

## Chapter 11

# Understanding the Method and Tools for Monitoring Router Components

This chapter describes the method and tools you use to monitor and isolate problems on router hardware components. It includes the following information:

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Basic Router Component Monitoring Tools on page 49

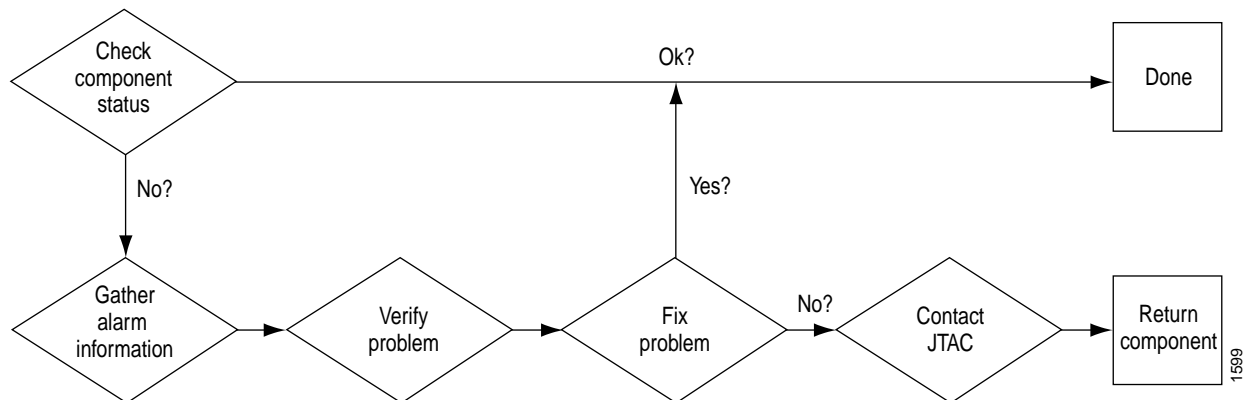
Using the Basic Monitoring Method on page 55

## Basic Router Component Monitoring Method

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Figure 11 shows the basic method you use to monitor router hardware components.

**Figure 11: Basic Method for Monitoring Router Components**



You should routinely monitor the status of all Juniper Networks routers running on the network.

The Simple Network Management Protocol (SNMP) network manager software running on a network management system (NMS) in the network operations center (NOC) discovers, polls, and exchanges network management information with the JUNOS software SNMP agent running on Juniper Networks routers. The SNMP network manager software collects information about router connectivity, operation, and events.

The SNMP agent responds to requests for information and controls access to its Management Information Bases (MIBs). The MIBs define all objects that can be managed on the router via SNMP. The JUNOS software chassis MIB provides environmental monitoring information on the router and its components. MIB objects represent each component and the status of the components.

A trap is generated and reported to the SNMP manager software when a significant event occurs on the router, such as an error or failure. When a trap occurs, you can log in to that router to get specific operational status information about the problem; for more information, see “Check the Router Component Status” on page 29 and “Gather Component Alarm Information” on page 33. Verify the problem and fix it if possible; for more information, see “Verify the Component Problem” on page 34 and “Fix the Problem” on page 35. If you cannot verify or fix the problem, contact the Juniper Networks Technical Assistance Center (JTAC) for more advanced analysis and troubleshooting, and return the component once failure is verified; for more information, see “Contact JTAC” on page 35 and “Return the Failed Component” on page 36.

## Basic Router Component Monitoring Tools

Table 13 lists and describes the purposes of the basic tools you use to monitor router hardware.

**Table 13: Basic Tools for Monitoring Router Components**

Router Component Monitor Tool	Purpose
JUNOS SNMP Agent, MIBs, and traps	<p>The JUNOS SNMP agent runs on Juniper Networks routers, exchanging network management information with SNMP manager software running on an NMS or host. The SNMP manager collects information about network connectivity, activity, and events by polling the router. The agent responds to requests for information and actions from the manager.</p> <p>The SNMP agent also controls access to the agent's MIBs. The JUNOS software chassis MIB represents each component and the status of the components.</p> <p>The agent sends a trap to the SNMP manager software when an event occurs on the router. A trap reports significant events occurring on a network device; for example, most often errors or failures.</p>
JUNOS software	<p>The primary means of accessing and controlling the JUNOS software is the command-line interface (CLI).</p> <p>For M5, M10, M20, and M40 routers, the router provides three ports on the craft interface for connecting external management devices to the Routing Engine and hence to the JUNOS software.</p> <p>For M40e, M160, M320, and T320 routers, and the T640 routing node, the management ports are located on the Connector Interface Panel (CIP).</p> <p>For M7i and M10i routers, the management ports are located on the Routing Engine.</p> <p>The management ports include the following:</p> <ul style="list-style-type: none"> <li>Ethernet—Used to connect the Routing Engine to a management LAN (or any other device that plugs into an Ethernet connection) for out-of-band management of the router. The Ethernet port can be 10 or 100 Mbps and uses an autosensing RJ-45 connector. The Ethernet management port has two LEDs, which indicate the type of connection in use. A yellow LED lights when a 10-Mbps connection is active, and a green LED lights when a 100-Mbps connection is active.</li> <li>Console—Used to connect a system console to the Routing Engine with an RS-232 serial cable.</li> <li>Auxiliary—Used to connect a laptop computer or modem to the Routing Engine with an RS-232 cable.</li> </ul>

Router Component Monitor Tool	Purpose
JUNOS software CLI commands	<p>The JUNOS software CLI has two modes: operational and configuration.</p> <p>Note: You only need to type <b>cli</b> if you log in to the router as root. Otherwise, the CLI should be already in operational mode.</p> <p>In operational mode, you monitor and troubleshoot the software, network connectivity, and router by entering CLI commands. To enter operational mode, log in to the router and type <b>cli</b> at the command prompt.</p> <p>In configuration mode, you configure the JUNOS software that controls the router. To enter configuration mode:</p> <ol style="list-style-type: none"> <li>a. Log in to the router.</li> <li>b. Start the CLI by typing <b>cli</b> at the command prompt.</li> <li>c. Type <b>edit</b> at the command prompt.</li> </ol> <p>For more information about JUNOS CLI commands, see “Monitoring the CIP” on page 381.</p>

Router Component Monitor Tool	Purpose
Router craft interface	<p>The craft interface provides status and troubleshooting information at a glance and lets you perform many system control functions. The craft interface provides the following information:</p> <p>M5 and M10 routers: Alarm LEDs and lamp test button, Routing Engine ports, link and activity status lights, and Physical Interface Card (PIC) online/offline buttons</p> <p>M7i router: Networking interface Link/Activity LEDs, PIC On/Off LEDs, and alarm LEDs are located on the FIC</p> <p>M10i routers: HCM status LEDs, PIC On/Off LEDs, and alarm LEDs are located on the HCM</p> <p>M20 router: Alarm relay contacts, LEDs, and cutoff button, Routing Engine interface ports and status indicators, Routing Engine LEDs and offline buttons, Flexible PIC Concentrator (FPC) LEDs and offline button</p> <p>M40 router: Alarm relay contacts, LEDs, cutoff button, FPC LEDs and offline button, LCD display and navigation buttons, and Routing Engine LEDs and interface ports</p> <p>M40e router: Alarm LEDs and alarm cutoff/lamp test button, LCD display and navigation buttons, host module LEDs, and FPC LEDs and offline button</p> <p>M160 router: Alarm LEDs and alarm cutoff/lamp test button, LCD display and navigation buttons, host module LEDs, and FPC LEDs and offline button</p> <p>M320 router: Routing Engine LEDs, Switch Interface Board (SIB) LEDs, power supply LEDs, LCD display and navigation buttons, alarm LEDs, and FPC LEDs</p> <p>T320 router and T640 routing node: Alarm LEDs and lamp test button, LCD display and navigation buttons, host subsystem LEDs, SIB LED, FPC LEDs, and FPC online/offline buttons</p> <p>The M40e, M160, and T320 routers and the T640 routing node have a CIP that contains the Alarm Relay contacts, management ports, and Link and Activity Status lights.</p> <p>To display craft interface information, use the following CLI command:</p> <pre>show chassis craft-interface</pre>

