

## Chapter 17

# Monitoring the Craft Interface

You monitor and maintain the craft interface or Front Panel Module (FPM) to ensure that you can view the router status and perform management operations from the panel on the front of the chassis. (See Table 51.) You can also display craft interface information from the JUNOS software command-line interface (CLI).

**Table 51: Checklist for Monitoring the Craft Interface**

Monitor Craft Interface Tasks	Command or Action
<b>Understanding the Craft Interface on page 199</b>	
M5 and M10 Router Craft Interface on page 199	
M20 Router Craft Interface on page 200	
M40 Router Craft Interface on page 200	
M40e and M160 Router Craft Interface on page 201	
M320 Router Craft Interface on page 201	
T320 Router and T640 Routing Node Craft Interface on page 202	
<b>Monitoring the Craft Interface Status on page 203</b>	
1. View the Craft Interface Status on page 203	show chassis craft interface Physically check the craft interface panel.
2. Check the Craft Interface Environmental Status on page 203	show chassis environment (M40e, M160, and T320 routers and T640 routing node only) show chassis environment fpm
<b>Viewing Craft Interface Information from the Command Line on page 204</b>	show chassis craft-interface
<b>Verifying Craft Interface Failure on page 205</b>	
1. Display Craft Interface Alarms on page 206	show chassis alarms
2. Display Craft Interface Error Messages in the System Log File on page 207	show log messages
3. Display Craft Interface Messages in the Chassis Daemon Log File on page 208	show log chassisd
4. Display Craft Interface Hardware Information on page 208	show chassis hardware

Monitor Craft Interface Tasks	Command or Action
<b>Replacing the Craft Interface on page 209</b>	
1. Replace the M20 Router Craft Interface on page 209	<ol style="list-style-type: none"> <li>1. Attach an ESD wrist strap to your wrist.</li> <li>2. Unscrew the thumbscrews on the left and right sides of the craft interface.</li> <li>3. Flip the ends of the two extractor clips towards the outside edges of the router.</li> <li>4. Grasp both sides of the craft interface and slide it out of the chassis.</li> </ol>
2. Replace the M40 Router Craft Interface on page 209	<p>The craft interface is attached to the lower impeller tray.</p> <ol style="list-style-type: none"> <li>1. Attach an ESD wrist strap to your wrist.</li> <li>2. Unscrew the three screws at the bottom edge of the lower impeller tray.</li> <li>3. Grasp the sides of the lower impeller tray, and slide it out of the chassis.</li> </ol>
3. Replace the M40e and M160 Router Craft Interface on page 210	<p>The craft interface is attached to the upper impeller assembly (front top blower).</p> <ol style="list-style-type: none"> <li>1. Attach an ESD wrist strap to your wrist.</li> <li>2. Undo the captive screws at the corners of the craft interface.</li> <li>3. Grasp the craft interface and pull it out of the chassis.</li> </ol>
4. Replace the M320 Router Craft Interface on page 211	<p>The craft interface is located on the front of the chassis above the FPC card cage.</p>
5. Replace the T320 Router and T640 Routing Node Craft Interface on page 212	<p>The craft interface is located on the front of the chassis above the FPC card cage.</p>
<b>Locating the Craft Interface Serial Number ID Label on page 213</b>	
1. Locate the M20 Router Craft Interface Serial Number ID Label on page 213	<p>Remove the craft interface and look for the serial number ID label on the back of the unit.</p>
2. Locate the M40 Router Craft Interface Serial Number ID Label on page 214	<p>Remove the craft interface and look for the serial number ID label on the back of the unit.</p>
3. Locate the M40e and M160 Router Craft Interface Serial Number ID Label on page 214	<p>Remove the craft interface and look for the serial number ID label on the back of the unit.</p>
4. Locate the M320 Router Craft Interface Serial Number ID Label on page 215	<p>Remove the craft interface and look for the serial number ID on the back of the unit, behind the alarm LEDs.</p>
5. Locate the T320 Router and T640 Routing Node Craft Interface Serial Number ID Label on page 215	<p>Remove the craft interface and look for the serial number ID label on the back of the unit.</p>
<b>Returning the Craft Interface on page 215</b>	<p>See “Replacing a Failed Component” on page 122, or follow the procedure in the appropriate router hardware guide.</p>

## Understanding the Craft Interface

**Purpose** Inspect the craft interface to ensure that you can monitor the status of the router and perform system management functions. The craft interface is also referred to as the Front Panel Module (FPM).

**What Is the Craft Interface** The craft interface, located on the front of the router chassis, provides status information, alarm indicators and contacts, Physical Interface Card (PIC) online and offline buttons, Flexible PIC Concentrator (FPC) online and offline buttons and LED status indicators, Routing Engine offline button and LED status indicators, and management access to the router.

You can display craft interface status information from the JUNOS software CLI.

The craft interface is hot-removable and hot-insertable. You can remove and replace it without powering down the router or disrupting routing functions.

For detailed information about how the router craft interface works, see the appropriate router hardware guide.

Figure 71 shows the M5 and M10 Internet router craft interface.

