



# Fault Manager Commands on Cisco IOS XR Software

---

This chapter describes the commands used to set Fault Manager operational attributes and monitor Fault Manager operations.

The Cisco IOS XR Fault Manager is the central clearinghouse for events detected by any portion of Cisco IOS XR High Availability Services. The Fault Manager is responsible for fault detection, fault recovery, and process reliability statistics in the system. The Fault Manager is policy driven and lets you configure the High Availability features of the system to fit your needs.

The Fault Manager monitors the reliability rates achieved by each process in the system. You can use these metrics during testing to identify components that do not meet their reliability or availability goals, allowing you to take corrective action.

For detailed information about Fault Manager concepts, configuration tasks, and examples, see the *Configuring and Managing Fault Manager Policies on Cisco IOS XR Software* module.

# fault manager environment

To set a Fault Manager environment variable, use the **fault manager environment** command in global configuration mode. To remove the configuration, use the **no** form of this command.

**fault manager environment** *var-name var-value*

**no fault manager environment** *var-name*

## Syntax Description

<i>var-name</i>	Name assigned to the Fault Manager environment configuration variable.
<i>var-value</i>	Series of characters, including embedded spaces, to be placed in the environment variable <i>var-name</i> .

## Defaults

No default behavior or values

## Command Modes

Global configuration

## Command History

Release	Modification
Release 2.0	This command was introduced on the Cisco CRS-1.
Release 3.0	No modification.
Release 3.2	This command was first supported on the Cisco XR 12000 Series Router.
Release 3.3.0	No modification.

## Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes the proper task IDs. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of the *Cisco IOS XR System Security Configuration Guide*.

Environment variables are available to Fault Manager policies when you set them using the **fault manager environment** command; they become unavailable when you remove them with the **no** form of this command.

By convention, the names of all environment variables defined by Cisco begin with an underscore character to set them apart (for example, `_show_cmd`).

Spaces may be used in the *var-value* argument. This command interprets everything after the *var-name* argument to the end of the line to be part of the *var-value* argument.

Use the **show fault manager environment** command to display the name and value of all Fault Manager environment variables before and after they have been set using the **fault manager environment** command.

## Task ID

Task ID	Operations
fault-mgr	read, write

---

**Examples**

The following example shows how to define a set of Fault Manager environment variables:

```
RP/0/RP0/CPU0:router(config)# fault manager environment _cron_entry 0-59/2 0-23/1 * * 0-7
RP/0/RP0/CPU0:router(config)# fault manager environment _show_cmd show fault manager
policy registered
RP/0/RP0/CPU0:router(config)# fault manager environment _email_server alpha@cisco.com
RP/0/RP0/CPU0:router(config)# fault manager environment _email_from beta@cisco.com
RP/0/RP0/CPU0:router(config)# fault manager environment _email_to beta@cisco.com
RP/0/RP0/CPU0:router(config)# fault manager environment _email_cc
```

---

**Related Commands**

Command	Description
<a href="#">show fault manager environment</a>	Displays the name and value for all Fault Manager environment variables.

---

# fault manager policy

To register a Fault Manager policy with the Fault Manager, use the **fault manager policy** command in global configuration mode. To unregister a Fault Manager policy with the Fault Manager, use the **no** form of this command.

```
fault manager policy {username username} [persist-time {seconds | infinite}]
  policy-name [system | user]
```

```
no fault manager policy policy-name
```

## Syntax Description

<b>username</b> <i>username</i>	(Required) Specifies the <i>username</i> used to run the script. This name can be different from the user who is currently logged in, but the registering user must have permissions that are a superset of the <i>username</i> that will run the script. Otherwise, the script will not be registered and the command be rejected.  In addition, the <i>username</i> that will run the script must have access privileges to the commands issued by the fault manager policy being registered.
<b>persist-time</b> { <i>seconds</i>   <b>infinite</b> }	(Optional) The number of seconds the username authentication is valid. The default time is 3600 seconds (1 hour). Enter 0 to stop the username authentication from being cached. Enter <b>infinite</b> to stop the username from being marked as invalid.
<i>policy-name</i>	Name of the policy file.
<b>system</b>	(Optional) Registers a system policy defined by Cisco.
<b>user</b>	(Optional) Registers a user-defined policy.

## Defaults

The default persist time is 1 hour (3600 seconds).

## Command Modes

Global configuration

## Command History

Release	Modification
Release 2.0	This command was introduced on the Cisco CRS-1.
Release 3.0	No modification.
Release 3.2	This command was first supported on the Cisco XR 12000 Series Router.
Release 3.3.0	Support was added for the required keyword and argument <b>username</b> <i>username</i> .  Support was added for the optional keyword and argument <b>persist-time</b> { <i>seconds</i>   <b>infinite</b> }.

## Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes the proper task IDs. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of the *Cisco IOS XR System Security Configuration Guide*.

The Fault Manager schedules and runs policies on the basis of an event specification that is contained within the policy itself. When the **fault manager policy** command is invoked, the Fault Manager examines the policy and registers it to be run when the specified event occurs. A Fault Manager script is available to be scheduled by the Fault Manager until the **no** form of this command is entered.



### Note

AAA authorization (such as the **aaa authorization exec default local** command) must be configured before Fault Manager policies can be registered. See the “Configuring AAA Services on Cisco IOS XR Software” module of *Configuring AAA Services on Cisco IOS XR Software* for more information on AAA authorization configuration.

### Username

Enter the username that will execute the script with the keyword and argument **username** *username*. This name can be different from the user who is currently logged in, but the registering user must have permissions that are a superset of the *username* that will run the script. Otherwise, the script will not be registered and the command will be rejected. In addition, the *username* that will run the script must have access privileges to the commands issued by the fault manager policy being registered.

### Persist-time

When a script is first registered, the configured **username** for the script is authenticated. If authentication fails, or if the AAA server is down, the script registration fails.

After the script is registered, the username is authenticated again each time a script is run.

If the AAA server is down, the username authentication can be read from memory. The **persist-time** determines the number of seconds this username authentication is held in memory.

- If the AAA server is down and the **persist-time** has not expired, then the username is authenticated from memory and the script runs.
- If the AAA server is down, and the **persist-time** has expired, then user authentication fails and the script does not run.



### Note

Fault Manager attempts to contact the AAA server and refresh the username reauthenticate whenever the configured **refresh-time** expires. See [fault manager refresh-time](#) for more information.

The following values can be used for **persist-time**.

- The default **persist-time** is 3600 seconds (1 hour). Enter the **fault manager policy** command without the **persist-time** keyword to set the **persist-time** to 1 hour.
- Enter 0 to stop the username authentication from being cached. If the AAA server is down, the username does not authenticate and the script does not run.
- Enter **infinite** to stop the username from being marked as invalid. The username authentication held in the cache will not expire. If the AAA server is down, the username is authenticated from the cache.

**System or user keywords**

If you enter the **fault manager policy** command without specifying either the **system** or **user** keyword, the Fault Manager first tries to locate the specified policy file in the system policy directory. If the Fault Manager finds the file in the system policy directory, it registers the policy as a system policy. If the Fault Manager does not find the specified policy file in the system policy directory, it looks in the user policy directory. If the Fault Manager locates the specified file in the user policy directory, it registers the policy file as a user policy. If the Fault Manager finds policy files with the same name in both the system policy directory and the user policy directory, the policy file in the system policy directory takes precedence and the policy file is registered as a system policy.

Task ID	Task ID	Operations
	fault-mgr	read, write

**Examples**

The following example shows how to register a user-defined policy named “cron.tc” located in the user policy directory:

```
RP/0/RP0/CPU0:router (config)# fault manager policy username lab cron.tc1 user
```

**Related Commands**

Command	Description
<b>fault manager refresh-time</b>	Specifies time between system attempts to contact the AAA server and refresh the username reauthentication.
<b>fault manager user-lib-directory</b>	Specifies a directory to use for storing user library files.
<b>fault manager user-policy-directory</b>	Specifies a directory to use for storing user-defined Fault Manager policies.
<b>show fault manager policy available</b>	Displays Fault Manager policies that are available to be registered.
<b>show fault manager policy registered</b>	Displays Fault Manager policies that are already registered.

# fault manager refresh-time

To define the time between refresh of user authentication for Fault Manager, use the **fault manager refresh-time** command in global configuration mode.

**fault manager refresh-time** *seconds*

<b>Syntax Description</b>	<i>seconds</i>	Number of seconds between user authentication refresh.
---------------------------	----------------	--

**Defaults** The default refresh time is 30 minutes (1800 seconds).

**Command Modes** Global configuration

<b>Command History</b>	<b>Release</b>	<b>Modification</b>
	Release 3.3.0	This command was introduced on the Cisco CRS-1 and Cisco XR 12000 Series Routers.

**Usage Guidelines** To use this command, you must be in a user group associated with a task group that includes the proper task IDs. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of the *Cisco IOS XR System Security Configuration Guide*.

Fault Manager will attempt to contact the AAA server and refresh the username reauthenticate whenever the configured **refresh-time** expires.

<b>Task ID</b>	<b>Task ID</b>	<b>Operations</b>
	fault-mgr	read, write

**Examples** The following example shows how to set the refresh time:

```
RP/0/RP0/CPU0:router(config)# fault manager refresh-time 1900
```

<b>Related Commands</b>	<b>Command</b>	<b>Description</b>
	<a href="#">fault manager policy</a>	Registers a Fault Manager policy.

