



Field Diagnostics for the Cisco 12000 Series Internet Router

Feature History

Release	Modification
11.2 GS	Feature was introduced to the Cisco 12000 Series Internet Router.
12.0(22)S	Line card diagnostic image was separated from IOS software image.
12.0(25)S	Update FPGA option was added to the field diagnostics.
12.0(31)S	Limitation regarding the master clock and scheduler card (CSC1) location and availability required before running the field diagnostics was added.

The command line interface for the field diagnostics for the Cisco 12000 Series Internet Routers is described in the following sections:

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Feature Overview

Field diagnostics are available for the Cisco 12000 Series Internet Router to help you isolate faulty hardware to the level of a field-replaceable unit (FRU). To run field diagnostics, the slot being tested is taken offline, while the rest of the cards in the chassis continue to operate normally. After you identify the faulty unit, you can replace it with a spare unit.

Field diagnostics are not designed to identify specific components within the router. They simply determine whether a particular card is operational or defective.



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Starting with IOS 12.0(22)S, Cisco Systems has unbundled the Cisco 12000 Series Internet Router field diagnostics line card image from the IOS image. In earlier versions, diagnostics could be launched from the command line and the embedded image would be launched. To accommodate customers with 20-MB Flash memory cards, line card field diagnostics are now stored and maintained as a separate image that must be available on a Flash memory card or a TFTP boot server before the field diagnostics commands can be used. Router processor and switch fabric field diagnostics continue to be bundled and need not be launched from a separate image. Note that the clock and scheduler card (CSC1) of the appropriate Cisco 12000 Series Internet Router (the default master) must be active in order to run the router processor or switch fabric field diagnostics.

Benefits

The modified field diagnostics offer the following benefits:

In-Service Testing

Field diagnostics can be run on an in-service router running Cisco IOS and only take the card being tested out of service. The tested card is returned to normal operation if the diagnostic tests pass. If there is a hardware fault, the card remains out of service after the testing is completed.

Smaller IOS Image

To accommodate customers with 20-MB Flash memory cards, the line card field diagnostics are stored and maintained as a separate image that must be available on a Flash memory card or a TFTP boot server.

Easy Access to Most Current Diagnostics Software

Since the field diagnostics software is now maintained as a separate image, the most recent version is always available on Cisco.com, without regard to the Cisco IOS software version currently in use.

Related Documents

For more information on Cisco 12000 Series Internet Routers, refer to the installation and configuration guide for your router.

Supported Platforms

The modified field diagnostics commands are supported on all Cisco 12000 Series Internet Routers.

Availability of Cisco IOS Software Images

Platform support for particular Cisco IOS software releases is dependent on the availability of the software images for those platforms. Software images for some platforms may be deferred, delayed, or changed without prior notice. For updated information about platform support and availability of software images for each Cisco IOS software release, refer to the online release notes.

Supported Standards, MIBs, and RFCs

None.

Prerequisites

Before you can use the line card field diagnostics commands, you must place a valid diagnostics image on a separate Flash memory card installed in the Cisco 12000 Series Internet Router to be tested or on a TFTP boot server.

The diagnostics image is named **c12k-fdiagsbflc-mz.120-25.S** and is always available on Cisco.com. 120-25.S is the version number of the image that corresponds to the Cisco IOS image, in this example: 12.0(25)S.

**Caution**

All Cisco Systems field diagnostics images available on Cisco.com are backwards compatible with any Cisco IOS 12.0(22)S software release and onward. Cisco strongly recommends always using the latest available field diagnostics image from Cisco.com for testing and verifying line cards.

Configuration Tasks


Upgrading the FPGA Image on a Line Card

If a line card does not boot and you receive an error message indicating that there is a problem with the field-programmable gate array (FPGA) image, or if the line card alphanumeric LED display remains frozen in IOS STRT state, you need to upgrade the FPGA image using the **diag** command.

**Note**

When the Cisco IOS image boots, it verifies that a compatible FPGA image is running on the router. The major version number of the FPGA image must be the same as that expected by the Cisco IOS image; the minor version number on the FPGA image must be the same as or greater than the minor version number expected by the Cisco IOS image. For example, if the Cisco IOS image expects a minimum FPGA image of 03.02, the software will verify that the actual major version number of the FPGA image in the line card bootflash is 03, and that the minor version number is 02 or above.

To upgrade the FPGA image on a line card, follow these steps:

	Command	Purpose
Step 1	Router> enable Password: <password>	Enters privileged EXEC mode.
Step 2	Router# diag slot-number update-fpga source {tftp flash} <i>source-path</i>	<p>Updates flash memory with field-programmable gate array (FPGA) image(s) from the current field diagnostics download image.</p> <p>The name of the image file is c12k-fdiagsbflc-mz.120-25.S where 120-25.S is the version number. For Flash cards, the source path would typically be slot0:c12k-fdiagsbflc-mz.120-25.S or slot1:c12k-fdiagsbflc-mz.120-25.S. The TFTP source path would typically be: tftp://tftp_server_ip_address/my_directory/c12k-fdiagsbflc-mz.120-25.S.</p> <p> Note Do not unplug the line card or terminate the field diagnostics session during this test.</p>

Command Reference

This section documents the new **diag** command. All other commands used with this feature are documented in the [Cisco IOS Master Command List](#) publications.

diag

To perform field diagnostics on a line card, Route Processor card (RP), including both the Performance Route Processor (PRP) and Gigabit Route Processor (GRP), Switch Fabric Card (SFC), or Clock Scheduler Card (CSC) in Cisco 12000 Series Internet Routers, use the **diag** command in privileged EXEC configuration mode. To halt a running field diagnostic session on a line card or RP, use the **diag halt** form of this command.

