Chapter 5
Hardware Overview

This chapter provides a hardware overview of the HP 9304M and HP 9308M routing switches.

HP routing switches are based on a hardware-based multilayer architecture. HP chassis routing switches support hardware-based Layer 2/3/4 switching and multi-protocol routing on a single, chassis-based platform.

For a detailed summary and description of all the software features of the routing switches, please refer to **Chapter 4**.

HP 9304M and HP 9308M Routing Switches

HP routing switches provide second generation, hardware-based Layer 2/3/4 switching and multi-protocol routing on a single, chassis-based platform.

Enterprises and Internet service providers (ISPs) can use the HP routing switches to build very high-performance, end-to-end packet networks that provide the class of service (CoS) needed to support delay-sensitive traffic. Designed for use in collapsed backbone data centers, server farms and wiring closets, HP routing switches deliver high-density Gigabit Ethernet and 10/100 Mbps ports and provides performance of up to 100,000,000 packets per second.

The HP routing switch family includes the 9304M (a four-slot chassis) and the 9308M (an eight-slot chassis) as seen in **Figures 5.1** and **5.9**, respectively.

Modules

Each slot of the HP 9304M or 9308M can be populated by either a managed or non-managed module.

Each system requires one **management module**. Management modules are offered with 10/100 Mbps or 1000 Mbps ports and provide a serial port for console access. Management modules also provide additional port density to the system. The management module can be installed within any slot.

The HP 9304M and 9308M can be populated with any of the following modules:

- J4141A HP ProCurve 9300 10/100 with management (16 port) (**Figure 5.2**)
- J4144A HP ProCurve 9300 Gigabit SX management module (8 port) (**Figure 5.3**)
- J4146A HP ProCurve 9300 Gigabit 4LX/4SX management module (8 port) (**Figure 5.4**)
- J4140A HP ProCurve 9300 10/100 module (24 port) (**Figure 5.5**)
- J4142A HP ProCurve 9300 100Base FX module (24 port MT-RJ) (**Figure 5.6**)
- J4143A HP ProCurve 9300 Gigabit SX module (8 port) (**Figure 5.7**)
- J4145A HP ProCurve 9300 Gigabit 4LX/4SX module (8 port) (**Figure 5.8**)

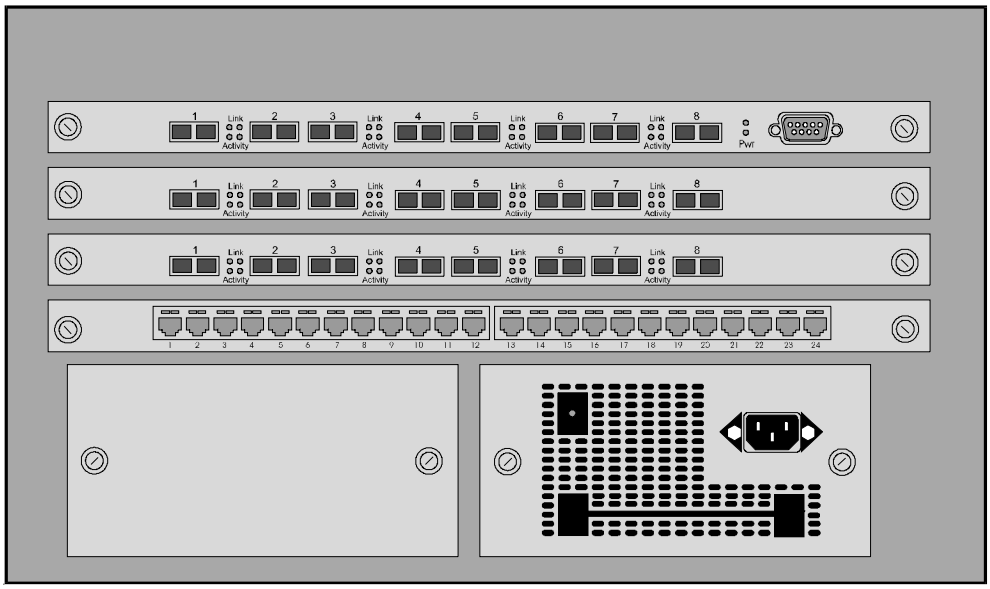

Figure 5.1 Example of a HP 9304M Routing Switch (4 slot)