# fault manager schedule-policy suspend

To suspend Fault Manager policy scheduling execution immediately, use the **fault manager schedule-policy suspend** command in global configuration mode. To remove the **fault manager schedule-policy suspend** command from the configuration file and restore the system to its default condition with respect to this command, use the **no** form of this command.

**fault manager schedule-policy suspend**

**no fault manager schedule-policy suspend**

**Syntax Description** This command has no arguments or keywords.

**Defaults** Policy scheduling is active by default.

**Command Modes** Global configuration

Command History	Release	Modification
	Release 2.0	This command was introduced on the Cisco CRS-1.
	Release 3.0	No modification.
	Release 3.2	This command was first supported on the Cisco XR 12000 Series Router.
	Release 3.3.0	No modification.

**Usage Guidelines** To use this command, you must be in a user group associated with a task group that includes the proper task IDs. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of the *Cisco IOS XR System Security Configuration Guide*.

Use the **fault manager schedule-policy suspend** command to suspend all policy scheduling requests and do no scheduling until you enter the **no** form of this command. The **no** form of this command resumes policy scheduling and runs any pending policies.

You might want to suspend policy execution immediately instead of unregistering policies one by one for the following reasons:

- For security—if you suspect the security of your system has been compromised

For performance—if you want to suspend policy execution temporarily to make more CPU cycles available for other functions

Task ID	Task ID	Operations
	fault-mgr	read, write

---

**Examples**

The following example shows how to disable policy scheduling:

```
RP/0/RP0/CPU0:router(config)# fault manager schedule-policy suspend
```

```
May 19 14:31:22.439: fm_server[12330]: fm_process_sync: Policy execution has been suspended
```

The following example shows how to enable policy scheduling:

```
RP/0/RP0/CPU0:router(config)# no fault manager schedule-policy suspend
```

```
May 19 14:31:40.449: fm_server[12330]: fm_server: Policy execution has been resumed
```

---

**Related Commands**

<b>Command</b>	<b>Description</b>
<a href="#">fault manager policy</a>	Registers a Fault Manager policy with the Fault Manager.

---

# fault manager user-lib-directory

To specify a directory to use for storing user library files, use the **fault manager user-lib-directory** command in global configuration mode. To remove the **fault manager user-lib-directory** command from the configuration file and restore the system to its default condition with respect to this command, use the **no** form of this command.

**fault manager user-lib-directory** *directory*

**no fault manager user-lib-directory**

<b>Syntax Description</b>	<i>directory</i>	Absolute pathname to the user library directory on the flash device.
---------------------------	------------------	--

<b>Defaults</b>	No default behavior or values	
-----------------	-------------------------------	--

<b>Command Modes</b>	Global configuration	
----------------------	----------------------	--

<b>Command History</b>	<b>Release</b>	<b>Modification</b>
	Release 2.0	This command was introduced on the Cisco CRS-1.
Release 3.0	No modification.	
Release 3.2	This command was first supported on the Cisco XR 12000 Series Router.	
Release 3.3.0	No modification.	

<b>Usage Guidelines</b>	<p>To use this command, you must be in a user group associated with a task group that includes the proper task IDs. For detailed information about user groups and task IDs, see the <i>Configuring AAA Services on Cisco IOS XR Software</i> module of the <i>Cisco IOS XR System Security Configuration Guide</i>.</p>
-------------------------	--

The user library directory is needed to store user library files associated with authoring Fault Manager policies. If you have no plans to write Fault Manager policies, you do not need to create a user library directory.

The Cisco IOS XR software supports only policy files created by using the Tool Command Language (TCL) scripting language. TCL software is provided in the Cisco IOS XR software image when the Fault Manager is installed on the network device. Files with the .tcl extension can be Fault Manager policies, TCL library files, or a special TCL library index file named tclindex. The tclindex file contains a list of user function names and the library files that contain the user functions (“procedures”). The Fault Manager searches the user library directory when TCL starts to process the tclindex file.

To create the user library directory before identifying it to the Fault Manager, use the **mkdir** command in EXEC mode. After creating the user library directory, you can then use the **copy** command to copy .tcl library files into the user library directory.

Task ID	Task ID	Operations
	fault-mgr	read, write

**Examples**

The following example shows how to set the path name for the user library directory to /usr/lib/tcl on disk0:

```
RP/0/RP0/CPU0:router(config)# fault manager user-lib-directory disk0:/usr/lib/tcl
```

**Related Commands**

Command	Description
<b>mkdir</b>	Creates a new directory on a flash file system.
<a href="#">show fault manager user-lib-directory</a>	Displays the directory to use for storing user library files.

# fault manager user-policy-directory

To specify a directory to use for storing user-defined Fault Manager policies, use the **fault manager user-policy-directory** command in global configuration mode. To remove the configuration, use the **no** form of this command.

