

Diagnostic Commands

This module describes the Cisco IOS XR Software commands to configure diagnostics for system monitoring on the router.

For detailed information about the online diagnostics, refer *Online Diagnostics* module in *System Monitoring Configuration Guide for Cisco 8000 Series Routers*.

To use commands of this module, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using any command, contact your AAA administrator for assistance.

For Cisco Technical Support contact information, see the 'Obtaining Documentation and Submitting a Service Request' section in the Preface.

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show diag

To display details about the hardware and software on each node in a router, use the **show diag** command in XR EXEC mode.

show diag [location node-id] [chassis | details | eeprom | fans | power-supply | summary]

Syntax Description

location node-id	(Optional) Displays diagnostic information from the designated node. The <i>node-id</i> argument is entered in the <i>rack/slot/module</i> notation.
chassis	(Optional) Displays detailed diagnostics information for the chassis.
details	(Optional) Displays detailed diagnostics information for the current node.

eeprom	(Optional) Displays field diagnostics results from the EEPROM.		
fans	(Optional) Displays information about the fans tray.		
power-supply	(Optional) Displays information about the power supply.		
summary	(Optional) Displays summarized diagnostics results for all nodes in the system.		

Command Default

Diagnostics for all nodes installed in the router are displayed.

Hardware and software information for all nodes installed in the router is displayed

Command Modes

XR EXEC mode

Command History

Release	Modification
Release 7.0.12	This command was introduced.

Usage Guidelines

The **show diag** command displays detailed information on the hardware components for each node, and on the status of the software running on each node.

Task ID

Task Operations ID sysmgr read

Examples

The following example shows excerpts of output from the show diag details command:

Router# show diag details

```
Rack O-Chassis IDPROM - Cisco 8201 1RU System with 24x400GE QSFP56-DD & 12x100GE QSFP28
Tnfo
   Controller Family
                             : 0045
                             : 0613
   Controller Type
                             : 8201-SYS
   PID
                             : V00
   Version Identifier
   UDI Description
                             : Cisco 8201 1RU System with 24x400GE QSFP56-DD & 12x100GE
   Chassis Serial Number
                           : FOC2325NREU
                            : 68-6825-06
   Top Assy. Part Number
   Top Assy. Revision
                             : 09
   PCB Serial Number
                             : FOC2324NP35
                             : 73-19428-08
   PCA Number
   PCA Revision
                             : 04
   CLEI Code
                            : UNASSIGNED
                             : ECI123
   ECI Number
    Deviation Number # 1
   Deviation Number # 2
                             : 0
   Deviation Number # 3
                             : 0
   Deviation Number # 4
                             : 0
   Deviation Number # 5
                            : 1126
                            : 00 00 00 00 00 00 00 00
   Manufacturing Test Data
   Calibration Data
                             : 00000000
   Chassis MAC Address
                             : 6c8b.d31f.d400
   MAC Addr. Block Size
                            : 512
   Hardware Revision
                             : 0.9
```

```
Unknown Field (type 0x00d7): 0
    Device values # 1
                        : 21 80 84 0c 00 00 00 00
0/RP0/CPU0-Base Board IDPROM - Cisco 8201 1RU System with 24x400GE QSFP56-DD & 12x100GE
QSFP28
Info
    Controller Family
                               : 0045
                              : 0613
    Controller Type
                              : 8201-SYS
    Version Identifier
                              : V00
                              : Cisco 8201 1RU System with 24x400GE QSFP56-DD & 12x100GE
    UDI Description
OSFP28
    Chassis Serial Number : FOC2325NREU
Top Assy. Part Number : 68-6825-06
    Top Assy. Revision
                              : 09
    PCB Serial Number
                              : FOC2324NP35
                              : 73-19428-08
    PCA Number
                              : 04
: UNASSIGNED
    PCA Revision
    CLEI Code
    ECI Number
                              : ECI123
   Deviation Number # 1
Deviation Number # 2
                              : 0
                              : 0
    Deviation Number # 3
                              : 0
: 0
    Deviation Number # 4
    Deviation Number # 5 : 1126
    Manufacturing Test Data : 00 00 00 00 00 00 00
    Calibration Data : 00000000
   Chassis MAC Address : 6c8b.d31f.d400
MAC Addr. Block Size : 512
Hardware Revision : 0.9
    Unknown Field (type 0x00d7): 0
    Device values # 1 : 21 80 84 0c 00 00 00
HundredGigE0/0/0/0-IDPROM - Cisco QSFP28 100G SR4 Pluggable Optics Module
Tnfo
    IDPROM Format Revision : 05
    Hardware Revision
                            : 1
                            : QSFP-100G-SR4-S
    PTD
    Version Identifier : V02
UDI Description :
                            : CMUIAL8CAB
    CLET Code
    ECI Number
                            : 0
    Top Assy. Part Number : AFBR-89CDDZ-CS3
   Top Assy. Revision : 05
PCB Serial Number : AVF2131S02J
PCA Number : N/A
                            : N/A
    PCA Revision
    Deviation Number # 1 : 0
    Asset ID
                            :
    Asset Alias
. . . . . . . . . .
```

