Online Offline Diagnostics—Field Diagnostics on the Cisco uBR10012 Router

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Online Offline Diagnostics (OOD) Field Diagnostics provides a means for testing and verifying hardware-related issues on a line card, when deployed in the field. The test results can be used to verify whether a line card is faulty and also to troubleshoot network issues.

Finding Feature Information

Your software release may not support all the features documented in this module. For the latest feature information and caveats, see 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 for Online Offline Diagnostics on the Cisco uBR10012 Router" section on page 18.

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.

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Prerequisites for Online Offline Diagnostics

Table 1 shows the hardware compatibility prerequisites for Online Offline Diagnostics:

Note The hardware components introduced in a given Cisco IOS Release are supported in all subsequent releases unless otherwise specified.

Table 1 Hardware Compatibility Matrix for Online Offline Diagnostics

CMTS Platform	Processor Engine	Cable Interface Cards
Cisco uBR10012 Universal Broadband Router	**Cisco IOS Release 12.2(33)SCA and later** • PRE1 • PRE2 **Cisco IOS Release 12.2(33)SCC and later** • PRE4	**Cisco IOS Release 12.2(33)SCA and later** • Cisco uBR10-MC5X20S/U Cisco 10000 series router WAN line cards: • Gigabit Ethernet line cards • OC-12/OC-48 POS line card • OC-48DPT line card **Cisco IOS Release 12.2(33)SCC and later** • Cisco uBR10-MC5X20H **Cisco IOS Release 12.2(33)SCF and later** • Cisco UBR-MC20X20V

Note Use the Field Diagnostic image (ubr10k-fdiagslc-mz.7_0.bin) to run field diagnostic testing for the cable interface line cards, and Field Diagnostic image (c10k-fdiagslc-mz.1.1.bin) for testing the Cisco 10000 series router WAN line cards, in the Cisco uBR10012 universal broadband router.

The software prerequisites for the Online Offline Diagnostics feature are:

- Ensure that OOD Field Diagnostic testing is supported on your hardware. To confirm this, run the **show diagnostic ood-status** command in the privileged EXEC mode.
- Before running the OOD Field Diagnostic tests on the working (active) card in an N + 1 redundancy setup, it is advisable to switch over to the protect (standby) line before loading the Field Diagnostic image onto the line card to avoid service interruption.

Note N+1 Redundancy is supported on the Cisco uBR10-MC5X20S/U/H and Cisco UBR-MC20X20V cable interface line cards.

- Console logging is often disabled on Cisco uBR10012 universal broadband routers for reasons unrelated to field diagnostics. Field diagnostic testing will run when console logging is disabled, however it is important to note that some field diagnostic messages may not be seen because of the console logging setting.

- When an OOD Field Diagnostic image is loaded onto the line card, the line card goes offline. Therefore, schedule a downtime for the line card to be tested before performing field diagnostic tests.
- Before performing any field diagnostic test, unplug all cables on the device that connect to other interfaces. If the cables that connect interfaces are not unplugged, some field diagnostic tests may send packets to connected devices, which increments packet counters on the receiving interfaces.

Restrictions for Online Offline Diagnostics

- When accessing a router through Telnet while running an OOD Field Diagnostic test, testing progress messages do not appear on the screen.
- If a switchover occurs during a field diagnostic test, the test stops immediately and the line card run-time image automatically replaces the Field Diagnostic image on the line card.
- Offline field diagnostics is not supported on the Cisco uBR10-MC5X20S cable interface line card from Cisco IOS Release 12.2(33)SCC onwards.
- Online diagnostics is not supported on the Cisco uBR10-MC5X20S/U/H cable interface line cards from Cisco IOS Release 12.2(33)SCC onwards.
- The Cisco UBR-MC20X20V cable interface line card does not support online diagnostics. It only supports offline diagnostics.

Information About Online Offline Diagnostics

The following sections provide an overview of the Online Offline Diagnostics feature, its benefits, and system requirements when used on the Cisco uBR10012 universal broadband router:

Overview of Online Offline Diagnostics

The Online Offline Diagnostics is a field diagnostic mechanism that provides customers with a method of testing and verifying line card hardware problems. For a list of hardware that support field diagnostics on the Cisco uBR10012 universal broadband router, see "Prerequisites for Online Offline Diagnostics" section on page 2.

