Interface Name
Each interface has an interface name, which specifies the media type, the slot in which the FPC is located, the location on the FPC on which the PIC is installed, and the PIC port. You use the interface name when configuring interfaces and when enabling various functions and properties, such as routing protocols, on individual interfaces.

The interface name is represented by a physical part, a channel part, and a logical part in the following format:

\[ \text{physical}<:\text{channel}>.\text{logical} \]

The channel part of the name is optional for all interfaces except for channelized interfaces.

Physical Part of an Interface Name
The physical part of an interface name identifies the physical device, which corresponds to a single physical network connector. This part of the interface name has the following format:

\[ \text{type-fpc/pic/port} \]

- **type** is the media type, which identifies the network device. It can be one of the following:
  - ae—Aggregated Ethernet interface
  - at—ATM interface
  - e1—E1 interface (including Channelized STM-1 interfaces)
  - e3—E3 interface
  - fe—Fast Ethernet interface
  - fxp—Management and internal Ethernet interfaces
  - ge—Gigabit Ethernet interface
  - gr—Generic Route Encapsulation tunnel interface
  - ip—IP-over-IP encapsulation tunnel interface
  - lo—Loopback interface
  - ml—Multilink interface
  - so—SONET/SDH interface
  - t1—T1 interface (including Channelized DS-3 and OC-3 interfaces)
  - t3—T3 interface (including Channelized OC-12 interfaces)

- **fpc** identifies the number of the FPC card on which the physical interface is located. Specifically, it is the number of the slot in which the FPC card is installed.

- **pic** identifies the number of the PIC on which the physical interface is located.

- **port** identifies a specific port on a PIC. The number of ports varies depending on the PIC. The port numbers are printed on the PIC.

Interface Numbering

<table>
<thead>
<tr>
<th>Router</th>
<th>FPC Number</th>
<th>PIC Number</th>
<th>Port Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>M160</td>
<td>0-7 from left to right</td>
<td>0-3 from top to bottom</td>
<td>Varies with PIC</td>
</tr>
<tr>
<td>M40</td>
<td>0-7 from left to right</td>
<td>0-3 from top to bottom</td>
<td>Varies with PIC</td>
</tr>
<tr>
<td>M20</td>
<td>0-3 from top to bottom</td>
<td>0-3 from right to left</td>
<td>Varies with PIC</td>
</tr>
<tr>
<td>M5 and M10</td>
<td>—</td>
<td>0-3 from right to left</td>
<td>Varies with PIC</td>
</tr>
</tbody>
</table>

For PICs that occupy more than one PIC location, use the lower location number. M5 and M10 routers do not have FPCs, but use the same format for interface names. On an M5 router, the number corresponding to the FPC slot is always 0. On an M10 router, the number is 0 for the upper row of PICs and 1 for the lower row.
**Channel Part of an Interface Name**

The channel identifier part of the interface name is required only on channelized interfaces. Channel 0 identifies the first channelized interface. A nonconcatenated (that is, channelized) SONET/SDH OC-48 interface has four OC-12 channels, numbered 0 through 3. A Channelized OC-12 interface has twelve DS-3 channels, numbered 0 through 11.

**Logical Part of an Interface Name**

The logical unit part of the interface name corresponds to the logical unit number, which can be a number in the range 0 through 65535.

For a physical interface device to function, you must configure at least one logical interface on that device. For each logical interface, you must at a minimum specify the protocol family that the interface supports. You can also configure other logical interface properties. These vary by PIC and encapsulation type, but can include the IP address of the interface, whether the interface supports multicast traffic, DLCIs, VCIs and VPIs, and traffic shaping.

PPP and Cisco HDLC encapsulations support only a single logical interface, whose logical unit number must be 0. Frame Relay and ATM encapsulations support multiple logical interfaces, so you can configure one or more logical unit numbers.

