
Cisco 2500 Series

Product Overview

The Cisco 2500 series routers provide a variety of models designed for branch office and remote site environments. These routers are typically fixed configuration with at least two of the following interfaces:

- Ethernet (AUI)
- 10BaseT Ethernet hub
- Token Ring
- Synchronous serial
- Asynchronous serial
- ISDN BRI

Key Features and Benefits

Cisco 2500 routers come with Flash EPROM technology for simplified software maintenance. These systems support a variety of Cisco IOS software feature sets, so you can choose a feature set that supports your specific protocol environment. The software feature sets range from an IP and bridging-only to the full array of Cisco's software functionality, including APPN and RMON.

Mission-specific models contain less memory and less hardware functionality to support a subset of protocols. Each mission-specific model can be upgraded to full router capability by downloading a new Cisco IOS software feature set and, if necessary, adding memory.

Cisco 2500 series models can be divided into the following categories:

- Single LAN routers—Models 2501, 2502, 2503, 2504, 2520, 2521, 2522 and 2523
- Mission-specific, entry-level routers—Models 2501CF, 2501LF, 2502CF, 2502LF, 2503I, 2504I, 2520CF, 2520LF, 2521CF, 2521LF, 2522CF, 2522LF, 2523CF and 2523LF
- Router/hub combinations—Models 2505, 2507 and 2516
- Access servers—Models 2509 to 2512 (refer to the “Cisco 2500 Series Access Servers” section in the “Access Servers” chapter later in the catalog)
- Dual LAN routers—Models 2513, 2514 and 2515
- Modular routers—Models 2524 and 2525 (optional integrated DSU/CSU or NT-1)

Specifications

Hardware

All the Cisco 2500 series models support the features listed in the following table.

Table 5-53: Cisco 2500 Series Specifications

Characteristic	Description
Flash memory	Minimum of 8 MB of Flash memory, except for the mission-specific routers which require only 4 MB of Flash memory. However, depending on the Cisco IOS release that shipped with the system, it might require more memory. Refer to the “Cisco IOS Software” chapter for the minimum Flash memory required for each feature set.
DRAM memory expandability	Minimum DRAM required by the Cisco IOS release that shipped with the system. Refer to the “Cisco IOS Software” chapter for the minimum DRAM required for each feature set.
Processor type	20-MHz 68030
Software options—Cisco IOS Release 11.2	IP Routing IP Routing Plus IP/IPX with IBM base functionality and APPN Desktop (IP/IPX/AppleTalk/DEC) Desktop (IP/IPX/AppleTalk/DEC) Plus Enterprise Enterprise Plus Enterprise/APPN/Plus Mission-specific Cisco 2500 series: application-specific software
Software options—Cisco IOS Release 11.1 and 11.0	IP Routing IP Routing with IBM base functionality IP/IPX Routing IP/IPX Routing with IBM base functionality IP/IPX with IBM base functionality and APPN Desktop Desktop with IBM base functionality Enterprise Enterprise/APPN RMON Mission-specific Cisco 2500 series: application-specific software
Dimensions (H x W x D)	Models 2501 to 2516 and 2520 to 2525: 1.75 x 17.5 x 10.56 in. (4.44 x 44.45 x 26.82 cm)
Weight (average shipping)	Models 2501 to 2516 and 2520 to 2525: 10 lb. (4.5 kg)
Standard components	Power supply and cord Console cable kit RJ-45-to-DB-9 adapter 19 in. rack-mount/wall-mount kit

1. If your system requires more than 8 MB of Flash memory, the additional memory must be ordered separately.
2. This feature set is available with Cisco IOS Release 11.0 and later releases.
3. The console cable kit includes an RJ-45-to-RJ-45 roll-over console cable, an RJ-45-to-DB-25 male DCE adapter, an RJ-45-to-DB-25 female DTE adapter, and an RJ-45-to-DB-9 female DTE adapter