The output displayed for the **show diag details** command is the most comprehensive output displayed for **show diag** command variations. All other variations show a subset of the fields displayed except for the **show diag chassis**, **show diag fans**, and **show diag power-supply** commands, which also enable you to display EEPROM information.

```
RP/0/RP0/CPU0:P1#show diag eeprom
Thu Mar 12 18:16:32.436 UTC
Rack 0-Chassis IDPROM - Cisco 8201 1RU Chassis

00: 1B 5C 04 FF 48 00 45 40 06 13 CB 92 38 32 30 31 .\..H.E@....8201
10: 2D 53 59 53 00 00 00 00 00
```

```
20:
  30 30 00 DA 3C 43 69 73 63 6F 20 38 32 30 31 20
                            00..<Cisco 8201
  31 52 55 20 43 68 61 73 73 69 73 00 00 00 00 00
30:
                            1RU Chassis....
  40:
                            ....-DD
50:
  20 26 20 31 32 78 31 30 30 47 20 51 53 46 50 32
                            & 12x100G QSFP2
                            8..FOC2217ELZL.D
  38 C2 8B 46 4F 43 32 32 31 37 45 4C 5A 4C 87 44
60:
70:
  18 86 04 8D 30 37 20 20 C1 8B 46 4F 43 32 32 31
                            ....07 ..FOC221
80:
  39 5A 4F 55 47 E2 46 00 49 00 48 7E 05 8A 30 35
                            9ZOUG.F.I.H~..05
90:
  20 20 C6 8A 55 4E 41 53 53 49 47 4E 45 44 EB 86
                            ..UNASSIGNED..
  45 43 49 31 32 33 88 00 00 00 00 88 00 00 00 00
                            ECI123.....
B0:
  08 00 00 00 00 00 00 00 00 86 00 00 00 00 C3 06
C0:
                            . . . . . . . . . . . . . . . .
  78 99 52 4C D8 00 43 02 00 41 00 01 D7 44 00 00
D0:
                            x.RL..C..A...D..
E0:
  00 00 C9 08 2F 20 22 08 00 00 00 00 FF FF FF FF
                            ..../ ".......
120:
  . . . . . . . . . . . . . . . .
130:
  . . . . . . . . . . . . . . . .
170:
  180:
  . . . . . . . . . . . . . . . .
1D0:
  . . . . . . . . . . . . . . . .
1E0:
```

This table describes the significant fields shown in the display.

Table 1: show diag Field Descriptions

Field	Description		
MAIN	Provides the following general information about the hardware:		
	Board type		
	• Revision		
	Device identifier		
	Serial number		
PCA	Cisco printed circuit assembly (PCA) hardware and revision number.		
PID	Displays the product identifier (PID) revision for the specified node.		
VID	Displays the version identifier (VID) for the specified node.		
CLEI	Displays the common language equipment identifier (CLEI) for the specified node.		
ECI	Displays the equipment catalog item (ECI) for the specified node.		
Board State	Displays the current software on the board and whether or not the board is running.		