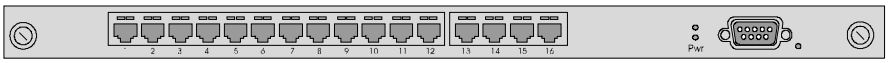

Figure 5.2 J4141A HP ProCurve 9300 10/100 management module (16 port)

Figure 5.3 J4144A HP ProCurve 1000BaseSX management module (8 port)

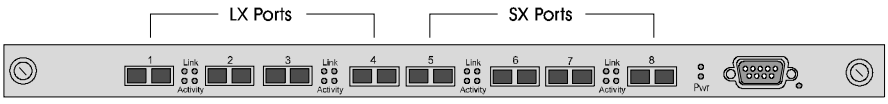

Figure 5.4 J4146A HP ProCurve 1000Base 4LX/4SX management module (8 port)

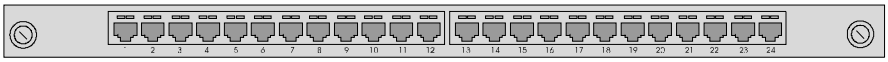

Figure 5.5 J4140A HP ProCurve 9300 10/100 module (24 port)

Figure 5.6 J4142A HP ProCurve 9300 100Base FX module (24 port MT-RJ)

Figure 5.7 J4143A HP ProCurve 9300 Gigabit SX module (8 port)

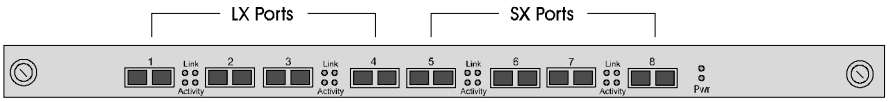

Figure 5.8 J4145A HP ProCurve 9300 Gigabit 4LX/4SX module (8 port)

NOTE: All 10/100 ports are auto-sensing and auto-negotiating for easy deployment into existing network topologies. Gigabit Ethernet interfaces are available in both multi-mode 1000BaseSX and single-mode/multi-mode 1000BaseLX.