Software

Table 5-54: Cisco 2500 Series Environmental Specifications

Description	Specification
Consumption	For models 2501 to 2525: 40W
Input	For models 2501 to 2516 and 2520 to 2525: 110 to 220 VAC, 50 to 60 Hz –48 VDC
Current rating	For models 2501 to 2516 and 2520 to 2525: 1.0A at 60 Hz, 0.5A at 50 Hz
Operating temperature range	For models 2501 to 2516 and 2520 to 2525: 32 to 104F (0 to 40C)
Nonoperating temperature range	For models 2501 to 2516 and 2520 to 2525: –40 to 185F (–40 to 85C)

Description	Specification
Humidity (noncondensing)	For models 2501 to 2525: 5 to 95%

Options

The Cisco 2500 series routers are discussed in the following sections:

- Memory Options
- Single LAN Routers
- Mission-Specific Routers
- Router/Hub Combinations
- Access Servers
- Dual LAN Routers
- Modular Routers
- Hardware Product Numbers

Memory Options

All Cisco 2500 models include a minimum of 8 MB of Flash memory, except for the mission-specific routers which include 4 MB or 8 MB of Flash memory, depending upon the Cisco IOS software release you order. Additional Flash memory can be purchased to allow for dual banking or potential future code growth.

There are two types of DRAM memory in the Cisco 2500 series routers: primary and shared (packet). Primary memory is used to store the operating configuration, routing tables, caches, and queues. Shared memory is used to store incoming and outgoing packets. In the table below, the physical configuration column lists the amount of DRAM SIMM memory supported. The system usage column lists how the system allocates the total DRAM memory installed.

Table 5-55: Shared and Primary DRAM Memory—Cisco 2500 Series

Total DRAM Memory	Physical Configuration	System Usage	
	DRAM SIMM	Shared DRAM Memory	Primary DRAM Memory
4 MB	4 MB	2 MB	2 MB
8 MB	8 MB	2 MB	6 MB
16 MB	16 MB	2 MB	14 MB

Hardware Product Numbers

The Cisco 2500 series offers the hardware, memory, and NPM cable options listed in the following table. If a product number ends with an equal sign (=), the item can be ordered only as a spare. If a product number does not end with an equal sign, the item can be ordered as a spare or as a configurable part of a system order. Other hardware options can also be ordered through the Cisco authorized reseller channel.

Note For options that apply to most systems, refer to the “Cables and Transceivers” or “Power Supplies and Power Cords” chapters later in the catalog.

Single LAN Routers

Models 2501, 2502, 2503, 2504, 2520, 2521, 2522, and 2523 (see through) contain the common Cisco 2500 series features listed in the following table. In addition, these models support the network interfaces listed in Table 11-90.

Note This section discusses standard models. The mission-specific models are described in the “Mission-Specific Routers” section later in this chapter.

Table 5-56: Single LAN Router Network Interfaces

Model	Ethernet	Token Ring	Low-Speed Serial ¹	Serial ²	ISDN BRI
2501	1	0	0	2	0
2502	0	1	0	2	0
2503	1	0	0	2	1
2504	0	1	0	2	1
2520	1	0	2	2	1
2521	0	1	2	2	1
2522	1	0	8	2	1
2523	0	1	8	2	1