To perform a hardware diagnostic test on a line card in the Cisco uBR10012 universal broadband router, download an OOD Field Diagnostic image free of charge from the Cisco website and use it to test whether the line card problems are due to faulty hardware. You can run field diagnostic tests on the standby line card at any time without interrupting service. Testing the standby line card improves high availability of the system by ensuring the protect line card is ready for a switchover.

Field Diagnostic Image Information

A Field Diagnostic image is used to run diagnostic tests on a line card and is available from Cisco Technical Assistance Center (TAC). It is typically loaded onto the router, then from the router onto the line card to perform field diagnostic tests. After the field diagnostic testing is complete, the Field Diagnostic image must be unloaded off the line card to resume normal line card operation.

Note The Field Diagnostic image is a separate image that cannot function as a Cisco IOS image.

- The Field Diagnostic is available from Cisco TAC and it must first be downloaded onto one of the flash file systems of the router.

  After the Field Diagnostic image is placed on one of the flash file systems of the router, the Field Diagnostic image is downloaded onto the line card. When the Field Diagnostic image is downloaded onto a line card, the line card is automatically taken offline. Once field diagnostic testing is complete and the test results have been gathered, the Field Diagnostic image must be unloaded off the line card. Normal line card operation will resume automatically after the Field Diagnostic image has been unloaded off the line card.
- See the "Prerequisites for Online Offline Diagnostics" section on page 2 for a list of line cards that can be tested using the Field Diagnostic image.

Field Diagnostic Test Information

The individual field diagnostic and per port tests are not currently relevant for troubleshooting purposes unless field diagnostic tests are already run. If you want to run field diagnostic tests, we recommend you select one of the following tests:

- **All**: This test suite performs all available tests for the specified line card, including external loopback tests. This test should only be performed if a line card is cabled for external loopback testing.
- **Default**: This test suite performs all available tests for a specified line card except the external loopback tests. If no specific test is specified, the default test is performed automatically.
- **Basic**: This test suite detects majority of hardware failures and takes lesser time to run than the all or default test suites. The basic test will save time, but it does not completely test the line card hardware.

The estimated time required to run each type of line card is given in the Field Diagnostics release notes.

Individual tests are useful for verification testing purposes. For instance, if a default test suite is run and all the tests pass except test 5, test 5 can be run independently to verify the failure without having to run the entire test suite.

Benefits of Online Offline Diagnostics

The Online Offline Diagnostics feature provides the following benefits:

Improved Troubleshooting

Field Diagnostics verifies whether a line card problem is hardware-related or not. In cases where a problem is software-related, the Field Diagnostic image allows users to quickly rule out hardware problems as the cause and instead focus on fixing the software issue causing the problem.

Pre-installation Line Card Hardware Verification

Field Diagnostics verifies whether a line card has hardware problems before installing the line card in a Cisco uBR10012 universal broadband router.

Onsite Fault Detection

Field Diagnostics verifies whether a line card problem is due to a hardware fault. This helps to confirm if the problem is hardware-related and a line card needs to be returned.

Additional Uptime

Field Diagnostics ensure that line cards are not mistakenly taken offline when a problem is not hardware-related, thereby increasing network uptime.

How to Use Online Offline Diagnostics on a Cisco uBR10012 Router

This section describes the tasks that are performed to use Online Offline Field Diagnostics on the Cisco uBR10012 universal broadband router. The command-line interface (CLI) commands are used to complete the Field Diagnostic tasks.

See the following sections for the Field Diagnostic tasks:

Running a Field Diagnostic Test

The following sections provide the instructions for running a Field Diagnostic test on a line card after the Cisco IOS image has been successfully loaded on the router.

This section covers the following topics:

Verifying the Line Cards That Support the Field Diagnostic Image

To check which line cards in the Cisco uBR10012 universal broadband router that support Field Diagnostic testing, enter the **show diagnostic ood-status** command in the privileged EXEC mode.

