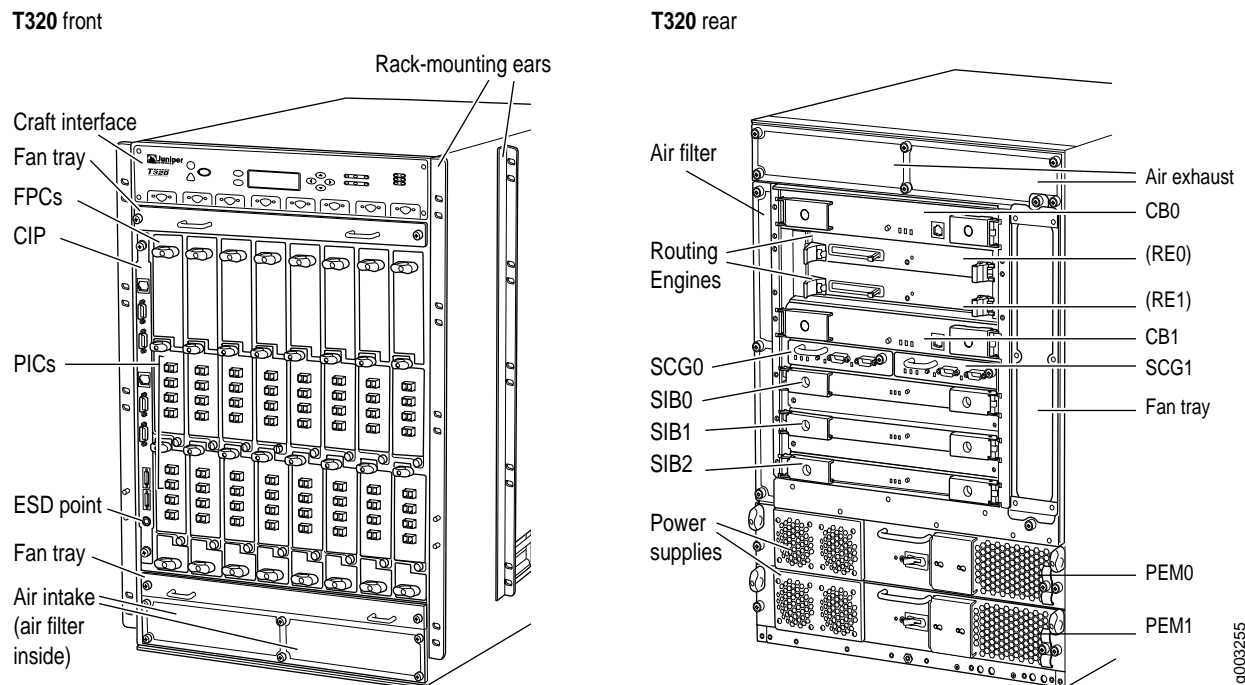


Chapter 9

T320 Internet Router Overview

The T320 router provides 320-Gbps throughput and 385-Mpps forwarding rate and supports 16 10-Gbps (OC192c/STM64 and 10-Gigabit Ethernet) ports, as well as OC48c/STM16 for medium and large core networks, as well as for intermediate core aggregation of access routers, peering, and metro Ethernet network applications, such as those supported by Internet service providers (ISPs). It provides a cost-effective migration path to an MPLS infrastructure. The T320 router supports the JUNOS software, which provides router configuration and monitoring. (See Figure 9.)

Figure 9: T320 Router



The router supports three types of FPCs:

FPC1—Supports PICs that are also used in the FPC1 of a Juniper Networks M-series router

FPC2—Supports PICs that are also used in the FPC2 of a Juniper Networks M-series router and T640 Internet routing node

FPC3—Supports higher-speed PICs that are also used in the FPC3 of a Juniper Networks T640 routing node

The router can operate with any combination of FPCs installed.

Forwarding operations in the router are performed by the Packet Forwarding Engines. Each FPC contains one Packet Forwarding Engine. The Packet Forwarding Engines receive incoming packets from the PICs installed on the FPC and forward them through the switch planes to the appropriate destination port. Each FPC contains data memory, which is managed by the Queuing and Memory Interface application-specific integrate circuits (ASICs).

PICs provide the physical connection to various network media types, receiving incoming packets from the network and transmitting outgoing packets to the network. PICs for the T320 router currently support the following network media types: ATM, ATM2, Fast Ethernet, Gigabit Ethernet, 10 Gigabit Ethernet, SONET/SDH OC3c/STM1, SONET/SDH OC12c/STM4, OC48c/STM16, OC192c/STM64, and Tunnel services. For more information on PICs used in the router, see the *T320 Internet Router PIC Guide*.

The T320 router supports two DC power supplies, which share the load evenly.

Three Switch Interface Boards (SIBs) provide the switching function to the destination FPC. The SIBs create the switch fabric for the router, providing up to a total of 320 million packets per second (Mpps) of forwarding.

Routing and system management functions of the router are performed by the host subsystem. The host subsystem consists of the Routing Engine and the Control Board.

The Routing Engine maintains the routing tables used by the router and controls the routing protocols that run on the router. Each Control Board works with an adjacent Routing Engine to provide control and monitoring functions for the router. These include determining Routing Engine mastership, controlling power, reset and SONET clocking for the other router components, monitoring and controlling fan speed, and monitoring system status using I²C controllers.

T320 Router Major Hardware Components

Table 11 lists the T320 router major components and characteristics.

Table 11: T320 Router Major Hardware Components

Component	Quantity	Function	Redundant	Field-Replaceable	Offline Button
Connector Interface Panel (CIP)	1	Provides ports for external management and alarm relay devices	—	Hot-pluggable	—
Control Board	1–2	Monitors and controls router components	Yes	Hot-pluggable	Yes
Cooling system	2 front fan trays, 1 rear fan tray	Cools router components	Yes	hot-removable, hot insertable	—

Component	Quantity	Function	Redundant	Field-Replaceable	Offline Button
Craft interface	1	Displays status and provides an interface for controlling router functions	—	Hot-removable, hot-insertable	—
FPC	1–8	Connect PICs to other router components, contains Packet Forwarding Engines	—	Hot-removable, hot-insertable	Yes
PIC	1–2 per FPC	Provides an interface to various network media	—	Hot-removable, hot-insertable	Yes
Power supply (DC only)	2	Distributes needed voltages to router components	Yes	Hot-removable, hot-insertable	—
Routing Engine	1–2	Provides routing functions and routing tables	Yes	Hot-removable, hot-insertable	Yes
SONET Clock Generator (SCG)	1–2	Provides Stratum 3 SONET/SDH clocking	Yes	Hot-pluggable	Yes
SIB	3	Provides switch fabric	2 active, 1 standby	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 T320 Router Components

See the following chapters for information about monitoring and troubleshooting the T320 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 Subsystem” on page 289

“Host Redundancy Overview” on page 463

“Monitoring the Control Board” on page 301

“Monitoring Redundant Control Boards” on page 559

“Monitoring the SCGs” on page 315

“Monitoring Redundant SCGs” on page 551

“Monitoring the SIBs” on page 325

“Monitoring Redundant SIBs” on page 543

“Monitoring the CIP” on page 381