Field	Description			
PLD	Displays the information about the following programmable logic device (PLD) components on the current module:			
	• Processor			
	• Power			
	• MONLIB			
SPEED	Displays speed information for the various components of the specified node, in megahertz.			
MEM Size	Displays the memory size of the specified node, in megabytes.			
RMA	Displays returned material adjustment (RMA) information for the specified node.			
DIAGNOSTICS RESULTS	Provides the following information about the last diagnostics test that was run or the specified node:			
	• ENTRY 1			
	• TIMESTAMP—Time stamp for the last diagnostic test that was run on the node.			
	• VERSION			
	• PARAM1			
	• PARAM2			
	• TESTNUM—Identifies the test that was run on the node.			
	 RESULT—Displays whether the last diagnostic test passed or failed. ERRCODE 			

diagnostic monitor interval

To change the interval at which the online diagnostic tests send packets to the Network Processing Units (NPU) for a specific interval at a specified location, use the **diagnostic monitor interval** command in Config mode. To disable the configuration and restore the system to its original state, use the **no** form of this command.

diagnostic monitor interval location node-id **test** test-name number-of-days hours:minutes:seconds.milliseconds

Syntax Description

node-id	Specifies a location where diagnostic monitoring was configured. The <i>node-id</i> argument is entered in the <i>rack/slot/module</i> notation.	
test-name	Name of the diagnostic test.	
number-of-days	Interval between each test run.	
	The <i>number-of-days</i> variable specifies the number of days between each test run.	

hours:minutes:seconds.milliseconds The hours:minutes:seconds.milliseconds variable specifies the test interval. Hours is a number in the range from 0 through 23, minutes is a number in the range from 0 through 59, seconds is a number in the range from 0 through 59, and milliseconds is a number in the range of 0 through 999.

Command Default

None

Command Modes

XR Config mode

Command History

Release	Modification
Release 7.5.2/Release 7.3.5	This command was introduced.

Usage Guidelines

None

Task ID

Task ID	Operations
diag	read, write
cisco-support	read

Examples

This example shows how to set the diagnostic testing at an interval of 1 hour, 2 minutes, 3 seconds, and 4 milliseconds at location 0/1/CPU0:

Router# config

Router(config) # diagnostic monitor interval location 0/1/cpu0 test 1 0 1:2:3.4

diagnostic monitor location disable

To disable automatic diagnostic testing for a specified location, use the diagnostic monitor location disable command in Config mode. To enable the diagnostic testing, use the **no** form of this command.

diagnostic monitor location node-id test test-name disable

Syntax Description

node-id Specifies a location where diagnostic monitoring was configured. The node-id argument is entered in the *rack/slot/module* notation.

test-name Name of the diagnostic test.

Disables diagnostic monitoring for a specified location. disable

Command Default

By default, the automatic diagnostic tests are enabled in the system.

Command Modes

XR Config mode

Command History	Release		Modification
	Release 7.5.2/Release 7.3.5		This command was introduced.
Usage Guidelines	None		
Task ID	Task ID	Operations	
	diag	read, write	
	cisco-support	t read	
Examples	This exampl	e shows how to d	isable the online diagnostic execution at location 0/1/CPU0:
	Router# con	_	.c monitor location 0/1/cpu0 test 1 disable

diagnostic monitor syslog

To enable the generation of a system log message when any online diagnosis fails, use the **diagnostic monitor syslog** command in Config mode. To remove the specified command from the configuration file and restore the system to its default condition, use the **no** form of this command.

diagnostic monitor syslog

	g				
Syntax Description	This command has no keywords or arguments.				
Command Default	None	None			
Command Modes	XR Config mode				
Command History	Release			Modification	
	Release 7	.5.2/Release 7.	3.5	This command was introduced.	
Usage Guidelines	None				
Task ID	Task ID	Operations			
	diag	read, write			
	cisco-suppo	ort read			

The following example shows how to generate a system log message when any online diagnostic test fails:

Router(config) # diagnostic monitor syslog

diagnostic monitor threshold

To set the number of successive failures that triggers the generation of an NP data log, use the **diagnostic monitor threshold** command in Config mode. To remove the specified command from the configuration file and restore the system to its default condition, use the **no** form of this command.

diagnostic monitor threshold location node-id test test-name failure-count failures

Syntax Description

node-id Specifies a location where diagnostic monitoring was configured. The node-id argument is entered in the rack/slot/module notation.

test-name Specifies the name of the diagnostic test.

failures Number of test failures that are allowed. The given range is 1 to 99.