**fault manager user-policy-directory** *directory*

**no fault manager user-policy-directory**

<b>Syntax Description</b>	<i>directory</i>	Absolute path name to the user policy directory on the flash device.
---------------------------	------------------	--

<b>Defaults</b>	No default behavior or values
-----------------	-------------------------------

<b>Command Modes</b>	Global configuration
----------------------	----------------------

<b>Command History</b>	<b>Release</b>	<b>Modification</b>
	Release 2.0	This command was introduced on the Cisco CRS-1.
	Release 3.0	No modification.
	Release 3.2	This command was first supported on the Cisco XR 12000 Series Router.
	Release 3.3.0	No modification.

<b>Usage Guidelines</b>	To use this command, you must be in a user group associated with a task group that includes the proper task IDs. For detailed information about user groups and task IDs, see the <i>Configuring AAA Services on Cisco IOS XR Software</i> module of the <i>Cisco IOS XR System Security Configuration Guide</i> .
-------------------------	--

The user policy directory is needed to store user-defined policy files. If you have no plans to write Fault Manager policies, you do not need to create a user policy directory. The Fault Manager searches the user policy directory when you enter the **fault manager policy** *policy-name* **user** command.

To create the user policy directory before identifying it to the Fault Manager, use the **mkdir** command in EXEC mode. After creating the user policy directory, you can then use the **copy** command to copy policy files into the user policy directory.

<b>Task ID</b>	<b>Task ID</b>	<b>Operations</b>
	fault-mgr	read, write

<b>Examples</b>	The following example shows how to set the location of the Fault Manager user policy directory to /usr/fm_policies on disk0:
-----------------	--

```
RP/0/RP0/CPU0:router (config) # fault manager user-policy-directory disk0:/usr/fm_policies
```

Related Commands	Command	Description
	<code>copy</code>	Copies files to a specified location.
	<code>fault manager policy</code>	Registers a Fault Manager policy with the Fault Manager.
	<code>mkdir</code>	Creates a new directory on a flash file system.
	<code>show fault manager user-policy-directory</code>	Displays the directory to use for storing user policy files.

# show fault manager environment

To display the names and values of Fault Manager environment variables, use the **show fault manager environment** command in EXEC mode.

```
show fault manager environment [all | environment-name]
```

Syntax Description	all	(Optional) Specifies all environment variables.
	<i>environment-name</i>	(Optional) Environment variables for which data is displayed.

**Defaults** All environment variables are displayed.

**Command Modes** EXEC

Command History	Release	Modification
	Release 2.0	This command was introduced on the Cisco CRS-1.
	Release 3.0	No modification.
	Release 3.2	This command was first supported on the Cisco XR 12000 Series Router.
	Release 3.3.0	No modification.

**Usage Guidelines** To use this command, you must be in a user group associated with a task group that includes the proper task IDs. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of the *Cisco IOS XR System Security Configuration Guide*.

Use this command to display the name and value of Fault Manager environment variables.

Task ID	Task ID	Operations
	fault-mgr	read

**Examples** The following is sample output from the **show fault manager environment** command:

```
RP/0/RP0/CPU0:router# show fault manager environment

No.  Name                               Value
 1   _email_cc                             mosnerd@cisco.com
 2   _email_to                             mosnerd@cisco.com
 3   _show_cmd                             show fault manager policy registered
 4   _cron_entry                           0-59/2 0-23/1 * * 0-7
 5   _email_from                           mosnerd@cisco.com
 6   _email_server                          zeta@cisco.com
```

[Table 1](#) describes the significant fields shown in the display.

**Table 1** *show fault manager environment Field Descriptions*

Field	Description
No.	Number of the Fault Manager environment variable.
Name	Name of the Fault Manager environment variable.
Value	Value of the Fault Manager environment variable.

**Related Commands**

Command	Description
<a href="#">fault manager environment</a>	Sets a Fault Manager environment variable.

# show fault manager metric hardware location

To display Fault Manager reliability data for processes running on a particular node, use the **show fault manager metric hardware location** command in EXEC mode.

**show fault manager metric hardware location** {*node-id* | **all**}

Syntax Description	<i>node-id</i>	FaultManager reliability data for a specified node. The <i>node-id</i> argument is entered in the <i>rack/slot/module</i> notation.
	<b>all</b>	Specifies all nodes.

Command Modes	EXEC
---------------	------

Command History	Release	Modification
	Release 2.0	This command was introduced on the Cisco CRS-1.
	Release 3.0	No modification.
	Release 3.2	This command was first supported on the Cisco XR 12000 Series Router.
	Release 3.3.0	No modification.

**Usage Guidelines**

To use this command, you must be in a user group associated with a task group that includes the proper task IDs. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of the *Cisco IOS XR System Security Configuration Guide*.

