Understanding Software Infrastructure and Processes

Each switch runs the JUNOS software for EX-series switches on its general-purpose processors. JUNOS software includes processes for Internet Protocol (IP) routing and for managing interfaces, networks, and the chassis.

The JUNOS software runs on the Routing Engine. The Routing Engine kernel coordinates communication among the JUNOS software processes and provides a link to the Packet Forwarding Engine.

With the J-Web interface and the command-line interface (CLI) to the JUNOS software, you configure switching features and routing protocols and set the properties of network interfaces on your switch. After activating a software configuration, use either the J-Web or CLI user interface to monitor the switch, manage operations, and diagnose protocol and network connectivity problems.

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Routing Engine and Packet Forwarding Engine

A switch has two primary software processing components:

- Packet Forwarding Engine—Processes packets; applies filters, routing policies, and other features; and forwards packets to the next hop along the route to their final destination.

- Routing Engine—Provides three main functions:
  - Creates the packet forwarding switch fabric for the switch, providing route lookup, filtering, and switching on incoming data packets, then directing outbound packets to the appropriate interface for transmission to the network.
  - Maintains the routing tables used by the switch and controls the routing protocols that run on the switch.
  - Provides control and monitoring functions for the switch, including controlling power and monitoring system status.

JUNOS Software Processes

The JUNOS software running on the Routing Engine and Packet Forwarding Engine consists of multiple processes that are responsible for individual functions.

The separation of functions provides operational stability, because each process accesses its own protected memory space.

Table 1 on page 2 describes the primary JUNOS software processes.
<table>
<thead>
<tr>
<th>Process</th>
<th>Name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chassis process</td>
<td>chassid</td>
<td>Detects hardware on the system that is used to configure network interfaces. Monitors the physical status of hardware components and field-replaceable units (FRUs), detecting when environment sensors such as temperature sensors are triggered. Relays signals and interrupts—for example, when devices are taken offline, so that the system can close sessions and shut down gracefully.</td>
</tr>
<tr>
<td>Ethernet switching process</td>
<td>eswd</td>
<td>Handles Layer 2 switching functionality such as MAC address learning, Spanning Tree protocol and access port security. The process is also responsible for managing Ethernet switching interfaces, VLANs, and VLAN interfaces. Manages Ethernet switching interfaces, VLANs, and VLAN interfaces.</td>
</tr>
<tr>
<td>Forwarding process</td>
<td>pfem</td>
<td>Defines how routing protocols operate on the switch. The overall performance of the switch is largely determined by the effectiveness of the forwarding process.</td>
</tr>
<tr>
<td>Interface process</td>
<td>dcd</td>
<td>Configures and monitors network interfaces by defining physical characteristics such as link encapsulation, hold times, and keepalive timers.</td>
</tr>
<tr>
<td>Management process</td>
<td>mgd</td>
<td>Provides communication between the other processes and an interface to the configuration database. Populates the configuration database with configuration information and retrieves the information when queried by other processes to ensure that the system operates as configured. Interacts with the other processes when commands are issued through one of the user interfaces on the switch. If a process terminates or fails to start when called, the management process attempts to restart it a limited number of times to prevent thrashing and logs any failure information for further investigation.</td>
</tr>
<tr>
<td>Routing protocol process</td>
<td>rpdm</td>
<td>Defines how routing protocols such as RIP, OSPF, and BGP operate on the device, including selecting routes and maintaining forwarding tables.</td>
</tr>
</tbody>
</table>

**Related Topics**

- For more information about basic system parameters, supported protocols, and software processes, see JUNOS System Basics Configuration Guide at [http://www.juniper.net/techpubs/software/junos/junos90/index.html](http://www.juniper.net/techpubs/software/junos/junos90/index.html).