Command Default

None

Command Modes

XR Config mode

Command History

Release	Modification
Release 7.5.2/Release 7.3.5	This command was introduced.

Usage Guidelines

None

Task ID

Task ID	Operations
diag	read, write
cisco-support	read

The following example shows how to set the failure threshold to 35 test failures for test 1 at location 0/1/CPU0:

Router# config

Router(config)# diagnostic monitor threshold location 0/1/cpu0 test 1 failure count 35

show dataplane-health status

To check the status of a data plane health test and information on whether the test is still running or if it's completed, along with a summary of the results, use the **show dataplane-health status** command in XR EXEC mode.

show dataplane-health status

Syntax Description

This command has no keywords or arguments.

Command Default

None

Command Modes

XR EXEC mode

Command History

Release	Modification
Release 7.3.5	This command was introduced.

Usage Guidelines

Use the show dataplane-health status command to check the status of a data plane health test and information on whether the test is still running or if it's completed, along with a summary of the results.

Task ID

Task ID	Operations
system	read

Examples

This example displays the status of a data plane health test that is in progress:

Router# show dataplane-health status

Dataplane health monitoring in progress..

This example displays the status of a data plane health test that is completed and has errors:

Router# show dataplane-health status

Dataplane health monitoring completed Summary of results (Module: fabric):

Output summary legend:

ERROR: Tests were not run for this slice due to some errors

GOOD: Tests were successful for this slice LOSS: Packet loss was observed for this slice

		=	ion was obser			
#####	######	+ # # # # # # # # #	############	#########	###########	##############
LC	NP	Slice	GOOD	LOSS	CORRUPT	ERROR
1	0	0	 2526253	0	0	0
		1	2527136	0	0	0
		2	2526235	0	0	0
	1	0	2527166	0	0	0
		1	2527217	0	0	0
		2	2526424	0	0	0
2	0	0	 2526733	0	0	0
		1	2526948	0	0	0
		2	2526554	0	0	0
	1	0	2526294	0	0	0
		1	2526220	0	0	0
		2	2526085	0	0	0
3	0	0	 2525876	0	0	0
Ŭ	,	1	2526642	0	0	0
		2.	2525957	0	0	0
		_		ŭ	· ·	-

	1	0	2526491	0	0	0
		1	2526263	0	0	0
		2	2526200	0	0	0
	2	0	2526804	0	0	0
		1	2526135	0	0	0
		2	2526328	0	0	0
4	0	0	493934	0	11501	0
		1	0	0	0	0
		2	0	0	0	0
	1	0	493605	0	11591	0
		1	0	0	0	0
		2	0	0	0	0
5	0	0	505389	0	30	0
		1	0	0	0	0
		2	0	0	0	0
	1	0	505358	0	23	0
		1	0	0	0	0
		2	0	0	0	0
 6	0	0	2526307	0	0	0
		1	2525905	0	0	0
					0	0
		2	2526142	0	U	U
	1	2	2526142 2526755	0	0	0
	1			0 0 0	0	0

Corruption detected: (LC4/0 <-> FC2/0) (LC4/1 <-> FC2/0) (LC5/0 <-> FC3/0) (LC5/1 <-> FC3/0)

FAILURES DETECTED IN DATAPATH for fabric mode.

Please run "monitor dataplane-health module no-fabric" Please check /harddisk:/dph mon/dataplane health fabric mode report.txt

show diagnostic trace location

To display the logging information of the online diagnostic tests for a specific location, use the **show diagnostic trace location** command in Config mode.

show diagnostic trace location node-id

Syntax Description

node-id Specifies a location where diagnostic monitoring was configured. The node-id argument is entered in the rack/slot/module notation.

Command Default

None

Command Modes

XR Config mode

Command History

Release	Modification
Release 7.5.2/Release 7.3.5	This command was introduced.