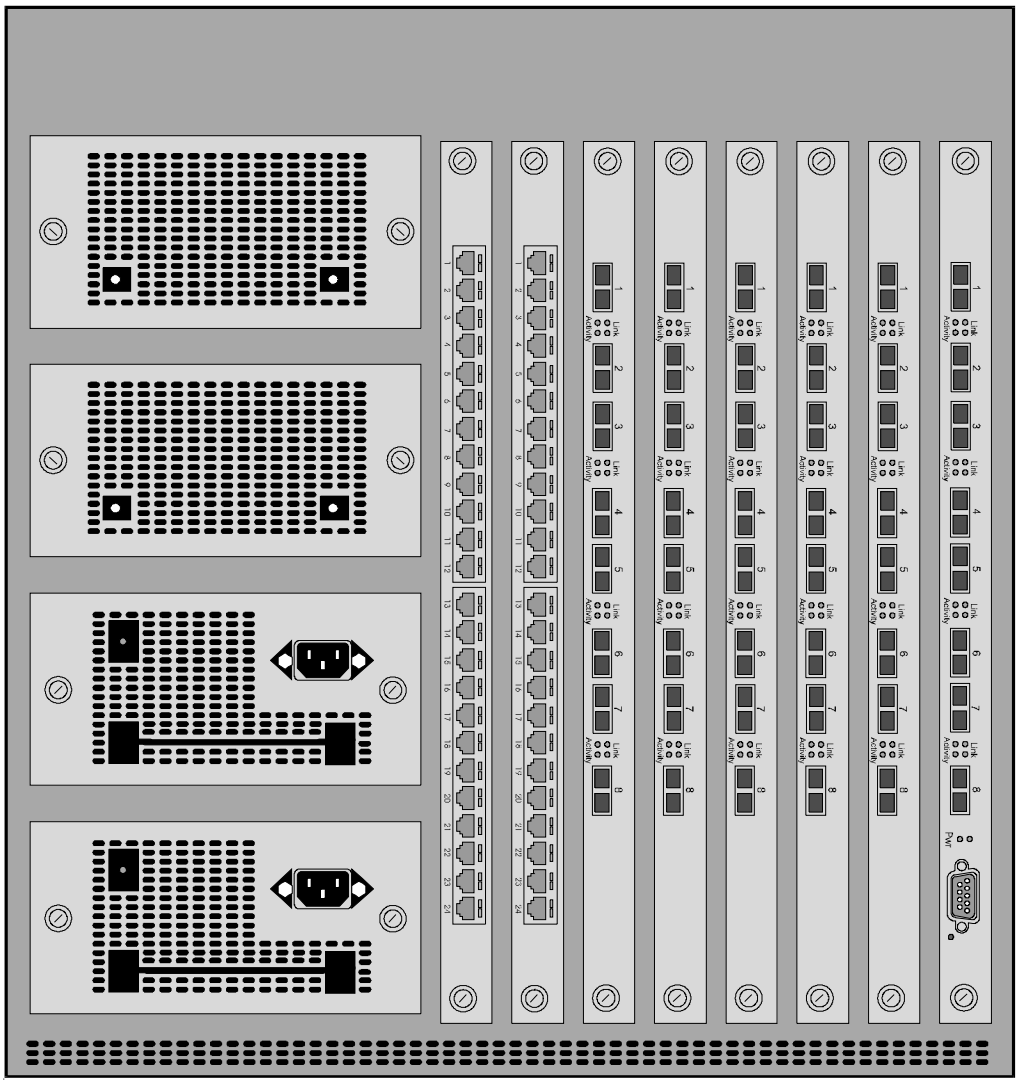

Figure 5.9 Example of a HP 9308M Routing Switch (8 slot)

System Architecture

Built on a fully non-blocking architecture, the routing switches provide switching capacity in the core and on each interface module of up to 128 Gbps for the HP 9304M and 256 Gbps for the HP 9308M.

The chassis core consists of a backplane and crosspoint switching fabric that supports four interfaces modules on the HP 9304M and 8 interface modules on the HP 9308M.

Each interface module utilizes a high bandwidth, shared memory switching fabric that switches up to 32 Gbps of bandwidth. This local switching fabric houses the forwarding engines and includes ASICs that provide packet switching functions such as priority handling. Each interface module also contains ASICs that perform high speed Layer 2 and Layer 3 lookups and forwarding, including IP sub-net look ups and packet modifications of IP and IPX packets.

Physical View

This section provides a snapshot of the front panels of the HP 9304M and HP 9308M routing switches.