Router Component Monitor Tool	Purpose
Router component LEDs	<p>Router components have faceplates with LEDs that display the component status:</p> <p>M5 and M10 routers: PICs and power supplies</p> <p>M7i router: Compact Forwarding Engine Board (CFEB), PICs, Fixed Interface Cards (FICs) (Fast Ethernet and Gigabit Ethernet), and power supplies</p> <p>M10i router: CFEB, High-Availability Chassis Manager (HCM), and power supplies</p> <p>M20 router: System and Switch Boards (SSBs) and power supplies</p> <p>M40 router: System Control Boards (SCBs) and power supplies</p> <p>M40e router: Switching and Forwarding Modules (SFMs), Packet Forwarding Engine Clock Generators (PCGs), Miscellaneous Control Subsystem (MCS), and power supplies</p> <p>M160 router: SFMs, PCGs, MCS, and power supplies</p> <p>M320 router: SIBs, Control Boards, and power supplies</p> <p>T320 router and T640 routing node: SIBs, Control Boards, SONET Clock Generators (SCGs), and power supplies</p> <p>To display some router component LED status, use the following CLI command:</p> <pre>show chassis craft-interface</pre>
messages system log file	<p>The messages system log file records the messages generated by component operational events, including error messages generated by component failures. To view the messages log file, use the following CLI command:</p> <pre>show log messages</pre> <p>To monitor the messages log file in real time, use the following CLI command:</p> <pre>monitor start messages</pre> <p>To stop monitoring the messages log file, use the following CLI command:</p> <pre>monitor stop messages</pre>
chassisd system log file	<p>The chassis daemon (chassisd) log file keeps track of the state of each chassis component. To view the chassisd log file, use the following CLI command:</p> <pre>show log chassisd</pre> <p>To monitor the chassisd log file in real time, use the following CLI command:</p> <pre>monitor start chassisd</pre> <p>To stop monitoring the chassisd log file, use the following CLI command:</p> <pre>monitor stop chassisd</pre>

Router Component Monitor Tool	Purpose
Swap test	Remove the failed component. Replace it with one that you know works. Check the component status. If the replacement component works, it confirms that the original one failed.
JTAC	For technical support, open a support case using the Case Manager link at <a href="http://www.juniper.net/support/">http://www.juniper.net/support/</a> or call 1-888-314-JTAC (within the United States) or 1-408-745-9500 (outside the United States). JTAC can do more extensive testing to determine the root of the problem.

### Common Operational Mode CLI Commands To Monitor Router Components



**NOTE:** If the Forwarding Engine Board (FEB) on M5 and M10 routers, CFEB on M10i routers, SSB on M20 routers, SCB on M40 routers, SFM on M40e and M160 routers, or SIB on M320 routers, T320 routers and the T640 routing node is not running and if you log in to the backup Routing Engine, no information about chassis components is available through the CLI.

**Action** To use the CLI to monitor routers, follow these steps:

1. Log in to the router.
2. At the command prompt, type **cli** to start the JUNOS software and enter operational mode.



**NOTE:** You only need to type **cli** if you log in to the router as root. Otherwise, the CLI should already be in operational mode.

3. Use one of the operational mode CLI commands listed in Table 14.

**Table 14: Operational Mode CLI Commands for Router Monitoring**

Command	Description
show version	Displays the router hostname, model number, and version of JUNOS software running on the router.
show chassis firmware	Displays firmware and operating system version for router components.
show chassis hardware	Displays an inventory of the hardware components installed in the router, including the component name, version, part number, serial number, and a brief description.
show chassis environment	Displays environmental information about the router chassis, including the temperature and status.

Command	Description
show chassis environment <i>component-name</i>	<p>Displays more detailed operational status information about the following components:</p> <p>M5, M10, M7i, M10i, M20 routers: Routing Engine</p> <p>M40e and M160 routers: FPC, FPM, MCS, PCG, Power Entry Modules (PEM), Routing Engine, and SFM</p> <p>M320 router: Control Board, FPC, FPM, PEM, Routing Engine, and SIB</p> <p>T320 router and T640 routing node: Control Board, FPC, FPM, PEM, Routing Engine, SCG, and SIB</p>
show chassis craft-interface	Displays operational status information about the router, including the alarm status and LED status of major components.
show chassis alarms	Displays the current router component alarms that have been generated, including the date, time, severity level, and description.
show chassis component-name	<p>Displays more detailed operational status information about the following components:</p> <p>M7i router: CFEB, FPC, PIC, and Routing Engine</p> <p>M10i router: CFEB, Ethernet switch, FPC, PIC, and Routing Engine</p> <p>M20 router: FPC, PIC, Routing Engine, and SSB</p> <p>M40e/M160 router: Ethernet switch, FPCs, PICs, Routing Engine, and SFMs</p> <p>M320 router: Ethernet switch, FPCs, SIBs, PICs, and Routing Engine</p> <p>T320 router and T640 routing node: Ethernet switch, FPCs, PICs, Routing Engine, SIBs, and switch processor mezzanine board (SPMB)</p> <p>The command displays the total CPU DRAM and SRAM being used by the SFM processor. The command output displays the time that the SFM became active and how long the SFM has been up and running. A small uptime means that the component came online a short time ago and could indicate a possible FPC error condition.</p>
show log messages	<p>Displays the contents of the messages system log file that records messages generated by component operational events, including error messages generated by component failures.</p> <p>To monitor the messages file in real time, use the monitor start messages CLI command. This command displays the new entries in the file until you stop monitoring by using the monitor stop messages CLI command.</p>

Command	Description
show log chassisd	<p>Displays the contents of the chassis daemon (chassisd) log file that keeps track of the state of each chassis component</p> <p>To monitor the chassisd file in real time, use the monitor start chassisd CLI command. This command displays the new entries in the file until you stop monitoring by using the monitor stop chassisd CLI command.</p>
request support information	<p>Use this command when you contact JTAC about your component problem. This command is the equivalent of using the following CLI commands (see “Contact JTAC” on page 35):</p> <ul style="list-style-type: none"> <li>show system uptime</li> <li>show version detail</li> <li>show system core-dumps</li> <li>show chassis hardware</li> <li>show system processes extensive</li> <li>show pfe statistics error</li> <li>show chassis routing-engine</li> <li>show chassis environment</li> <li>show chassis firmware</li> <li>show chassis fpc detail</li> <li>show system boot-messages</li> <li>show system storage</li> <li>show system virtual-memory</li> <li>show system buffer</li> <li>show system queues</li> <li>show system statistics</li> <li>show configuration   except SECRET-DATA</li> <li>show interfaces extensive (for each configured interface)</li> <li>show chassis hardware extensive</li> </ul>

## Using the Basic Monitoring Method

**Steps To Take** To monitor router components, follow these steps:

1. Check the Router Component Status on page 56
2. Gather Component Alarm Information on page 60
3. Verify the Component Problem on page 84
4. Fix the Problem on page 84
5. Contact JTAC on page 84
6. Return the Failed Component on page 86

## Step 1: Check the Router Component Status

**Steps To Take** To check the router component status, follow these steps:

1. Check the Router Craft Interface on page 56
2. Check the Component LEDs on page 57
3. Display Detailed Component Environmental Information on page 59
4. Display Detailed Component Operational Information on page 60

### Check the Router Craft Interface

**Action** To check the craft interface information for router status, do one of the following:

Use the following CLI command:

```
user@host> show chassis craft-interface
```

The command output displays the router alarm indicator status, the LCD display information (router name, router uptime, and status message that rotates at 2-second intervals), and the major component LED status. Table 15 describes the CLI command output for each router type. For more detailed information about the craft interface, see “Monitoring the Craft Interface” on page 197.

