

Chapter 22

Monitoring the Control Board

You monitor and maintain the Control Boards that provide control and monitoring functions for the router. These functions include determining Routing Engine mastership, controlling power, performing reset and SONET clocking for the other router components, monitoring and controlling fan speed, and monitoring system status using I²C controllers. (See Table 71.)

For information on monitoring the Control Boards, see “Monitoring the Host Subsystem” on page 289.

Table 71: Checklist for Monitoring the Control Board

Monitor the Control Board Tasks	Command or Action
Understanding the Control Board on page 303	
M320 Router Control Board on page 303	
T320 Router Control Board on page 304	
T640 Routing Node Control Board on page 304	
M320 Router, T320 Router, and T640 Routing Node Control Board Location on page 305	
Monitoring the Control Board Status on page 306	
1. Check the Control Board Environmental Status on page 306	show chassis environment cb
2. Check the Control Board Status from the Craft Interface on page 307	show chassis craft-interface Check the LEDs on the Control Board faceplate. Check the Host Subsystem LEDs on the T320 router and the T640 routing node craft interface.
Checking the Control Board Alarms on page 308	
1. Display Control Board Alarms on page 308	show chassis alarms For conditions that trigger M320 router alarms, see Table 25 on page 74. For conditions that trigger T320 router alarms, see Table 26 on page 77. For conditions that trigger T640 routing node alarms, see Table 27 on page 80.
2. Check the Control Board LEDs on page 309	Look at the LEDs on the Control Board faceplate.
3. Display Control Board Error Messages in the System Log File on page 309	show log messages match cb
4. Display Control Board Error Messages in the Chassis Daemon Log File on page 309	show log chassisd match cb

Monitor the Control Board Tasks	Command or Action
Verifying Control Board Failure on page 310	
1. Check the Control Board Connection on page 310	1. Make sure that the Control Board is properly seated in the midplane. 2. Ensure that none of the pins are bent. 3. Check the thumbscrews on the ejector locking tabs.
2. Check the Control Board Fuses on page 311	The fuses for the Control Boards are located in the rear of the midplane behind the power supply in slot PEMO.
3. Perform a Control Board Swap Test on page 312	1. Take the host subsystem offline if the Control Board is master. 2. Replace the Control Board with one that you know works. 3. Bring the Control Board online. 4. Check the Control Board status.
4. Display the Control Board Hardware Information on page 313	show chassis hardware
5. Locate the Control Board Serial Number ID Label on page 314	Look on the bottom of the left side of the Control Board.
Returning the Control Board on page 314	Follow the procedure in the appropriate hardware guide.

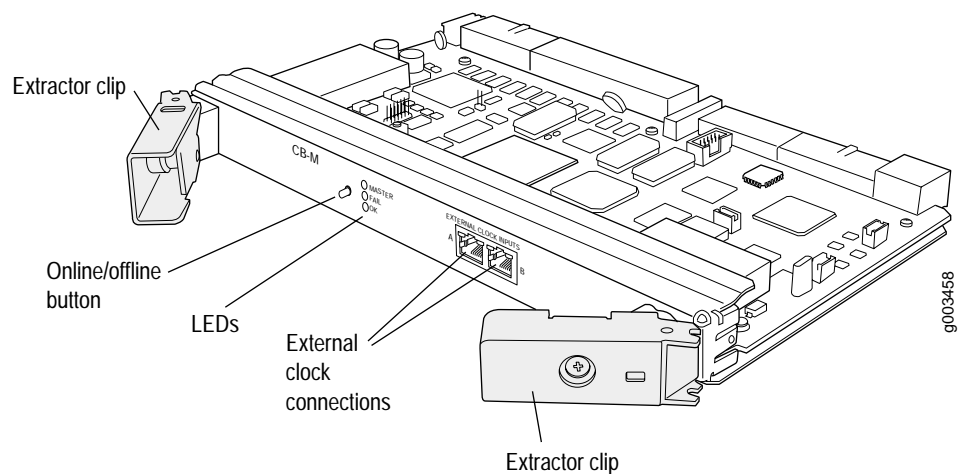
Understanding the Control Board

Purpose	Inspect the Control Boards to ensure that control and monitoring functions occur for the router.
What Is the Control Board	The Control Board works with an adjacent Routing Engine in the host subsystem on M320 and T320 routers and the T640 routing node to provide control and monitoring functions. These functions include determining Routing Engine mastership, controlling power, performing reset and SONET clocking for the other router components, monitoring and controlling fan speed, and monitoring system status using I ² C controllers.