**Figure 71: M5 and M10 Router Craft Interface**

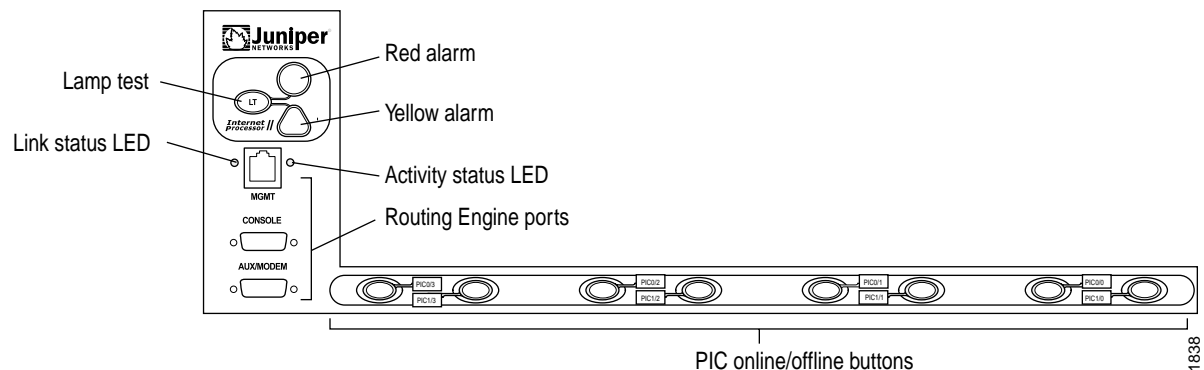


Figure 72 shows the M20 Internet router craft interface.

Figure 72: M20 Router Craft Interface

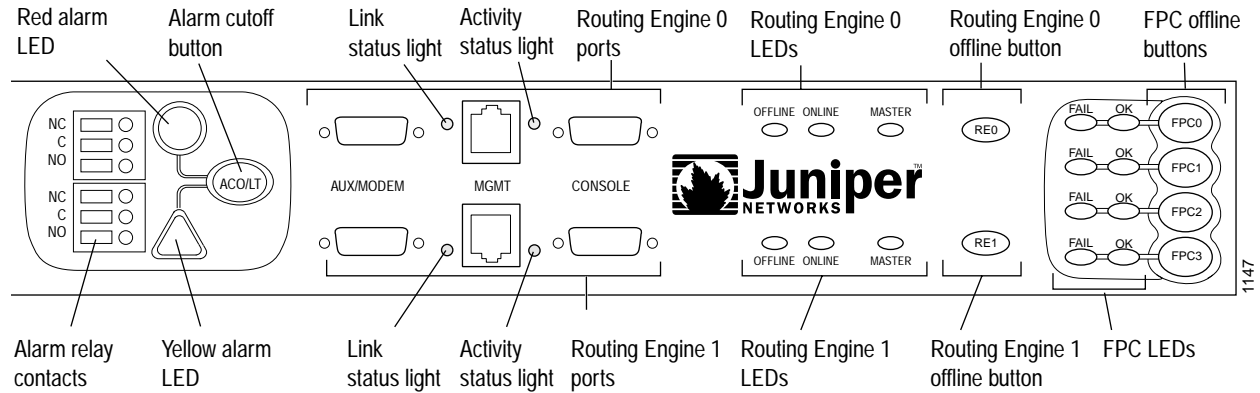


Figure 73 shows the M40 Internet router craft interface.

Figure 73: M40 Router Craft Interface

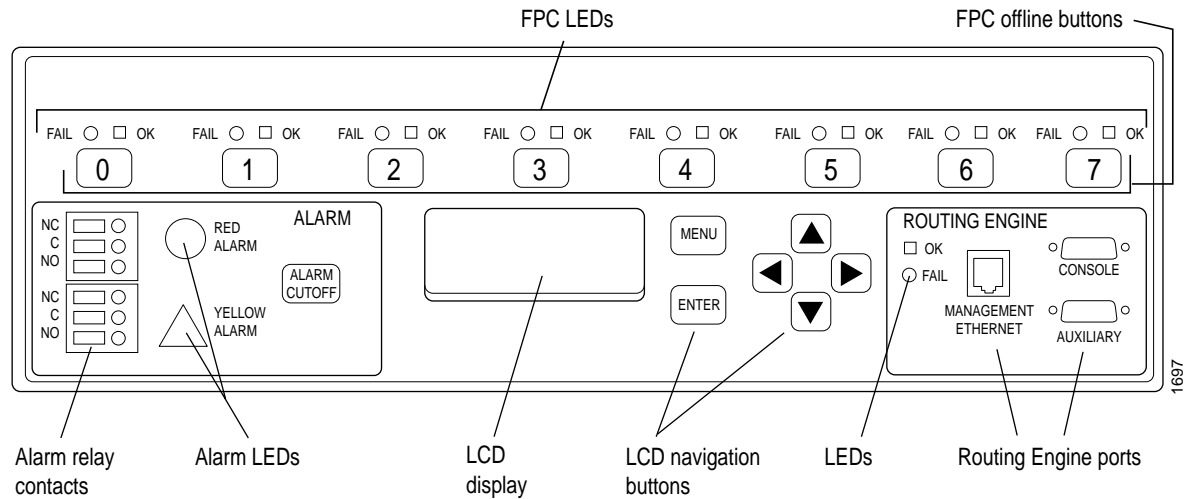


Figure 74 shows the M40e and M160 Internet router craft interface.