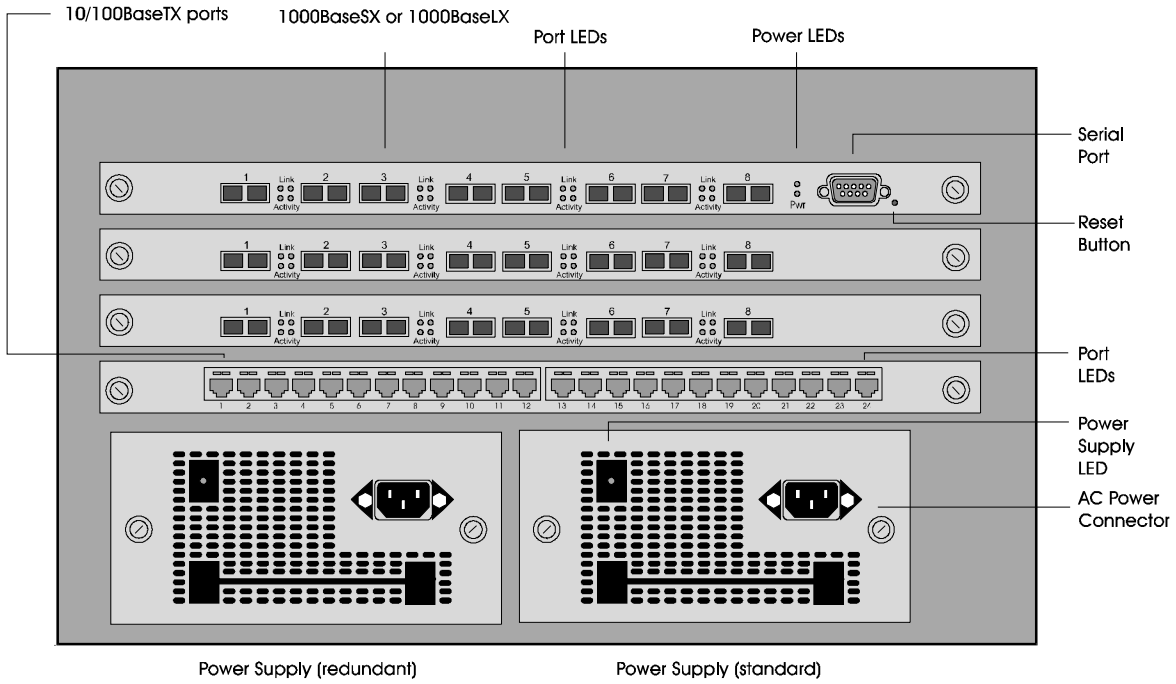

Figure 5.10 Example front panel of an HP 9304M routing switch

NOTE: The rear panel of the HP routing switch provides no network or power connections and therefore is not shown.

AC Power Connector

The power supply is found at the front of the unit, and the power supply connector is embedded within the power supply.

Buffering

HP routing switches provide 2 Megabytes (MB) of buffering memory for their ports.

Fans

The HP 9304M comes standard with four fans. The HP 9308M comes standard with six fans.

LEDs

HP routing switches are equipped with LEDs that denote port and power supply status. The tables below reflect the different port and expansion module port states.

Table 5.1 Port LED indicators for 1000BaseLX/SX ports

LED	Position	State	Meaning
Link	Top	On	Port is connected.
		Off	No port connection exists.
Activity	Bottom	On	Traffic is being transmitted and received on that port.
		Off	No traffic is being transmitted.
		Blinking or solid	Traffic is being transmitted and received on that port.

Table 5.2 Port LED indicators for 10/100BaseTX ports

LED	Position	LED State	Meaning
Link/Activity	Left	On	Port is connected.
		Off	No port connection exists.
		Blinking or solid	Traffic is being transmitted and received on that port.
FDX	Right	On	The port is operating at full-duplex.
		Off	The port is operating at half-duplex.

Table 5.3 Port LED indicators for 100BaseFX MT-RJ ports

State	Meaning
On	Port is connected but no transmit or receive activity is occurring on the link .
Off	No port connection exists or the link is bad.
Blinking	The link is good and traffic is being transmitted and received on that port.

Ports

The following port types are supported on the HP 9304M and 9308M.

10/100BaseTX Ports

The 10/100BaseTX ports are auto-sensing, auto-negotiating ports with RJ-45 UTP connectors. These ports accept Category 5 Unshielded Twisted Pair (UTP) cables. Please refer to **Chapter 2** for cabling pinouts and signalling specifics.

100BaseFX Ports

The 100BaseFX ports are equipped with MT-RJ connectors and operate at 100 Mbps in half-duplex mode and 200 Mbps in full-duplex mode.

1000BaseSX Ports

The 1000BaseSX ports operate in full-duplex mode and are equipped with SC connectors. Multi-mode fiber cabling is supported.

1000BaseLX

The 1000BaseLX ports operate in full-duplex mode and are equipped with SC connectors. Both single-mode fiber (SMF) and multi-mode fiber (MMF) cabling is supported. The 1000BaseLX ports must be connected to another 1000BaseLX port. Connection to a 1000BaseSX port is not supported.

NOTE: 1000BaseSX and 1000BaseLX ports support auto-negotiation when the **auto-gig** option is enabled on the system.