M320 Router Control Board

Figure 124 shows the Control Board component used on the M320 router.

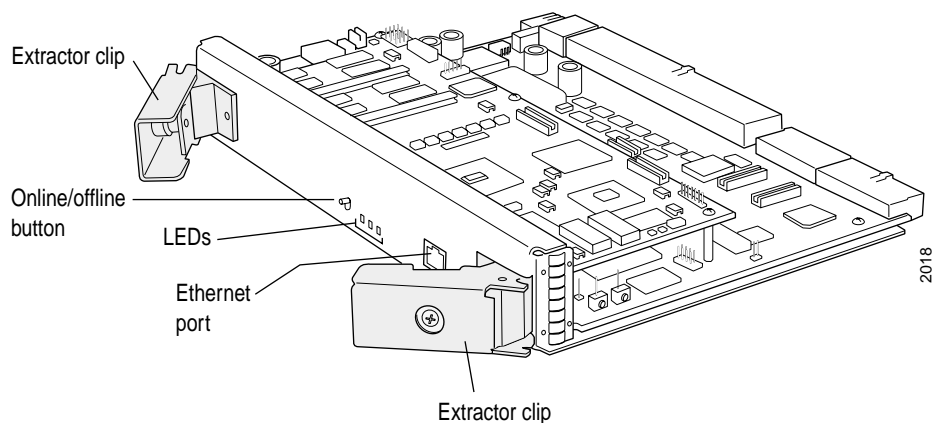
Figure 124: M320 Router Control Board Component



T320 Router Control Board

Figure 125 shows the T320 router Control Board component of the host subsystem.

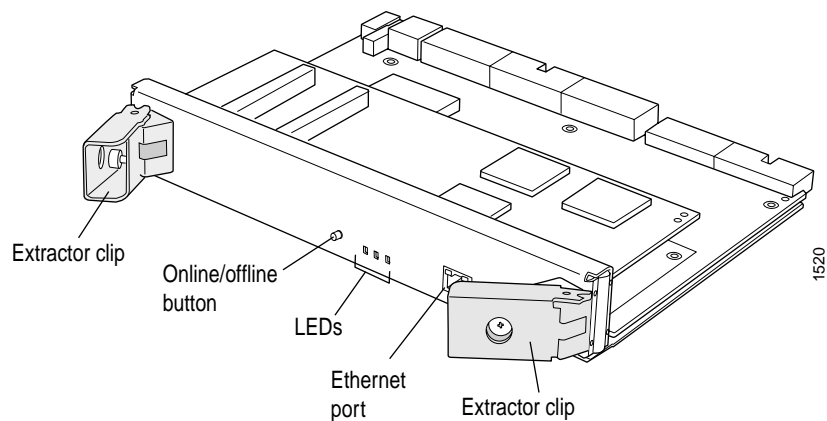
Figure 125: T320 Router Control Board Component



T640 Routing Node Control Board

Figure 124 shows the T320 router Control Board component of the host subsystem.