Cisco 12000 Series Internet Router Line Cards

```
diag slot-number source {tftp | flash} source-path [verbose] [wait] [full] [coe]
[dl-timeout-plus <1-2000>] [ind-test-timeout-plus <seconds>] [test-timeout-plus
<seconds>] [device <device_id>] [messaging <value>]
```

```
diag slot-number previous
```

```
diag slot-number halt
```

```
diag slot-number update-fpga source {tftp | flash} source-path [dl-timeout-plus <1-2000>]
```

Cisco 12000 Series Internet Router RPs

```
diag slot-number [verbose] [wait] [full] [coe] [messaging <value>]
```

```
diag slot-number previous
```

```
diag slot-number halt
```

Cisco 12008, Cisco 12012, and Cisco 12016 SFCs and CSCs

```
diag slot-number [verbose]
```

Syntax Description

<i>slot-number</i>	Slot number of the card you want to test.
source	Specifies that the source path of the line card diagnostic image follows. This keyword must be followed by either the tftp or flash keyword.
tftp	Specifies that the source of the diagnostic image is a TFTP server. This keyword must be followed by the <i>source-path</i> .
flash	Specifies that the source of the diagnostic image is a Flash memory card. This keyword must be followed by the <i>source-path</i> .
<i>source-path</i>	Path to the diagnostic image. The name of the image file is c12k-fdiagsbflc-mz.120-25.S , where 120-25.S corresponds to Cisco IOS image 12.0(25)S. For Flash cards, the source path would typically be slot0:c12k-fdiagsbflc-mz.120-25.S or slot1:c12k-fdiagsbflc-mz.120-25.S . The TFTP source path would typically be: tftp://tftp_server_ip_address/my_directory/c12k-fdiagsbflc-mz.120-25.S . This option is available and required for line card testing only.
halt	(Optional) Stops the field diagnostic testing on the line card. This option is only available for line cards and RPs.
previous	(Optional) Displays previous test results (if any) for the card.

verbose	(Optional) Enables progress and error messages to be displayed on the console. By default, only the minimum status messages are displayed on the console, along with the final result. Due to the comprehensive nature of diagnostic testing, invoking the command without the verbose option will result in a delay before any results are displayed. This delay depends upon the target card: RPs can take upto 15 minutes before displaying their banner and then another 15-60 minutes before displaying the final RP status, while LCs can take upto 5 minutes before display their banner and 30-120 minutes before display the final LC status. To avoid these long command silences, Cisco recommends that the verbose option be used to provide visual feedback that diagnostics is running, moreover Cisco requires these results when communicating with Cisco TAC.
wait	(Optional) Stops the automatic reloading of the Cisco IOS software on the line card after the successful completion of the field diagnostic testing. If you use this keyword, you must use the microcode reload slot global configuration command, or manually remove and insert the line card (to power it up) in the slot so that the RP recognizes the line card and downloads the Cisco IOS software image to the line card. This option is supported by field diags on the standby RP. When the standby RP is held offline with this parameter, the router is at risk due to no RP redundancy.
coe	(Optional) Continue On Error. Normally the field diagnostics stop immediately upon failing any one test within a test session. Using the coe keyword forces the testing to continue to the end of the internal test list, even if a failure occurs. Caution should be exercised because in some cases where a cascade of failures is found, using this option MAY require the router to be reloaded, affecting all RPs and line cards. This option is only available for line cards and RPs.
full	(Optional) The default set of tests emphasize memory and data path tests. To force the line card or RP to complete the most extensive set of tests, use the full option. The test time will be slightly longer. This option is only available for line cards and RPs.
dl-timeout-plus <1-2000 seconds>	(Optional) Allows you to manipulate the download timeout value. 300 seconds is the baseline value. Any value from 1 to 2000 adds that value to 300. For example, a dl-timeout-plus value of 12 makes the total value 312 seconds. Supports users with slow TFTP boot paths.
ind-test-timeout-plus lus <seconds>	(Optional) Allows you to manipulate the per-test timeout value. 13 minutes is the baseline value. Each test is allowed a set amount of time to complete. If the test does not complete within the timeout period, the card is assumed to have entered an infinite loop, or some other lockup, and declare the board as timed out and failed.
test-timeout-plus <seconds>	(Optional) Allows you to manipulate the total test timeout value. 90 minutes is the baseline value. A certain amount of time is allowed for all tests on a single card to complete. If the test does not complete within the timeout period, the card is assumed to have entered an infinite loop, or some other lockup, and declare the board as timed out and failed.

device <device_id>	(Optional) Allows you to identify the device to run field diags, where <device_id> can be one of the following: 0: (default) means run against everything in the slot 1: means run against the LC only 2: means run against bay 0 only 3: means run against bay 1 only 4: means run against bay 2 only 5: means run against bay 3 only
update-fpga	(Optional) Updates flash memory with field-programmable gate array (FPGA) image(s) from the current field diagnostics download image. This option limits the field diagnostics session to one task; updating the FPGA images in flash memory on the line card. No other testing is performed during this session. This option updates ALL FPGA images in flash memory. This process is non-selective in cases where a line card contains multiple FPGAs. DO NOT unplug the line card or terminate the field diagnostics session during this test.
messaging <value>	Provides additional troubleshooting information.

Defaults

No default behavior or values.

Command Modes

Privileged EXEC

Command History

Release	Modification
11.2 GS	This command is added to support Cisco 12000 Series Internet Routers.
12.0(22)S	The source command is added.
12.0(23.2)S	The dl-timeout-plus <1-2000 seconds> option is added.
12.0(25)S	The update-fpga option is added.

Usage Guidelines

Before you can use the line card field diagnostics commands, you must place a valid diagnostics image on a separate Flash memory card installed in the Cisco 12000 Series Internet Router to be tested or on a TFTP boot server. The diagnostics image is named **c12k-fdiagsbflc-mz.120-25.S** (where 120-25.S is the version number corresponding to Cisco IOS release 12.0(25)S) and is always available on Cisco.com.

RP, SFC, and CSC field diagnostics are embedded within the IOS image and thus do not require an external image.

Field diagnostics cannot be run on the PRP-2 unless you are using Cisco IOS release 12.0(30)S or higher.