Use the **show fault manager metric hardware location** command to display Fault Manger reliability data for processes running on a particular node.

Task ID	Task ID	Operations
	fault-mgr	read

**Examples**

The following is sample output from the **show fault manager metric hardware location** command:

```
RP/0/RP0/CPU0:router# show fault manager metric hardware location 0/RP1/CPU0
```

```
=====
node: 0/RP1/CPU0
most recent start time: Wed Jan  7 16:25:34 2004
most recent normal end time: n/a
most recent abnormal end time: n/a
most recent abnormal reason: n/a
cumulative available time: 18 hours 5 minutes 28 seconds 856 milliseconds
cumulative unavailable time: 0 hours 0 minutes 0 seconds 4 milliseconds
number of times hardware card started: 1
number of times hardware card shutdown normally: 0
number of times hardware card shutdown abnormally: 0
```

Table 2 describes the significant fields shown in the display.

**Table 2** *show fault manager metric hardware location Field Descriptions*

Field	Description
node	Node with processes running.
most recent start time	Last time the node was started.
most recent normal end time	Last time the node was stopped normally.
most recent abnormal end time	Last time the process was terminated abnormally.
most recent abnormal reason	Reason for the last abnormal process termination. For example, the process was aborted or crashed.
cumulative available time	Total time the node has been available.
cumulative unavailable time	Total time the node has not been available.
number of times hardware card started	Number of times the card has been started.
number of times hardware card shutdown normally	Number of times the card has been shut down normally.
number of times hardware card shutdown abnormally	Number of times the card has been shut down abnormally.

#### Related Commands

Command	Description
<b>show processes</b>	Displays information about active processes.

# show fault manager metric process

To display Fault Manager reliability metric data for processes, use the **show fault manager metric process** command in EXEC mode.

```
show fault manager metric process {all | job-id | process-name} [location {all | node-id}]
```

## Syntax Description

<b>all</b>	All processes.
<i>job-id</i>	Process associated with this job identifier.
<i>process-name</i>	Process associated with this name.
<b>location</b>	(Optional) Specifies the location of the node.
<b>all</b>	(Optional) Displays hardware reliability metric data for all nodes.
<i>node-id</i>	(Optional) Hardware reliability metric data for a specified node. Displays detailed CEF information for the designated node. The <i>node-id</i> argument is entered in the <i>rack/slot/module</i> notation.

## Command Modes

EXEC

## Command History

Release	Modification
Release 2.0	This command was introduced on the Cisco CRS-1.
Release 3.0	No modification.
Release 3.2	This command was first supported on the Cisco XR 12000 Series Router.
Release 3.3.0	No modification.

## Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes the proper task IDs. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of the *Cisco IOS XR System Security Configuration Guide*.

The system maintains a record of when processes start and end. This data is used as the basis for reliability analysis.

Use the **show fault manager metric process** command to obtain availability information for a process or group of processes. A process is considered available when it is running.

## Task ID

Task ID	Operations
fault-mgr	read

## Examples

The following is sample output from the **show fault manager metric process** command:

```
RP/0/RP0/CPU0:router# show fault manager metric process all location all
```

```
=====
job id: 53, node name: node0
```

```

process name: clear_autoboot, instance: 1
comp id: 0, version:00.00.0000
-----
last event type: process end
recent end type: normal
recent start time: n/a
recent normal end time: Sat Jan 1 00.00.08 2004
recent abnormal end time: n/a
recent abnormal end type: n/a
number of times started: 0
number of times ended normally: 1
number of times ended abnormally: 0
most recent 10 process start times:

most recent 10 process end times and types:
-----
Sat Jan 1 00.00.08 2004, normal
-----

cumulative process available time: n/a
cumulative process unavailable time: n/a
process availability: n/a
number of abnormal ends within the past 60 minutes: 0
number of abnormal ends within the past 24 hours: 0
number of abnormal ends within the past 30 days: 0
=====
job id: 112, node name: node0
process name: psarb, instance: 1
comp id: 0, version: 00.00.0000
-----
last event type: process start
recent end type: n/a
recent start time: Sat Jan 1 00.00.08 2004
recent normal end time: n/a
recent abnormal end time: n/a
recent abnormal end type: n/a
number of times started: 1
number of times ended normally: 0
.
.
.
    
```

Table 3 describes the significant fields shown in the display.

**Table 3** show fault manager metric process Field Descriptions

Field	Description
job id	Number assigned as the job identifier.
node name	Node with the process running.
process name	Name of the process running on the node.
instance	Instance or thread of a multithreaded process.
comp id	Component of which the process is a member.
version	Specific software version or release of which the process is a member.
last event type	Last event type on the node.
recent end type	Most recent end type.