SUMMARY STEPS

1. **enable**
2. **show diagnostic ood-status**

DETAILED STEPS

	Command or Action	Purpose
Step 1	**enable** **Example:** `Router> enable`	Enables privileged EXEC mode. • Enter your password if prompted.
Step 2	**show diagnostic ood-status** **Example:** `Router# show diagnostic ood-status`	Displays status information, such as the line card slot and name, Field Diagnostic image status, and overall results from previous diagnostic tests

Determining the Field Diagnostic Tests to Run

The following tests can be run on the line card:

- The **default** test suite should be the selected test suite in most testing cases.
- The **all** test suite should only be used if all the ports on the line card are ready for external loopback tests (in most cases, this means that all the ports have been cabled using external loopback cables).
- The **basic** test suite should only be used if time is critical and the line card cannot be down for more than a couple of minutes. The **basic** test suite is used when line cards are placed in the network for the first time, and users want to verify the hardware before it is placed onto the network.

Note When you are unsure of the test suite to run, use the **default** test suite.

Loading the Field Diagnostic Image onto a Line Card and Starting a Field Diagnostic Test

To begin field diagnostic testing on a line card, the Field Diagnostic image must be loaded from the FTP or TFTP server onto the line card to be tested.

Note The **show diag** command can be used to see the current Field Diagnostic image version. (The **show diag** command is not the **show diagnostic** command. Both these commands produce different outputs). The output for the **show diag** command displays information of all the line cards on the uBR10012 universal broadband router. In Cisco IOS Release 12.2(33)SCC, if the **show diag** command is used with *slot/subslot* argument, the command output displays information of the line card that has the Field Diagnostic image.

The following steps are required to download the Field Diagnostic image on to the line card:

Step 1 (Optional) Shut down the line card problem interface or interfaces using the **shut** command, if you think performance of the line card is impacting the performance of the entire system. This will ensure that the line card does not come back online after field diagnostic testing is complete.

Step 2 Load the Field Diagnostic image depending on whether you want to begin field diagnostic testing immediately or not. To begin field diagnostic testing immediately, follow the instructions in step a. below. To start testing after loading the image, or to run individual tests, or to run more than one test after having already run the first test, follow the directions in step b. below.

a. If you already know which field diagnostic test to run, enter the **diagnostic load subslot** *slot/subslot image-url* **autostart test** [**basic** | **default**] command. This command loads the Field Diagnostic image onto the line card and starts field diagnostic tests automatically.

Note The **per-port** and **all** test options were intentionally left off the explanation above. These options should not be used until the **default** test is run. However, these options will appear if the **?** help option is used. See the "Running a Per-Port or All Test" section on page 9 for information on running **per-port** and **all** tests.

In the following example, the Field Diagnostic image is downloaded from the assigned TFTP server on to the line card in subslot 8/1 and the default field diagnostic test suite is run:

```
Router# diagnostic load subslot 8/1
tftp://126.1.1.1/myfolder/ubr10k-fdiagsclc-mz.7.0.bin autostart test default
```

b. If you do not want to use **autostart** option, enter the **diagnostic load subslot** *slot/subslot image-url* command and ensure the **autostart** option is not entered.

The following example shows the Field Diagnostic image is loaded from the TFTP server on to the line card in subslot 8/1. Note that the Field Diagnostic image has only been loaded onto the line card; field diagnostic testing has not begun.

```
Router# diagnostic load subslot 8/1
tftp://126.1.1.1/mytftpfolder/folder/ubr10k-fdiagsclc-mz.7.0.bin
```

Note If the Field Diagnostic image is loaded onto a line card but no tests are being run, the line card is still offline and it cannot send and receive traffic. The diagnostic image has to be removed from the line card using the **diagnostic unload** command to resume normal line card operation.

Step 3 If field diagnostic testing was not autostarted or a second test needs to be run while the Field Diagnostic image is still loaded onto the line card, enter the **diagnostic start subslot** *slot/subslot* **test** command to begin field diagnostic testing on the line card.

See the "Running a Per-Port or All Test" section on page 9, for information on running **per-port** and **all** tests.

In the following example, a field diagnostic test with the default test suite is started on subslot 8/1. The example assumes that a Field Diagnostic image has been loaded onto the line card in subslot 8/1.

```
Router# diagnostic start subslot 8/1 test
```

Note The Field Diagnostic image should not be unloaded off the line card until the test results have been analyzed (see the "Analyzing Test Results" section on page 8). Normal line card operation will not resume until the Field Diagnostic image has been unloaded off the line card.