Figure 74: M40e and M160 Router Craft Interface

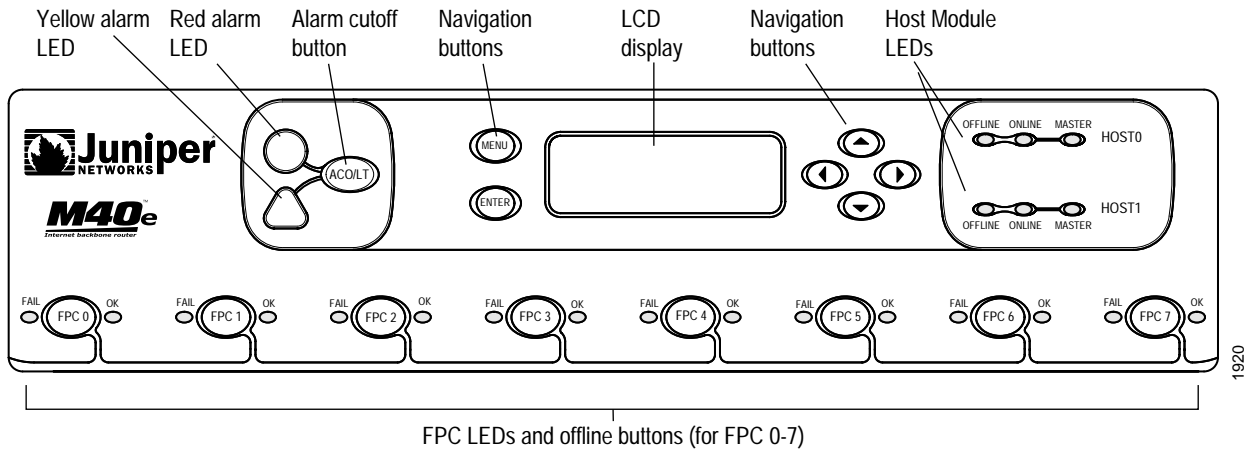


Figure 76 shows the M320 Internet router craft interface.

Figure 75: M320 Router Craft Interface

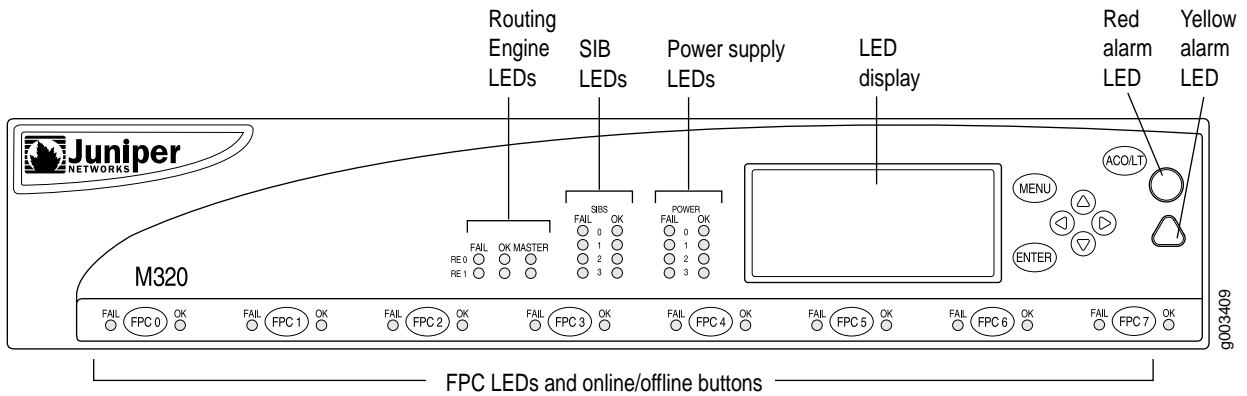


Figure 76 shows the T320 Internet router and T640 Internet routing node craft interface.

Figure 76: T320 Router and T640 Routing Node Craft Interface

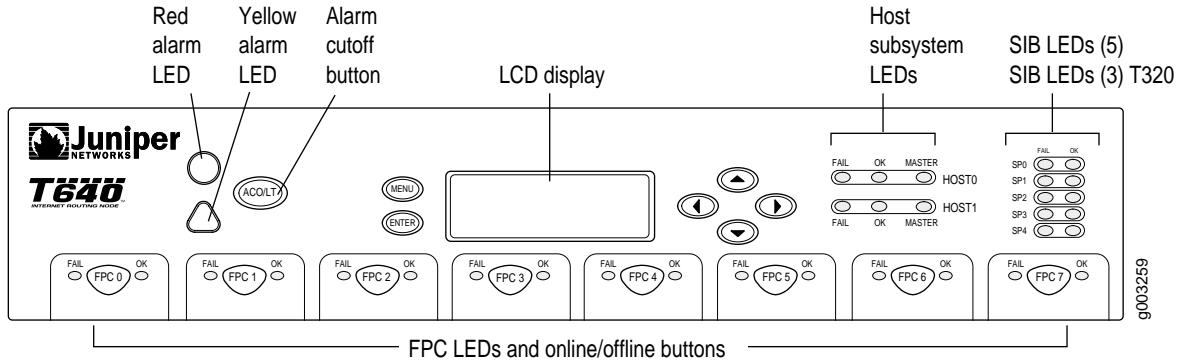


Table 52 lists the craft interface characteristics for each routing platform.

