

# Chapter 30

## Router Chassis Configuration Guidelines

You can configure properties of the router chassis, including the clock source, conditions that activate the red and yellow alarm LEDs on the router's craft interface, and SONET/SDH framing and concatenation properties for individual PICs.

To configure router chassis properties, you include statements at the [edit chassis] hierarchy level of the configuration. This section discusses the following tasks:

```
chassis {
  alarm {
    interface-type {
      alarm-name (red | yellow | ignore);
    }
  }
  fpc slot-number {
    pic pic-number {
      framing (sdh | sonet);
      no-concatenate;
    }
  }
  (source-route | no-source-route);
  redundancy {
    failover on-loss-of-keepalives;
    keepalive-time seconds;
    routing-engine slot-number (master | backup | disabled);
    ssb slot-number (always | preferred);
  }
}
```

This chapter describes the following tasks for configuring the router chassis:

Minimum Chassis Configuration on page 360

Configure Conditions That Trigger Alarms on page 360

Configure SONET/SDH Framing on page 362

Configure Channelized PIC Operation on page 363

Configure the Drop Policy for Traffic with Source-Route Constraints on page 364

Configure Redundancy on page 364

## Minimum Chassis Configuration

All the statements at the [edit chassis] hierarchy level of the configuration are optional.

## Configure Conditions That Trigger Alarms

For the different types of Physical Interface Connectors (PICs), you can configure which conditions trigger alarms and whether they trigger a red or yellow alarm, or are ignored. Red alarm conditions light the RED ALARM LED on the router's craft interface and trigger an audible alarm if one is connected to the contacts on the craft interface. Yellow alarm conditions light the YELLOW ALARM LED on the router's craft interface and trigger an audible alarm if one is connected to the craft interface.

To configure conditions that trigger alarms and that can occur on any interface of the specified type, include the alarm statement at the [edit chassis] hierarchy level:

```
[edit chassis]
alarm {
  interface-type {
    alarm-name (red | yellow | ignore);
  }
}
```

*alarm-name* is the name of an alarm. Table 16 lists the system-wide alarms and the alarms for each interface type.

Table 16: Configurable PIC Alarm Conditions

| Interface/System  | Alarm Condition                     | Configuration Option |
|-------------------|-------------------------------------|----------------------|
| SONET/SDH and ATM | Link alarm indication signal        | ais-l                |
|                   | Path alarm indication signal        | ais-p                |
|                   | Signal degrade (SD)                 | ber-sd               |
|                   | Signal fail (SF)                    | ber-sf               |
|                   | Loss of cell delineation (ATM only) | locd                 |
|                   | Loss of framing                     | lof                  |
|                   | Loss of light                       | lol                  |
|                   | Loss of pointer                     | lop-p                |
|                   | Loss of signal                      | los                  |
|                   | Phase locked loop out of lock       | pll                  |
|                   | STS payload label (C2) mismatch     | plm-p                |
|                   | Line remote failure indication      | rfl-l                |
|                   | Path remote failure indication      | rfl-p                |
|                   | STS path (C2) unequipped            | uneq-p               |
| T3                | Alarm indicator signal              | ais                  |
|                   | Excessive numbers of zeros          | exz                  |
|                   | Failure of the far end              | ferf                 |
|                   | Idle alarm                          | idle                 |
|                   | Line code violation                 | lcv                  |
|                   | Loss of frame                       | lof                  |
|                   | Loss of signal                      | los                  |
|                   | Phase locked loop out of lock       | pll                  |
|                   | Yellow alarm                        | ylw                  |
| Ethernet          | Management Ethernet disconnected    | link-down            |

### ***Chassis Conditions That Trigger Alarms***

Various conditions related to the chassis components trigger yellow and red alarms. You cannot configure these conditions. Table 17 lists the alarms that the chassis components can generate.