1. Synchronous and asynchronous.
2. Synchronous.

Figure 5-13: Cisco 2501 Rear View

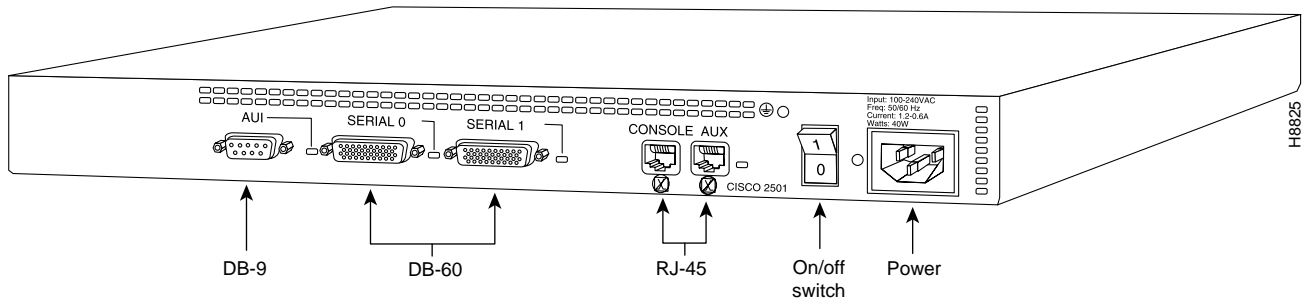


Figure 5-14: Cisco 2502 Rear View

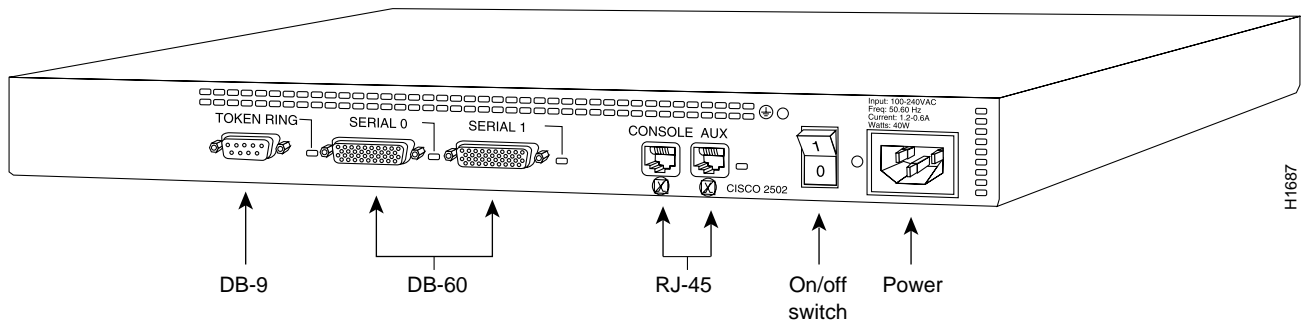


Figure 5-15: Cisco 2503 Rear View

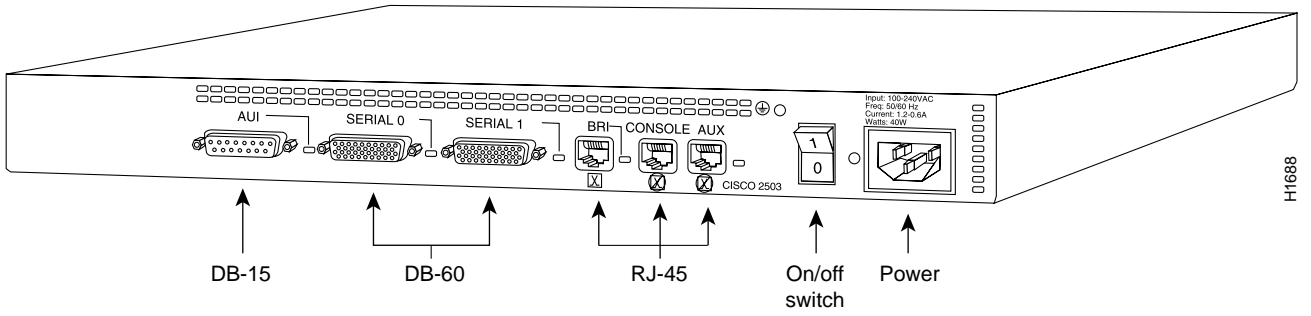


Figure 5-16: Cisco 2504 Rear View

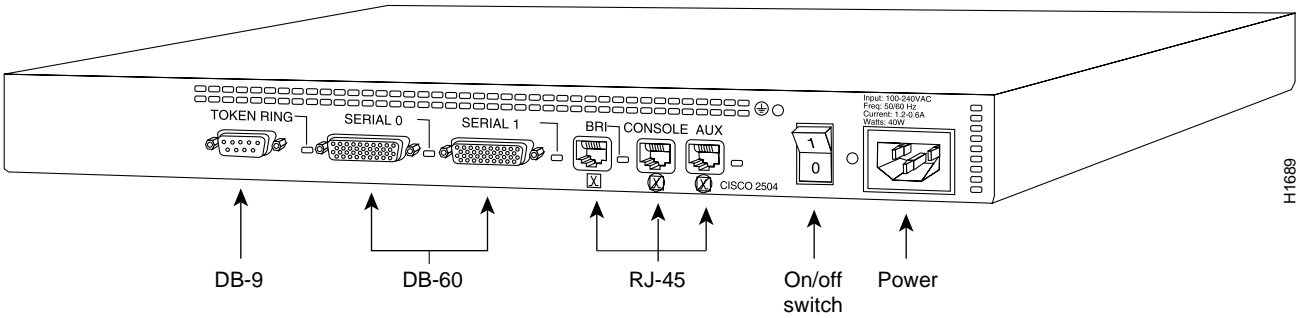


Figure 5-17: Cisco 2520 Rear View

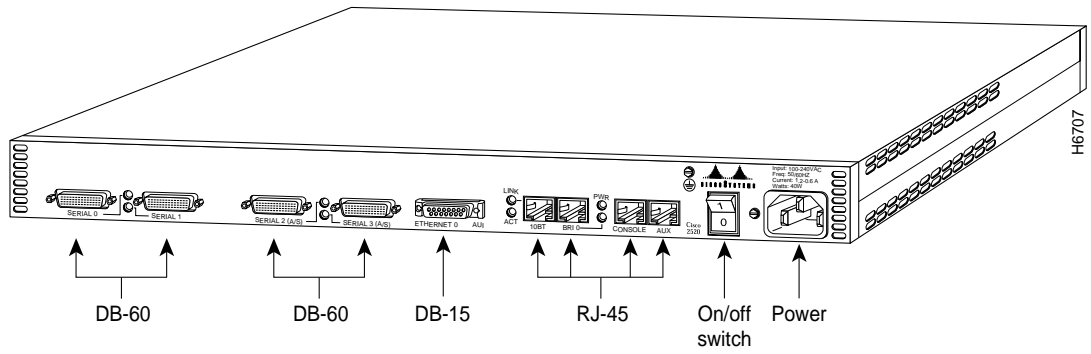


Figure 5-18: Cisco 2521 Rear View

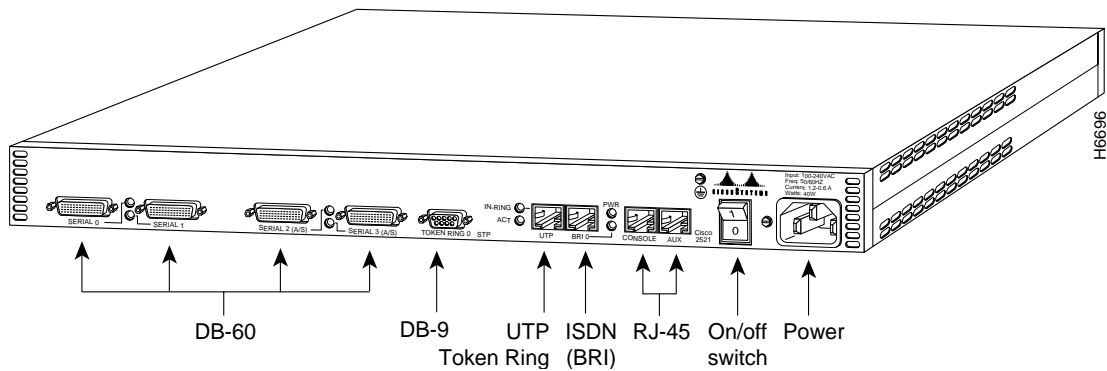


Figure 5-19: Cisco 2522 Rear View

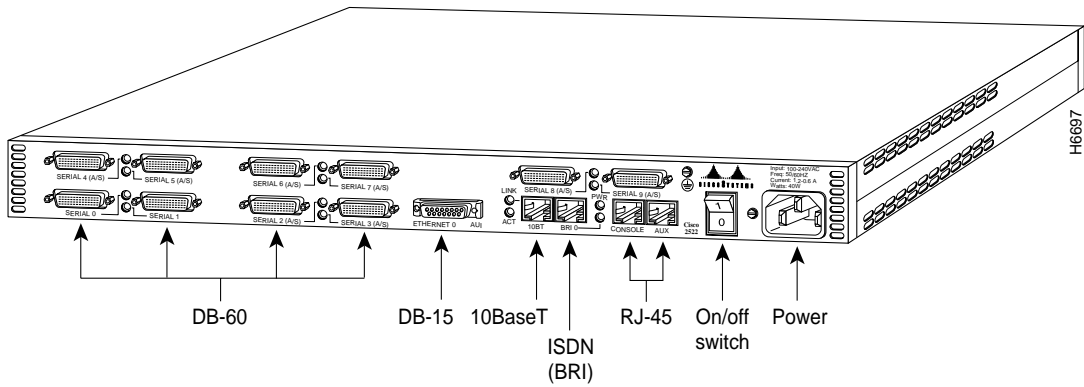
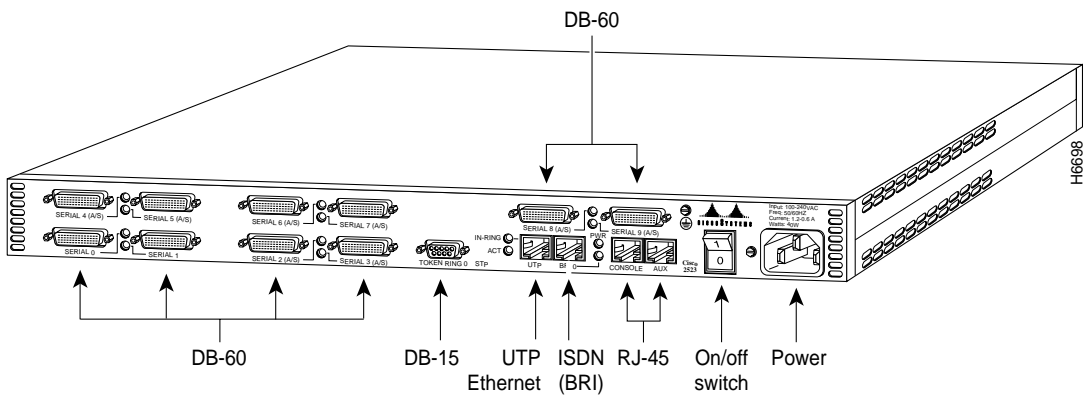


Figure 5-20: Cisco 2523 Rear View



