

# Cisco 4000 Series Overview

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The Cisco 4000 series comprises the Cisco 4000-M, the Cisco 4500-M, and the Cisco 4700. All models provide a configurable modular router platform using network processor modules—individual modules that when installed in the router are ready for external network hardware connections. Performance is the key distinction between the Cisco 4000-M, Cisco 4500-M and Cisco 4700.

For maximum performance in the Cisco 4000 series, the Cisco 4700 contains a 133-MHz Orion RISC microprocessor from Integrated Device Technology, Incorporated (IDT), along with a 512 kilobyte (KB) secondary cache; the Cisco 4500-M contains a 100-MHz Orion RISC microprocessor from IDT; and the Cisco 4000-M contains a 40-MHz Motorola 68EC030 microprocessor. The Cisco 4000 series provides flexibility, allowing network managers to easily reconfigure the router when needs change.

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**Note** This publication contains the initial hardware installation and selected maintenance procedures. For initial software configuration and operating information, refer to the appropriate printed software publication or UniverCD.

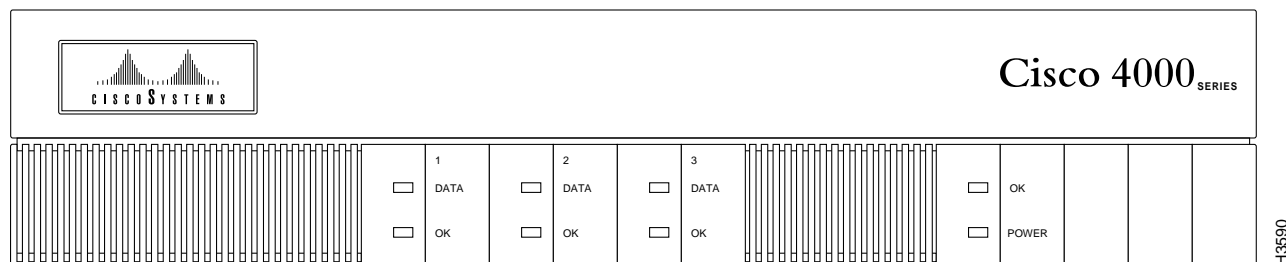
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## External Differences in Models of the Cisco 4000 Series

The Cisco 4000-M, Cisco 4500-M, and Cisco 4700 are all labeled *Cisco 4000 Series* on the front panel. The rear label of the Cisco 4000-M reads *Cisco 4000 M+*, the rear label of the Cisco 4500-M reads *Model 4500 M+*, and the rear label of the Cisco 4700 reads *Model 4700*. Newer models have no safety latch on the chassis rear.

Figure 1-1 shows the front panel of a Cisco 4000 series router.

**Figure 1-1 Cisco 4000 Series Chassis—Front Panel**



## Series Specifications

Design specifications for the Cisco 4000 series follow:

- Modular router platform
- Flash memory capability
- User-upgradable network processor modules, shared memory, and processor local memory
- Hardware thermal alarm to warn of excessively high operating temperature
- Rack-mountable in either a standard 19-inch rack or telco rack
- Wall, desktop, or desk-side mountable
- Support for up to three network processor modules at a time, including Ethernet, Token Ring, serial, single-mode and multimode Fiber Distributed Data Interface (FDDI), ISDN BRI, G.703, channelized T1/PRI, channelized T1/PRI, and ATM modules. Network processor modules can be placed in any of the three available positions in any desired combination.

The BRI 4-port and 8-port network interface modules (NP-4B/NP-8B) are not compatible with the Channelized T1/ISDN PRI network interface module (NP-CT1) or with the Channelized E1/ISDN PRI network interface module ((NP-CE1).

The Cisco 4000-M can support only one FDDI network processor module in combination with any two other types of network processor modules. The Cisco 4500-M and Cisco 4700 can support two FDDI network processor modules. For optimum heat dissipation, use the center slot position for the FDDI module if one is present.

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**Note** The Cisco 4500-M and Cisco 4700 support all network processor modules except the single-port Ethernet network processor module and early versions of the single and dual Token Ring, dual Ethernet, and FDDI modules.

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Table 1-1 lists the physical specifications for the Cisco 4000 series routers.