Table 17: Chassis Component Alarm Conditions

| Chassis Component | Alarm Condition   | Alarm Severity |
|-------------------|---|----------------|
| Fans              | One fan has been removed from the chassis.  | Yellow         |
|                   | Two or more fans have been removed from the chassis.  | Red            |
|                   | One fan in the chassis is installed but not spinning.   | Red            |
| Power supplies    | A power supply has been removed from the chassis.   | Yellow         |
|                   | A power supply has failed. If both power supplies fail, the router shuts down and the software might report the failures in the syslog file.  | Red            |
| Temperature       | Chassis temperature has exceeded 54 degrees Centigrade and the fans have been turned on to full speed.  | Yellow         |
|                   | Chassis temperature has exceeded 75 degrees Centigrade and the router has been shut down.   | Red            |
|                   | The temperature sensor has failed.  | Red            |
| SCB/SSB/FEB/SFM   | The control board (SCB, SSB, FEB, or SFM, depending on model) has failed. If this occurs, the board attempts to reboot.   | Red            |
| FPC               | 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.   | Red            |
| Craft interface   | The craft interface has failed.   | 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            |

## Silence External Devices

You can manually silence external devices connected to the alarm relay contacts by pressing the alarm cutoff button located on the craft interface front panel. Silencing the device does not remove the alarm messages from the display (if present on the router) or extinguish the alarm LEDs. In addition, new alarms that occur after an external device is silenced reactivate the external device.

## Configure SONET/SDH Framing

By default, SONET/SDH PICs use SONET framing. To configure a PIC to use SDH framing, include the framing statement at the [edit chassis fpc slot-number pic pic-number] hierarchy level, specifying the sdh option:

```
[edit chassis]
user@host# set fpc slot-number pic pic-number framing sdh
[edit chassis]
user@host# show
fpc slot-number {
  pic pic-number {
    framing sdh;
  }
}
```

To explicitly configure a PIC to use SONET framing, include the framing statement at the [edit chassis fpc *slot-number* pic *pic-number*] hierarchy level, specifying the sonet option:

```
[edit chassis]
user@host# set fpc slot-number pic pic-number framing sonet
[edit chassis]
user@host# show
fpc slot-number {
  pic pic-number
  framing sonet;
}
```

## Configure Channelized PIC Operation

By default, packet-over-SONET PICs (interfaces with names *so-fpc/pic/port*) operate in concatenated mode, a mode in which the bandwidth of the interface is in a single channel. To configure a PIC to operate in channelized (multiplexed) mode, include the no-concatenate statement at the [edit chassis fpc *slot-number* pic *pic-number*] hierarchy level:

```
[edit chassis]
user@host# set fpc slot-number pic pic-number no-concatenate
[edit chassis]
user@host# show
fpc slot-number {
  pic pic-number
  no-concatenate;
}
```

When configuring and displaying information about interfaces that are operating in channelized mode, you must specify the channel number in the interface name (*physical:channel*); for example, *so-2/2/0:0* and *so-2/2/0:1*. For more information about interface names, see “Configure the Interface Name” on page 28.



### Note

When you switch between concatenated mode (the default mode of operation) and nonconcatenated mode, you must reboot an M20 or M40 router for the change to take effect. On M5, M10, or M160 routers, the change takes effect immediately without requiring a reboot on routers running JUNOS Internet software Release 4.2 or later; routers running Release 4.1 will require rebooting.

On SONET OC-48 interfaces that are configured for channelized (multiplexed) mode, the bytes e1-quiet and bytes f1 options in the sonet-options statement have no effect. The bytes f2, bytes z3, bytes z4, and path-trace options work correctly on channel 0 and work in the transmit direction only on channels 1, 2, and 3.

The M160 four-port channelized OC-12 PIC can run each of the OC-12 links in concatenated mode only, and requires a Type 2 M160 FPC. The links cannot be configured in non-concatenated mode. Similarly, the four-port OC-3 PIC cannot run in non-concatenated mode on any platform.

## Configure the Drop Policy for Traffic with Source-Route Constraints

By default, the router forwards IP traffic that has either loose or strict source-route constraints. However, you might want the router to use only the IP destination address on transit traffic for forwarding decisions. You can configure the router to discard IP traffic with source-route constraints by including the `no-source-route` statement at the `[edit chassis]` hierarchy level:

```
[edit chassis]
no-source-route;
```

## Configure Redundancy

For routers that have multiple Routing Engines or multiple System and Switch Boards (SSBs), you can configure redundancy properties. A separate log file is provided for redundancy logging, located at `/var/log/mastership`.