**Table 15: show chassis craft-interface CLI Command Output for Router Types**

Router	CLI Command Output
M5/M10	Red alarm, Yellow alarm, Routing Engine OK, Routing Engine Fail, FPCs, and LCD screen. <i>Note:</i> Even though there is no LCD screen on the M5/M10 routers, there is still output from this command for the LCD.
M7i/M10i	Red alarm, Yellow alarm, Routing Engine OK, Routing Engine Fail, FPCs, and LCD screen. <i>Note:</i> Even though there is no LCD screen on the M7i/M10i routers, there is still output from this command for the LCD.
M20	Red alarm, Yellow alarm, Routing Engine OK, Routing Engine Fail, FPCs, and LCD screen.
M40	Red alarm, Yellow alarm, Routing Engine OK, Routing Engine Fail, FPCs, and LCD screen.
M40e/M160	FPM Display contents, Front Panel System LEDs (Routing Engine OK, Fail, Master), Front Panel Alarm Indicators (Red LED, Yellow LED, Major relay, Minor relay), Front Panel FPC LEDs, MCS LEDs, PCG LEDs, and SFM LEDs.
M320	FPM Display contents, Front Panel System LEDs (Routing Engine OK, Fail, Master), Front Panel Alarm Indicators (Red LED, Yellow LED, Major relay, Minor relay) Front Panel FPC LEDs, Control Board LEDs, SIB LEDs, and power supply (PS) LEDs.
T320/T640	FPM Display contents, Front Panel System LEDs (Routing Engine OK, Fail, Master), Front Panel Alarm Indicators (Red LED, Yellow LED, Major relay, Minor relay), Front Panel FPC LEDs, Control Board LEDs, SCG LEDs, and SIB LEDs.

Physically look at the router craft interface. Table 16 shows the component characteristics of each router craft interface.

**Table 16: Router Craft Interface Component Characteristics**

Component	M5/ M10	M7i/ M10i	M20	M40	M40e	M160	M320	T320	T640	
Alarm LEDs	X	X	X	X	X	X	X	X	X	
Alarm cutoff/Lamp Test button (AC)/LT	X	X	X		X	X	X	X	X	
Alarm relay contacts		X	X	X	X (in CIP)	X (in CIP)		X (in CIP)	X (in CIP)	
Link and activity status lights	X	X	X		X (in CIP)	X (in CIP)		X (in CIP)	X (in CIP)	
LCD display and navigation buttons				X	X	X	X	X	X	
Routing Engine ports	X		X	X	X (in CIP)	X (in CIP)		X (in CIP)	X (in CIP)	
Routing Engine LEDs			X	X			X			
Host module LEDs					X	X				
Host subsystem LEDs								X	X	
PIC online and offline buttons	X	X								
FPC LEDs	No Craft Interface	No Craft Interface	X	X	X	X	X	X	X	
FPC offline buttons			X	X	X	X	X	X	X	
SIB LEDs								X	X	X
Power supply LEDs								X		

### Check the Component LEDs

**Action** To check the component LED status, do one of the following:

Use the following CLI command:

```
user@host> show chassis craft-interface
```

The command output displays the LED status for the following components:

M7i/M10i/M20 router: Routing Engine and FPC

M40e/M160 router: Routing Engine, FPC, MCS, PCG, and SFM

M320 router: Routing Engine, FPC, Control Board, SIB, and power supply (PS)

T320 router and T640 routing node: Routing Engine, FPC, Control Board, SCG, and SIB

Physically look at the craft interface. You see the following component LEDs:

M5/M10, M20, and M40 routers: Routing Engine

M40e/M160 routers: host module

T320 router and T640 routing node: host subsystem, FPCs, PICs, and SIBs

Look at the LEDs on the component faceplate. Table 17 describes where the LEDs are located on the router.

**Table 17: Component LED Location on the Router**

Component	LED Location on the Router
Routing Engine	<p>(M5/M10, M40e, and M160 routers) Remove the component cover.</p> <p>(M7i/M10i routers) On the Routing Engine faceplate at the front of the router.</p> <p>(M20 router) On the rear Routing Engine panel.</p> <p>(M20, M40, M40e, M160, and M320 routers) On the craft interface.</p> <p>The M40e and M160 router Routing Engine is paired with an MCS and is monitored by the host module LEDs on the craft interface.</p> <p>The M320 router, T320 router, and the T640 routing node Routing Engine is paired with a Control Board and is monitored by the host subsystem LEDs on the craft interface</p> <p>Remove the cover for the Routing Engine on the M40e, M160, and T320 routers and the T640 routing node.</p> <p><i>Note:</i> You cannot see the Routing Engine LED on the M40 router.</p>
FPC	<p>(M20, M40, M40e, M160, and M320 routers) On the FPC faceplate at the front of the router.</p> <p>(M320 router) On the craft interface</p>
PIC	<p>(M5 and M10 routers) On the craft interface.</p> <p>(M7i router) On the PIC faceplate at the front of the router.</p> <p>(M10i router) On the FIC faceplate at the front of the router and on the PIC faceplate at front of the router.</p> <p>(All other routers) On the PIC faceplate at the front of the router.</p>
Power supply	<p>On the power supply faceplate at the bottom rear of the router.</p> <p>(M320 router) On the craft interface.</p>
Host module	<p>(M40e and M160 routers) On the craft interface. Remove the component cover.</p>
SFM	<p>(M40e and M160 routers) On the SFM faceplate at the rear of the router. Remove the component cover.</p>
MCS	<p>(M40e and M160 routers) On the MCS faceplate at the rear of the router. Remove the component cover.</p>
PCG	<p>(M40e and M160 routers) On the PCG faceplate at the rear of the router. Remove the component cover.</p>
SCB	<p>(M40 router) On the SCB faceplate at the front of the router, vertical in the middle of the FPC card cage.</p>
SSB	<p>(M20 router) On the SSB faceplate at the top front of the router.</p>
Control Board	<p>(T320 router and T640 routing node) On the Control Board faceplate at the upper rear of the chassis.</p>

Component	LED Location on the Router
SCG	(T320 router and T640 routing node) On the SCG faceplate at the upper rear of the chassis.
SIB	(M320, T320 router and T640 routing node) On the SIB faceplate at the center rear of the chassis. (M320 router) On the craft interface.
CFEB	(M7i/M10i routers) On the DFEB faceplate at the rear of the router.
FIC	(M7i router) On the FIC faceplate at front of the router.
HCM	(M10i router) On the HCM faceplate at front of the router.

### Display Detailed Component Environmental Information

(For M7i, M10i, M40e, M160, M320, and T320 routers and T640 routing node) You can display detailed environmental status information about certain router components.

**Action** To display detailed environmental status information about a component, use the following CLI command:

```
user@host> show chassis environment component-name
```

The command output displays the temperature of the air passing by the component, in degrees Centigrade and Fahrenheit. It also displays whether the fans and/or blowers are at normal or high speed.

Table 18 lists the operational mode CLI commands for each router component for which you can display more detailed information.

**Table 18: Component Detailed Environmental Status CLI Commands**

Component	Operational Mode CLI Command
FEB	show chassis environment feb
FPC	show chassis environment fpc
FPM or craft interface	show chassis environment fpm
MCS	show chassis environment mcs
PCG	show chassis environment pcg
PEM or power supply	show chassis environment pem
Routing Engine	show chassis environment routing-engine
SFM	show chassis environment sfm
Control Board	show chassis environment cb
SIB	show chassis environment sib
SCG	show chassis environment scg

### Display Detailed Component Operational Information

You can display detailed operational information about certain router components. This feature is available on all routing platforms except the M5/M10, M20, and M40 routing platforms.

**Action** To display detailed operational information about a component, use the following CLI command:

```
user@host> show chassis component-name
```

The command output displays the temperature of the air passing by the component, in degrees Centigrade and Fahrenheit. It displays the total percentage of CPU, interrupt, heap space, and buffer space being used by the component processor, including the total DRAM available to the component processor. The command output displays the time when the component started running and how long the component has been running. A short uptime can indicate a problem with the component.

Table 19 lists the components for which you can display more detailed operational status information.

**Table 19: Component Detailed Operational Status CLI Commands**

Component	Operational Mode CLI Command
CFEB	show chassis cfeb
Ethernet switch	show chassis ethernet-switch
FPC	show chassis fpc
Routing Engine	show chassis routing-engine
FEB	show chassis feb
SCB	show chassis scb
SFM	show chassis sfm
SSB	show chassis ssb
SPMB	show chassis spmb
SIB	show chassis spmb sibs
Control Board (Ethernet switch)	show chassis ethernet-switch

### Step 2: Gather Component Alarm Information

**Steps To Take** To gather component alarm information, follow these steps:

1. Display the Current Router Alarms on page 33
2. Display Error Messages in the Messages Log File on page 33
3. Display Error Messages in the Chassis Daemon Log File on page 34

## Display the Current Router Alarms

**Action** To display the current router component alarms, use the following CLI command:

```
user@host> show chassis alarms
```

The command output displays the number of alarms currently active, the time when the alarm began, the severity level, and an alarm description. Note the date and time of an alarm so that you can correlate it with error messages in the messages system log file.