To configure the logical unit number, include the `unit` statement at the `[edit interfaces interface-name]` hierarchy level:

```
[edit interfaces]
interface-name {
    unit 0 {
        ... 
    }
} interface-name {
    unit logical-unit-number {
        ... 
    }
}
```

**Separators in Interface Names**

There is a separator of some kind between each element of an interface name:

- In the physical part of the name, a hyphen (–) separates the media type from the FPC number, and a slash (/) separates the FPC, PIC, and port numbers.
- In the virtual part of the name, a period (.) separates the channel and logical unit numbers.
- A colon (:) separates the physical and virtual parts of the interface name.

**Wildcard Characters in Interface Names**

With the `show interfaces` commands, you can use wildcard characters when specifying interface names (in the `interface-name` option) to refer to groups of interface names so that you do not have to type each name individually. You must enclose all wildcard characters except the asterisk in quotation marks (“ ”).

<table>
<thead>
<tr>
<th>Wildcard Character</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>* (asterisk)</td>
<td>Match any string of characters in that position in the interface name. For example, so* matches all SONET/SDH interfaces.</td>
</tr>
<tr>
<td>“[character&lt;character...&gt;]*”</td>
<td>Match one or more individual characters in that position in the interface name. For example, “so-[03]” * matches all SONET/SDH interfaces in slots 0 and 3.</td>
</tr>
<tr>
<td>“[!character&lt;character...&gt;]*”</td>
<td>Match all characters except the ones included in the brackets. For example, “so-[!03]” * matches all SONET/SDH interfaces except for those in slots 0 and 3.</td>
</tr>
<tr>
<td>“[character1-character2]”</td>
<td>Match a range of characters. For example, so-“[0-3]” * matches all SONET/SDH interfaces in slots 0, 1, 2, and 3.</td>
</tr>
<tr>
<td>“[!character1-character2]”</td>
<td>Match all characters that are not in the specified range of characters. For example, so-“![0-3]” * matches all SONET/SDH interfaces in slots 4, 5, 6, and 7.</td>
</tr>
</tbody>
</table>
Common Configuration Examples
The following is a basic configuration for a SONET/SDH interface:

```
[edit interfaces]
user@host# show so-1/1/0
so-1/1/0 {
  mtu 8000;
  clocking internal;
  encapsulation ppp;
  sonet-options {
    rfc-2615;
  }
  unit 0 {
    family inet {
      address 12.12.12.21/32 {
        destination 12.12.12.22;
      }
    }
  }
}
```

The following is a basic configuration for a T3 (DS-3) interface:

```
[edit interfaces]
user@host# show t3-0/1/1
t3-0/1/1 {
  encapsulation ppp;
  t3-options {
    no-long-buildout;
    compatibility-mode larscom;
    payload-scrambler;
  }
  unit 0 {
    family inet {
      address 10.0.0.1/32 {
        destination 10.0.0.2;
      }
    }
    family iso;
  }
}
```

Interface Commands

**monitor interface**

The `monitor interface` command displays real-time statistics about a physical interface, updating them every second. The output of this command also shows the amount that each field has changed since you started the command or since you cleared the counters. This command also checks for and displays common interface failures, such as SONET/SDH and T3 alarms, loopbacks detected, and increases in framing errors.

To control the output of the command while it is running, use the following keys:

<table>
<thead>
<tr>
<th>Action</th>
<th>Key</th>
</tr>
</thead>
<tbody>
<tr>
<td>Display information about the next interface. The <code>monitor interface</code> command scrolls through the physical or logical interfaces in the same order that they are displayed by the <code>show interfaces terse</code> command.</td>
<td>n</td>
</tr>
<tr>
<td>Display information about a different interface. The command prompts you for the name of a specific interface.</td>
<td>i</td>
</tr>
<tr>
<td>Freeze the display, halting the display of updated statistics.</td>
<td>f</td>
</tr>
<tr>
<td>Thaw the display, resuming the display of updated statistics.</td>
<td>t</td>
</tr>
<tr>
<td>Clear (zero) the counters.</td>
<td>c</td>
</tr>
<tr>
<td>Stop the <code>monitor interface</code> command.</td>
<td>q</td>
</tr>
</tbody>
</table>
**show interfaces**