Usage Guidelines

None

Task ID

Task ID	Operations
diag	read, write
cisco-support	read

The following example shows the online diagnostic logging information at 0/1/CPU0 location:

```
Router# config
Router(config) # show diagnostic trace location 0/1/CPU0
Apr 1 18:09:38.180 diags/online/packet 0/1/CPU0 t5879 Sending a packet to SPP
Apr 1 18:09:38.180 diags/online/packet 0/1/CPU0 t5879 Sending a packet to SPP
    1 18:09:38.180 diags/online/engineer 0/1/CPU0 t5879 Now sending a pak(seq 1276),
destination slot 1 (card type 0x2), NP 0
Apr 1 18:09:38.180 diags/online/engineer 0/1/CPU0 t5879 Now sending a pak(seq 1276),
destination slot 1 (card type 0x2), NP 1
Apr 1 18:09:38.180 diags/online/engineer 0/1/CPU0 6904# t5879 Slot 1 has 2 NPs for NPU
loopback test, Inactive NP mask: 0x0
Apr 1 18:09:38.180 diags/online/engineer 0/1/CPU0 7456# t5879 Packets sent, time
tick=77148425000000
Apr 1 18:09:38.190 diags/online/gold message 0/1/CPU0 9188# t5879 0/1/CPU0:
SFNPULoopback{ID=1} Completed Successfully.
Apr 1 18:09:38.190 diags/online/gold message 0/1/CPU0 9740# t5879 0/1/CPU0: running parallel
Apr 1 18:09:38.190 diags/online/engineer 0/1/CPU0 8008# t5879 Time took to receive 2 pkts:
10000000 nsec, timeout val: 500000000 nsec
Apr 1 18:09:38.190 diags/online/engineer 0/1/CPU0 8560# t5879 Successfully verified a
packet, seq. no.: 1276
Apr 1 18:09:38.190 diags/online/engineer 0/1/CPU0 9112# t5879 Successfully verified a
packet, seq. no.: 1276
Apr 1 18:09:38.190 diags/online/engineer 0/1/CPU0 9664# t5879 exp mask: 0x00000003 mask:
0x00000003, err mask: 0x00000000
```

show diagnostic result

To display diagnostic test results, use the **show diagnostic result** command in EXEC mode.

show diagnostic result location node-id [detail]

•	-	
Syntax	Heer	rintion
JVIIII	DCOL	HUUUUI

location node-id	Displays the diagnostic test results for a specified location. The <i>node-id</i> argument is entered in the <i>rack/slot/module</i> notation.
detail	(Optional) Specifies detailed results.

Command Default

None

Command Modes

Exec mode

Command History

Release	Modification
Release 7.5.2/Release 7.3.5	This command was introduced.

Usage Guidelines

None

Task ID

Task ID	Operations
diag	read, write
cisco-support	read

The following example shows the online diagnostic test results at 0/5/CPU0 location:

```
Router#show diagnostic result location 0/5/CPU0
0/5/CPU0:
Overall diagnostic result: PASS
Diagnostic level at card bootup: bypass
Test results: (. = Pass, F = Fail, U = Untested)
1 ) SFNPULoopback ----> .
Router#show diagnostic result location 0/5/CPU0 detail
0/5/CPU0:
Overall diagnostic result: PASS
Diagnostic level at card bootup: bypass
Test results: (. = Pass, F = Fail, U = Untested)
1 ) SFNPULoopback -----> .
Error code -----> 0 (DIAG SUCCESS)
Total run count ----> 31
Last test execution time ----> Fri Jun 9 08:28:39 2023
First test failure time ----> n/a
Last test failure time ----> n/a
Last test pass time -----> Fri Jun 9 08:28:39 2023
Total failure count ----> 0
Consecutive failure count ---> 0
```

monitor dataplane-health

To monitor the health of data plane components including fabric and NPUs, use the **monitor dataplane-health** command in EXEC mode.