Various conditions related to the chassis components trigger yellow and red alarms. You cannot configure these conditions. Table 20 through Table 27 list the alarms that the chassis components can generate.

Table 20 lists the alarms that the chassis components can generate on an M5 or M10 router.

**Table 20: M5 or M10 Router Chassis Component Alarm Conditions**

Chassis Component	Alarm Condition	Remedy	Alarm Severity
Alternative media	The router boots from alternate boot device: the hard disk. Typically, the router boots from the flash drive. If you configure your router to boot from the hard disk, ignore this alarm condition.	For technical support, open a support case using the Case Manager link at <a href="http://www.juniper.net/support/">http://www.juniper.net/support/</a> or call 1-888-314-JTAC (within the United States) or 1-408-745-9500 (outside the United States).	Yellow
Craft interface	The craft interface failed.	Replace the failed craft interface.	Red
Fan trays	One fan tray was removed from the chassis.	Install the missing fan tray.	Yellow
	Two or more fan trays were removed from the chassis.	Install the missing fan trays.	Red
	One fan in the chassis is not spinning or is spinning below required speed.	Replace the failed fan tray.	Red
FEB	The Control Board failed. If this occurs, the board attempts to reboot.	Replace the failed FEB.	Red
FPC	An FPC failed. If this occurs, the FPC attempts to reboot. If the SCB sees that an FPC is rebooting too often, it shuts down the FPC.	Replace the failed FPC.	Red
Hot swapping	Too many hot-swap interrupts are occurring. This message generally indicates that a hardware component that plugs into the router's backplane from the front (generally, an FPC) is broken.	-----	Red

Chassis Component	Alarm Condition	Remedy	Alarm Severity
Routing Engine	Error in reading or writing compact flash.	Reformat the compact flash and install a bootable image. If this fails, replace the failed Routing Engine.	Yellow
	System booted from hard disk.	Install a bootable image on the compact flash. If this fails, replace failed Routing Engine.	Yellow
	Compact flash is missing in boot list.	Replace the failed Routing Engine.	Red
	Hard disk is missing in boot list.	Replace the failed Routing Engine.	Red
Power supplies	A power supply was removed from the chassis.	Install the missing power supply.	Yellow
	A power supply failed.	Replace the failed power supply.	Red
Temperature	The chassis temperature exceeded 55 degrees, the fans were turned on to full speed, and one or more fans failed.	Check the room temperature. Check the air filter and replace it. Check the air flow. Check the fan.	Yellow
	The chassis temperature exceeded 65 degrees C and the fans turned on to full speed.	Check the room temperature. Check the air filter and replace it. Check the air flow. Check the fan.	Yellow
	The chassis temperature exceeded 65 degrees C and a fan has failed. If this condition persists for more than 4 minutes, the router shuts down.	Check the room temperature. Check the air filter and replace it. Check the air flow. Check the fan.	Red
	The chassis temperature exceeded 75 degrees C. If this condition persists for more than 4 minutes, the router shuts down.	Check the room temperature. Check the air filter and replace it. Check the air flow. Check the fan.	Red
	The temperature sensor failed.	For technical support, open a support case using the Case Manager link at <a href="http://www.juniper.net/support/">http://www.juniper.net/support/</a> or call 1-888-314-JTAC (within the United States) or 1-408-745-9500 (outside the United States).	Red

Table 22 lists the alarms that the chassis components can generate on M7i and M10i routing platforms.

**Table 21: M7i or M10i Router Chassis Component Alarm Conditions**

Chassis Component	Alarm Condition	Remedy	Alarm Severity
Alternative media	The router has a optional flash disk and boots from an alternate boot device. If you configure your router to boot from the hard disk, ignore this alarm condition.	For technical support, open a support case using the Case Manager link at <a href="http://www.juniper.net/support/">http://www.juniper.net/support/</a> or call 1-888-314-JTAC (within the United States) or 1-408-745-9500 (outside the United States).	Yellow
CFEB	For an M7i router, the CFEB failed. If this occurs, the board attempts to reboot.	Replace the failed CFEB.	Red
	For an M10i router, both Control Boards were removed or have failed.	Replace the failed or missing CFEB.	Red
	Too many hard errors in CFEB memory.	Replace the failed CFEB.	Red
	Too many soft errors in CFEB memory.	Replace the failed CFEB.	Red
	A CFEB microcode download failed.	Replace the failed CFEB.	Red
Fan trays	A fan has failed.	Replace the failed fan tray.	Red
	For an M7i router, a fan tray was removed from the chassis.	Install the missing fan tray.	Red
	For an M10i router, both fan trays are absent from the chassis.	Install the missing fan tray.	Red
Hot swapping	Too many hot-swap interrupts are occurring. This message generally indicates that a hardware component that plugs into the router's midplane from the front is broken.	-----	Red
Power supplies	A power supply was removed.	Insert missing power supply.	Yellow
	A power supply failed.	Replace the failed power supply.	Red
	For an M10i router, only one power supply is operating.	Insert or replace the secondary power supply.	Red

Chassis Component	Alarm Condition	Remedy	Alarm Severity
Routing Engine	Error in reading or writing hard disk.	Reformat the hard disk and install a bootable image. If this fails, replace the failed Routing Engine.	Yellow
	Error in reading or writing compact flash.	Reformat the compact flash and install bootable image. If this fails, replace the failed Routing Engine.	Yellow
	System booted from hard disk. This alarm only applies, if you have an optional flash drive.	Install a bootable image on the compact flash. If this fails, replace the failed Routing Engine.	Yellow
	Compact flash is missing in boot list.	Replace the failed Routing Engine.	Red
	Hard disk is missing in boot list.	Replace the failed Routing Engine.	Red
	Routing Engine failed to boot.	Replace the failed Routing Engine.	Red
Temperature	The chassis temperature exceeded 55 degrees C, the fans turned on to full speed, and one or more fans failed.	<p>Check the room temperature.</p> <p>Check the air filter and replace it.</p> <p>Check the air flow.</p> <p>Check the fan.</p>	Yellow
	The chassis temperature exceeded 65 degrees C and the fans turned on to full speed.	<p>Check the room temperature.</p> <p>Check the air filter and replace it.</p> <p>Check the air flow.</p> <p>Check the fan.</p>	Yellow
	The chassis temperature exceeded 65 degrees C and a fan failed. If this condition persists for more than 4 minutes, the router shuts down.	<p>Check the room temperature.</p> <p>Check the air filter and replace it.</p> <p>Check the air flow.</p> <p>Check the fan.</p>	Red
	The chassis temperature exceeded 75 degrees C. If this condition persists for more than 4 minutes, the router shuts down.	<p>Check the room temperature.</p> <p>Check the air filter and replace it.</p> <p>Check the air flow.</p> <p>Check the fan.</p>	Red
	The temperature sensor failed.	For technical support, open a support case using the Case Manager link at <a href="http://www.juniper.net/support/">http://www.juniper.net/support/</a> or call 1-888-314-JTAC (within the United States) or 1-408-745-9500 (outside the United States).	Red

Table 22 lists the alarms that the chassis components can generate on an M20 router.