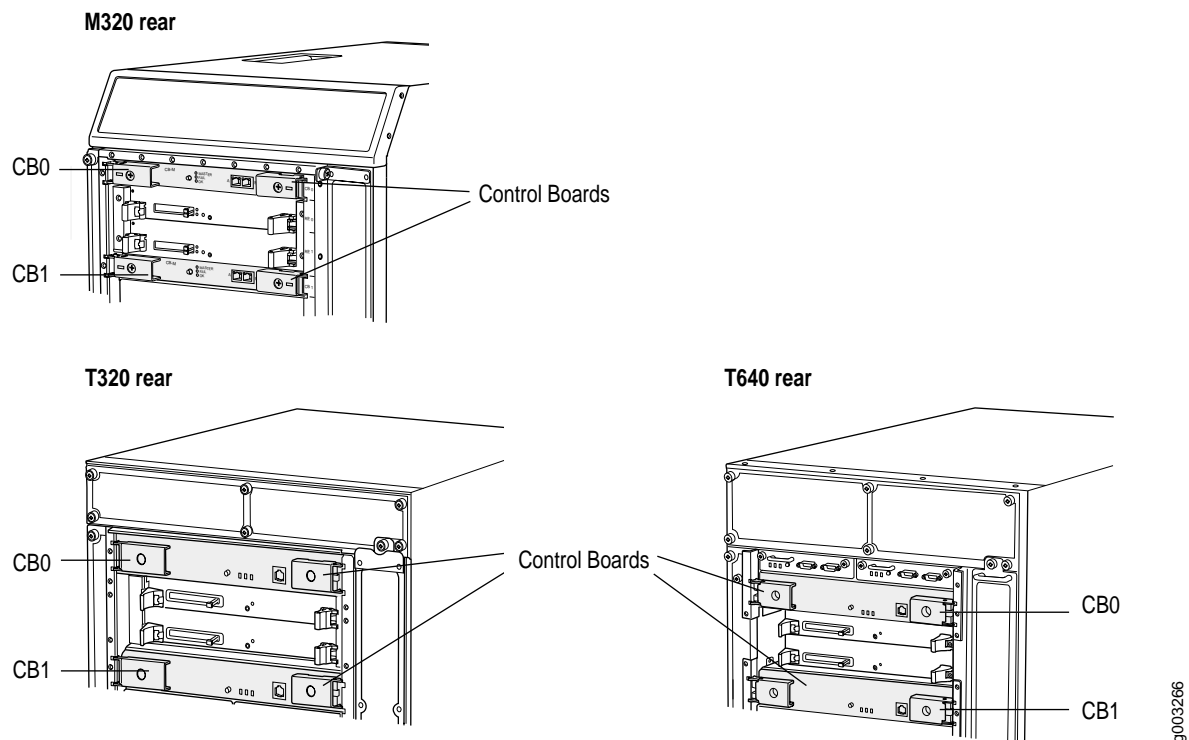
Figure 126: T640 Routing Node Control Board Component



M320, T320 Router, and T640 Routing Node Control Board Location

You can install one or two Control Boards in the router. The Control Boards install into the upper rear of the chassis in the slots labeled CB0 and CB1 (see Figure 127).

Figure 127: M320 Router, T320 Router, and T640 Routing Node Control Board Location



Each Control Board requires that a Routing Engine be installed in the adjacent slot. CB0 installs above RE0, and CB1 installs below RE1. A Control Board does not function if no Routing Engine is present in the adjacent slot.

If two Control Boards are installed, one functions as master and the other acts as backup. If the master Control Board fails or is removed, the backup restarts and becomes master.

The Control Boards are hot-pluggable.

See Also Monitoring the Control Board on page 301

Monitoring the Routing Engine on page 125

Monitoring the Host Subsystem on page 289

Monitoring the Control Board Status

Steps To Take To check the Control Board status, follow these steps:

1. Check the Control Board Environmental Status on page 306
2. Check the Control Board Status from the Craft Interface on page 307

Step 1: Check the Control Board Environmental Status

Action To check the Control Board environmental status, use the following CLI command:

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

Sample Output

```
t640@host> show chassis environment cb
CB 0 status:
State           Online Master
Temperature      29 degrees C / 84 degrees F
Power:
 1.8 V          1805 mV
 2.5 V          2501 mV
 3.3 V          3293 mV
 4.6 V          4725 mV
 5.0 V          5032 mV
12.0 V          11975 mV
 3.3 V bias     3286 mV
 8.0 V bias     7589 mV
GBUS Revision   40
FPGA Revision   7
CB 1 status:
State           Online Standby
Temperature      32 degrees C / 89 degrees F
Power:
 1.8 V          1802 mV
 2.5 V          2482 mV
 3.3 V          3289 mV
 4.6 V          4720 mV
 5.0 V          5001 mV
12.0 V          11946 mV
 3.3 V bias     3274 mV
 8.0 V bias     7562 mV
GBUS Revision   40
FPGA Revision   7
```

What It Means The command output lists the Control Board state, redundancy status, temperature, power supply voltages, and circuitry revision level. If you do not specify a Control Board slot number, the command displays the environmental status for each Control Board installed in the router chassis. If you specify a Control Board slot number, the command displays the status for that slot only.