**Note**

While testing the line cards, it is required that all the interfaces running on all the line cards must be disconnected to avoid risk having false failures or diagnostics traffic being leaked out of the interface.

The diagnostics software prompts you for confirmation before altering the router configuration. For example, running diagnostics on an SFC or CSC will cause the fabric to go from full bandwidth to one-quarter bandwidth. Bandwidth is not affected by RP or line card diagnostics.

Perform diagnostics on the CSC only if a redundant CSC is in the router. Diagnostics can be performed on redundant RPs only. Currently SFC and CSC testing is not available for Cisco 12400 Series Internet Routers.


Caution

Performing field diagnostics on a line card stops all activity on the line card. Before the **diag** command begins running diagnostics, you are prompted to confirm the request to perform field diagnostics on the line card.


Note

Perform field diagnostics only on one slot at a time. Do not perform field diagnostics on multiple slots at the same time. Running on multiple slots at the same time can lead to false test failures.

In normal mode, if a test fails, the title of the failed test is displayed on the console. However, not all tests that are performed are displayed. To view all performed tests, use the **verbose** keyword.

After all diagnostic tests are completed on the line card, a PASSED or TEST FAILURE message is displayed. If the line card sends a PASSED message, the Cisco IOS software image on the line card is automatically reloaded unless the **wait** keyword is specified. If the line card sends a TEST FAILURE message, the Cisco IOS software image on the line card is not automatically reloaded.

If you want to reload the line card after it fails diagnostic testing, use the microcode **reload slot** global configuration command or **hw-module reload** command.


Note

When you stop the field diagnostic test using the **diag halt** command, the line card remains down (in other words, in an unbooted state). Generally, you would stop testing in order to remove or replace the line card. If this is not the case, and you need to bring the line card back up (online), use the microcode **reload** global configuration command or power cycle the line card.

If the line card fails the test, the line card is defective and should be replaced. Under certain circumstances, TAC engineers may direct you to replace field-replaceable memory modules and retest. This should **ONLY** be done under the guidance of a TAC engineer. For example, if the DRAM test failed, a customer might only need to replace the DRAM on the line card.

For more information, refer to the appropriate Cisco 12000 Series Internet Router installation and configuration guide.

Examples

The following example shows the output when field diagnostics are performed on the line card in slot 5. After the line card passes all field diagnostic tests, the Cisco IOS software is automatically reloaded on the card. Before starting the diagnostic tests, you must confirm the request to perform these tests on the line card because all activity on the line card is halted. The *total/indiv. timeout set to 5400/780 sec.* message indicates that 5400 seconds are allowed to perform all field diagnostics tests, and that no single test should exceed 780 seconds to complete.

```
f-diag-5-6# diag 5 source tftp tftp://223.255.254.254/image/c12k-fdiagsbflc-mz.120-32.S9
Running DIAG config check
Fabric Download for Field Diags chosen: If timeout occurs, try 'mbus' option.
Running Diags will halt ALL activity on the requested slot. [confirm]
f-diag-5-6#
Launching a Field Diagnostic for slot 5
```



```

*Feb 26 03:27:48.999: %F_DIAG-5-FDIAG_START: Field diags starting on slot 5
*Feb 26 03:27:48.999: %F_DIAG-5-FDIAG_DL_START: Field diags downloading to slot 5 via the
fabric.
Loading image/c12k-fdiagsbflc-mz.120-32.S9 from 223.255.254.254 (via Ethernet0):
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
[OK - 21454616 bytes]

FD 5> *****
FD 5> GSR IOS Field Diagnostics v7.11.0.0-LC
FD 5>
FD 5> Compiled by jrr on Mon Mar 24 09:36:01 PDT 2008
FD 5>
FD 5> gsr view: REL-FDIAGS
FD 5>         Frozen-Time: 07-Mar-2008.13:52:53UTC-08:00
FD 5> spa view: REL-FDIAGS_SPA
FD 5>         Frozen-Time: 06-Mar-2008.19:23:38UTC-08:00
FD 5> ids version: ids3_rel_2.7
FD 5> *****
Executing all diagnostic tests in slot 5
(total/individ. timeout set to 5400/780 sec.)
FD 5> BFR_CARD_TYPE_1P_GE found
FD 5> Available test types 0x2
FD 5>         0x1
FD 5> Completed f_diags_board_discovery() (0x2)
FD 5> Test list selection received: Test ID 1, Device 0
FD 5> Reminder, CLI option "device": uses 0 for all, 1 for SIP, 2 for bay 0, 3 for bay 1,
etc.
FD 5> running in slot 5 (72 tests from test list ID 1)
FD 5> Just into idle state
*Feb 26 03:29:07.859: %F_DIAG-5-FDIAG_DL_DONE: Field diags download completed on slot 5.
Status: DL done.
FD 5> 3.3V      5V      MBUS 5V  Hot Sensor  Inlet Sensor
FD 5> (mv)      (mv)      (mv)    (deg C)    (deg C)
FD 5> 3272     5016     5040    30.5       28.0
FD 5> Displaying Environmental information
FD 5> 3.3V      5V      MBUS 5V  Hot Sensor  Inlet Sensor
FD 5> (mv)      (mv)      (mv)    (deg C)    (deg C)
FD 5> 3272     5016     5048    30.5       28.0
FD 5>
FD 5> Displaying Test Result Summary
FD 5>
FD 5>           Passed   Failed   Skipped
FD 5>          - - - - - - - - - - - - - - - -
FD 5> Main Card         72         0         0
FD 5>
Field Diagnostic ****PASSED**** for slot 5

Shutting down diags in slot 5

Board will reload
*Feb 26 03:32:44.975: %F_DIAG-5-FDIAG_DONE: Field diags completed for slot 5
SLOT 5:00:00:09: %SYS-5-RESTART: System restarted --
Cisco Internetwork Operating System Software
IOS (tm) GS Software (GLC1-LC-M), Experimental Version 12.0(20080325:174412)
[jrr-v120_32_s_throttle 114]
Copyright (c) 1986-2008 by cisco Systems, Inc.
Compiled Wed 26-Mar-08 14:07 by jrr

```

The following example shows the output of a line card test with the **verbose** option specified (highly recommended).

```

f-diag-9-11# diag 4 verbose source tftp
tftp://223.255.254.254/image/c12k-fdiagsbflc-mz.120-32.S9
Running DIAG config check

```

Fabric Download for Field Diags chosen: If timeout occurs, try 'mbus' option.