Table 52: Router Craft Interface Characteristics Per Routing Platform

Characteristic	M5 /M10	M7i	M10i	M20	M40	M40e	M160	M320	T320	T640
Alarm LEDs	X	X	X	X	X	X	X	X	X	X
Lamp test button	X									
Alarm cutoff button				X		X	X	X	X	X
Alarm relay contacts				X	X					
Link and activity status lights	X	X		X						
LCD display and navigation buttons					X	X	X	X	X	X
Routing Engine ports	X			X	X					
Routing Engine LEDs				X	X			X		
Host module LEDs						X	X			
Switch Interface Board (SIB) LEDs								X		
Host subsystem LEDs	No Craft Interface	No Craft Interface	No Craft Interface						X	X
PIC online and offline buttons	X	X	X							
FPC LEDs				X	X	X	X	X	X	X
FPC offline buttons				X						
Power Supply LEDs								X		
HCM LEDs			X							

**See Also**      Monitoring the Router Chassis on page 107

Monitoring the CIP on page 381

## Monitoring the Craft Interface Status

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**Steps To Take** To monitor the craft interface status, follow these steps:

1. View the Craft Interface Status on page 203
2. Check the Craft Interface Environmental Status on page 203

### Step 1: View the Craft Interface Status

**Action** To view the craft interface status, look at the craft interface panel on the front of the router chassis. (See Figure 71 on page 199 through Figure 76 on page 202.)

When the craft interface fails, you might not see any lights on the craft interface panel and the LCD display will be blank. In addition, the buttons on the panel might not work as indicated.

**Alternative Action** You can view the craft interface information with the following CLI command:

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

If the craft interface fails, you can still view current craft interface information at the command line. A craft interface failure or removal generates a red alarm. See “Viewing Craft Interface Information from the Command Line” on page 204.

### Step 2: Check the Craft Interface Environmental Status

**Action** To check the craft interface status, use the following CLI command:

```
user@host> show chassis environment
```

**Sample Output** For M5, M10, M20, and M40 routers:

```
user@host> show chassis environment
Class Item      Status  Measurement
[...Output truncated...]
Misc  Craft Interface  OK
```

For M40e and M160 routers:

```
user@host> show chassis environment
Class Item      Status  Measurement
[...Output truncated...]
FPM CMB         OK     32 degrees C / 89 degrees F
FPM Display     OK     32 degrees C / 89 degrees F
[...Output truncated...]
```

For M40e and M160 routers:

```
user@host> show chassis environment
Class Item      Status  Measurement
[...Output truncated...]
FPM GBUS        OK     28 degrees C / 82 degrees F
FPM Display     OK     31 degrees C / 87 degrees F
[...Output truncated...]
```

**What It Means** For M5, M10, M20, and M40 routers, the command output displays the craft interface state, which can be OK or Absent.

For M40e and M160 routers, the command output displays the FPM Chassis Management Bus (CMB) status and the FPM display status, which can be OK or Absent.

For M320 routers, the command output displays the FPM CMB status only.

For T320 routers and T640 routing nodes, the command output displays the FPM circuitry and the FPM display status, which can be OK or Absent.

**Alternative Action** (For M40e, M160, M320, and T320 routers and the T640 routing node) To monitor the craft interface environmental status, use the following CLI command:

```
user@host> show chassis environment fpm
```

```
user@host> show chassis environment fpm
FPM status:
State           Online
FPM CMB Voltage:
 5.0 V bias     5030 mV
 8.0 V bias     8083 mV
FPM Display Voltage:
 5.0 V bias     4998 mV
FPM CMB temperature 34 degrees C / 93 degrees F
FPM Display temperature 35 degrees C / 95 degrees F
CMB Revision      12
```

The command output displays the status of the FPM or craft interface, which can be Online or Offline. It also displays information about the power supplied to the FPM CMB or FPM GBUS, information about the FPM display power supply, the temperature of the air flowing past the FPM CMB or FPM GBUS and the FPM display, and the CMB or GBUS revision level.

## Viewing Craft Interface Information from the Command Line

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If the craft interface fails, you can still display the craft interface information from the CLI. The values reflect what would be visible if the craft interface were operating normally.

**Action** To display craft interface information, use the following CLI command:

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

```

Sample Output user@host> show chassis craft-interface
WARNING: Front panel not present. The following values
            reflect what would be currently visible.

Red alarm:  LED on, relay on
Yellow alarm: LED on, relay on
Host OK LED:  On
Host fail LED: Off

FPCs   0 1 2 3
-----
Green  . . * *
Red    . . . .

LCD screen:
+-----+
|myrouter   |
|2 Alarms active |
|R: fpx0: link down |
|Y: Bchip uCode ovflw|
+-----+

```

**What It Means** The command output displays the information that is currently displayed on the craft interface, including the alarm indicator status, the component status, and the alarm messages currently displayed on the LCD display. The command output is for an M20 router. A craft interface failure generates a red alarm, and you see an fpx0: link down alarm in the LCD screen output. The fpx0 interface or the Ethernet management interface provides an out-of-band method of connecting to the router from the craft interface.

## Verifying Craft Interface Failure

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When the craft interface fails, you might not see any lights on the craft interface panel and the LCD display will be blank. In addition, the buttons on the panel might not work as indicated.

On M5 and M10 routers, you can use the lamp test button to ensure that the alarm LED lights are working properly.