Checking the Testing Process

To verify whether the field diagnostic tests are running, use the **show diagnostic ood-status subslot** *slot/subslot* **detail** command.

Note Some individual tests require more time to run than others and the output to the console may take a while even if the tests are running properly.

Analyzing Test Results

Note Test results should be analyzed before unloading the Field Diagnostic image from the line card as some information cannot be gathered after unloading the Field diagnostic image. If you want to resume normal line card operation, analyze the test results, take the steps recommended in this section, and then unload the Field Diagnostic image. Normal line card operation cannot resume until the Field Diagnostic image is unloaded from the line card.

After the field diagnostic test is run, an overall test result is displayed on the console. It can be either pass or fail.

The overall results shown after executing the **show diagnostic result** and **show diagnostic ood-status** commands display the overall results of all previously run tests, and not just the most recently selected test or test suite. The overall test results of the **show diagnostic result** and **show diagnostic ood-status** commands are as follows:

Pass—This result indicates that there is no hardware related problem in the line card.

Minor Error—This result is only seen with per-port and all tests. This error indicates that the tested interface is faulty but the other interfaces on the line card are not.

Major Error—This result indicates a hardware problem with the entire line card and the line card should not be used.

Use the recommendations below to decide on how to proceed after running a Field Diagnostics test:

Fail Result

If a test fails, rerun the failed test or tests (not the entire test suite, just the test or tests that failed) by entering the **diagnostic start** *target* **test** *failed-test-id* command. This will confirm that the fail result is correct.

If the test fails again, copy messages on the console exactly as they appear and gather the output of the **show diagnostic result** and **show diagnostic result detail** commands and contact customer support.

Pass Result

Each one of these tests suggests performing an external loopback test as a final test step. The external loopback test is supported on most, but not all, interfaces.

To see if external loopback testing is supported on an interface, enter the **show diagnostic content** command and see if the L attribute is available for an individual test. For information on running an external loopback test, see "Reviewing Test Results" section on page 9.

- **All Test Pass**—If you get a pass result, recable the router, unload the Field Diagnostic image, and place the line card back online. The problem is likely not in the line card hardware.
- **Default Test Pass**—If you get a pass result, recable the router, unload the Field Diagnostic image, and place the line card back online.

  If your interface supports external loopback tests, you can test the line card further. To do so, attach an external loopback cable to the problem port (if the problem is in a particular port) or to all ports, and use the **diagnostic start subslot** *slot/subslot* **test per-port** *port-number* command to test the ports. If you are still getting a pass result or external loopback testing is not supported on the interface, recable the router, unload the Field Diagnostic image, and place the line card back online. The problem is likely not in the line card hardware.
- **Basic or Individual Test Pass**—If you get a pass result, you can place the line card online. If you want to run further tests after a basic test or individual tests, run a default test.

Running a Per-Port or All Test

The external loopback test is supported on some, but not all, interfaces. To see if external loopback testing is supported on an interface, enter the **show diagnostic content** command and see if the L attribute is available for an individual test.

For information on cabling DB-15 and RJ-45 connections for external loopback tests, see the *Hard Plug Loopback Tests for E1 Lines* document. Refer to Cisco documentation on loopback cabling for particular cables and connector types.

A per-port field diagnostic test is used to test a specific port for hardware problems. A per-port test should be run only after a default test has been run and no problems were found on the other line card components. The **all** test suite is a test suite that includes the default test as well as the per-port tests.

The **all** test suite should be run only if all of the interfaces are cabled with external loopback cables. Per-port tests utilize external loopbacks to test the interface hardware. In most, but not all cases, the interfaces tested must be cabled with external loopback cables before per-port or all testing can begin.

In the following example, a per-port test is run on port 1 of the line card in subslot 8/1:

```
Router# diagnostic start subslot 8/1 test per-port port 1
```

In the following example, all tests including all per-port diagnostic tests are run on the line card in subslot 8/1:

```
Router# diagnostic start subslot 8/1 test all
```

Reviewing Test Results

After completing a field diagnostic test, a message appears on the console indicating the overall test results. Additional **show** commands can be used to gather test results and events information.

Table 2 lists the commands required to gather additional information on diagnostic events and results.