Mission-Specific Routers

Mission-specific routers are entry-level routers that are based on standard Cisco 2500 hardware. However, mission-specific routers contain less memory than standard models and run reduced software images designed for CFRAD, LAN FRAD, and ISDN applications. These reduced software images disable unused ports. Mission-specific routers can be upgraded to full standard-model functionality by purchasing additional software and memory.

Table 5-57: Mission-Specific Router Network Interfaces

Model	Ethernet	Token Ring	Serial	Low-Speed Serial	ISDN BRI
2501CF	Software disabled	0	2	0	0
2501LF	1	0	2	0	0
2502CF	0	Software disabled	2	0	0
2502LF	0	1	2	0	0
2503I	1	0	Software disabled	0	1
2504I	0	1	Software disabled	0	1
2520CF	Software disabled	0	2	2	Software disabled
2520LF	1	0	2	2	Software disabled
2521CF	0	Software disabled	2	2	Software disabled
2521LF	0	1	2	2	Software disabled
2522CF	Software disabled	0	2	8	Software disabled
2522LF	1	0	2	8	Software disabled

Model	Ethernet	Token Ring	Serial	Low-Speed Serial	ISDN BRI
2523CF	0	Software disabled	2	8	Software disabled
2523LF	0	1	2	8	Software disabled

Router/Hub Combinations

Models 2505, 2507, and 2516 support integrated hub functionality as well as all the common features listed in Table 11-89. In addition, these models support the interfaces listed in the following table.