**Steps To Take** To verify craft interface failure, follow these steps:

1. Display Craft Interface Alarms on page 206
2. Display Craft Interface Error Messages in the System Log File on page 207
3. Display Craft Interface Messages in the Chassis Daemon Log File on page 208
4. Display Craft Interface Hardware Information on page 208

## Step 1: Display Craft Interface Alarms

A craft interface failure generates a red or yellow alarm, or both. For information about conditions that trigger craft interface alarms, see “Gather Component Alarm Information” on page 60.

**Action** To display a craft interface alarm, use the following CLI command:

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

**Sample Output** For an M20 router:

```
user@host> show chassis alarms
1 alarms currently active
Alarm time      Class Description
2002-05-09 00:00:54 UTC Major fpx0: ethernet link down
```

For M40e and M160 routers:

```
user@host> show chassis alarms
2 alarms currently active
Alarm time      Class Description
2002-06-07 18:20:00 UTC Minor Craft Failure
2002-06-07 18:20:00 UTC Minor Front Top Fan Absent
```

**What It Means** (M20 router) If the craft interface fails or is removed, you see an alarm. For example, if you remove the craft interface, a major management Ethernet interface down alarm is generated. The Ethernet link to the router is down. The Ethernet management interface, or fpx0, provides an out-of-band method for connecting to the router. You can connect to the management interface over the network using utilities such as secure shell (SSH) and telnet. The Simple Network Management Protocol (SNMP) can use the management interface to gather statistics from the router.

(M40e and M160 routers) The craft interface is connected to the front top fan assembly. If the craft interface fails or is removed, a craft interface failure alarm and a front top fan absence alarm are generated.

## Step 2: Display Craft Interface Error Messages in the System Log File

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

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

**Sample Output** For an M20 router:

```
user@host> show log messages
Jun 3 16:43:19 flitter ssb CM(0): ALARM SET: (Major) fxp0: ethernet link down
Jun 3 16:43:19 flitter craftd[582]: forwarding display request to chassisd: type = 4, subtype = 43
Jun 3 16:43:19 flitter alarmd[581]: Alarm set: fxp0 color=RED, class=ETHER, reason=fxp0: ethernet link down
Jun 3 16:43:19 flitter mib2d[586]: SNMP_TRAP_LINK_DOWN: ifIndex 1, ifAdminStatus up(1), ifOperStatus
down(2), ifName fxp0
Jun 3 16:43:21 flitter /kernel: fxp0: media DOWN 100Mb / full-duplex
```

For M40e and M160 routers:

```
user@host> show log messages
Jun 7 18:18:50 myrouter craftd[2654]: Minor alarm set, Front Top Fan Absent
Jun 7 18:18:50 myrouter chassisd[2652]: CHASSISD_BLOWERS_SPEED: blowers
being set to full speed [fan/blower missing]
Jun 7 18:18:50 myrouter alarmd[2653]: Alarm set: Fan color=YELLOW,
class=CHASSIS, reason=Front Top Fan Absent
Jun 7 18:18:50 myrouter craftd[2654]: fpm led error: Unknown error: -1
Jun 7 18:18:50 myrouter alarmd[2653]: Alarm set: Craft IF color=YELLOW,
class=CHASSIS, reason=Craft Failure
Jun 7 18:18:50 myrouter craftd[2654]: Minor alarm set, Craft Failure
```

**What It Means** The messages system log file records the time the failure or event occurred, the severity level, a code, and a message description. Use the `show log messages` CLI command to browse error messages that are generated at least 5 minutes before and after an event. Use this information to diagnose a problem and to let the Juniper Networks Technical Assistance Center (JTAC) know what error messages were generated and the router events prior to the event.

For an M20 router, the messages file output shows that the Ethernet management interface (fxp0) that provides an out-of-band method for connecting to the router from the craft interface is down. For more information about system log messages, see the *JUNOS System Log Messages Reference*.

For an M160 router, since the craft interface is attached to the front top fan, you see both craft interface and fan error messages.

## Step 3: Display Craft Interface Messages in the Chassis Daemon Log File

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

**Action** To display craft interface status messages in the chassisd log file, use the following CLI command:

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

**Sample Output**

```
user@host> show log chassisd
Jun 7 18:18:50 *** inventory change ***
Jun 7 18:18:50 fru 42 set alarm 0x2
```

```

Jun 7 18:18:50 alarm op fru 42 op 1 reason 2
Jun 7 18:18:50 send: yellow alarm set, class 100 obj 100 reason 2
Jun 7 18:18:50 front top blower removed
Jun 7 18:18:50 FPM set alarm 0x1
Jun 7 18:18:50 alarm op fru 33 op 1 reason 1
Jun 7 18:18:50 send: yellow alarm set, class 100 obj 106 reason 106
Jun 7 18:18:50 FPM removed
Jun 7 18:18:50 CHASSISD_BLOWERS_SPEED: blowers being set to full speed
[fan/blower missing]
    
```

**What It Means** The chassisd database provides the date, time, and a component status message. The chassisd database is dynamic. It is initialized at router startup and is updated when components are added or removed.