NOTE: 1000BaseSX and 1000BaseLX ports operate at full-duplex only**.**

Port Connectors

- 1000BaseSX and 1000BaseLX ports come with dual SC connectors.
- 100BaseFX ports come with MT-RJ connectors.
- 10/100BaseTX ports come with RJ-45 connectors.

Processors

The HP 9304M and 9308M come standard with a 240 MHz processor.

Power Supply

HP routing switches are equipped with an autoranging 100-120 VAC/200-240 VAC power supply rated at 8A where ACM = 100 and 4A where ACM = 200 and 50/60 Hz.

Standard and Redundant Power Options

Redundant power is an option for the HP routing switches. Each power supply can be connected to a separate AC power source for additional power redundancy.

The HP 9304M comes standard with one power supply. An additional power supply can be ordered for redundancy.

The HP 9308M comes standard with two power supplies. Up to four power supplies can be supported. If fewer than four power supplies are installed, those slots should be covered by safety covers.

Additional power supplies can be ordered for redundancy.

Reset Button

The reset button allows the user to restart the system. This button is recessed to prevent it from being pushed accidentally.

The reset button is located to the right of the serial port on the management module, as labeled in **Figure 5.10**.

Standards Compliance

Listed below is a summary of standards that are supported on the HP 9304M and 9308M routing switches.

- IEEE 802.3, 10BaseT
- IEEE 802.3u, 100BaseT
- 802.3z 1000BaseT
- 802.3x Flow Control
- 802.1P/Q VLAN Tagging
- 802.1d Bridging
- 802.3 Ether-like MIB
- Repeater MIB
- Ethernet Interface MIB
- SNMPV1
- SNMP MIB II

RFC and Protocols

- IP
- OSPF
- IPX/RIP/SAP
- AppleTalk Phase II
- DVMRP V3
- Standby Router Protocol (SRP)
- DNS client
- PIM Dense Mode
- RFC 783 TFTP
- RFC 854 Telnet
- RFC 951 BootP
- RFC 1058 RIP
- RFC 1112 IGMP
- RFC 1155 Structure and Identification of Management Information (SMI)
- RFC 1157 SNMP version 1
- RFC 1212 Concise MIB Definitions
- RFC 1213 MIBII Definitions
- RFC 1215 SNMP generic traps
- RFC 1256 Router Discovery Protocol
- RFC 1398 Ether-like MIB
- RFC 1493 Bridge MIB (excluding filtering of objects) and private MIB extensions for multiple bridge groups
- RFC 1542 BootP
- RFC 1643 Ethernet Like MIB (incorporates RFC 1398)

- RFC 1723 RIP V2
- RFC 1757 RMON groups 1, 2, 3, 9 (statistics, history, alarms and events)
- RFC 1812 Requirements for IP version 4 routers
- RFC 2003 IP Tunneling
- RFC 2068 HTTP

Drafts

- IETF-IDMR-DVMRP version 3.05, obsoletes RFC 1075
- IETF-IDMR-PIM-DM 05 (version 1 format)

Physical Specifications

Electrical Specifications

Table 5.4 Electrical specifications

Platform	Input Voltage Range	Current Rating	Line Frequency
HP 9304M, HP 9308M	100-120 VAC/200-240 VAC auto-ranging	8A ACM = 100V 4A ACM = 200V	50/60 Hz

Physical Dimensions

Table 5.5 Physical dimensions

Platform	Depth	Width	Height	Weight
HP 9308M	15"	17.5"	21"	69.1 lbs.(31.3 kg) fully populated
HP 9304M	15"	17.5"	9"	47.7 lbs. (21.6 kg) fully populated

Operating Environment

Operating Temperature: 41° to 104° F, 5° to 40° C

Relative Humidity: 5% to 80%, non-condensing

Operating Altitude: 0 to 10,000 feet

EMC Compliance

FCC Class A, Part 15, Subpart B

EN 55022A Class A

VCCI Class A

EN50082-1

Safety

UL 1950 3rd Edition

CSA-C22.2 No. 950

TUV EN 60950 IEC 950