**Table 22: M20 Router Chassis Component Alarm Conditions**

Chassis Component	Alarm Condition	Remedy	Alarm Severity
Alternative media	The router boots from alternate boot device: the hard disk. Typically, the router boots from the flash drive. If you configure your router to boot from the hard disk, ignore this alarm condition.	For technical support, open a support case using the Case Manager link at <a href="http://www.juniper.net/support/">http://www.juniper.net/support/</a> or call 1-888-314-JTAC (within the United States) or 1-408-745-9500 (outside the United States).	Yellow
Craft interface	The craft interface failed.	Replace the failed craft interface.	Red
Fan trays	One fan tray was removed from the chassis.	Install the missing fan tray.	Yellow
	Two or more fan trays were removed from the chassis.	Install the missing fan trays.	Red
	One fan in the chassis is not spinning or is spinning below required speed.	Replace the fan tray.	Red
FPC	An FPC failed. If this occurs, the FPC attempts to reboot. If the SCB sees that an FPC is rebooting too often, it shuts down the FPC.	Replace the failed FPC.	Red
Hot swapping	Too many hot-swap interrupts are occurring. This message generally indicates that a hardware component that plugs into the router's backplane from the front (generally, an FPC) is broken.	-----	Red

Chassis Component	Alarm Condition	Remedy	Alarm Severity
Routing Engine	Error in reading or writing hard disk.	Reformat the hard disk and install a bootable image. If this fails, replace the failed Routing Engine.	Yellow
	Error in reading or writing compact flash.	Reformat the compact flash and install a bootable image. If this fails, replace the failed Routing Engine.	Yellow
	System booted from the default backup Routing Engine. If you manually switched mastership, ignore this alarm condition.	Install a bootable image on the default master Routing Engine. If this fails, replace the failed Routing Engine.	Yellow
	System booted from the hard disk.	Install a bootable image on the compact flash. If this fails, replace the failed Routing Engine.	Yellow
	Compact flash is missing in the boot list.	Replace the failed Routing Engine.	Red
	Hard disk is missing in the boot list.	Replace the failed Routing Engine.	Red
	Routing Engine failed to boot.	Replace the failed Routing Engine.	Red
Power supplies	A power supply was removed from the chassis.	Insert power supply into empty slot.	Yellow
	A power supply failed.	Replace the failed power supply.	Red
SSB	The Control Board failed. If this occurs, the board attempts to reboot.	Replace the failed Control Board.	Red

Chassis Component	Alarm Condition	Remedy	Alarm Severity
Temperature	The chassis temperature exceeded 55 degrees, the fans turned on to full speed, and one or more fans have failed	Check the room temperature. Check the air filter and replace it. Check the air flow. Check the fan.	Yellow
	The chassis temperature exceeded 65 degrees C and the fans turned on to full speed.	Check the room temperature. Check the air filter and replace it. Check the air flow. Check the fan.	Yellow
	The chassis temperature exceeded 65 degrees C and a fan failed. If this condition persists for more than 4 minutes, the router shuts down.	Check the room temperature. Check the air filter and replace it. Check the air flow. Check the fan.	Red
	The chassis temperature exceeded 75 degrees C. If this condition persists for more than 4 minutes, the router shuts down.	Check the room temperature. Check the air filter and replace it. Check the air flow. Check the fan.	Red
	The temperature sensor failed.	For technical support, open a support case using the Case Manager link at <a href="http://www.juniper.net/support/">http://www.juniper.net/support/</a> or call 1-888-314-JTAC (within the United States) or 1-408-745-9500 (outside the United States).	Red

Table 23 lists the alarms that the chassis components can generate on an M40 router.

**Table 23: M40 Router Chassis Component Alarm Conditions**

Chassis Component	Alarm Condition	Remedy	Alarm Severity
Air filter	Change the air filter.	Change the air filter.	-----
Alternative media	The router boots from an alternate boot device: the hard disk. Typically, the router boots from the flash drive. If you configure your router to boot from the hard disk, ignore this alarm condition.	For technical support, open a support case using the Case Manager link at <a href="http://www.juniper.net/support/">http://www.juniper.net/support/</a> or call 1-888-314-JTAC (within the United States) or 1-408-745-9500 (outside the United States).	Yellow
Craft interface	The craft interface failed.	Replace the failed craft interface.	Red
Fan trays	One fan tray was removed from the chassis.	Install the missing fan tray.	Yellow
	Two or more fan trays were removed from the chassis.	Install the missing fan trays.	Red
	One fan in the chassis is not spinning or is spinning below the required speed.	Replace the fan tray.	Red
FPC	An FPC has an out-of-range or invalid temperature reading.	Replace the failed FPC.	Yellow
	An FPC microcode download has failed.	Replace the failed FPC.	Red
	An FPC failed. If this occurs, the FPC attempts to reboot. If the SCB sees that an FPC is rebooting too often, it shuts down the FPC.	Replace the failed FPC.	Red
	Too many hard errors in FPC memory.	Replace the failed FPC.	Red
	Too many soft errors in FPC memory.	Replace the failed FPC.	Red
Hot swapping	Too many hot-swap interrupts are occurring. This message generally indicates that a hardware component that plugs into the router's backplane from the front (generally, an FPC) is broken.	-----	Red

Chassis Component	Alarm Condition	Remedy	Alarm Severity
Power supplies	A power supply was removed from the chassis.	Insert a power supply into an empty slot.	Yellow
	A power supply temperature sensor failed.	Replace the failed power supply or power entry module.	Yellow
	A power supply fan failed.	Replace the failed power supply fan.	Yellow
	A power supply has high temperature.	Replace the failed power supply or power entry module.	Red
	A 5V power supply has failed.	Replace the failed power supply or power entry module.	Red
	A 3.3V power supply failed.	Replace the failed power supply or power entry module.	Red
	A 2.5V power supply failed.	Replace the failed power supply or power entry module.	Red
	A power supply input failed.	Check the power supply input connection.	Red
	A power supply has failed.	Replace the failed power supply or power entry module.	Red
Routing Engine	Error in reading or writing hard disk.	Reformat the hard disk and install a bootable image. If this fails, replace the failed Routing Engine.	Yellow
	Error in reading or writing compact flash.	Reformat the compact flash and install a bootable image. If this fails, replace the failed Routing Engine.	Yellow
	System booted from default backup Routing Engine. If you manually switched mastership, ignore this alarm condition.	Install a bootable image on the default master Routing Engine. If this fails, replace the failed Routing Engine.	Yellow
	System booted from hard disk.	Install a bootable image on the compact flash. If this fails, replace the failed Routing Engine.	Yellow
	Compact flash missing in boot list.	Replace the failed Routing Engine.	Red
	Hard disk missing in boot list.	Replace the failed Routing Engine.	Red
	Routing Engine failed to boot.	Replace the failed Routing Engine.	Red
SCB	The SCB failed. If this occurs, the board attempts to reboot.	Replace the failed SCB.	Red

Chassis Component	Alarm Condition	Remedy	Alarm Severity
Temperature	The chassis temperature exceeded 55 degrees C, the fans turned on to full speed, and one or more fans failed.	Check the room temperature. Check the air filter and replace it. Check the air flow. Check the fan.	Yellow
	The chassis temperature exceeded 65 degrees, and the fans turned on to full speed.	Check the room temperature. Check the air filter and replace it. Check the air flow. Check the fan.	Yellow
	The chassis temperature exceeded 65 degrees C and a fan failed. If this condition persists for more than 4 minutes, the router shuts down.	Check the room temperature. Check the air filter and replace it. Check the air flow. Check the fan.	Red
	The chassis temperature exceeded 75 degrees C. If this condition persists for more than 4 minutes, the router shuts down.	Check the room temperature. Check the air filter and replace it. Check the air flow. Check the fan.	Red
	The temperature sensor failed.	For technical support, open a support case using the Case Manager link at <a href="http://www.juniper.net/support/">http://www.juniper.net/support/</a> or call 1-888-314-JTAC (within the United States) or 1-408-745-9500 (outside the United States).	Red

Table 24 lists the alarms that the chassis components can generate on an M40e or M160 router.

**Table 24: M40e or M160 Router Chassis Component Alarm Conditions**

Chassis Component	Alarm Condition	Remedy	Alarm Severity
Air filter	Change the air filter.	Change the air filter.	----- -
Alternative media	The router boots from an alternate boot device: the hard disk. Typically, the router boots from the flash drive. If you configure your router to boot from the hard disk, ignore this alarm condition.	For technical support, open a support case using the Case Manager link at <a href="http://www.juniper.net/support/">http://www.juniper.net/support/</a> or call 1-888-314-JTAC (within the United States) or 1-408-745-9500 (outside the United States).	Yellow
CIP	A CIP is missing.	Insert a CIP into an empty slot.	Red
Craft interface	The craft interface failed.	Replace the failed craft interface.	Red
Fan trays	One fan tray was removed from the chassis.	Install the missing fan tray.	Yellow
	Two or more fan trays were removed from the chassis.	Install the missing fan trays.	Red
	One fan in the chassis is not spinning or is spinning below the required speed.	Replace the fan tray.	Red
FPC	An FPC has an out-of-range or invalid temperature reading.	Replace the failed FPC.	Yellow
	An FPC microcode download failed.	Replace the failed FPC.	Red
	An FPC failed. If this occurs, the FPC attempts to reboot. If the MCS sees that an FPC is rebooting too often, it shuts down the FPC.	Replace the failed FPC.	Red
	Too many hard errors in FPC memory.	Replace the failed FPC.	Red
	Too many soft errors in FPC memory.	Replace the failed FPC.	Red
Hot swapping	Too many hot-swap interrupts are occurring. This message generally indicates that a hardware component that plugs into the router's backplane from the front (generally, an FPC) is broken.	-----	Red