### Step 4: Display Craft Interface Hardware Information

**Action** To display the craft interface hardware information, use the following CLI command:

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

**Sample Output** For M5, M10, M20, and M40 routers:

```

user@host> show chassis hardware
Hardware inventory:
Item      Version Part number Serial number  Description
[...Output truncated...]
Display   REV 07  710-000150 AA7812
    
```

For M40e, M160, M320, and T320 routers and T640 routing nodes:

```

user@host> show chassis hardware
Hardware inventory:
Item      Version Part number Serial number  Description
[...Output truncated...]
FPM CMB    REV 03  710-001642 AH5159
FPM Display REV 01  710-001647 AA2920
[...Output truncated...]
    
```

**What It Means** For M5, M10, M20, and M40 routers, the command output displays the display version level, part number, and serial number. For M40e, M160, M320, and T320 routers and T640 routing nodes, the command output displays the hardware information for the FPM CMB or the FPM GBUS and the FPM display. If the craft interface has failed or is absent, you will not see the craft interface or FPM hardware information in the command output.

## Replacing the Craft Interface

The craft interface is hot-removable and hot-insertable. You can remove and replace it without powering down the router or disrupting routing functions.



**NOTE:** The M5 and M10 router craft interface is a part of the router chassis. You cannot remove it.

**Steps To Take** To replace the craft interface, do one of the following:

1. Replace the M20 Router Craft Interface on page 209
2. Replace the M40 Router Craft Interface on page 209
3. Replace the M40e and M160 Router Craft Interface on page 210
4. Replace the M320 Router Craft Interface on page 211
5. Replace the T320 Router and T640 Routing Node Craft Interface on page 212

### ***Step 1: Replace the M20 Router Craft Interface***

**Action** To remove the M20 router craft interface, follow these steps:

1. Attach an electrostatic discharge (ESD) wrist strap to your bare wrist, and connect the wrist strap to one of the two ESD points on the chassis.
2. Unscrew the thumbscrews on the left and right sides of the card carrier to unseat the craft interface from the midplane.
3. Flip the ends of the two extractor clips, which are adjacent to the thumbscrews, toward the outside edges of the router.
4. Grasp both sides of the craft interface and slide it about three-quarters of the way out of the router.
5. Move one of your hands underneath the craft interface to support it, and slide the craft interface completely out of the chassis.

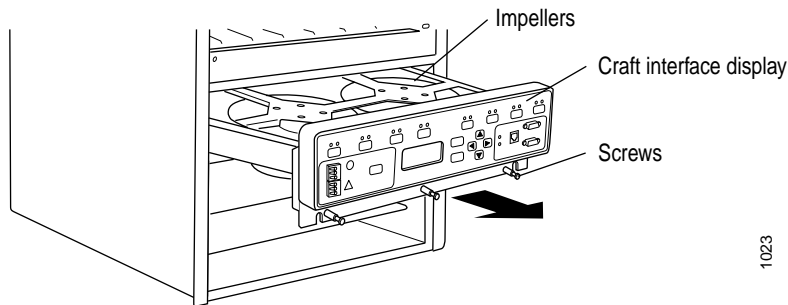
### ***Step 2: Replace the M40 Router Craft Interface***

The craft interface is attached to the lower impeller tray.

**Action** To remove the M40 router craft interface, follow these steps:

1. Attach an ESD wrist strap to your bare wrist, and connect the wrist strap to one of the two ESD points on the chassis.
2. Unscrew the three screws at the bottom edge of the lower impeller tray.
3. Grasp the sides of the lower impeller tray and slide it out of the chassis. (See Figure 77 on page 210.)

**Figure 77: Removing the Lower Impeller Tray**



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**Step 3: Replace the M40e and M160 Router Craft Interface**

The craft interface is attached to the upper impeller assembly (front top blower).

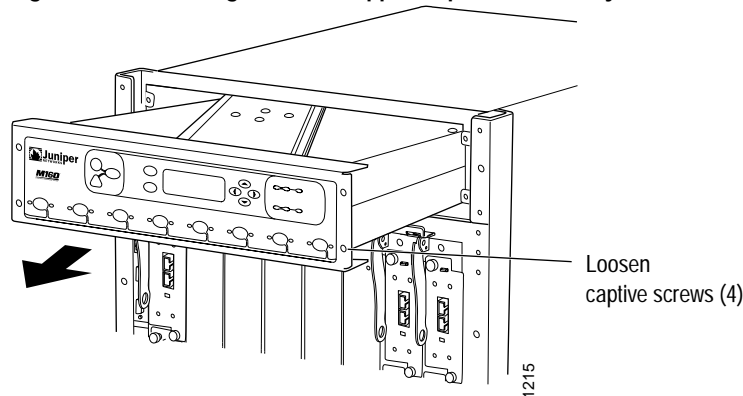
**Action** To remove the M40e and M160 router craft interface, follow these steps:

1. Attach an ESD wrist strap to your bare wrist, and connect the wrist strap to one of the two ESD points on the chassis.
2. Unscrew the captive screws at the corners of the impeller assembly (the craft interface).
3. Grasp the impeller assembly and pull it halfway out of the chassis. (See Figure 78.)



**CAUTION:** If the impeller is still spinning, do not put your fingers or any tool into the impeller assembly as you pull it out. To avoid injury, wait until the impeller stops spinning before removing the assembly.

**Figure 78: Removing the Front Upper Impeller Assembly**



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4. Pull the impeller assembly completely out of the chassis.
5. Place the assembly top-side down (the lettering on the craft interface is upside down) on an antistatic mat on a flat, stable surface.