**Table 3** *show fault manager metric process Field Descriptions (continued)*

<b>Field</b>	<b>Description</b>
recent start time	Last time the process was started.
recent normal end time	Last time the process was stopped normally.
recent abnormal end time	Last time the process was terminated abnormally.
recent abnormal end type	Reason for the last abnormal process termination. For example, the process was aborted or crashed.
number of times started	Number of times the process has been started.
number of times ended normally	Number of times the process has been stopped normally.
number of times ended abnormally	Number of times the process has stopped abnormally.
most recent 10 process start times	Times of the last ten process starts.
cumulative process available time	Total time the process has been available.
cumulative process unavailable time	Total time the process has been out of service due to a restart, abort, communication problems, and so on.
process availability	Uptime percentage of the process (time running—the duration of any outage).
number of abnormal ends within the past 60 minutes	Number of times the process has stopped abnormally within the last 60 minutes.
number of abnormal ends within the past 24 hours	Number of times the process has stopped abnormally within the last 24 hours.
number of abnormal ends within the past 30 days	Number of times the process has stopped abnormally within the last 30 days.

**Related Commands**

<b>Command</b>	<b>Description</b>
<b>show processes</b>	Displays information about active processes.

# show fault manager policy available

To display Fault Manager policies that are available to be registered, use the **show fault manager policy available** command in EXEC mode.

**show fault manager policy available [system | user]**

Syntax Description	system	(Optional) Displays all available system policies.
	user	(Optional) Displays all available user policies.

**Defaults** If this command is invoked with no optional keywords, it displays information for all available system and user policies.

**Command Modes** EXEC

Command History	Release	Modification
	Release 2.0	This command was introduced on the Cisco CRS-1.
	Release 3.0	No modification.
	Release 3.2	This command was first supported on the Cisco XR 12000 Series Router.
	Release 3.3.0	No modification.

**Usage Guidelines** To use this command, you must be in a user group associated with a task group that includes the proper task IDs. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of the *Cisco IOS XR System Security Configuration Guide*.

Use this command to find out what policies are available to be registered just prior to using the **fault manager policy** command to register policies.

This command is also useful if you forget the exact name of a policy required for the **fault manager policy** command.

Task ID	Task ID	Operations
	fault-mgr	read

**Examples** The following is sample output from the **show fault manager policy available** command:

```
RP/0/RP0/CPU0:router# show fault manager policy available
```

```
No.  Type    Time Created                               Name
1    system  Tue Jan 12 09:41:32 2004                pr_sample_cdp_abort.tcl
2    system  Tue Jan 12 09:41:32 2004                pr_sample_cdp_revert.tcl
3    system  Tue Jan 12 09:41:32 2004                sl_sample_intf_down.tcl
4    system  Tue Jan 12 09:41:32 2004                tm_sample_cli_cmd.tcl
```

## show fault manager policy available

```

5    system  Tue Jan 12 09:41:32 2004    tm_sample_crash_hist.tcl
6    system  Tue Jan 12 09:41:32 2004    wd_sample_proc_mem_used.tcl
7    system  Tue Jan 12 09:41:32 2004    wd_sample_sys_mem_used.tcl

```

Table 4 describes the significant fields shown in the display.

**Table 4** *show fault manager policy available Field Descriptions*

Field	Description
No.	Number of the policy.
Type	Type of policy.
Time Created	Time the policy was created.
Name	Name of the policy.

### Related Commands

Command	Description
<a href="#">fault manager policy</a>	Registers a Fault Manager policy with the Fault Manager.
<a href="#">show fault manager policy registered</a>	Displays Fault Manager policies that are already registered.

# show fault manager policy registered

To display Fault Manager policies that are already registered, use the **show fault manager policy registered** command in EXEC mode.

```
show fault manager policy registered [event-type event-name] [system | user] [time-ordered | name-ordered]
```

Syntax Description	
<b>event-type</b> <i>event-name</i>	(Optional) Displays the registered policies for a specific event type, where the valid <i>event-name</i> options are as follows: <ul style="list-style-type: none"> <li>• <b>application</b>—Application event type</li> <li>• <b>counter</b>—Counter event type</li> <li>• <b>hardware</b>—Hardware event type</li> <li>• <b>oir</b>—Online insertion and removal (OIR) event type</li> <li>• <b>process-abort</b>—Process abort event type</li> <li>• <b>process-start</b>—Process start event type</li> <li>• <b>process-term</b>—Process termination event type</li> <li>• <b>process-user-restart</b>—Process user restart event type</li> <li>• <b>process-user-shutdown</b>—Process user shutdown event type</li> <li>• <b>statistics</b>—Statistics event type</li> <li>• <b>syslog</b>—Syslog event type</li> <li>• <b>timer-absolute</b>—Absolute timer event type</li> <li>• <b>timer-countdown</b>—Countdown timer event type</li> <li>• <b>timer-cron</b>—Clock daemon (cron) timer event type</li> <li>• <b>timer-watchdog</b>—Watchdog timer event type</li> <li>• <b>wdsysmon</b>—Watchdog system monitor event type</li> </ul>
<b>system</b>	(Optional) Displays the registered system policies.
<b>user</b>	(Optional) Displays the registered user policies.
<b>time-ordered</b>	(Optional) Displays the policies by registration time.
<b>name-ordered</b>	(Optional) Displays the policies in alphabetical order by the policy name.