Verbose mode: Test progress and errors will be displayed

Running Diags will halt ALL activity on the requested slot.[confirm]

f-diag-9-11#

Launching a Field Diagnostic for slot 4

01:20:34: %F_DIAG-5-FDIAG_START: Field diags starting on slot 4

01:20:34: %F_DIAG-5-FDIAG_DL_START: Field diags downloading to slot 4 via the fabric.

01:20:34: %SPA_OIR-6-OFFLINECARD: SPA (SPA-8XOC12-POS) offline in subslot 4/0

01:20:34: %SPA_OIR-6-OFFLINECARD: SPA (SPA-8XOC3-POS) offline in subslot 4/1

Loading image/c12k-fdiagsbflc-mz.120-32.S9 from 223.255.254.254 (via Ethernet0):

!!!!!!....

[OK - 21453920 bytes]

FD 4> *****

FD 4> GSR IOS Field Diagnostics v7.12.0.0-LC

FD 4>

FD 4> Compiled by jrr on Mon Apr 14 12:27:13 PDT 2008

FD 4>

FD 4> gsr view: REL-FDIAGS_IOS

FD 4> Frozen-Time: 11-Apr-2008.01:57:03UTC-07:00

FD 4> spa view: REL-FDIAGS_IOS_SPA

FD 4> Frozen-Time: 08-Apr-2008.23:38:52UTC-07:00

FD 4> ids version: ids3_rel_2.7

FD 4> *****

FD 4> CSC Type:0x90, Full Fabric Mask:0x7f, Primary CSC:CSC_1(0x2), Fia Config:0x7

Executing all diagnostic tests in slot 4

(total/individ. timeout set to 5400/780 sec.)f

FD 4> Scanning SPA Bays ...

01:22:10: %F_DIAG-5-FDIAG_DL_DONE: Field diags download completed on slot 4. Status: DL done.

FD 4> BFR_CARD_TYPE_E192_CEC_V2 found

FD 4> Spa0 (0x404) 8xOC12 (Gladiator) found...

FD 4> Spa1 (0x505) 8xOC3 (Gladiator) found...

FD 4> Spa2 (0x0) empty skipping...

FD 4> Spa3 (0x0) empty skipping...

FD 4> Available test types 0x2

FD 4> 0x1

FD 4> Completed f_diags_board_discovery() (0x39)

FD 4> Verbosity now (0x00000211) TESTSDISP FATL IDSPRINTF

FD 4> Test list selection received: Test ID 1, Device 0

FD 4> Reminder, CLI option "device": uses 0 for all, 1 for SIP, 2 for bay 0, 3 for bay 1, etc.

FD 4> running in slot 4 (159 tests from test list ID 1)