This section describes the following tasks for configuring redundancy:

Configure Routing Engine Redundancy on page 364

Configure SSB Redundancy on page 366

## **Configure Routing Engine Redundancy**

For routers with two Routing Engines, you can configure which Routing Engine is the master and which is the backup. By default, the Routing Engine in slot 0 is the master and the one in slot 1 is the backup. To modify the default configuration, include the `routing-engine` statement at the `[edit chassis redundancy]` hierarchy level:

```
[edit chassis redundancy]
routing-engine slot-number (master | backup | disabled);
```

`slot-number` can be 0 or 1. To configure the Routing Engine to be the master, specify the `master` option. To configure it to be the backup, specify the `backup` option. To switch between the master and the backup Routing Engines, you must modify the configuration and then activate the configuration by issuing the `commit` command.



For routers that have two Routing Engines, both Routing Engines must be running JUNOS Internet software Release 4.0 or later. Do not run JUNOS Internet software Release 3.4 on one of the Routing Engines and Release 4.0 on the other. (Note that Release 3.4 does not support Routing Engine redundancy, so if you are using this release of the software, only one Routing Engine can be installed in the router. It can be installed in either slot.)

If you have Release 3.4 installed on one of the Routing Engines and Release 4.0 or later on the other, either remove the backup Routing Engine from the router or install Release 4.0 or later on that Routing Engine.

You must also ensure that both Routing Engines have the same configuration file. You can use either the console port or the management Ethernet (fxp0) port to establish connectivity between the two Routing Engines. You can then copy or ftp the configuration from the master to the backup, and load the file and commit it in the normal way. For further information, see the *JUNOS Internet Software Configuration Guide: Installation and System Management*.

To make a tty connection to the other Routing Engine using the router's internal Ethernet network, issue the following command:

```
user@host > request routing-engine login (other-routing-engine | re0 | re1)
```

### **Copy a Configuration File from one Routing Engine to the Other**

To copy a configuration file from one Routing Engine to the other, you use the existing file copy command:

```
user@host > file copy source destination
```

In this case, *source* is the name of the configuration file. These files are stored in the directory /config. The active configuration is /config/juniper.conf, and older configurations are in /config/juniper.conf { 1...9 }. *destination* is a file on the other Routing Engine.

The following is an example of copying a configuration file from Routing Engine 0 to Routing Engine 1:

```
user@host> file copy /config/juniper.conf re1:/var/tmp/copied-juniper.conf
```

To load the file into configuration mode, use the load replace configuration mode command:

```
user@host% load replace /var/tmp/copied-juniper.conf
```



**Caution**

Make sure you change any IP addresses specified in fxp0 on Routing Engine 0 to addresses appropriate for Routing Engine 1.

### **Load a Package from the Other Routing Engine**

You can load a package from the other Routing Engine onto the local Routing Engine using the existing request system software add *package-name* command:

```
user@host > request system software add re(0|1):/filename
```

In the re portion of the URL, specify the number of the other Routing Engine. In the *filename* portion of the URL, specify the path to the package. Packages are typically in the directory /var/sw/pkg.

### **Change over to the Backup Routing Engine**

Once you have configured a backup Routing Engine, you can direct it to assume mastership automatically if it detects loss of keepalive signal from the master. By default, this feature is disabled; to enable it, include the failover on-loss-of-keepalives statement at the [edit chassis redundancy] hierarchy level:

```
[edit chassis redundancy]
failover on-loss-of-keepalives;
```

By default, failover will occur after five minutes. To change the keepalive time period, include the keepalive-time statement at the [edit chassis redundancy] hierarchy level:

```
[edit chassis redundancy]
keepalive-time seconds;
```

The range for keepalive-time is 300 through 10,000 seconds.

The sequence of events is as follows:

1. After one minute of keepalive loss, a message is printed.
2. After the second minute passes, the backup Routing Engine attempts to assume mastership. An alarm is generated whenever the backup is active and the display is updated with status.
3. Once the backup Routing Engine assumes mastership, it will continue to function as master even after the originally configured master Routing Engine has successfully resumed operation. Operator intervention is required to restore its previous backup status. However, if at any time one of the Routing Engines is not present, the other one becomes master automatically, regardless of how redundancy is configured.

### **Configure SSB Redundancy**

For routers with two System and Switch Boards, you can configure which SSB is the master and which is the backup. By default, the SSB in slot 0 is the master and the one in slot 1 is the backup. To modify the default configuration, include the ssb statement at the [edit chassis redundancy] hierarchy level:

```
[edit chassis redundancy]
ssb slot-number (always | preferred);
```

slot-number can be 0 or 1.

always defines the ssb as the sole device.

preferred defines the ssb as the preferred device of at least two.