## Defaults

If this command is invoked with no optional keywords or arguments, it displays the registered Fault Manager policies for all event types. The policies are displayed according to registration time.

## Command Modes

EXEC

show fault manager policy registered

**Command History**

Release	Modification
Release 2.0	This command was introduced on the Cisco CRS-1.
Release 3.0	No modification.
Release 3.2	This command was first supported on the Cisco XR 12000 Series Router.
Release 3.3.0	No modification.

**Usage Guidelines**

To use this command, you must be in a user group associated with a task group that includes the proper task IDs. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of the *Cisco IOS XR System Security Configuration Guide*.

The output of the **show fault manager policy registered** command is most helpful if you are writing and monitoring Fault Manager policies. The output displays registered policy information in two parts. The first line in each policy description lists the index number assigned to the policy, policy type (system or user), type of event registered, time when the policy was registered, and name of the policy file. The remaining lines of each policy description display information about the registered event and how the event is to be handled, and come directly from the Tool Command Language (TCL) command arguments that make up the policy file. This information is documented in the Cisco publication *Writing Fault Manager Policies*.

**Task ID**

Task ID	Operations
fault-mgr	read

**Examples**

The following is sample output from the **show fault manager policy registered** command:

```
RP/0/RP0/CPU0:router# show fault manager policy registered

No.      Type      Event Type      Time Registered      Name
1        system   proc abort      Wed Jan 16 23:44:56 2004  test1.tcl
  version 00.00.0000 instance 1 path {cdp}
  priority normal maxrun_sec 20 maxrun_nsec 0
2        system   timer cron      Wed Jan 16 23:44:58 2004  test2.tcl
  name {crontimer1}
  priority normal maxrun_sec 20 maxrun_nsec 0
3        system   proc abort      Wed Jan 16 23:45:02 2004  test3.tcl
  path {cdp}
  priority normal maxrun_sec 20 maxrun_nsec 0
4        system   syslog          Wed Jan 16 23:45:41 2004  test4.tcl
  occurs 1 pattern {test_pattern}
  priority normal maxrun_sec 90 maxrun_nsec 0
5        system   timer cron      Wed Jan 16 23:45:12 2004  test5.tcl
  name {crontimer2}
  priority normal maxrun_sec 30 maxrun_nsec 0
6        system   wdsysmon        Wed Jan 16 23:45:15 2004  test6.tcl
  timewin_sec 120 timewin_nsec 0 sub1 mem_tot_used {node {localhost} op gt
  val 23000}
  priority normal maxrun_sec 40 maxrun_nsec 0
7        system   wdsysmon        Wed Jan 16 23:45:19 2004  test7.tcl
  timewin_sec 120 timewin_nsec 0 sub1 mem_proc {node {localhost} procname
  {wdsysmon} op gt val 80 is_percent FALSE}
  priority normal maxrun_sec 40 maxrun_nsec 0
```

Table 5 describes the significant fields shown in the display.

**Table 5** *show fault manager policy registered Field Descriptions*

Field	Description
No.	Number of the policy.
Type	Type of policy.
Event Type	Type of fault manager event for which the policy is registered.
Time Registered	Time the policy was registered.
Name	Name of the policy.

**Related Commands**

Command	Description
<a href="#">fault manager policy</a>	Registers a Fault Manager policy with the Fault Manager.

# show fault manager statistics-table

To display the currently supported statistic counters maintained by the Fault Detector Data Engine catalog, use the **show fault manager statistics-table** command in EXEC mode.

**show fault manager statistics-table** {*stats-name* | **all**}

Syntax Description	<i>stats-name</i>	Specific statistics type to be displayed. There are three statistics types:
		<ul style="list-style-type: none"> <li>generic (ifstats-generic)</li> <li>interface table (ifstats-iftable)</li> <li>data rate (ifstats-datarate)</li> </ul>
	<b>all</b>	Provides output for all three statistics types.

**Command Modes** EXEC

Command History	Release	Modification
	Release 2.0	This command was introduced on the Cisco CRS-1.
	Release 3.0	No modification.
	Release 3.2	This command was first supported on the Cisco XR 12000 Series Router.
	Release 3.3.0	No modification.