Table 5-58: 10BaseT Hub Ports

Model	Serial	Hub Ports	ISDN BRI
2505	2	8	0
2507	2	16	0
2516	2	14	1

Figure 5-21: Cisco 2505 Rear View

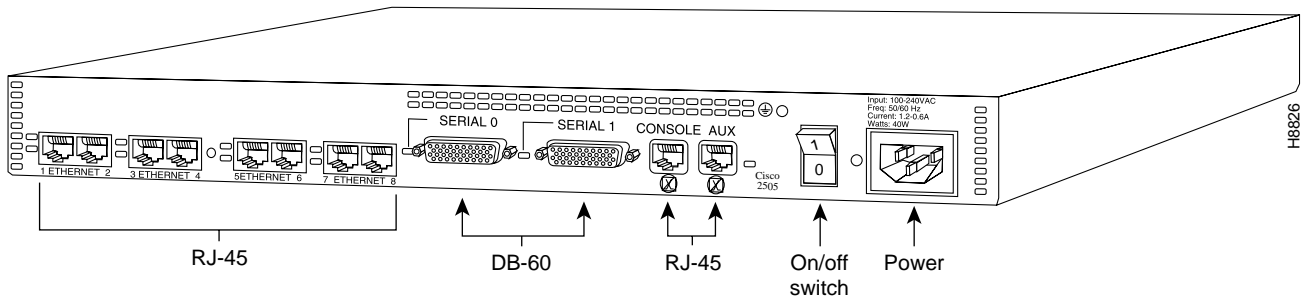


Figure 5-22: Cisco 2507 Rear View

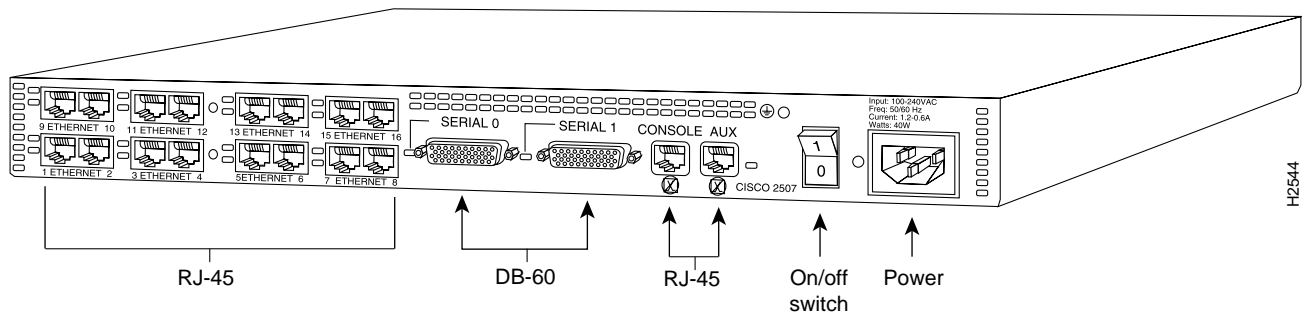
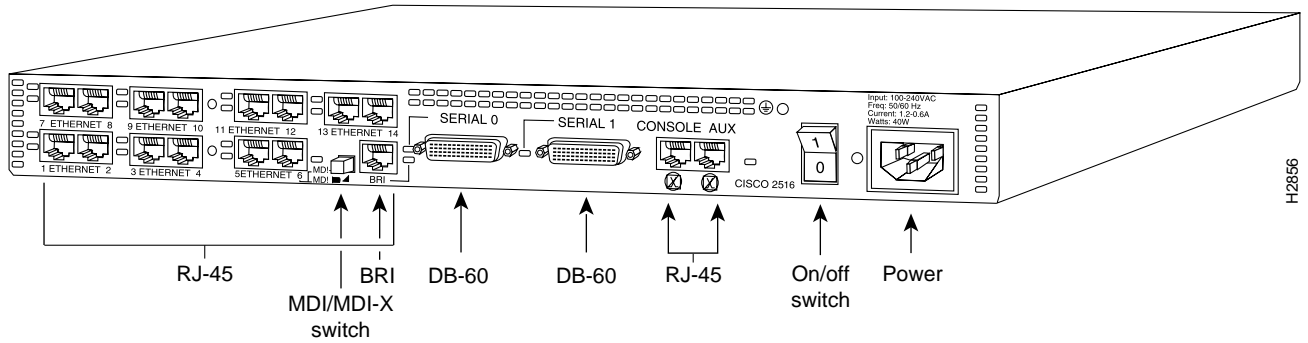


Figure 5-23: Cisco 2516 Rear View



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Access Servers

Models 2509, 2510, 2511, and 2512 are designed to function as access servers for remote node and asynchronous/synchronous routing. For complete information, refer to the "Access Servers" chapter later in the catalog.