Step 2: Check the Control Board Status from the Craft Interface

Action To check the Control Board operation status from the craft interface, use the following CLI command:

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

Sample Output t640@host> show chassis craft-interface

FPM Display contents:

[...Output truncated...]

CB LEDs:

CB 0 1

Amber . .

Green * *

Blue * .

[...Output truncated...]

What It Means The sample output shows that the routing platform has two Control Boards online and functioning normally. The Control Board installed in slot 0 is functioning as master. If an amber asterisk displays, the Control Board has failed.

Alternative Action To view the Control Board status, you can do one of the following:

(T320 router and T640 routing node) Look at the router craft interface host module status or look at the LCD display for any Control Board alarms.

Table 72 describes the T320 router and T640 routing node host subsystem LED states.

Table 72: T320 Router and T640 Routing Node Host Subsystem Craft Interface LEDs

Label	Color	State	Description
OK	Green	On steadily	Host is online and functioning normally.
FAIL	Red	On steadily	Host is offline.
MASTER	Green	On steadily	Host is functioning as master.

Look at the Control Board LEDs on the faceplate. See Figure 127 on page 305 for the Control Board location. For more information, see “Check the Control Board LEDs” on page 309.

Checking the Control Board Alarms

Steps To Take To check for Control Board alarms, follow these steps:

1. Display Control Board Alarms on page 308
2. Display Control Board Error Messages in the System Log File on page 309
3. Display Control Board Error Messages in the Chassis Daemon Log File on page 309

Step 1: Display Control Board Alarms

For a listing of the conditions that trigger Control Board alarms, see “M320 Router Chassis Component Alarm Conditions” on page 74, “T320 Router Chassis Component Alarm Conditions” on page 77, and “T640 Routing Node Chassis Component Alarm Conditions” on page 80.

Table 73 lists the Control Board alarm messages that display on the router craft interface LCD and at the CLI command line for the M320 and T320 routers and the T640 routing node.

Table 73: Control Board Alarm Messages

Component	LCD Short Version	CLI Long Version
Control Board	CB <i>CB-number</i> Failure	RED ALARM - CB <i>CB-number</i> Failure
	CB <i>CB-number</i> Removed	RED ALARM - CB <i>CB-number</i> Removed

Action To display any active Control Board alarms, use the following CLI command:

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

Sample Output

```
user@host> show chassis alarms
1 alarms currently active
Alarm time      Class  Description
2004-01-07 17:35:03 PST Major CB 1 Failure
```

What It Means The command output displays the current FPC alarms, including the time the alarm occurred, the severity level, and the alarm description.

Alternative Actions To check for Control Board errors, you can also look at the show chassis craft-interface CLI command output or check the LEDs on the Control Board faceplate.

Step 2: Check the Control Board LEDs

Action To check the Control Board LEDs, look at the three LEDs located on the Control Board faceplate. Figure 124 on page 303, Figure 125 on page 304, and Figure 129 on page 314 show the Control Board faceplates. Table 74 describes the functions of the Control Board LEDs.



NOTE: The online/offline button on the Control Board is currently nonfunctional.

Table 74: Control Board LEDs

Label	Color	State	Description
OK	Green	On steadily	Control Board is online and functioning normally.
FAIL	Amber	On steadily	Control Board has failed.
MASTER	Blue	On steadily	Control Board is functioning as master.

Step 3: Display Control Board Error Messages in the System Log File

Action To check for Control Board error messages in the system log messages file, use the following CLI command:

```
user@host> show log messages | match cb
```

Check for messages at least 5 minutes before and after a Control Board alarm occurs.

Sample Output user@host> **show log messages | match cb**
May 18 16:04:06 routerhost chassisd[4836]: CHASSISD_FRU_OFFLINE_NOTICE: CB 1 offline: Offlined

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. You can also use the `show log messages | match cb` command to see error messages that are generated when a Control Board fails or is offline. Use this information to diagnose a Control Board problem and to let the Juniper Networks Technical Assistance Center (JTAC) know what error messages were generated and the router events that occurred before and after the problem. For more information about system log messages, see the *JUNOS System Log Messages Reference*.