Chassis Component	Alarm Condition	Remedy	Alarm Severity
MCS	An MCS has an out-of-range or invalid temperature reading.	Replace the failed MCS.	Yellow
	An MCS was removed.	Reinstall MCS0.	Yellow
	An MCS has failed.	Replace the failed MCS.	Red
PCG	A backup PCG is offline.	Set the backup PCG online.	Yellow
	A PCG has an out-of-range or invalid temperature reading.	Replace the failed PCG.	Yellow
	A PCG was removed.	Insert a PCG into empty slot.	Yellow
	A PCG failed to come online.	Replace the failed PCG.	Red
Routing Engine	Error in reading or writing hard disk.	Reformat the hard disk and install a bootable image. If this fails, replace the failed Routing Engine.	Yellow
	Error in reading or writing compact flash.	Reformat the compact flash and install a bootable image. If this fails, replace the failed Routing Engine.	Yellow
	System booted from the default backup Routing Engine. If you manually switched mastership, ignore this alarm condition.	Install a bootable image on the default master Routing Engine. If this fails, replace the failed Routing Engine.	Yellow
	System booted from hard disk.	Install a bootable image on the compact flash. If this fails, replace the failed Routing Engine.	Yellow
	Compact flash is missing in the boot list.	Replace the failed Routing Engine.	Red
	Hard disk is missing in the boot list.	Replace the failed Routing Engine.	Red
	Routing Engine failed to boot.	Replace the failed Routing Engine.	Red
Power supplies	A power supply was removed from the chassis.	Insert a power supply into the empty slot.	Yellow
	A power supply failed.	Replace the failed power supply.	Red

Chassis Component	Alarm Condition	Remedy	Alarm Severity
SFM	An SFM has an out of range or invalid temperature reading on SPP.	Replace the failed SFM.	Yellow
	An SFM has an out of range or invalid temperature reading on SPR.	Replace the failed SFM.	Yellow
	An SFM is offline.	Set the SFM online.	Yellow
	An SFM has failed.	Replace the failed SFM.	Red
	An SFM has been removed from the chassis.	Insert the SFM into an empty slot.	Red
	All SFMs are offline or missing from the chassis.	Insert SFMs into an empty slots or set all SFMs online.	Red
Temperature	The chassis temperature exceeded 55 degrees, the fans turned on to full speed, and one or more fans failed.	Check the room temperature. Check the air filter and replace it. Check the air flow. Check the fan.	Yellow
	The chassis temperature exceeded 65 degrees C and the fans turned on to full speed.	Check the room temperature. Check the air filter and replace it. Check the air flow. Check the fan.	Yellow
	The chassis temperature exceeded 65 degrees C and a fan failed. If this condition persists for more than 4 minutes, the router shuts down.	Check the room temperature. Check the air filter and replace it. Check the air flow. Check the fan.	Red
	The chassis temperature exceeded 75 degrees C. If this condition persists for more than 4 minutes, the router shuts down.	Check the room temperature. Check the air filter and replace it. Check the air flow. Check the fan.	Red
	The temperature sensor failed.	For technical support, open a support case using the Case Manager link at <a href="http://www.juniper.net/support/">http://www.juniper.net/support/</a> or call 1-888-314-JTAC (within the United States) or 1-408-745-9500 (outside the United States).	Red

Table 25 lists the alarms that the chassis components can generate on an M320 router.

**Table 25: M320 Router Chassis Component Alarm Conditions**

Chassis Component	Alarm Condition	Remedy	Alarm Severity
Air filters	Change the air filter.	Change the air filter.	-----
Alternative media	The router boots from an alternate boot device: the hard disk. Typically, the router boots from the flash drive. If you configure your router to boot from the hard disk, ignore this alarm condition.	For technical support, open a support case using the Case Manager link at <a href="http://www.juniper.net/support/">http://www.juniper.net/support/</a> or call 1-888-314-JTAC (within the United States) or 1-408-745-9500 (outside the United States).	Yellow
Control Board	A Control Board was removed.	Insert a Control Board into the empty slot.	Yellow
	A Control Board temperature sensor alarm failed.	Replace the failed Control Board.	Yellow
	A Control Board failed.	Replace the failed Control Board.	Red
CIP	A CIP is missing.	Insert a CIP into an empty slot.	Red
Craft interface	The craft interface failed.	Replace the failed craft interface.	Red
Fan trays	One fan tray was removed from the chassis.	Install the missing fan tray.	Yellow
	Two or more fan trays were removed from the chassis.	Install the missing fan trays.	Red
	One fan in the chassis is not spinning or is spinning below the required speed.	Replace the fan tray.	Red
FPC	An FPC has an out of range or invalid temperature reading.	Replace the failed FPC.	Yellow
	An FPC microcode download has failed.	Replace the failed FPC.	Red
	An FPC failed. If this occurs, the FPC attempts to reboot. If the SCB sees that an FPC is rebooting too often, it shuts down the FPC.	Replace the failed FPC.	Red
	Too many hard errors in FPC memory.	Replace the failed FPC.	Red
	Too many soft errors in FPC memory.	Replace the failed FPC.	Red

Chassis Component	Alarm Condition	Remedy	Alarm Severity
Hot swapping	Too many hot-swap interrupts are occurring. This message generally indicates that a hardware component that plugs into the router's backplane from the front (generally, an FPC) is broken.	-----	Red
Power supplies	A power supply was removed from the chassis.	Insert a power supply into the empty slot.	Yellow
	A power supply failed.	Replace the failed power supply.	Red
Routing Engine	Error in reading or writing hard disk.	Reformat the hard disk and install a bootable image. If this fails, replace the failed Routing Engine.	Yellow
	Error in reading or writing compact flash.	Reformat compact flash and install bootable image. If this fails, replace failed Routing Engine.	Yellow
	System booted from the default backup Routing Engine. If you manually switched mastership, ignore this alarm condition.	Install a bootable image on default master Routing Engine. If this fails, replace the failed Routing Engine.	Yellow
	System booted from hard disk.	Install a bootable image on compact flash. If this fails, replace the failed Routing Engine.	Yellow
	Compact flash is missing in boot list.	Replace the failed Routing Engine.	Red
	Hard disk is missing in boot list.	Replace the failed Routing Engine.	Red
	Routing Engine failed to boot.	Replace the failed Routing Engine.	Red
SIB	A spare SIB is missing.	Insert a spare SIB into an empty slot.	Yellow
	An SIB failed.	Replace the failed SIB.	Yellow
	A spare SIB failed.	Replace the failed SIB.	Yellow
	An SIB has an out of range or invalid temperature reading.	Replace the failed SIB.	Yellow
	An SIB is missing.	Insert a SIB into an empty slot.	Red
	An SIB has failed.	Replace the failed SIB.	Red

Chassis Component	Alarm Condition	Remedy	Alarm Severity
Temperature	The chassis temperature has exceeded 55 degrees C, the fans have been turned on to full speed, and one or more fans have failed.	<p>Check the room temperature.</p> <p>Check the air filter and replace it.</p> <p>Check the air flow.</p> <p>Check the fan.</p>	Yellow
	The chassis temperature has exceeded 65 degrees C and the fans have been turned on to full speed.	<p>Check the room temperature.</p> <p>Check the air filter and replace it.</p> <p>Check the air flow.</p> <p>Check the fan.</p>	Yellow
	The chassis temperature exceeded 65 degrees C and a fan has failed. If this condition persists for more than 4 minutes, the router shuts down.	<p>Check the room temperature.</p> <p>Check the air filter and replace it.</p> <p>Check the air flow.</p> <p>Check the fan.</p>	Red
	Chassis temperature exceeded 75 degrees C. If this condition persists for more than 4 minutes, the router shuts down.	<p>Check the room temperature.</p> <p>Check the air filter and replace it.</p> <p>Check the air flow.</p> <p>Check the fan.</p>	Red
	The temperature sensor has failed.	<p>For technical support, open a support case using the Case Manager link at <a href="http://www.juniper.net/support/">http://www.juniper.net/support/</a> or call 1-888-314-JTAC (within the United States) or 1-408-745-9500 (outside the United States).</p>	Red

Table 26 lists the alarms that the chassis components can generate on an T320 router.

