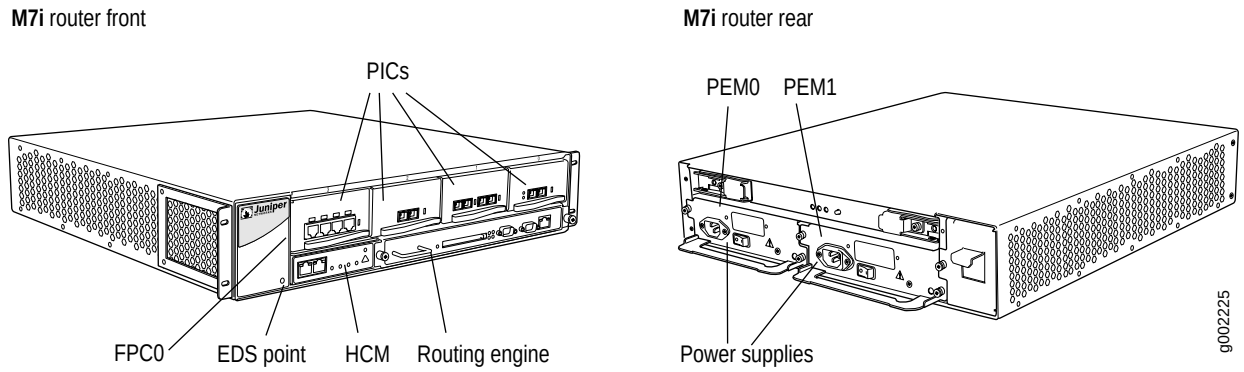
Chapter 2

# M7i Internet Router Overview

The M7i Internet router provides security and performance in small to medium Points of Presence (PoPs), as well as a carrier-class customer premise equipment (CPE) solution for managed services and campus border router applications. (See Figure 2.)

**Figure 2: M7i Router**




The M7i router includes the Compact Forwarding Engine Board (CFEB) which provides route lookup, filtering, and switching on incoming data packets, then directs outbound packets to the appropriate interface for transmission to the network. It can process 16 million packets per second (Mpps). The CFEB communicates with the Routing Engine using a dedicated 100-Mbps link that transfers routing table data from the Routing Engine to the forwarding table. The link is also used to transfer routing link-state updates and other packets destined for the router from the CFEB to the Routing Engine.

A built-in tunnel interface encapsulates arbitrary packets inside a transport protocol, providing a private, secure path through an otherwise public network. The built-in tunnel interface on the CFEB is configured the same way as a PIC. For information about configuring the built-in tunnel interface, see the *JUNOS Services Interfaces Configur ation Guide*.

The Adaptive Services PIC-Integrated (ASP-I) is an optional component on the CFEB which performs one or more services on traffic—Stateful firewall, Network Address Translation (NAT) or intrusion detection services (IDS)—before it reaches its destination.

In addition to accommodating up to four Physical Interface Cards (PICs), the M7i router includes a built-in Fixed Interface Card (FIC) that provides two Fast Ethernet ports or one Gigabit Ethernet port, depending on which FIC or which model was ordered. For more information about Fast Ethernet and Gigabit Ethernet interfaces, see the *M7i Internet R outer PIC Guide* .

The M7i router supports various PICs, including ATM, channelized, Ethernet, IP services, and SONET/SDH interfaces. For more information about supported PICs, see the *M7i Internet R outer PIC Guide* .

The M7i router provides a maximum aggregate throughput of 8.4 gigabits per second (Gbps). Control operations in the router are perform Control operations in the router are performed by the Routing Engine, which runs JUNOS software to handle routing protocols, traffic engineering, policy, policing, monitoring, and configuration management. Forwarding operations in the router are performed by the Packet Forwarding Engine.

## M7i Router Components

Table 4 lists the major M7i router components and characteristics.

**Table 4: M7i Router Major Hardware Components**

| Component | Quantity | Function | Redundant | Field-Replaceable | Offline Button |
|---|---|---|---|---|---|
| CFEB | 1 | Provides route lookup, management of shared memory, transfer of outgoing data packets, and transfer of exception and control packets; includes built-in tunnel interface and optional Adaptive Services PIC | – | Hot-pluggable (routing functions are interrupted when removed) | Yes |
| Cooling system | 1 fan tray (4 fans) | Cools router components | – | Hot-removable, hot-insertable | – |
| FIC | 1 | Receives incoming packets and transmits outgoing packets to the network, displays alarm status, and takes PICs online and offline (2 Fast Ethernet or 1 Gigabit Ethernet) | – | Built-in | PICs On/Off button |
| PIC | 1–4 | Provides interfaces to various network media and performs framing and line-speed signaling | – | Hot-removable, hot-insertable | Yes |
| Power supply | 2 AC or 2 DC | Distributes needed voltages to components | Yes | Hot-removable, hot-insertable | Yes |
| Routing Engine | 1 | Maintains the routing tables, manages the routing protocols, controls the interfaces, controls some chassis components, and provides the interface for system management and user access | – | Hot-pluggable (routing functions are interrupted when removed) | Yes |

Field-replaceable units (FRUs) are router components that can be replaced at the customer site. Replacing FRUs requires minimal router downtime. There are three types of FRUs:

Hot-removable and hot-insertable—You can remove and replace the component without powering down the router or interrupting the routing functions.

Hot-pluggable—You can remove the component without powering down the router, but routing functions are interrupted until the replacement is installed.

Requires router shutdown—You must power down the router before removing the component.

## Monitoring M7i Router Components

See the following chapters for information about monitoring the M7i router components:

"Monitoring the Router Chassis" on page 107

"Monitoring the Routing Engine" on page 125

"Monitoring PICs" on page 183

"Monitoring the FIC" on page 443

"Monitoring the CFEBs" on page 417

"Monitoring Power Supplies" on page 217

"Monitoring Redundant Power Supplies" on page 507

"Monitoring the Cooling System" on page 251