Step 4: Display Control Board Error Messages in the Chassis Daemon Log File

Action To display Control Board error messages in the chassisd log file, use the following CLI command:

```
user@host> show log chassisd | match cb
```

Sample Output user@host> **show log chassisd | match cb**
May 18 16:04:06 CHASSISD_FRU_OFFLINE_NOTICE: Taking CB 1 offline: Offlined

```
May 18 16:04:06 GBUS cmd to CB#1 [0x9], Green LED Off [0x1a]
May 18 16:04:06 CB#1 - Green LED Off
May 18 16:04:06 hwdb: entry for cbd 296 at slot 1 deleted
```

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. You can search for multiple items in the chassisd log file by using the `| match cb` command to see error messages that are generated when a Control Board fails or is offline. Use this information to diagnose a Control Board problem and to let JTAC know what error messages were generated and the router events that occurred before and after the problem. For more information about system log messages, see the *JUNOS System Log Messages Reference*.

Verifying Control Board Failure

Steps To Take To verify a Control Board failure, follow these steps:

1. Check the Control Board Connection on page 310
2. Check the Control Board Fuses on page 311
3. Perform a Control Board Swap Test on page 312
4. Display the Control Board Hardware Information on page 313
5. Locate the Control Board Serial Number ID Label on page 314

Step 1: Check the Control Board Connection

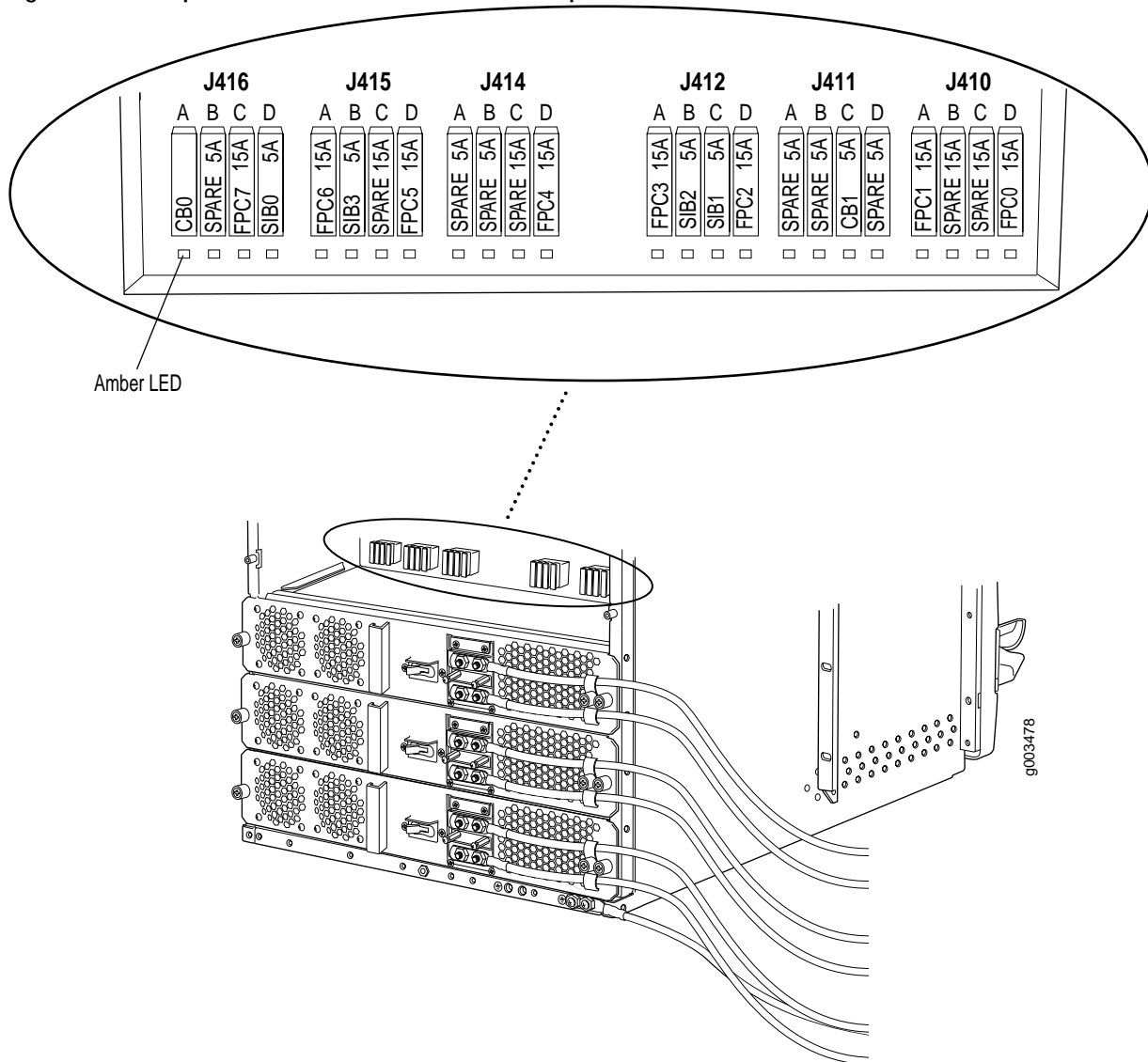
Action To check the Control Board connection, make sure that it is properly seated in the midplane. Ensure that none of the pins are bent. Check the captive screws on the Control Board ejector handles.

