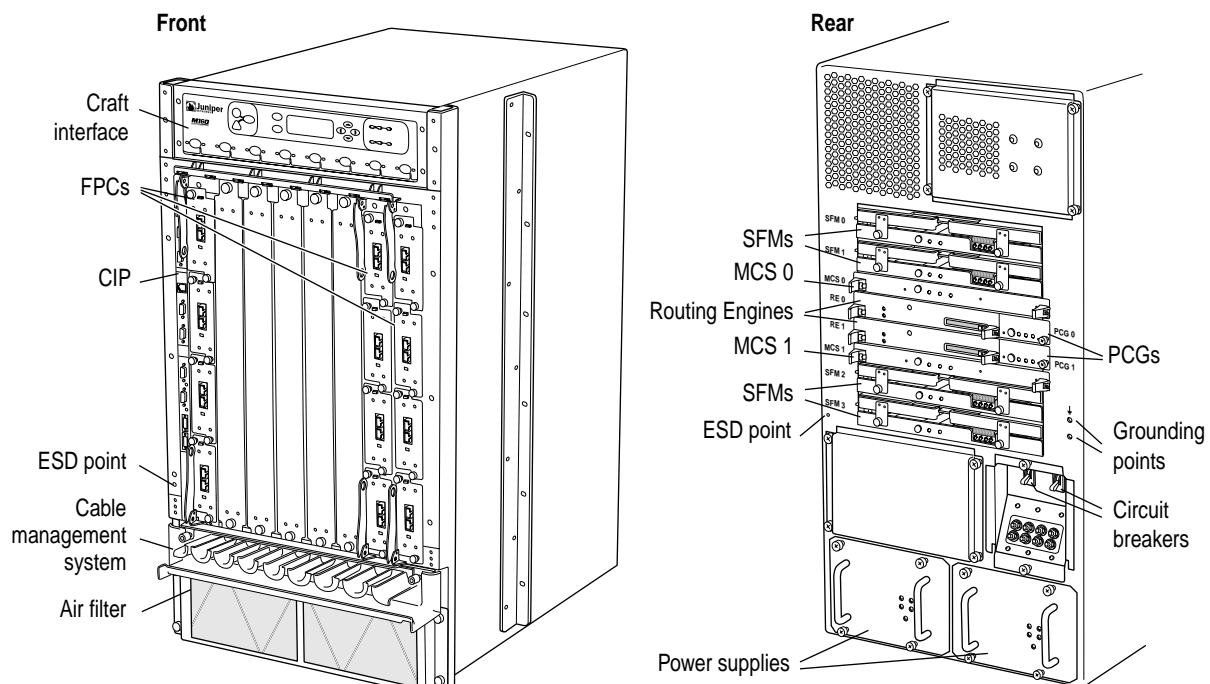


Chapter 7

M160 Internet Router Overview

The M160 Internet router provides a dense, highly redundant platform primarily for large backbone core IP networks where switching fabric and Routing Engine redundancy are required. The M160 router supports the JUNOS software which provides router configuration and monitoring. (See Figure 7.)

Figure 7: M160 Router



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The Type 1 Flexible PIC Concentrators (FPCs) for the M40e and M160 routers are interchangeable. The M160 router supports two types of FPCs: FPC1 supports Physical Interface Cards (PICs), including the single-port OC12 and Gigabit Ethernet; and FPC2 supports higher-speed PICs, including OC48 and Tunnel Services. The router can operate with any combination of FPC1s and FPC2s installed. For more information about supported PICs and FPCs for each M-series router type, see the appropriate PIC installation guide.

The M160 router accepts only DC power supplies.

The M160 router can have up to four Switching and Forwarding Modules (SFMs). The SFMs contain the Internet Processor II application-specific integrated circuit (ASIC) and two Distributed Buffer Manager ASICs, and make forwarding decisions, distribute packets throughout memory, and forward notification of outgoing packets.

The M160 router includes the host module that constructs routing tables, performs system management functions, and generates the SONET/SDH clock signal for SONET/SDH interfaces. The host module contains the Routing Engine and the Miscellaneous Control Subsystem (MCS). The Routing Engine manages routing protocols and maintains the routing tables. For a host module to function, both of these components must be installed and operational.

PICs are available in supported media types, including Asynchronous Transfer Mode (ATM), Channelized DS3, E1, E3, T1, Ethernet, SONET/SDH, and IP services. The M160 router supports both M160 and M40e PICs. For more information about supported PICs for each M-series router type, see the appropriate PIC installation guide.

The M160 router Internet Processor II ASIC forwards packets at a throughput rate of up to 160 Gbps. The ASIC technology provides such packet processing as route lookups, filtering, sampling, rate limiting, load balancing, buffer management, switching, and encapsulation and de-encapsulation of IP services.

M160 Router Major Hardware Components

Table 9 lists the major M160 router components and characteristics.

Table 9: M160 Router Major Hardware Components

Component	Quantity	Function	Redundant	Field-replaceable	Offline Button
CIP	1	Provides ports for external management, BITS interfaces, and alarm relay devices	–	Requires router shutdown	–
Cooling system	3 impellers and 1 fan tray (4 fans)	Cools router components	Yes	Hot-removable	–
Craft interface	1	Displays status and allows you to perform control functions	–	Hot-removable, hot-insertable	–
FPC	1–8	Connects PICs to other components and houses shared memory	–	Hot-removable, hot-insertable	Yes
Host module	1–2	Handles routing protocols and maintains routing tables	Yes	Hot-pluggable	–
MCS	1–2	Provides system control and monitoring	Yes	Hot-pluggable	Yes
PCG	2	Provides a 125-MHz system clock	Yes	Hot-pluggable	Yes
PICs	1–4 per FPC	Provides interfaces to various network media	–	Hot-removable, hot-insertable	Yes
Power supply (DC only)	2	Distributes needed voltages to components	Yes	Hot-removable, hot-insertable	–

Component	Quantity	Function	Redundant	Field-replaceable	Offline Button
Routing Engine	1–2	Manages routing protocols and maintains routing tables	Yes	Hot-pluggable	–
SFM	1–4	Provides packet switching, packet forwarding, and route lookup	Yes	Hot-removable, hot-insertable	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 M160 Router Components

See the following chapters for information about monitoring and troubleshooting the M160 router components:

“Monitoring the Router Chassis” on page 107

“Monitoring the Routing Engine” on page 125

“Monitoring Redundant Routing Engines” on page 491

“Monitoring FPCs” on page 163

“Monitoring PICs” on page 183

“Monitoring the Craft Interface” on page 197

“Monitoring Power Supplies” on page 217

“Monitoring Redundant Power Supplies” on page 507

“Monitoring the Cooling System” on page 251

“Monitoring Redundant Cooling System Components” on page 523

“Maintaining the Cable Management System, Cables, and Connectors” on page 275

“Monitoring the Host Module” on page 341

“Monitoring the SFMs” on page 347

“Monitoring Redundant SFMs” on page 577

“Monitoring the MCS” on page 359

“Monitoring Redundant MCSs” on page 567

“Monitoring the PCG” on page 369

“Monitoring Redundant PCGs” on page 595

“Monitoring the CIP” on page 381