**Table 1-1 Cisco 4000 Series Physical Specifications**

Description	Design Specification
Dimensions (W x D x H)	17.6" x 17.7" x 3.4" (44.7 cm x 45 cm x 8.6 cm)
Weight	24 lb (10.9 kg) (including the chassis and network processor modules)
Power	200W, 85 to 264 VAC, 50 to 60 Hz, or 40 to 72 VDC
Wire Gauge for DC-Input Power Connections	16 AWG <sup>1</sup>
Network Interface Options	Ethernet, Serial, Token Ring, FDDI, BRI, G.703, Channelized T1/PRI, Channelized T1/PRI, ATM
Serial Interfaces	EIA/TIA-232 <sup>2</sup> , EIA/TIA-449 <sup>1</sup> , V.35, X.21, NRZ/NRZI, DTE/DCE; EIA-530 DTE
Console Port	EIA/TIA-232 DB-25 female connector
Auxiliary Port	EIA/TIA-232 DB-25 male connector
Nonoperating Temperature	-40 to 185°F (-40 to 85°C)
Operating Humidity	5 to 95%, noncondensing
Operating Temperature	32 to 104°F (0 to 40°C)

1. AWG—American Wire Gauge

2. EIA/TIA-232 and EIA/TIA-449 were known as recommended standards RS-232 and RS-449 before their acceptance as standards by the Electronic Industries Association (EIA) and Telecommunications Industry Association (TIA).

Table 1-2 lists the processor and memory specifications for the Cisco 4000 series routers.

**Table 1-2 Cisco 4000 Series Processor and Memory Specifications**

Description	Cisco 4000-M	Cisco 4500-M	Cisco 4700
Processor	40-MHz Motorola 68EC030	100-MHz IDT Orion RISC <sup>1</sup>	133-MHz IDT Orion RISC
Main Memory (DRAM) <sup>2</sup>	4, 8, 16, 32 MB	8, 16, or 32 MB	16 or 32 MB
Secondary Cache Memory	None	None	512 KB
Shared Memory (DRAM)	4 MB	4, 8, or 16 MB	4, 8, or 16 MB
Flash Memory	4 or 8 MB	4, 8, 16, 32, or 64 MB	4, 8, 16, 32, or 64 MB
Nonvolatile RAM <sup>3</sup>	128 KB	128 or 512 KB	128 or 512 KB
Boot ROM <sup>4</sup>	128 KB to 1 MB	128 to 512 KB	128 to 512 KB
Boot Flash	Not available	4 to 16 MB	4 to 16 MB

1. The Orion microprocessor is based on the MIPS R4400 and is pin-compatible.

2. DRAM—Dynamic random access memory.

3. RAM—Random access memory.

4. ROM—Read-only memory.

# Memory Systems

The Cisco 4000 series memory systems (see Figure 1-2) have the following functions:

- Main memory—Stores the running configuration and routing tables. The Cisco Internetwork Operating System (Cisco IOS) software executes from main memory.
- Shared memory—Used for packet buffering by the router’s network interfaces.
- Nonvolatile memory—Stores the system configuration file and the virtual configuration register.
- Flash memory—Stores the operating system software image. In the Cisco 4500-M, the Flash memory also stores the boot helper software.
- EPROM-based memory—In the Cisco 4000-M, EPROM-based memory stores the *boot helper*—a subset of the Cisco IOS software—and the *ROM monitor*. In the Cisco 4500-M and Cisco 4700, only the ROM monitor is EPROM-based. The boot helper image allows you to boot the router when Flash memory does not contain a valid system image. In the Cisco 4500-M, the ROM monitor allows you to boot a system image from Flash memory if a boot helper image is not present in boot Flash memory.

The boot helper prompt is as follows:

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router(boot)>
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The ROM monitor prompt for the Cisco 4000-M is the greater than sign:

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>
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The Cisco 4500-M and Cisco 4700 ROM monitor prompt is as follows:

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rommon 1 >
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(See the appendix “Cisco 4000 Series Virtual Configuration Register,” the appendix “Cisco 4000-M ROM Monitor,” and the appendix “Cisco 4500-M and Cisco 4700 ROM Monitor.”)

Figure 1-2 Cisco 4000 Series Memory Systems and Software Images