Step 2: Check the Control Board Fuses

The M320 router requires fuses for the Control Board. The fuses for the Control Board, Switch Interface Boards (SIBs) and Flexible PIC Concentrators (FPCs) are located in the rear of the midplane behind the power supply in slot PEMO. When the fuse for a Control Board blows, the Control Board stops functioning even though it is installed correctly and the power supplies are providing power to the router.

Figure 128 shows the location of the fuses in the rear of the midplane for the Control Boards. (The labels shown in the figure do not appear on the actual fuses—the clear cover on every fuse reads BUSS GMT-X—and might not match the labels on the midplane. Ignore the labels on the midplane.)

Figure 128: Component Fuses in the M320 Router Midplane



Step 3: Perform a Control Board Swap Test



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

Action To perform a Control Board swap test, follow these steps:

1. Determine whether the host subsystem is functioning as master or backup, using one of the two following methods:

Check the host subsystem LEDs on the craft interface. If the green MASTER LED is lit, the corresponding host subsystem is functioning as master.

Display which host subsystem is functioning as master, using the following CLI command:

```
user@host> show chassis routing-engine
```

2. If the host subsystem is functioning as master, switch it to backup, using the following CLI command:

```
user@host> request chassis routing-engine master switch
```

When you switch the host subsystem from master to backup, the functioning of the routing node is interrupted for up to several minutes as the system reboots and the new master host subsystem downloads software to the SIBs.

3. Have ready an antistatic mat, placed on a flat, stable surface.
4. Attach an electrostatic discharge (ESD) wrist strap to your bare wrist, and connect the wrist strap to one of the ESD points on the chassis.
5. Loosen the captive screws on the ejector handles on both sides of the Control Board faceplate.
6. Flip the ejector handles outwards to unseat the Control Board.
7. Grasp the ejector handles and slide the Control Board about halfway out of the chassis.
8. Move one of your hands underneath the Control Board to support it, and slide it completely out of the chassis.
9. Remove the replacement Control Board from its electrostatic bag.
10. Carefully align the sides of the Control Board with the guides inside the chassis.
11. Slide the Control Board all the way into the chassis.
12. Grasp both ejector handles and press them inwards to seat the Control Board.

13. Tighten the captive screws on the ejector handles.
14. To bring the Control Board online, press the online/offline button until the green ONLINE LED lights.

