switch:

```
Switch# show diagnostic result

Switch 1: SerialNo :
Overall diagnostic result: PASS
Test results: (. = Pass, F = Fail, U = Untested)
1) TestPortAsicStackPortLoopback ---> .
2) TestPortAsicLoopback -----> .
3) TestPortAsicCam -----> .
4) TestPortAsicRingLoopback -----> .
5) TestMicRingLoopback -----> .
6) TestPortAsicMem -----> .
```

This example shows how to display the online diagnostic test status:

```
Switch# show diagnostic status

<BU> - Bootup Diagnostics, <HM> - Health Monitoring Diagnostics,
<OD> - OnDemand Diagnostics, <SCH> - Scheduled Diagnostics
=====
Card   Description                               Current Running Test           Run by
-----
1      N/A                                         N/A                             N/A
2      TestPortAsicStackPortLoopback             <OD>
      TestPortAsicLoopback                     <OD>
      TestPortAsicCam                           <OD>
      TestPortAsicRingLoopback                 <OD>
      TestMicRingLoopback                      <OD>
      TestPortAsicMem                           <OD>
3      N/A                                         N/A                             N/A
4      N/A                                         N/A                             N/A
=====
Switch#
```

This example shows how to display the online diagnostic test schedule for a switch:

```
Switch# show diagnostic schedule switch 1

Current Time = 14:39:49 PST Tue May 5 2013
Diagnostic for Switch 1:
Schedule #1:
To be run daily 12:00
Test ID(s) to be executed: 1.
```

## Additional References for Online Diagnostics

### Related Documents

Related Topic	Document Title
Online diagnostics commands	<i>Catalyst 2960-X Switch System Management Command Reference</i>
Platform-independent command references	<i>Cisco IOS 15.3M&amp;T Command References</i>

Related Topic	Document Title
Platform-independent configuration information	<i>Cisco IOS 15.3M&amp;T Configuration Guides</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 Release 15.0(2)EX	This feature was introduced.