FDIAG_STAT_IN_PROGRESS(4): test #1 R5K Internal Cache

FDIAG_STAT_IN_PROGRESS(4): test #2 Burst Operations

FDIAG_STAT_IN_PROGRESS(4): test #3 Subblock Ordering

FDIAG_STAT_IN_PROGRESS(4): test #4 P4/EEPROM Clock Speed Matching

FDIAG_STAT_IN_PROGRESS(4): test #5 Dram Datapins

FDIAG_STAT_IN_PROGRESS(4): test #6 WATERWOLF Registers

FDIAG_STAT_IN_PROGRESS(4): test #7 Waterwolf Interrupt

FDIAG_STAT_IN_PROGRESS(4): test #8 STINGRAY to WATERWOLF Command Parity

FDIAG_STAT_IN_PROGRESS(4): test #9 STINGRAY to WATERWOLF Data Parity

FDIAG_STAT_IN_PROGRESS(4): test #10 RX WAHOO to WATERWOLF Head/Tail Ready Parity

FDIAG_STAT_IN_PROGRESS(4): test #11 Sockeye Asic Registers

FDIAG_STAT_IN_PROGRESS(4): test #12 Salsa Dram Access

FDIAG_STAT_IN_PROGRESS(4): test #13 Salsa P4 Timeout

FDIAG_STAT_IN_PROGRESS(4): test #14 Salsa Asic General Purpose Counter

FDIAG_STAT_IN_PROGRESS(4): test #15 Picante Asic Real Time Interrupt

FDIAG_STAT_IN_PROGRESS(4): test #16 Salsa Errors

FDIAG_STAT_IN_PROGRESS(4): test #17 Salsa Dram Read Around Write

FDIAG_STAT_IN_PROGRESS(4): test #18 Salsa Prefetch/Write Buffers

FDIAG_STAT_IN_PROGRESS(4): test #19 SALSA Asic Write Buffers

FDIAG_STAT_IN_PROGRESS(4): test #20 Sockeye To Piranha Fcram Read Around Write

FDIAG_STAT_IN_PROGRESS(4): test #21 Sockeye to Stingray Fcram Read Around Write

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FDIAG_STAT_IN_PROGRESS(4): test #22 Fishstick Registers
FDIAG_STAT_IN_PROGRESS(4): test #23 Superfish Registers
FDIAG_STAT_IN_PROGRESS(4): test #24 Superfish TFIA Internal Cell FIFO Memtest
FDIAG_STAT_IN_PROGRESS(4): test #25 Superfish TFIA To FFIA Packet Test
FDIAG_STAT_IN_PROGRESS(4): test #26 Superfish TFIA To FFIA Fabric Packet Test
FDIAG_STAT_IN_PROGRESS(4): test #27 RX WAHOO Asic Registers Test
FDIAG_STAT_IN_PROGRESS(4): test #28 RX WAHOO Forwarding TCAM Registers
FDIAG_STAT_IN_PROGRESS(4): test #29 RX WAHOO Netflow TCAM Registers
FDIAG_STAT_IN_PROGRESS(4): test #30 RX WAHOO Classification TCAM Registers
FDIAG_STAT_IN_PROGRESS(4): test #31 RX NFTCAM Masks Cell Datapins
FDIAG_STAT_IN_PROGRESS(4): test #32 RX NFTCAM Value Cell Datapins
FDIAG_STAT_IN_PROGRESS(4): test #33 RX CTCAM Masks Cell Datapins
FDIAG_STAT_IN_PROGRESS(4): test #34 RX CTCAM Value Cell Datapins
FDIAG_STAT_IN_PROGRESS(4): test #35 RX WAHOO CTC SRAM Datapins
FDIAG_STAT_IN_PROGRESS(4): test #36 RX WAHOO FTCAM 72 bit lookup
FDIAG_STAT_IN_PROGRESS(4): test #37 RX WAHOO FTCAM 144 bit lookup
FDIAG_STAT_IN_PROGRESS(4): test #38 RX WAHOO FTCAM 288 bit lookup
FDIAG_STAT_IN_PROGRESS(4): test #39 RX WAHOO NFTCAM 72 bit lookup
FDIAG_STAT_IN_PROGRESS(4): test #40 RX WAHOO NFTCAM 144 bit lookup
FDIAG_STAT_IN_PROGRESS(4): test #41 RX WAHOO NFTCAM 288 bit lookup
FDIAG_STAT_IN_PROGRESS(4): test #42 RX WAHOO CTCAM 72 bit lookup
FDIAG_STAT_IN_PROGRESS(4): test #43 RX WAHOO CTCAM 144 bit lookup
FDIAG_STAT_IN_PROGRESS(4): test #44 RX WAHOO CTCAM 288 bit lookup
FDIAG_STAT_IN_PROGRESS(4): test #45 RX WAHOO FTCAM Masks Cell March
FDIAG_STAT_IN_PROGRESS(4): test #46 RX WAHOO FTCAM Value Cell March
FDIAG_STAT_IN_PROGRESS(4): test #47 RX WAHOO NFTCAM Masks Cell March
FDIAG_STAT_IN_PROGRESS(4): test #48 RX WAHOO NFTCAM Value Cell March
FDIAG_STAT_IN_PROGRESS(4): test #49 RX WAHOO CTCAM Masks Cell March
FDIAG_STAT_IN_PROGRESS(4): test #50 RX WAHOO CTCAM Value Cell March
FDIAG_STAT_IN_PROGRESS(4): test #51 RX WAHOO CTC SRAM March
FDIAG_STAT_IN_PROGRESS(4): test #52 RX WAHOO CBSRAM Marching Pattern
FDIAG_STAT_IN_PROGRESS(4): test #53 RX WAHOO CBSRAM Datapins
FDIAG_STAT_IN_PROGRESS(4): test #54 RX WAHOO CTC parity
FDIAG_STAT_IN_PROGRESS(4): test #55 RX WAHOO FCRAM/RLDRAM Datapins Test
FDIAG_STAT_IN_PROGRESS(4): test #56 RX WAHOO FCRAM/RLDRAM Indirect Access
FDIAG_STAT_IN_PROGRESS(4): test #57 RX WAHOO FCRAM/RLDRAM Marching Pattern
FDIAG_STAT_IN_PROGRESS(4): test #58 RX WAHOO FSRAM Datapins Test
FDIAG_STAT_IN_PROGRESS(4): test #59 RX WAHOO CSSRAM Datapins Test
FDIAG_STAT_IN_PROGRESS(4): test #60 RX WAHOO NSRAM Datapins Test
FDIAG_STAT_IN_PROGRESS(4): test #61 RX WAHOO FSRAM Marching Pattern
FDIAG_STAT_IN_PROGRESS(4): test #62 RX WAHOO CSSRAM Marching Pattern
FDIAG_STAT_IN_PROGRESS(4): test #63 RX WAHOO NSRAM Marching Pattern
FDIAG_STAT_IN_PROGRESS(4): test #64 RX WAHOO Tune Bits Test
FDIAG_STAT_IN_PROGRESS(4): test #65 PLIM to RX WAHOO Command Parity
FDIAG_STAT_IN_PROGRESS(4): test #66 PLIM to RX WAHOO Data Parity
FDIAG_STAT_IN_PROGRESS(4): test #67 TX WAHOO Asic Registers Test
FDIAG_STAT_IN_PROGRESS(4): test #68 TX WAHOO Forwarding TCAM Registers
FDIAG_STAT_IN_PROGRESS(4): test #69 TX WAHOO Netflow TCAM Registers
FDIAG_STAT_IN_PROGRESS(4): test #70 TX WAHOO Classification TCAM Registers
FDIAG_STAT_IN_PROGRESS(4): test #71 TX FTCAM Masks Cell Datapins
FDIAG_STAT_IN_PROGRESS(4): test #72 TX FTCAM Value Cell Datapins
FDIAG_STAT_IN_PROGRESS(4): test #73 TX NFTCAM Masks Cell Datapins
FDIAG_STAT_IN_PROGRESS(4): test #74 TX NFTCAM Value Cell Datapins
FDIAG_STAT_IN_PROGRESS(4): test #75 TX CTCAM Masks Cell Datapins
FDIAG_STAT_IN_PROGRESS(4): test #76 TX CTCAM Value Cell Datapins
FDIAG_STAT_IN_PROGRESS(4): test #77 TX WAHOO CTC SRAM Datapins
FDIAG_STAT_IN_PROGRESS(4): test #78 TX WAHOO FTCAM 72 bit lookup
FDIAG_STAT_IN_PROGRESS(4): test #79 TX WAHOO FTCAM 144 bit lookup
FDIAG_STAT_IN_PROGRESS(4): test #80 TX WAHOO FTCAM 288 bit lookup
FDIAG_STAT_IN_PROGRESS(4): test #81 TX WAHOO NFTCAM 72 bit lookup
FDIAG_STAT_IN_PROGRESS(4): test #82 TX WAHOO NFTCAM 144 bit lookup
FDIAG_STAT_IN_PROGRESS(4): test #83 TX WAHOO NFTCAM 288 bit lookup
FDIAG_STAT_IN_PROGRESS(4): test #84 TX WAHOO CTCAM 72 bit lookup
FDIAG_STAT_IN_PROGRESS(4): test #85 TX WAHOO CTCAM 144 bit lookup