Step 4: Display the Control Board Hardware Information

Action To display the Control Board hardware information, use the following CLI command:

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

Sample Output

```
t640@host> show chassis hardware
Hardware inventory:
Item      Version  Part number  Serial number  Description
Chassis           65565      M320
Midplane    REV 05   710-009120  RB0662        M320 Midplane
FPM GBUS     REV 04   710-005928  HV7564        M320 Board
FPM Display  REV 05   710-009351  HY0996        VFPD
CIP          REV 04   710-005926  HV2440        SCP
PEM 0       Rev 03   740-009148  QD17663       DC Power Entry Module
PEM 1       Rev 03   740-009148  QD17664       DC Power Entry Module
PEM 2       Rev 03   740-009148  QD17662       DC Power Entry Module
PEM 3       Rev 03   740-009148  QD16006       DC Power Entry Module
Routing Engine 0 REV 05   740-008883  P11123900322  RE-4.0
Routing Engine 1 REV 05   740-008883  P11123900311  RE-4.0
CB 0        REV 07   710-009115  HW8716        M320 Control Board
CB 1        REV 07   710-009115  HW8693        M320 Control Board
[...Output truncated...]
```

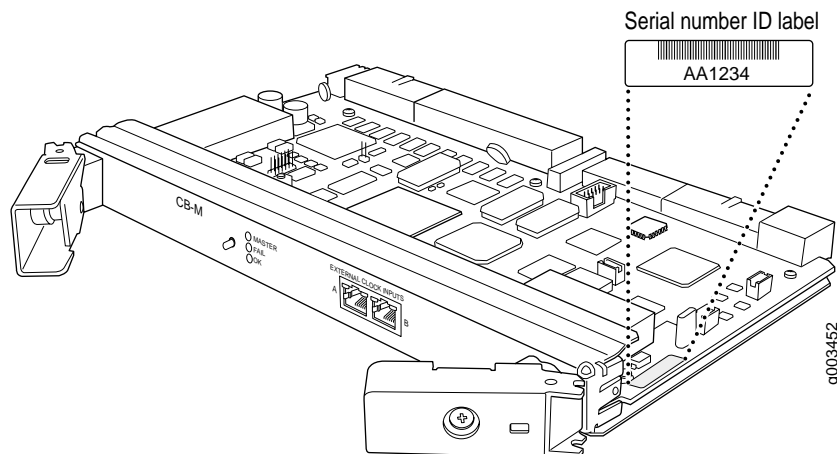
What It Means The command output displays the Control Board slot number, revision level, part number, serial number, and description. The command output for this T640 routing node shows two Control Boards installed in slots CB0 and CB1.

Step 5: Locate the Control Board Serial Number ID Label

Action To find the Control Board serial number ID label locations, do the following:

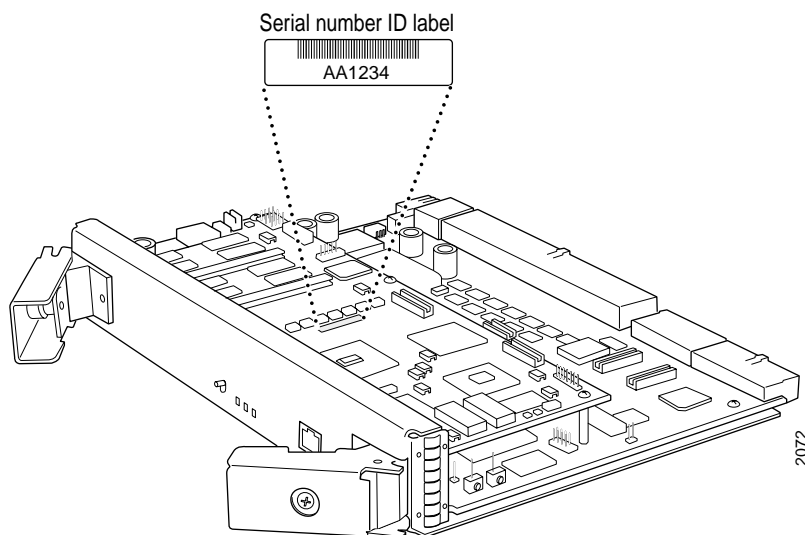
On the M320 router, look on the right side of the top of the Control Board (see Figure 129).

Figure 129: M320 Router Control Board Serial Number ID Label Location



On the T320 router and the T640 routing node, look on the bottom left side of the Control Board (see Figure 130).

Figure 130: T320 Router and T640 Routing Node Control Board Serial Number ID Label



Returning the Control Board

Action To return the Control Board, see “Return the Failed Component” on page 86 or follow the procedure in the appropriate router hardware guide.