**Table 26: T320 Router Chassis Component Alarm Conditions**

Chassis Component	Alarm Condition	Remedy	Alarm Severity
Air filters	Change the air filter.	Change the air filters.	-----
Alternative media	The router boots from alternate boot device: the hard disk. Typically, the router boots from the flash drive. If you configure your router to boot from the hard disk, ignore this alarm condition.	For technical support, open a support case using the Case Manager link at <a href="http://www.juniper.net/support/">http://www.juniper.net/support/</a> or call 1-888-314-JTAC (within the United States) or 1-408-745-9500 (outside the United States).	Yellow
Control Board	A Control Board was removed.	Insert a Control Board into an empty slot.	Yellow
	A Control Board temperature sensor alarm failed.	Replace the failed Control Board.	Yellow
	A Control Board failed.	Replace the failed Control Board.	Red
CIP	A CIP is missing.	Insert a CIP into an empty slot.	Red
Craft interface	The craft interface failed.	Replace the failed craft interface.	Red
Fan Trays	One fan tray has been removed from the chassis.	Install the missing fan tray.	Yellow
	Two or more fan trays have been removed from the chassis.	Install the missing fan trays.	Red
	One fan in the chassis is not spinning or spinning below require speed.	Replace the fan tray.	Red
FPC	An FPC has an out-of-range or invalid temperature reading.	Replace the failed FPC.	Yellow
	An FPC microcode download has failed.	Replace the failed FPC.	Red
	An FPC has failed. If this occurs, the FPC attempts to reboot. If the SCB sees that an FPC is rebooting too often, it shuts down the FPC.	Replace the failed FPC.	Red
	Too many hard errors in FPC memory.	Replace the failed FPC.	Red
	Too many soft errors in FPC memory.	Replace the failed FPC.	Red

Chassis Component	Alarm Condition	Remedy	Alarm Severity
Hot swapping	Too many hot-swap interrupts are occurring. This message generally indicates that a hardware component that plugs into the router's backplane from the front (generally, an FPC) is broken.	-----	Red
Power supplies	A power supply was removed from the chassis.	Insert a power supply into an empty slot.	Yellow
	A power supply failed.	Replace the failed power supply.	Red
Routing Engine	Error in reading or writing hard disk.	Reformat hard disk and install a bootable image. If this fails, replace the failed Routing Engine.	Yellow
	Error in reading or writing compact flash.	Reformat the compact flash and install bootable image. If this fails, replace failed Routing Engine.	Yellow
	System booted from default backup Routing Engine. If you manually switched mastership, ignore this alarm condition.	Install a bootable image on default master Routing Engine. If this fails, replace the failed Routing Engine.	Yellow
	System booted from hard disk.	Install a bootable image on the compact flash. If this fails, replace the failed Routing Engine.	Yellow
	Compact flash missing in boot list.	Replace the failed Routing Engine.	Red
	Hard disk missing in boot list.	Replace the failed Routing Engine.	Red
	Routing Engine failed to boot.	Replace the failed Routing Engine.	Red
	SIB	A spare SIB is missing.	Insert the spare SIB into an empty slot.
An SIB has failed.		Replace the failed SIB.	Yellow
A spare SIB has failed.		Replace the failed SIB.	Yellow
A SIB has an out-of-range or invalid temperature reading.		Replace the failed SIB.	Yellow
An SIB is missing.		Insert an SIB into an empty slot.	Red
An SIB has failed.		Replace the failed SIB.	Red

Chassis Component	Alarm Condition	Remedy	Alarm Severity
Temperature	The chassis temperature exceeded 55 degrees, the fans turned on to full speed, and one or more fans failed.	Check the room temperature. Check the air filter and replace it. Check the air flow. Check the fan.	Yellow
	The chassis temperature exceeded 65 degrees C and the fans turned on to full speed.	Check the room temperature. Check the air filter and replace it. Check the air flow. Check the fan.	Yellow
	The chassis temperature exceeded 65 degrees C and a fan failed. If this condition persists for more than 4 minutes, the router shuts down.	Check the room temperature. Check the air filter and replace it. Check the air flow. Check the fan.	Red
	Chassis temperature exceeded 75 degrees C. If this condition persists for more than 4 minutes, the router shuts down.	Check the room temperature. Check the air filter and replace it. Check the air flow. Check the fan.	Red
	The temperature sensor failed.	For technical support, open a support case using the Case Manager link at <a href="http://www.juniper.net/support/">http://www.juniper.net/support/</a> or call 1-888-314-JTAC (within the United States) or 1-408-745-9500 (outside the United States).	Red

Table 27 lists the alarms that the chassis components can generate on a T640 routing node.

**Table 27: T640 Routing Node Chassis Component Alarm Conditions**

Chassis Component	Alarm Condition	Remedy	Alarm Severity
Air filter	Change the air filter.	Change the air filter.	-----
Alternative media	The router boots from alternate boot device, the hard disk. Typically, the router boots from the flash drive. If you configure your router to boot from the hard disk, ignore this alarm condition.	For technical support, open a support case using the Case Manager link at <a href="http://www.juniper.net/support/">http://www.juniper.net/support/</a> or call 1-888-314-JTAC (within the United States) or 1-408-745-9500 (outside the United States).	Yellow
Control Board	A Control Board was removed.	Insert a Control Board into an empty slot.	Yellow
	A Control Board temperature sensor alarm has failed.	Replace the failed Control Board.	Yellow
	A Control Board failed.	Replace the failed Control Board.	Red
CIP	A CIP is missing.	Insert a CIP into an empty slot.	Red
Craft interface	The craft interface failed.	Replace the failed craft interface.	Red
Fan trays	One fan tray was removed from the chassis.	Install the missing fan tray.	Yellow
	Two or more fan trays were removed from the chassis.	Install the missing fan trays.	Red
	One fan in the chassis is not spinning or is spinning below the required speed.	Replace the fan tray.	Red
FPC	An FPC has an out-of-range or invalid temperature reading.	Replace the failed FPC.	Yellow
	An FPC microcode download has failed.	Replace the failed FPC.	Red
	An FPC has failed. If this occurs, the FPC attempts to reboot. If the SCB sees that an FPC is rebooting too often, it shuts down the FPC.	Replace the failed FPC.	Red
	Too many hard errors in FPC memory.	Replace the failed FPC.	Red
	Too many soft errors in FPC memory.	Replace the failed FPC.	Red

Chassis Component	Alarm Condition	Remedy	Alarm Severity
Hot swapping	Too many hot-swap interrupts are occurring. This message generally indicates that a hardware component that plugs into the router's backplane from the front (generally, an FPC) is broken.	-----	Red
Routing Engine	Error in reading or writing hard disk.	Reformat the hard disk and install a bootable image. If this fails, replace the failed Routing Engine.	Yellow
	Error in reading or writing compact flash.	Reformat the compact flash and install a bootable image. If this fails, replace the failed Routing Engine.	Yellow
	System booted from the default backup Routing Engine. If you manually switched mastership, ignore this alarm condition.	Install a bootable image on the default master Routing Engine. If this fails, replace the failed Routing Engine.	Yellow
	System booted from the hard disk.	Install a bootable image on the compact flash. If this fails, replace the failed Routing Engine.	Yellow
	Compact flash is missing in boot list.	Replace the failed Routing Engine.	Red
	Hard disk is missing in boot list.	Replace the failed Routing Engine.	Red
	Routing Engine failed to boot.	Replace the failed Routing Engine.	Red
Power supplies	A power supply was removed from the chassis.	Insert a power supply into an empty slot.	Yellow
	A power supply has failed.	Replace the failed power supply.	Red
SCG	A backup SCG is offline.	Set the backup SCG online.	Yellow
	An SCG has an out-of-range or invalid temperature reading.	Replace the failed SCG.	Yellow
	An SCG was removed.	Insert an SCG into an empty slot.	Yellow
	All SCGs are offline or missing.	Insert SCGs into empty slots or set all SCGs online.	Red
	An SCG failed.	Replace the failed SCG.	Red