Table 2 Field Diagnostic show Commands for Viewing Test Results

Command	Description
show diagnostic result [**all** | **subslot** *slot*/*subslot* **[detail]**]	Displays additional details on the diagnostic test results. For statistical information on each individual diagnostic test, use the **detail** option with this command. **Note** The output of the **show diagnostic result** command is erased when the Field Diagnostic image is removed from a line card. To retain test results, copy and paste the output the **show diagnostic result** command into a separate file before unloading the Field Diagnostic image.
show diagnostic status subslot *subslot* [**detail**]	Displays detailed status information, including the tests that are passed, failed, or were not run.
show diagnostic events [**event-type** {**error** | **info** | **warning**} {**subslot** *slot*/*subslot*]}	Displays the history of all field diagnostic events since the last system reload.

Removing a Field Diagnostic Image from a Line Card

Note To retain the results of a diagnostic test, copy and paste the **show diagnostic result** command output into a separate file before unloading the Field Diagnostic image.
The output of the **show diagnostic result** command cannot be gathered after unloading the Field Diagnostic image from the line card.

The **diagnostic unload subslot** *slot*/*subslot* command can be used to unload a Field Diagnostic image when a diagnostic test is not in progress. To unload a Field Diagnostic image while a test is in progress, use the **diagnostic stop subslot** *slot*/*subslot* command to stop the test, followed by the **diagnostic unload subslot** *slot*/*subslot* command to unload the Field Diagnostic image. Normal line card operation should resume after removing the Field Diagnostic image from the line card.

In the following example, the Field Diagnostic image is unloaded off the line card in subslot 8/1 and normal line card operation resumes. Note that the Field Diagnostic image unloading process does not begin until **y** is entered at the prompt to verify the operation.

```
Router# diagnostic unload subslot 8/1

 ************************************************************************
 WARNING:All Field Diagnostics test results and information will be
          unavailable to both the "show diagnostic result <target>" and
          "show diagnostic content <target>" commands.
          To save the test results, cancel the unloading process and enter
          the "show diagnostic result <target>" command. Copy the output
          into a file, then re-enter the "diagnostic unload <target>" command
          to restore normal line card operation.
 ************************************************************************

% Are you sure that you want to perform this operation? [no]:y
FDIAG [subslot 8/1]> Unloading the Field Diagnostics image and restoring the original
run-time image, please wait ...

FDIAG [subslot 8/1]> Field Diagnostics image was successfully unloaded
```

Specifying Testing Options

The following table provides a list of optional commands that can be entered before performing a field diagnostic test. None of these commands must be entered during a field diagnostic test and most test cases do not require these commands.

See the *Cisco IOS CMTS Command Reference* guide for additional information on the commands given in Table 3:

Table 3 Field Diagnostics Pre-Testing Options

Command	Description
diagnostic event-log size *event-size*	This global configuration command sets the size of the event table. The default *event-size* is 500.
diagnostic ondemand iterations *iteration-count*	This EXEC command sets the number of times each specified field diagnostic test is run when the **diagnostic load** command is used to start a field diagnostic test. The default *iteration-count* is 1.
diagnostic ondemand action-on-failure [**continue** *failure-limit* | **stop**]	This EXEC command sets the number of failed tests that can occur during a field diagnostic test before the entire series of tests is stopped. By default, the Field Diagnostic tests will run to completion even if a testing error occurs.

The following example shows how to change the size of the event table to 250. Note that the event table size is changed in global configuration mode.

```
Router# configure terminal
Router(config)# diagnostic event-log size 250
```

The following example shows how to change diagnostic on-demand settings and then verify the changed diagnostic on-demand settings.

```
Router# diagnostic ondemand iterations 2
Router# diagnostic ondemand action-on-failure stop
Router# show diagnostic ondemand settings

Test iterations = 2
Action on test failure = stop
```

Stopping an In-Progress Field Diagnostic Test

To stop an in-progress test, enter the **diagnostic stop subslot** *slot/subslot* command.

Note The **diagnostic stop** command can be entered at any time, even if a prompt is not present because the console is displaying diagnostic testing events. However, hitting **Enter** on your keyboard while a test is in progress displays a router prompt and enables entering the **diagnostic stop** command easily.