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FDIAG_STAT_IN_PROGRESS(4): test #86 TX WAHOO CTCAM 288 bit lookup
FDIAG_STAT_IN_PROGRESS(4): test #87 TX WAHOO FTCAM Masks Cell March
FDIAG_STAT_IN_PROGRESS(4): test #88 TX WAHOO FTCAM Value Cell March
FDIAG_STAT_IN_PROGRESS(4): test #89 TX WAHOO NFTCAM Masks Cell March
FDIAG_STAT_IN_PROGRESS(4): test #90 TX WAHOO NFTCAM Value Cell March
FDIAG_STAT_IN_PROGRESS(4): test #91 TX WAHOO CTCAM Masks Cell March
FDIAG_STAT_IN_PROGRESS(4): test #92 TX WAHOO CTCAM Value Cell March
FDIAG_STAT_IN_PROGRESS(4): test #93 TX WAHOO CTC SRAM March
FDIAG_STAT_IN_PROGRESS(4): test #94 TX WAHOO CBSRAM Marching Pattern
FDIAG_STAT_IN_PROGRESS(4): test #95 TX WAHOO CBSRAM Datapins
FDIAG_STAT_IN_PROGRESS(4): test #96 TX WAHOO CTC parity
FDIAG_STAT_IN_PROGRESS(4): test #97 TX WAHOO FCRAM/RLDRAM Datapins Test
FDIAG_STAT_IN_PROGRESS(4): test #98 TX WAHOO FCRAM/RLDRAM Indirect Access
FDIAG_STAT_IN_PROGRESS(4): test #99 TX WAHOO FCRAM/RLDRAM Marching Pattern
FDIAG_STAT_IN_PROGRESS(4): test #100 TX WAHOO FSRAM Datapins Test
FDIAG_STAT_IN_PROGRESS(4): test #101 TX WAHOO CSSRAM Datapins Test
FDIAG_STAT_IN_PROGRESS(4): test #102 TX WAHOO NSRAM Datapins Test
FDIAG_STAT_IN_PROGRESS(4): test #103 TX WAHOO FSRAM Marching Pattern
FDIAG_STAT_IN_PROGRESS(4): test #104 TX WAHOO CSSRAM Marching Pattern
FDIAG_STAT_IN_PROGRESS(4): test #105 TX WAHOO NSRAM Marching Pattern
FDIAG_STAT_IN_PROGRESS(4): test #106 SUPERFISH to TX WAHOO Cmd Parity
FDIAG_STAT_IN_PROGRESS(4): test #107 SUPERFISH to TX WAHOO Data Parity
FDIAG_STAT_IN_PROGRESS(4): test #108 TX WAHOO Tune Bits Test
FDIAG_STAT_IN_PROGRESS(4): test #109 PIRANHA Registers
FDIAG_STAT_IN_PROGRESS(4): test #110 RX WAHOO to PIRANHA Command Parity
FDIAG_STAT_IN_PROGRESS(4): test #111 RX WAHOO to PIRANHA Data Parity
FDIAG_STAT_IN_PROGRESS(4): test #112 PIRANHA DDR_|| SRAM Busfloat
FDIAG_STAT_IN_PROGRESS(4): test #113 PIRANHA DDR SRAM ECC SINGLE BIT
FDIAG_STAT_IN_PROGRESS(4): test #114 PIRANHA DDR SRAM ECC MULTI BIT
FDIAG_STAT_IN_PROGRESS(4): test #115 PIRANHA DDR SRAM ECC TOGGLE BIT
FDIAG_STAT_IN_PROGRESS(4): test #116 PIRANHA FCRAM 2 Datapins
FDIAG_STAT_IN_PROGRESS(4): test #117 PIRANHA FCRAM ECC SINGLE BIT
FDIAG_STAT_IN_PROGRESS(4): test #118 PIRANHA FCRAM ECC MULTI BIT
FDIAG_STAT_IN_PROGRESS(4): test #119 PIRANHA FCRAM ECC TOGGLE BIT
FDIAG_STAT_IN_PROGRESS(4): test #120 STINGRAY Registers
FDIAG_STAT_IN_PROGRESS(4): test #121 STINGRAY DDR_|| SRAM Marching Pattern
FDIAG_STAT_IN_PROGRESS(4): test #122 STINGRAY DDR_|| SRAM Busfloat
FDIAG_STAT_IN_PROGRESS(4): test #123 STINGRAY DDR_|| SRAM Datapins Memory
FDIAG_STAT_IN_PROGRESS(4): test #124 TX WAHOO to STINGRAY Command Parity
FDIAG_STAT_IN_PROGRESS(4): test #125 TX WAHOO to STINGRAY Data Parity
FDIAG_STAT_IN_PROGRESS(4): test #126 PLIM to STINGRAY Command Parity
FDIAG_STAT_IN_PROGRESS(4): test #127 STINGRAY FCRAM ECC SINGLE BIT
FDIAG_STAT_IN_PROGRESS(4): test #128 STINGRAY FCRAM ECC MULTI BIT
FDIAG_STAT_IN_PROGRESS(4): test #129 STINGRAY FCRAM ECC TOGGLE BIT
FDIAG_STAT_IN_PROGRESS(4): test #130 STINGRAY QDR SRAM ECC SINGLE BIT
FDIAG_STAT_IN_PROGRESS(4): test #131 STINGRAY QDR SRAM ECC MULTI BIT
FDIAG_STAT_IN_PROGRESS(4): test #132 STINGRAY QDR SRAM ECC TOGGLE BIT
FDIAG_STAT_IN_PROGRESS(4): test #133 DUMP Sram March Test
FDIAG_STAT_IN_PROGRESS(4): test #134 EE192 ZL30000 Register Test
FDIAG_STAT_IN_PROGRESS(4): test #135 PIRANHA to SUPERFISH - UNICAST HiPri Packet
FDIAG_STAT_IN_PROGRESS(4): test #136 PIRANHA to STINGRAY Packet - Superfish Fabric
loopback
FDIAG_STAT_IN_PROGRESS(4): test #137 STINGRAY to SOCKEYE Packet
FDIAG_STAT_IN_PROGRESS(4): test #138 bay-0: FPGA Register Test
FDIAG_STAT_IN_PROGRESS(4): test #139 bay-0: FPGA Version Test
FDIAG_STAT_IN_PROGRESS(4): test #140 bay-0: Arsenal Register Test
FDIAG_STAT_IN_PROGRESS(4): test #141 bay-0: Gladiator IDPROM Test
FDIAG_STAT_IN_PROGRESS(4): test #142 bay-0: Gladiator Temp-Sensor Test
FDIAG_STAT_IN_PROGRESS(4): test #143 bay-0: SPA Interrupt Test
FDIAG_STAT_IN_PROGRESS(4): test #144 bay-0: SPA Quack test
FDIAG_STAT_IN_PROGRESS(4): test #145 bay-0: SFP IDPROM Test
FDIAG_STAT_IN_PROGRESS(4): test #146 bay-0: DDTc Test
FDIAG_STAT_IN_PROGRESS(4): test #147 bay-0: POS DCC Test
FDIAG_STAT_IN_PROGRESS(4): test #148 bay-0: SPA LPBK glad

```