The `show interfaces` command displays static status information about router interfaces. The information displayed varies with the different types of interfaces. The options brief, detail, extensive, summary, and terse control how much information is displayed. The options description, media, routing, and statistics control what kind of information is displayed. You can display information about all interfaces or specify one particular interface by including the `interface-name` option.

**show interface description**—Displays the interface descriptions that have been configured with the description statement at the [edit interfaces interface-name] hierarchy level.

**show interface media**—Displays media-specific information about network interfaces.

**show interface routing**—Lets the routing protocol process display its view of the state of the router’s interfaces. Use this command for performing router diagnostics only, when you are checking whether the routing protocols and the JUNOS software disagree about the state of an interface.

**show interface statistics**—Displays static interface statistics, such as errors.

### Commands for Monitoring Interfaces

Below is a summary of the command-line interface (CLI) commands that you can use to monitor and troubleshoot router interfaces.

<table>
<thead>
<tr>
<th>Task Category</th>
<th>Task or Information to Monitor</th>
<th>CLI Command</th>
</tr>
</thead>
<tbody>
<tr>
<td>Status interface information</td>
<td>General interface information</td>
<td>show interfaces</td>
</tr>
<tr>
<td></td>
<td>Summary interface information</td>
<td>show interfaces terse</td>
</tr>
<tr>
<td></td>
<td>Configured interface descriptions</td>
<td>show interfaces</td>
</tr>
<tr>
<td></td>
<td>Routing information for each interface</td>
<td>show interfaces</td>
</tr>
<tr>
<td></td>
<td>Media-specific interface information</td>
<td>show interfaces</td>
</tr>
<tr>
<td></td>
<td>Interface statistics</td>
<td>show interfaces</td>
</tr>
<tr>
<td></td>
<td>Clear (zero) interface statistics</td>
<td>clear interfaces</td>
</tr>
<tr>
<td>Real-time interface information</td>
<td>Interface statistics</td>
<td>monitor interface</td>
</tr>
<tr>
<td></td>
<td>Automatic protection switching</td>
<td>show aps</td>
</tr>
<tr>
<td>BERT tests</td>
<td>Start bit error rate testing</td>
<td>test interface</td>
</tr>
<tr>
<td>(for T3 Interfaces Only)</td>
<td>Stop bit error rate testing</td>
<td>bert-start</td>
</tr>
<tr>
<td></td>
<td>Transmit the line loopback activate code word sequence on</td>
<td>test interface</td>
</tr>
<tr>
<td></td>
<td>the interface’s FEAC channel</td>
<td>bert-stop</td>
</tr>
<tr>
<td></td>
<td>Transmit the line loopback deactivate code word sequence</td>
<td>test interface</td>
</tr>
<tr>
<td></td>
<td>on the interface’s FEAC channel</td>
<td>feac-loop initiate</td>
</tr>
<tr>
<td></td>
<td></td>
<td>feac-loop terminate</td>
</tr>
<tr>
<td>VRRP</td>
<td>VRRP groups</td>
<td>show vrp</td>
</tr>
<tr>
<td></td>
<td>Clear (zero) VRRP groups</td>
<td>clear vrp</td>
</tr>
<tr>
<td>ILMI</td>
<td>ILMI messages</td>
<td>show ilmi</td>
</tr>
<tr>
<td></td>
<td>ILMI statistics</td>
<td>show ilmi statistics</td>
</tr>
<tr>
<td></td>
<td>Clear (zero) ILMI statistics</td>
<td>clear ilmi statistics</td>
</tr>
</tbody>
</table>