The following example shows a diagnostic test being started and then stopped:

```
Router# diagnostic start subslot 8/1 test basic

FDIAG [subslot 8/1]> Test ID(s) selected: 1-2,4,7,9-29,32-33

FDIAG [subslot 8/1]> Running Field Diagnostics [Iteration #1] ...
```

```
FDIAG [subslot 8/1]>         Running MPC8260 Register Test {ID=1} ...
FDIAG [subslot 8/1]>         MPC8260 Register Test {ID=1} passed

FDIAG [subslot 8/1]>         Running MPC8260 Timer Test {ID=2} ...
FDIAG [subslot 8/1]>         MPC8260 Timer Test {ID=2} passed

FDIAG [subslot 8/1]>         Running march_dram_64 {ID=4} ...

Router# diagnostic stop subslot 8/1
FDIAG [subslot 8/1]>         march_dram_64 {ID=4} passed

FDIAG [subslot 8/1]>         Testing is being aborted

FDIAG [subslot 8/1]> Total testing time = 00:00:05.500

FDIAG [subslot 8/1]> Field Diagnostics was successfully stopped
```

Verification Examples for Online Offline Diagnostics

This section describes sample verification examples used to verify Online Offline Diagnostics on a line card.

Verifying Field Diagnostic Support for a Line Card: Example

In the following example, **show diagnostic ood-status** command is used to check whether field diagnostic testing is supported on the line cards. The support for the Field Diagnostic image is listed in the FDiag Support column of the **show diagnostic ood-status** command output:

```
Router# show diagnostic ood-status

Load for five secs: 1%/0%; one minute: 2%; five minutes: 2%
Time source is hardware calendar, *06:00:19.575 EDT Thu Oct 22 2009

==== ======================== ======= ========== =========== ==============
                              FDiag   Loaded     Overall     Current
Slot Card Description         Support Image Type Diag Result Card State
---- ------------------------ ------- ---------- ----------- --------------
A    Active PRE2-RP           YES     IOS        N/A         ONLINE
B    Standby PRE2-RP          YES     N/A        N/A         OFFLINE
1    2jacket-1                YES     LCDOS      N/A         ONLINE
1    2cable-dtcc              NO      LCDOS      N/A         ONLINE
2/1  2cable-tccplus           NO      LCDOS      N/A         ONLINE
3/0  1gigethernet-hh-1        YES     LCDOS      N/A         ONLINE
3/1  1gigethernet-hh-1        YES     LCDOS      N/A         ONLINE
5/0  5cable-mc520h-d          YES     IOS        N/A         ONLINE
6/0  5cable-mc520h-d          YES     Field Diag N/A         RUNNING DIAG
8/1  5cable-mc520u-d          YES     IOS        N/A         ONLINE
==== ======================== ======= ========== =========== ==============
```

Displaying Detailed Test Results Run on a Line Card: Example

In the following sample output, the test results per line card is displayed when the **show diagnostic ood-status** command is used along with **subslot** and **detail** keywords. The output displays diagnostic status of the line card along with details of the tests being run and their status, on the line card.

```
Router# show diagnostic ood-status subslot 6/0 detail

==== ======================== ======= ========== =========== ==============
                              FDiag   Loaded     Overall     Current
Slot Card Description         Support Image Type Diag Result Card State
---- ------------------------ ------- ---------- ----------- --------------
6/0  5cable-mc520h-d          YES     Field Diag N/A         RUNNING DIAG
==== ======================== ======= ========== =========== ==============

 Detail testing progress for card in slot 6/0:

 Current card state: RUNNING DIAG
                                                        Test
 ID   Test Name              [Selected To Run (Y/N)] Status
 ==== ================================================ =======
   1) Lookout2 RW test ..................... [Y] Passed
   2) Lookout2 R/W Intr bits ............... [Y] Passed
   3) Lookout2 Reset test .................. [Y] Passed
   4) JIB2 PCI ID test ..................... [Y] Passed
   5) JIB2 Register read/write test ........ [Y] Passed
   6) JIB2 R/W Intr bits ................... [Y] Passed
   7) JIB2 Reset test ...................... [Y] Passed
   8) JIB2 ifa6 SDRAM Test ................. [Y] Running
   9) JIB2 ECC Disabled SDRAM Test ......... [Y] Not Run
  10) JIB2 Data Bus/Address SDRAM Test ..... [Y] Not Run
  11) JIB2 ifa6 SSRAM Test ................. [Y] Not Run
  12) JIB2 Data Bus/Address SSRAM Test ..... [Y] Not Run
 13) Mfpga R/W Intr bits ................... [Y] Not Run
  14) Mfpga Register read/write test ....... [Y] Not Run
  15) Mfpga Reset test..................... [Y] Not Run
  16) Internal Timer Test ................. [Y] Not Run
  17) Random Register Test ................ [Y] Not Run
  18) Processor Id Test ................... [Y] Not Run
  19) Ping Test ........................... [Y] Not Run
  20) Core2 Memory Access Test ............ [Y] Not Run
  21) L1 Cache Test ....................... [Y] Not Run
  22) core 2 L1 Cache Test ................ [Y] Not Run
  23) System DDR Test ..................... [Y] Not Run
  24) Local UART Port 0 Internal Loopback Test . [Y] Not Run
  25) Local UART Port 1 Internal Loopback Test . [Y] Not Run
  26) PCI Bridge R/W Test ................. [Y] Not Run
  27) PCI Bridge ID Test .................. [Y] Not Run
  28) DM Channel Test ..................... [Y] Not Run
  29) SMM665 Voltage Test ................. [Y] Not Run
  30) MarchingPattern_nvram ............... [Y] Not Run
  31) DataPins_nvram ...................... [Y] Not Run
```