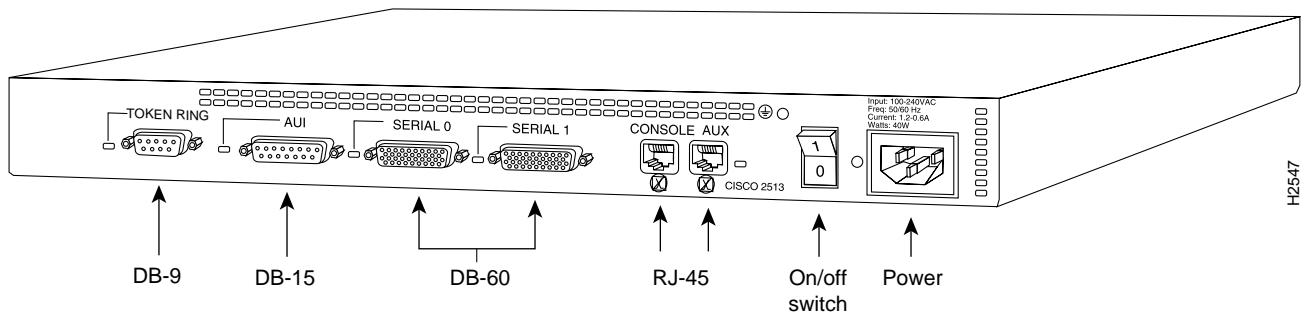
Dual LAN Routers

Models 2513, 2514, and 2515 provide higher-density LAN support and include all the common features listed in Table 11-89. In addition, these models support the interfaces listed in the table below.

Table 5-59: Dual LAN Router Interface Options

Model	Ethernet	Token Ring	Serial
2513	1	1	2
2514	2	0	2
2515	0	2	2

Figure 5-24: Cisco 2513 Rear View



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Figure 5-25: Cisco 2514 Rear View

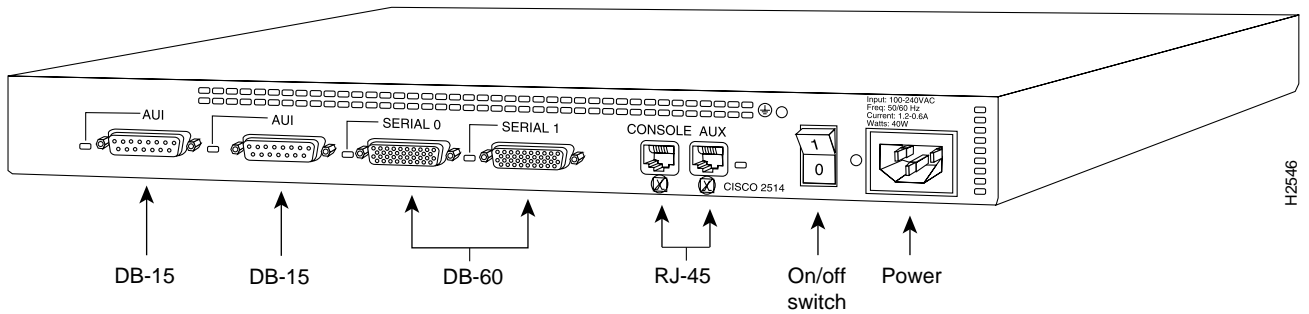
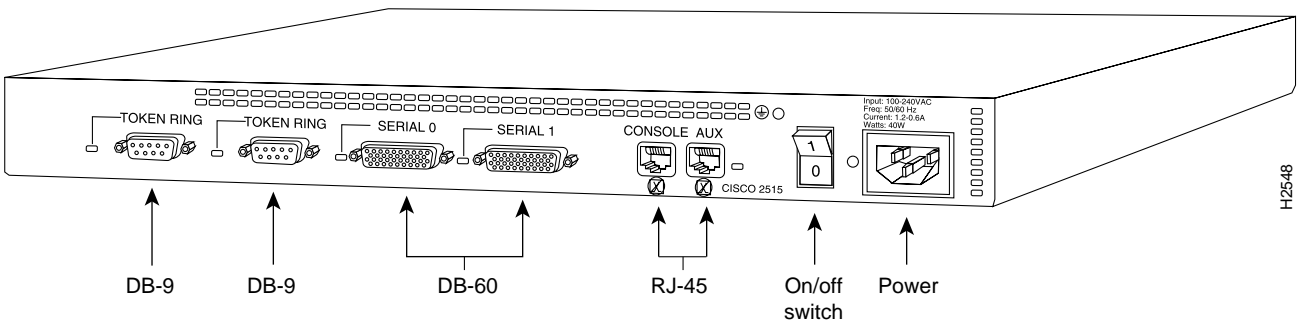