```

FDIAG_STAT_IN_PROGRESS(4): test #149 bay-1: FPGA Register Test
FDIAG_STAT_IN_PROGRESS(4): test #150 bay-1: FPGA Version Test
FDIAG_STAT_IN_PROGRESS(4): test #151 bay-1: Arsenal Register Test
FDIAG_STAT_IN_PROGRESS(4): test #152 bay-1: Gladiator IDPROM Test
FDIAG_STAT_IN_PROGRESS(4): test #153 bay-1: Gladiator Temp-Sensor Test
FDIAG_STAT_IN_PROGRESS(4): test #154 bay-1: SPA Interrupt Test
FDIAG_STAT_IN_PROGRESS(4): test #155 bay-1: SPA Quack test
FDIAG_STAT_IN_PROGRESS(4): test #156 bay-1: SFP IDPROM Test
FDIAG_STAT_IN_PROGRESS(4): test #157 bay-1: DDTc Test
FDIAG_STAT_IN_PROGRESS(4): test #158 bay-1: POS DCC Test
FDIAG_STAT_IN_PROGRESS(4): test #159 bay-1: SPA LPBK glad
FD 4> Displaying Environmental information
FD 4> Main Card: 12V 3.3V 2.5V 1.25V 1.8V 1.5V 0.75V 1.5V(PLL)
FD 4> Slot # (mv) (mv) (mv) (mv) (mv) (mv) (mv) (mv)
FD 4> 4 11999 03300 02499 01250 01799 01501 00750 01500
FD 4> 1.3V(CPU) 1.2V1 1.2V2 1.1V(T1) 1.1V(T2) 1.1V(T3)
FD 4> (mv) (mv) (mv) (mv) (mv) (mv)
FD 4> 01301 01199 01201 01100 01100 01100

FD 4> Dgth Card: 12V 3.3V 3.3V(SNT) 2.5V 1.25V 1.8V 1.5V .75V
FD 4> Slot # (mv) (mv) (mv) (mv) (mv) (mv) (mv) (mv)
FD 4> 4 12006 03302 03300 02499 01251 01798 01499 00750
FD 4> 1.5V(PLL) 1.5V(WW) 1.2V1 1.2V2 1.1V(T1) 1.1V(T2) 1.1V(T3)
FD 4> (mv) (mv) (mv) (mv) (mv) (mv) (mv)
FD 4> 01500 01500 01199 01199 01100 01100 01099

FD 4> Temperature Inlet Hot
FD 4> Sensors (deg. C) (deg.C)
FD 4> 35 45
FDIAG_STAT_DONE(4)

FD 4>
FD 4> Displaying Test Result Summary
FD 4>
FD 4> Passed Failed Skipped
FD 4> -----
FD 4> Main Card 137 0 0
FD 4> bay 0 11 0 0
FD 4> bay 1 11 0 0
FD 4> bay 2 Empty
FD 4> bay 3 Empty
FD 4>
FD 4> Changed current_status to FDIAG_STAT_IDLE
Field Diagnostic ****PASSED**** for slot 4

Field Diag eeprom values: run 204 fail mode 0 (PASS) slot 4
last test failed was 0, error code 0
Shutting down diags in slot 4

Board will reload
01:55:24: %F_DIAG-5-FDIAG_DONE: Field diags completed for slot 4
SLOT 4:00:01:19: %SYS-5-RESTART: System restarted --
Cisco Internetwork Operating System Software
IOS (tm) GS Software (GLC1-LC-M), Experimental Version 12.0(20080610:161456)
[jrr-v120_32_sy_throttle 103]
Copyright (c) 1986-2008 by cisco Systems, Inc.
Compiled Tue 10-Jun-08 10:42 by jrr
SLOT 4:00:01:19: Setting LEDs
01:57:48: %SPA_OIR-6-ONLINECARD: SPA (SPA-8XOC12-POS) online in subslot 4/0
01:57:48: %SPA_OIR-6-ONLINECARD: SPA (SPA-8XOC3-POS) online in subslot 4/1

```

Following is an example of a test FAILURE condition on a GRP card. This card would need to be replaced and returned to Cisco for repair:

```

Field Diag download COMPLETE for slot 7
FD 3> *****
FD 3> GSR Field Diagnostics V6.01
FD 3> Compiled by award on Tue Apr 9 07:22:53 PDT 2002
FD 3> view: award-conn_isp.f_diag_new
FD 3> *****
Diagnostics have been downloaded to slot 7
Executing all diagnostic tests in slot 7
(total/indiv. timeout set to 2000/600 sec.)
FD 3> BFRP w/ECC testing...
FD 3> Secondary Discovery found ID 2
FD 3> BFR_CARD_TYPE_BFRP_CARD w/ ECC testing...
FD 3> Available test types 2
FD 3>          1
FD 3> Completed f_diags_board_discovery() (0x1)
FD 3> Verbosity now (0x00000011) TESTSDISP FATL
FD 3> Test list selection received: Test ID 1, Device 0
FD 3> running in slot 7 (24 tests from test list ID 1)
FDIAG_STAT_IN_PROGRESS(3): test #1 BFRP Dram Datapins Test
FDIAG_STAT_IN_PROGRESS(3): test #2 Dram Marching Pattern Test
FDIAG_STAT_IN_PROGRESS(3): test #3 DataPins_Sram
FDIAG_STAT_IN_PROGRESS(3): test #4 March_Sram
FDIAG_STAT_IN_PROGRESS(3): test #5 High Memory DRAM Marching Pattern
FDIAG_STAT_IN_PROGRESS(3): test #6 diags_csar_regtest
FDIAG_STAT_IN_PROGRESS(3): test #7 diags_test_p4_csar_int
FDIAG_STAT_IN_PROGRESS(3): test #8 NVRAM Memory Test
FD 3> 32 bit data compare error. Wrote 0xcccccccc, read back 0xcc41cccc at location
0xbe03fff0
FDIAG_STAT_DONE_FAIL(3) test_num 8, error_code 1
COMPLETED Field Diags: pid 128, status 5, test_num 8, error_code 1
Field Diagnostic: ****TEST FAILURE**** slot 7: first test failed: 8,
NVRAM Memory Test, error 1
Field Diag results from eeprom before updating slot 7, run# 0x5000042 were 0x0
previous field diag eeprom values: run 66 fail mode 5 (DOWNLOAD FAILURE)
last test failed was 0, error code 0
Field Diag eeprom values: run 67 fail mode 1 (TEST FAILURE) slot 7
last test failed was 8, error code 1
Shutting down diags in slot 7
slot 7 done, will not reload automatically

```

The following example shows the previous test results of a line card. Diagnostics had been run 64 times on this line card. Because the board PASSED the last field diagnostics session, the fail mode was 0 as was the last test that failed.

```

Router # diag 7 prev
Field Diag eeprom values: run 64 fail mode 0 (PASS) slot 7
      last test failed was 0, error code 0

```

The following example shows the output of a line card test with the **update-fpga** option specified.

```

Router# diag 7 verbose source tftp tftp://223.255.254.254/c12k-fdiagsbflc-mz.120-25.5
update-fpga
Running DIAG config check
Fabric Download for Field Diags chosen: If timeout occurs, try 'mbus' option.
Verbose mode: Test progress and errors will be displayed
UUT will update FPGA's flash
Running Diags will halt ALL activity on the requested slot. [confirm]
Router#
PID of f_diag_run is 121, set test_pid[3]
gdb slot is 0
Launching a Field Diagnostic for slot 7
Loading c12k-fdiagsbflc-mz.new_fpga from 223.255.254.254 (via Ethernet0):

```

```
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
!!!!!!!!!!!!!!!!!!!!!!!!
```

```
Calling enable_slot_and_type_on_fabric(DISABLE) for slot 7
Calling enable_slot_and_type_on_fabric(ENABLE) for slot 7
FD 3> *****
FD 3> GSR Field Diagnostics V6.9
FD 3> Compiled by ckhuong on Fri Jan 17 15:51:36 PST 2003
FD 3> view: ckhuong-conn_isp.inti4
FD 3> *****
Diagnostics have been downloaded to slot 7
Executing all diagnostic tests in slot 7
(total/indiv. timeout set to 2000/600 sec.)
FD 3> BFR_CARD_TYPE_4P_GE_E48 testing...
FD 3> Available test types 2
FD 3> 1
FD 3> 3
FD 3> 11
FD 3> Completed f_diags_board_discovery() (0x32)
FD 3> Verbosity now (0x00000011) TESTSDISP FATL
FD 3> Test list selection received: Test ID 3, Device 0
FD 3> running in slot 7 (1 tests from test list ID 3)
FD 3> Just into idle state
FDIAG_STAT_IN_PROGRESS(3): test #1 Tetra Flash Mem Upgrading
FD 3> Upgraded FPGA image in Flash from version 0xcc53 to 0xcc54
Calling enable_slot_and_type_on_fabric(DISABLE) for slot 7
Calling enable_slot_and_type_on_fabric(ENABLE) for slot 7
FDIAG_STAT_DONE(3)

FD 3> Changed current_status to FDIAG_STAT_IDLE
COMPLETED Field Diags: pid 121, status 6, test_num 1, error_code 0
```

Field Diagnostic ****PASSED**** for slot 7

```
Field Diag results from eeprom before updating slot 7, run# 0x10 were 0x0
previous field diag eeprom values: run 16 fail mode 0 (PASS)
    last test failed was 0, error code 0
Field Diag eeprom values: run 17 fail mode 0 (PASS) slot 7
    last test failed was 0, error code 0
Shutting down diags in slot 7
```

Board will reload
Router#

Related Commands

Command	Description
microcode reload	Reloads the Cisco IOS image on a line card on the Cisco 12000 Series Internet Routers after all microcode configuration commands have been entered.

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