Reviewing Test Results: Example

The following example shows how to display the result of the last Field Diagnostic test run on the line card 8/1. The output reveals which tests passed, failed, and were not run (untested).

```
Router# show diagnostic result all

Slot 8/1: 5cable-mc520s-d, 5 ports

  Overall diagnostic result: PASS

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

    1) Gt Internal Reg (R/W) Test ----------------> .
    2) GT Sys Ctrlr PCI ID Test ------------------> .
    3) GT PCI Conf Reg R/W Test ------------------> .
    4) Gt Counters Test --------------------------> .
    5) ifa6 Memory Test --------------------------> .
    6) busErrorTest ------------------------------> .
    7) midPlaneRegTest ---------------------------> .
    8) Processor Id Test -------------------------> .
    9) Internal Timer Test -----------------------> .
   10) Random Register Test ----------------------> .
(Additional output removed for readability)
```

The following output shows detailed information for each Field Diagnostic test on the line card 8/1:

```
Schooner# show diagnostic result all detail

Slot 8/1: 5cable-mc520s-d, 5 ports

  Overall diagnostic result: NOT AVAILABLE

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

  ____________________________________________________________________________

    1) Gt Internal Reg (R/W) Test ----------------> U

          Error code -----------------------------> 0 (DIAG_SUCCESS)
          Total run count ------------------------> 0
          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) GT Sys Ctrlr PCI ID Test ------------------> U

          Error code -----------------------------> 0 (DIAG_SUCCESS)
          Total run count ------------------------> 0
          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
  ____________________________________________________________________________
(Additional output removed for readability)
```

The following example shows how to display a list of previous diagnostic events with a brief description of each event.

```
Router# show diagnostic events

Diagnostic events (storage for 500 events, 18 events recorded)
Event Type (ET): I - Info, W - Warning, E - Error

Time Stamp         ET [Card] Event Message
------------------ -- ------------------------------------------------------
04/25 11:01:43.847 I  [1/1] Card detected: 2cable-tccplus, S/N:
04/25 11:01:51.991 I  [8/1] Card detected: 5cable-mc520s-d, S/N:N/A
04/25 11:40:36.163 I  [8/1] Loading Field Diag image into 5cable-mc520s-d
04/25 11:40:44.247 E  [8/1] Invalid URL for Field Diag image
04/25 11:49:02.003 I  [8/1] Card detected: 5cable-mc520s-d, S/N:N/A
04/25 12:01:31.451 I  [8/1] Loading Field Diag image into 5cable-mc520s-d
04/25 12:01:36.571 E  [8/1] Invalid URL for Field Diag image
04/25 12:02:44.799 I  [8/1] Loading Field Diag image into 5cable-mc520s-d
04/25 12:02:46.019 E  [8/1] Field Diag image has crashed during bootup
04/25 12:02:46.019 I  [8/1] Restoring original run-time image
04/25 12:02:46.799 E  [8/1] Invalid URL for Field Diag image
04/25 12:09:52.003 I  [8/1] Card detected: 5cable-mc520s-d, S/N:N/A
04/25 12:21:20.599 I  [8/1] Loading Field Diag image into 5cable-mc520s-d
04/25 12:21:22.599 E  [8/1] Invalid URL for Field Diag image
04/25 12:29:12.003 I  [8/1] Card detected: 5cable-mc520s-d, S/N:N/A
04/25 14:20:40.963 I  [8/1] Loading Field Diag image into 5cable-mc520s-d
04/25 14:21:46.059 I  [8/1] Field Diag image is loaded and booting
04/25 14:21:48.355 I  [8/1] Test list retrieval is completed
```