**Usage Guidelines** To use this command, you must be in a user group associated with a task group that includes the proper task IDs. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of the *Cisco IOS XR System Security Configuration Guide*.

Use the **show fault manager statistics-table all** command to display output for all statistics types,

Task ID	Task ID	Operations
	fault-mgr	read

**Examples** The following is sample output from the **show fault manager statistics-table all** command:

```
RP/0/RP0/CPU0:router# show fault manager statistics-table all
```

Name	Type	Description
ifstats-generic	bag	Interface generic stats
ifstats-iftable	bag	Interface iftable stats
ifstats-datarate	bag	Interface datarate stats

The following is sample output providing more detailed information on the “ifstats-iftable” interface statistics table:

```
RP/0/RP0/CPU0:router# show fault manager statistics-table ifstats-iftable
```

Name	Type	Description
input_pkts	uint64	packets rcvd
input_bytes	uint64	bytes rcvd
output_pkts	uint64	packets sent
output_bytes	uint64	bytes sent
input_mcast_pkts	uint64	multicast pkts rcvd
input_bcast_pkts	uint64	broadcast pkts rcvd
output_mcast_pkts	uint64	multicast pkts sent
output_bcast_pkts	uint64	broadcast pkts sent
output_total_drops	uint32	total output drops
input_total_drops	uint32	total input drops
input_queue_drops	uint32	input queue drops
input_unknown_proto	uint32	unknown protocol pkts rcvd
input_total_errors	uint32	total input errors
input_crc	uint32	input crc errors
input_overrun	uint32	input overruns
input_frame	uint32	framing-errors rcvd
output_total_errors	uint32	total output errors
output_underrun	uint32	output underruns
resets	uint32	number of board resets
availability_flag	uint32	availability bit mask
last_clear	uint32	seconds since last clear counters

Table 6 describes the significant fields shown in the display.

**Table 6** show fault manager statistics-table Field Descriptions

Field	Description
Name	Name of the statistic.  When the <b>all</b> keyword is specified, there are three types of statistics displayed: <ul style="list-style-type: none"> <li>• ifstats-generic</li> <li>• ifstats-iftable</li> <li>• ifstats-datarate</li> </ul> When a statistics type is specified, the statistics for the statistic type are displayed.
Type	Type of statistic.
Description	Description of the statistic.

**Related Commands**

Command	Description
<a href="#">show fault manager environment</a>	Displays the name and value of all Fault Manager environment variables.

# show fault manager user-lib-directory

To display the directory to use for storing user library files, use the **show fault manager user-lib-directory** command in EXEC mode.

**show fault manager user-lib-directory**

**Syntax Description** This command has no arguments or keywords.

**Command Modes** EXEC

Command History	Release	Modification
	Release 2.0	This command was introduced on the Cisco CRS-1.
	Release 3.0	No modification.
	Release 3.2	This command was first supported on the Cisco XR 12000 Series Router.
	Release 3.3.0	No modification.

**Usage Guidelines** To use this command, you must be in a user group associated with a task group that includes the proper task IDs. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of the *Cisco IOS XR System Security Configuration Guide*.

Use the **show fault manager user-lib-directory** command to get the current value of the Fault Manager user policy directory.

Task ID	Task ID	Operations
	fault-mgr	read

**Examples** The following is sample output from the **show fault manager user-lib-directory** command:

```
RP/0/RP0/CPU0:router# show fault manager user-lib-directory
disk0:/fm_user_lib_dir
```

Related Commands	Command	Description
	<a href="#">fault manager user-lib-directory</a>	Specifies a directory to use for storing user library files.

# show fault manager user-policy-directory

To display the directory to use for storing user policy files, use the **show fault manager user-policy-directory** command in EXEC mode.

**show fault manager user-policy-directory**

**Syntax Description** This command has no arguments or keywords.

**Command Modes** EXEC

Command History	Release	Modification
	Release 2.0	This command was introduced on the Cisco CRS-1.
	Release 3.0	No modification.
	Release 3.2	This command was first supported on the Cisco XR 12000 Series Router.
	Release 3.3.0	No modification.

**Usage Guidelines** To use this command, you must be in a user group associated with a task group that includes the proper task IDs. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of the *Cisco IOS XR System Security Configuration Guide*.

Use the **show fault manager user-policy-directory** command to display the directory to use for storing user policy files.

Task ID	Task ID	Operations
	fault-mgr	read

**Examples** The following is sample output from the **show fault manager user-policy-directory** command:

```
RP/0/RP0/CPU0:router# show fault manager user-policy-directory
disk0:/fm_user_pol_dir
```

Related Commands	Command	Description
	<a href="#">fault manager user-policy-directory</a>	Specifies a directory to use for storing user-defined Fault Manager policies.

■ show fault manager user-policy-directory