6. Using a Phillips screwdriver, loosen and remove the four screws that secure the bottom of the craft interface housing to the impeller assembly.
7. Turn the impeller assembly over so that the lettering on the craft interface is right side up.
8. Using a Phillips screwdriver, loosen and remove the four screws that secure the top of the craft interface housing to the impeller assembly.
9. Using a Phillips screwdriver, loosen and remove the screws located on the rear side of the craft interface at the side. There are two screws at each side, located near the holes for the captive screws that secure the impeller assembly to the chassis.
10. Grasp the sides of the craft interface and pull it straight off the front of the impeller assembly.

#### **Step 4: Replace the M320 Router Craft Interface**

The craft interface is located on the front of the chassis above the FPC card cage.

**Action** To remove the craft interface, follow these steps:

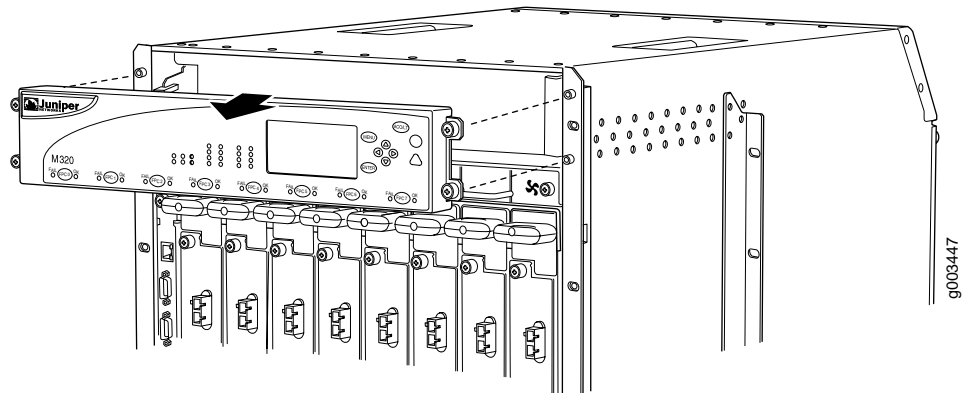


**NOTE:** Removing the front upper fan tray before you remove the craft interface might make it easier to grasp the craft interface as you remove it. For instructions on removing a front fan tray, see the appropriate router hardware guide.

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1. Attach an ESD wrist strap to your bare wrist, and connect the wrist strap to one of the ESD points on the chassis.
2. Remove the upper cable guards by loosening the three captive screws on each cable guard.
3. Completely loosen the four captive screws that attach the craft interface to the chassis.
4. Grasp the craft interface by the left and right flanges and carefully pull it straight out of the chassis. (See Figure 79 on page 212.)

Figure 79: Remove the Craft Interface



### Step 5: Replace the T320 Router and T640 Routing Node Craft Interface

The craft interface is located on the front of the chassis above the FPC card cage.

**Action** To remove the craft interface, follow these steps:



**NOTE:** Removing the front upper fan tray before you remove the craft interface might make it easier to grasp the craft interface as you remove it. For instructions on removing a front fan tray, see the appropriate nrouter hardware guide.

1. Attach an ESD wrist strap to your bare wrist, and connect the wrist strap to one of the ESD points on the chassis.
2. Completely loosen the screws at the four corners of the craft interface.
3. Insert the blade of a flat-blade screwdriver into the slot on one side of the craft interface, then gently pry that side out from the chassis.
4. Repeat Step 3 for the other side of the craft interface.
5. Grasp the craft interface by the top and bottom edges and carefully pull it straight out of the chassis.

## Locating the Craft Interface Serial Number ID Label

If the craft interface has failed or is absent, it does not appear in the hardware list output when you use the `show chassis hardware` command. You must remove the craft interface and manually locate the craft interface serial number ID label.



**NOTE:** The M5 and M10 router craft interfaces are part of the chassis. You cannot remove them.

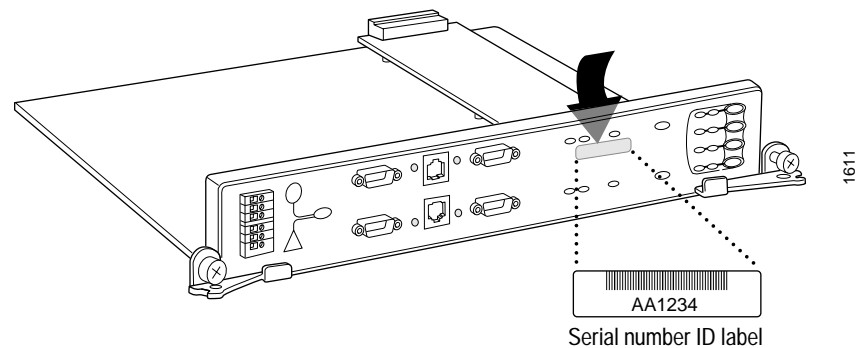
**Steps To Take** To locate the craft interface serial number ID label, do one of the following:

1. Locate the M20 Router Craft Interface Serial Number ID Label on page 213
2. Locate the M40 Router Craft Interface Serial Number ID Label on page 214
3. Locate the M40e and M160 Router Craft Interface Serial Number ID Label on page 214
4. Locate the M320 Router Craft Interface Serial Number ID Label on page 215
5. Locate the T320 Router and T640 Routing Node Craft Interface Serial Number ID Label on page 215

### Step 1: Locate the M20 Router Craft Interface Serial Number ID Label

**Action** To locate the M20 router craft interface serial number ID label, look on the back of the craft interface panel (see Figure 80).