Additional References

The following sections provide references related to configure Online Offline Diagnostics:

Related Documents

Related Topic	Document Title
CMTS Command Reference	*Cisco IOS CMTS Cable Command Reference,* at the following URL: http://www.cisco.com/en/US/docs/ios/cable/command/reference/cbl_book.html
Cisco uBR10012 Universal Broadband Router Documentation	*Cisco uBR10012 Universal Broadband Router Hardware Installation Guide*, at the following URL: http://www.cisco.com/en/US/docs/cable/cmts/ubr10012/installation/guide/hig.html *Cisco uBR10012 Universal Broadband Router Software Configuration Guide*, at the following URL: http://www.cisco.com/en/US/docs/cable/cmts/ubr10012/configuration/guide/scg.html Cisco uBR10012 Universal Broadband Router Release Notes http://www.cisco.com/en/US/products/hw/cable/ps2209/prod_release_notes_list.html

Standards

Standard	Title
No new or modified standards are supported by this feature, and support for existing standards has not been modified by this feature.	—

MIBs

MIB	MIBs Link
No new or modified MIBs are supported by this feature, and support for existing MIBs has not been modified by this feature.	To locate and download MIBs for selected platforms, Cisco IOS releases, and feature sets, use Cisco MIB Locator found at the following URL: http://www.cisco.com/go/mibs

RFCs

RFC	Title
No new or modified RFCs are supported by this feature, and support for existing RFCs has not been modified by this feature.	—

Technical Assistance

Description	Link
The Cisco Support and Documentation website provides online resources to download documentation, software, and tools. Use these resources to install and configure the software and to troubleshoot and resolve technical issues with Cisco products and technologies. Access to most tools on the Cisco Support and Documentation website requires a Cisco.com user ID and password.	http://www.cisco.com/cisco/web/support/index.html

Feature Information for Online Offline Diagnostics on the Cisco uBR10012 Router

Table 4 lists the release history for this feature.

Use Cisco Feature Navigator to find information about platform support and software image support. Cisco Feature Navigator enables you to determine which software images support a specific software release, feature set, or platform. To access Cisco Feature Navigator, go to http://www.cisco.com/go/cfn. An account on Cisco.com is not required.

Note Table 4 lists only the Cisco IOS software release that introduced support for a given feature in a given Cisco IOS software release. Unless noted otherwise, subsequent releases of that Cisco IOS software release also support that feature.

Table 4 Feature Information for Online Offline Diagnostics

Feature Name	Releases	Feature Information
Online Offline Diagnostics	12.2(33)SCA and 12.2(33)SCB	Online Offline Diagnostics - Field Diagnostics is supported on the Cisco uBR10-MC5X20S/U cable interface line card. The following commands were introduced or modified: • **diagnostic event-log size** • **diagnostic load** • **diagnostic ondemand action-on-failure** • **diagnostic ondemand iterations** • **diagnostic start** • **diagnostic stop** • **diagnostic unload** • **show diagnostic content** • **show diagnostic events** • **show diagnostic ondemand settings** • **show diagnostic result** • **show diagnostic status** • **show diag**
Online Offline Diagnostics	12.2(33)SCC	Online Offline Diagnostics - Field Diagnostics is supported on the Cisco uBR10-MC5X20H cable interface line card. The following commands were introduced or modified: • **show diagnostic ood-status** • **show diag**
Online Offline Diagnostics	12.2(33)SCF	Online Offline Diagnostics - Field Diagnostics is supported on the Cisco UBR-MC20X20V cable interface line card.