Chassis Component	Alarm Condition	Remedy	Alarm Severity
SIB	A spare SIB is missing.	Insert a spare SIB into an empty slot.	Yellow
	An SIB failed.	Replace the failed SIB.	Yellow
	A spare SIB failed.	Replace the failed SIB.	Yellow
	A SIB has an out-of-range or invalid temperature reading.	Replace the failed SIB.	Yellow
	An SIB is missing.	Insert an SIB into empty slot.	Red
	An SIB failed.	Replace the failed SIB.	Red
SPMB	A local SPMB is offline.	Reset the Control Board. If this fails, replace the Control Board.	Red
Temperature	The chassis temperature exceeded 55 degrees, the fans turned on to full speed, and one or more fans have failed.	Check the room temperature. Check the air filter and replace it. Check the air flow. Check the fan.	Yellow
	The chassis temperature exceeded 65 degrees C and the fans have been turned on to full speed.	Check the room temperature. Check the air filter and replace it. Check the air flow. Check the fan.	Yellow
	The chassis temperature exceeded 65 degrees C and a fan failed. If this condition persists for more than 4 minutes, the router shuts down.	Check the room temperature. Check the air filter and replace it. Check the air flow. Check the fan.	Red
	Chassis temperature exceeded 75 degrees C. If this condition persists for more than 4 minutes, the router shuts down.	Check the room temperature. Check the air filter and replace it. Check the air flow. Check the fan.	Red
	The temperature sensor failed.	For technical support, open a support case using the Case Manager link at <a href="http://www.juniper.net/support/">http://www.juniper.net/support/</a> or call 1-888-314-JTAC (within the United States) or 1-408-745-9500 (outside the United States).	Red

## Display Error Messages in the Messages Log File

**Action** To display router component error messages in the messages system log file, use the following CLI command:

```
user@host> show log messages
```

The messages system log file records the time the failure or event occurred, the severity level, a code, and a message description. Display the error messages in the messages system log file logged at least 5 minutes before and after the alarm event.

To search for specific information in the log file, use the `| match component-name` command; for example, use `show log messages | match fpc`. If there is a space in the component name, enclose the component name in quotation marks; for example, `| match "power supply"`.

To search for multiple items in the log file, use the `| match` command followed by the multiple items, separated by the `|` (pipe), and enclosed in quotation marks; for example, `| match "fpc | sfm | kernel | tnp"`.

To monitor the messages file in real time, use the `monitor start messages` CLI command. This command displays the new entries in the file until you stop monitoring by using the `monitor stop messages` CLI command.

For more information about system log messages, see the *JUNOS System Log Messages Reference*.

## Display Error Messages in the Chassis Daemon Log File

**Action** To display router component errors in the chassis daemon (chassisd) system log file, use the following CLI command:

```
user@host> show log chassisd
```

The chassis daemon (chassisd) log file keeps track of the state of each chassis component.

To search for specific information in the log file, use the `| match component-name` command; for example, `show log messages | match fpc`. If there is a space in the component name, enclose the component name in quotation marks; for example, `| match "power supply"`.

To search for multiple items in the log file, use the `| match` command followed by the multiple items, separated by the `|` (pipe), and enclosed in quotation marks; for example, `| match "fpc | sfm | kernel | tnp"`.

To monitor the chassisd file in real time, use the `monitor start chassisd` CLI command. This command displays the new entries in the file until you stop monitoring by using the `monitor stop chassisd` CLI command.

### Step 3: Verify the Component Problem

Test a component only if it is not associated with a previously reported router component failure case and if testing will not compromise the integrity of the router and other components.

**Action** To verify component failure, follow these steps:

1. Make sure that the component is well seated in its slot and connected to the router midplane.



**CAUTION:** Before performing a swap test, always check for bent pins in the midplane and check the component for stuck pins in the connector. Pins stuck in the component connector can damage other good slots during a swap test.

2. Perform a swap test on the component that has failed or has a problem. Take the component offline if necessary, remove it, and replace it with one that you know works. If the replaced component works, there was a problem with the component you removed.

### Step 4: Fix the Problem

**Action** If the router alarm condition is your responsibility, take action and correct it. For example, replace a dirty air filter, clean a fiber-optic cable, connect the component securely to the midplane, or reset the component. Otherwise, escalate the alarm condition and contact JTAC.



**NOTE:** Do not straighten component pins. If a component's pins are bent, return the component with a Return Material Authorization (RMA). Straightening the pins may cause intermittent problems in the future.

### Step 5: Contact JTAC

JTAC performs more advanced troubleshooting. If you cannot determine the cause of a problem or need additional assistance, open a support case using the Case Manager link at <http://www.juniper.net/support/> or call 1-888-314-JTAC (within the United States) or 1-408-745-9500 (outside the United States).

**Action** To provide JTAC with information about the system, use the following CLI command:

```
user@host> request support information
```

Include the command output in your support request.

Because the output of this command is generally quite long, you can redirect the output to a file by using the following CLI command:

```
user@host> request support information | save filename
```

The request support information command is a combination of the following CLI operational mode commands:

show version detail—Display the current time and information about how long the router, router software, and routing protocols have been running.

show version detail—Display version information for the JUNOS software packages and the software for each software process.

show system core-dumps—This is a hidden command used specifically by JTAC for troubleshooting router problems.

show chassis hardware—Display a list of all the components installed in the router chassis. The output includes the component name, version, part number, serial number, and a brief description.

show system processes extensive—Display exhaustive system processes that are running on the router and have controlling terminal information. This option is equivalent to the UNIX top -bSld1 infinity command.

show pfe statistics error—Display statistics about the Packet Forwarding Engine errors.

show chassis routing-engine—Display information about the Routing Engine.

show chassis environment—Display environmental information about the router chassis, including the temperature and information about the fans, power supplies, and Routing Engine.

show chassis firmware—Display the version levels of the firmware running on the SCB, SFM, SSB, FEB, and FPCs.

show chassis fpc detail—Display detailed status information for all FPCs or for a specified FPC.

show system boot messages—Display initial messages generated by the system kernel upon boot. This is the contents of the /var/run/dmesg.boot file.

show system storage—Display statistics about the amount of free disk space in the router's file systems. Values are displayed in 1024-byte (1-KB) blocks. This command is equivalent to the UNIX df -k command.

show system virtual-memory—Display the usage of JUNOS kernel memory, listed first by size of allocation and then by type of usage.

show system buffer—Display information about the buffer pool that the Routing Engine uses for local traffic, which is the routing and management traffic that is exchanged between the Routing Engine and the Packet Forwarding Engine within the router, as well as the routing and management traffic from IP (that is, from OSPF, BGP, SNMP, pings, and so on).

show system statistics—Display system statistics for all protocols.

`show configuration | except SECRET-DATA`—Display the configuration that currently is running on the router, which is the last committed configuration. If you have modified the configuration since you last committed it, the configuration information displayed by the `show configuration` command will be different from that displayed with the `show` command from the `[edit]` hierarchy level in JUNOS software CLI configuration mode.

`show interfaces extensive`—Display static status information about router interfaces.

`show chassis hardware extensive`—Display extensive information about hardware installed in the router chassis.

## Step 6: Return the Failed Component

**Action** To return a failed component, follow these steps:

1. Determine the part number and serial number of the component. To list the numbers for all components installed in the chassis, use the following CLI command:

```
user@host> show chassis hardware
```

If the component does not appear in the hardware inventory listing, check the failed component for the attached serial number ID label.



**NOTE:** The cooling system components (fans and impellers) do not have serial numbers. Therefore, you will not see a serial number listed in the hardware inventory or a serial number ID label on the component.

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2. Obtain a Return Materials Authorization (RMA) number from JTAC. Open a support case using the Case Manager link at <http://www.juniper.net/support/> or call 1-888-314-JTAC (within the United States) or 1-408-745-9500 (outside the United States).

Provide the following information in your e-mail message or during the telephone call:

Part number, description, and serial number of the component

Your name, organization name, telephone number, fax number, and e-mail address

Shipping address for the replacement component, including a contact name, phone number, and e-mail address

Description of the failure, including log messages

The support representative will validate your request and issue an RMA number for the return of the component.

3. Pack the router or component for shipment, as described in the appropriate router hardware guide. Label the package with the corresponding RMA number.