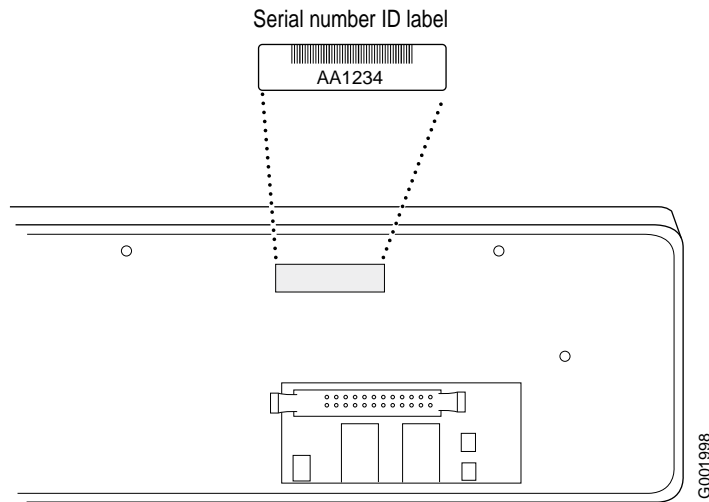
**Figure 80: M20 Router Craft Interface Serial Number ID Label**



### Step 2: Locate the M40 Router Craft Interface Serial Number ID Label

**Action** To locate the M40 router craft interface serial number ID label, look on the back of the panel, above the connector (see Figure 81).

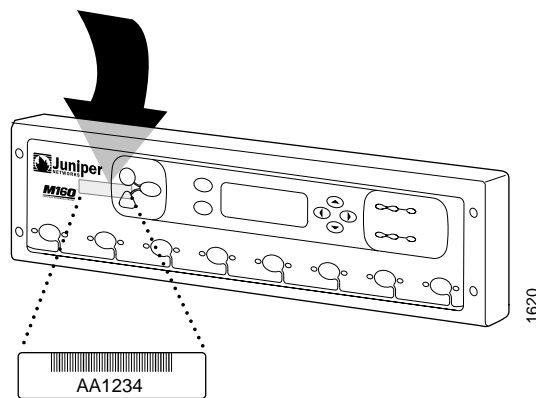
**Figure 81: M40 Router Craft Interface Serial Number ID Label**



### Step 3: Locate the M40e and M160 Router Craft Interface Serial Number ID Label

**Action** To locate the M40e and M160 router serial number ID label, look on the back of the panel, behind the alarm LEDs (see Figure 82).

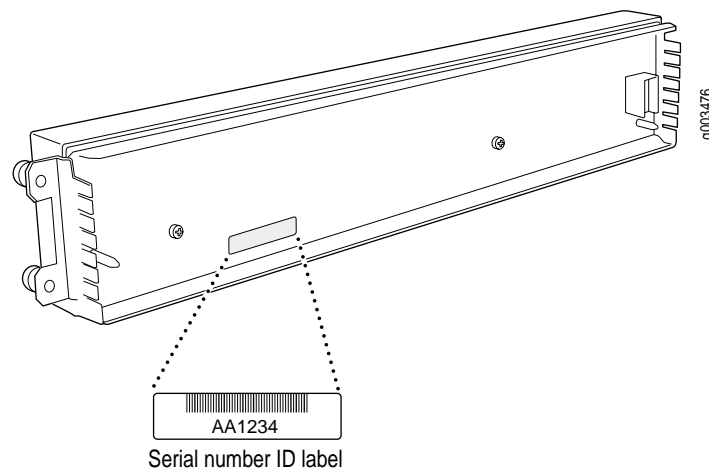
**Figure 82: M40e and M160 Router Craft Interface Serial Number ID Label**



### Step 4: Locate the M320 Router Craft Interface Serial Number ID Label

**Action** To locate the M320 router serial number, look on the back of the craft interface panel, behind the alarm LEDs (see Figure 83).

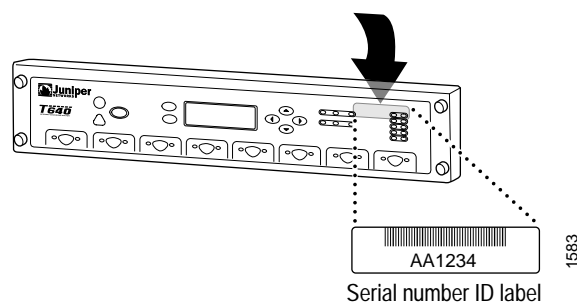
**Figure 83: M320 Router Serial Number ID Label**



### Step 5: Locate the T320 Router and T640 Routing Node Craft Interface Serial Number ID Label

**Action** To locate the T320 router and T640 routing node serial number, look on the back of the craft interface panel, behind the alarm LEDs (see Figure 84).

**Figure 84: T320 Router and T640 Routing Node Serial Number ID Label**



## Returning the Craft Interface

The craft interface is hot-removable and hot-insertable. You can remove or replace a craft interface without powering down the system and disrupting routing functions.

**Action** To return the craft interface, see “Replacing a Failed Component” on page 122 or the appropriate router hardware guide.