Syntax Description

fabric	(Optional) Checks the fabric path for issues.
no-fabric	(Optional) Checks the NPU path for issues.
<pre>pattern { byte-pattern default-patterns }</pre>	(Optional) Specifies the data pattern that must be used by the utility to detect datapath memory corruption. You can either specify a byte pattern from a range of 0-255, or specify default-patterns . The available default patterns are 0x00 , 0xf0 , 0x0f , 0xff , 0x55 .
duration test-duration	(Optional) Specifies the duration for which the traffic tests are run for each pattern. The default duration is 10 seconds per pattern. For example, if the default pattern is used, and duration is specified as 10 seconds, the test traffic runs for 50 seconds. Range is 1–60 seconds.
gap time-gap	(Optional) Specifies the time interval between traffic test runs on consecutive NPU slices. Default gap is 5 seconds. Range is 1–30 seconds.
report { detail summary }	(Optional) Displays the summary or detailed report. By default, the summary report is displayed. Detail option displays more detailed information. In both cases, a detailed report (regardless of the selected option) is saved at the location: harddisk:/dataplane_health_detail_report.txt
	Note You must archive the report file before subsequent runs, as this file is overwritten on re-execution of the command.
location { all node-id }	(Optional) Specifies the line card on which the utility is run. By default, the utility is executed on all LCs in the system. You can also choose a specific LC if necessary.
stop-on-failure-for-lc { true false }	(Optional) Specifies if the testing must stop or continue when the utility detects an issue. If true (default) option is selected, the testing stops when an issue is detected. If false is selected, the testing continues to completion even after an issue is detected on the LC.
prompt	(Optional) Displays a warning message on the impact of this utility, and prompts for your confirmation to run this utility. If you choose NO to the prompt, tests will not be executed. By default, the utility does not prompt for your confirmation.

Command Default

Monitoring is disabled.

Command Modes

EXEC mode

Command History

Release	Modification
Release 7.3.5	This command was introduced.

Usage Guidelines

Use the **monitor dataplane-health** command to run the Data plane Health Check utility. Do not use this command on a router that carries live traffic, as this utility affects the system performance. Use this command only on an isolated router.

Task ID

Task ID	Operations		
system	execute		
basic-services			

This example shows how to run the Data plane Health Check utility:

Router# monitor dataplane-health

```
Wed Aug 9 20:28:18.263 UTC
THIS COMMAND IMPACTS SYSTEM PERFORMANCE AND SHOULD IDEALLY BE RUN ON A ROUTER THAT IS
ISOLATED.
DO YOU REALLY WANT TO CONTINUE? (yes/no):
Details of the test results are logged in harddisk:/dataplane health detail report.txt
Estimated time for completion: 804 seconds
Ensure that the terminal/vty session timeout is greater than 804 seconds
Testing in progress (suggest not to break the tests)
.....
Datapath test on all requested LC/NPU/slice completed
Summary of results:
Output summary legend:
ERROR: Tests were not run for this slice due to some errors
GOOD: Tests were successful for this slice
LOSS: Packet loss was observed for this slice
CORRUPT: Packet corruption was observed for this slice
NP
          Slice GOOD LOSS CORRUPT
                                        ERROR
_____
                       0 0
0 0
0 0
0 0
0 0
0 0
       0
          0
                  500
                                            0
               1
                    500
                                            0
                  500
              2
                                           Ω
                  500
               1
                   500
                                           0
                    500
               2.
                                            0
                    500
       2
               0
                           0
                                   0
                                            0
                                   0
               1
                    500
                           Ω
                                            Ω
               2
                    500
                           0
                                   0
                                           0

    501
    0
    0

    500
    0
    0

    500
    0
    0

    501
    0
    0

    502
    0
    0

       0
               0
                                        0
  2
               1
                                            0
               2
                           0
                                  0
       1
              Ω
                    501
                                            Ω
                                 0
0
               1
                    501
                           0
                                            0
               2
                    500
                           0
                                            0
       2
               0
                    500
                           0
                                   0
                                            0
                    501
                            0
                                    0
                    500
                           0
                                   Ω
                                            0
```

0 0

1	0	0	0	0	5	
	1	500	0	0	0	
	2	0	0	0	5	
2	0	0	0	0	5	
	1	500	0	0	0	
	2	0	0	0	5	
3	0	0	0	0	5	
	1	500	0	0	0	
	2	0	0	0	5	

SOME ERRORS PREVENTED DATAPATH CHECKS FROM BEING RUN FOR SOME LC/NP/SLICE
Please check harddisk:/dataplane_health_detail_report.txt

monitor dataplane-health