Figure 5-26: Cisco 2515 Rear View



Modular Routers

Models 2524 and 2525 provide LAN and WAN access in a low-cost modular router platform that can grow with your internetworking needs. The Cisco 2524 offers an Ethernet (AUI or 10BaseT) LAN connection, and the Cisco 2525 offers a Token Ring (STP or UTP) LAN connection. Both routers can accommodate up to three WAN modules—two synchronous serial and one ISDN.

The choice of synchronous serial WAN modules is as follows:

- 2-wire, switched, 56-kbps DSU/CSU
- 4-wire, 56/64-Kbps DSU/CSU
- Fractional T1/T1 DSU/CSU
- Five-in-one synchronous serial

Note The five-in-one synchronous serial WAN module gets its name from the five types of signaling it supports, which include: EIA/TIA-232, EIA/TIA-449, V.35, X.21 and EIA-530. You can order a DB-60 shielded serial transition cable. The router end of the cable has a DB-60 connector; the other end of the cable has the appropriate connector for the standard interface you specify.

The choice of ISDN WAN modules is as follows:

- ISDN BRI
- ISDN with integrated NT1 device

The ISDN WAN modules are keyed so that you cannot insert them into the synchronous serial WAN slots. A blank slot cover is installed over unused slots.

Figure 5-27: Cisco 2524 Rear View

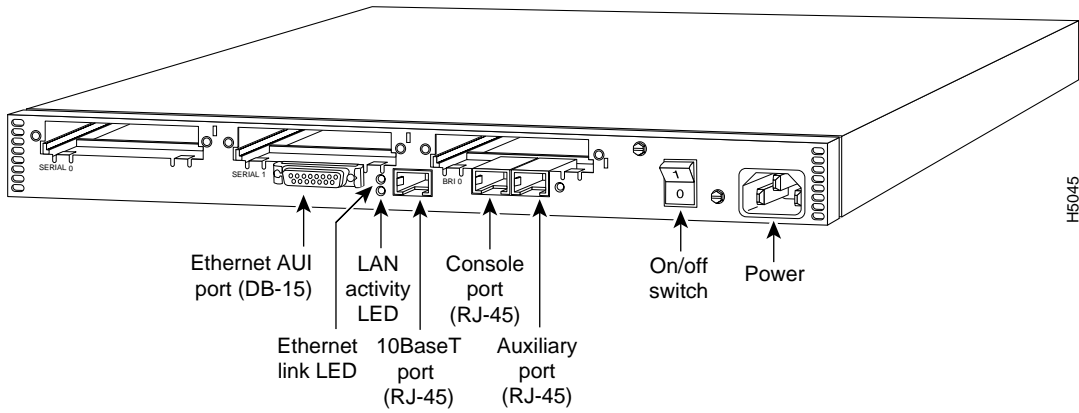


Figure 5-28: Cisco 2525 Rear View

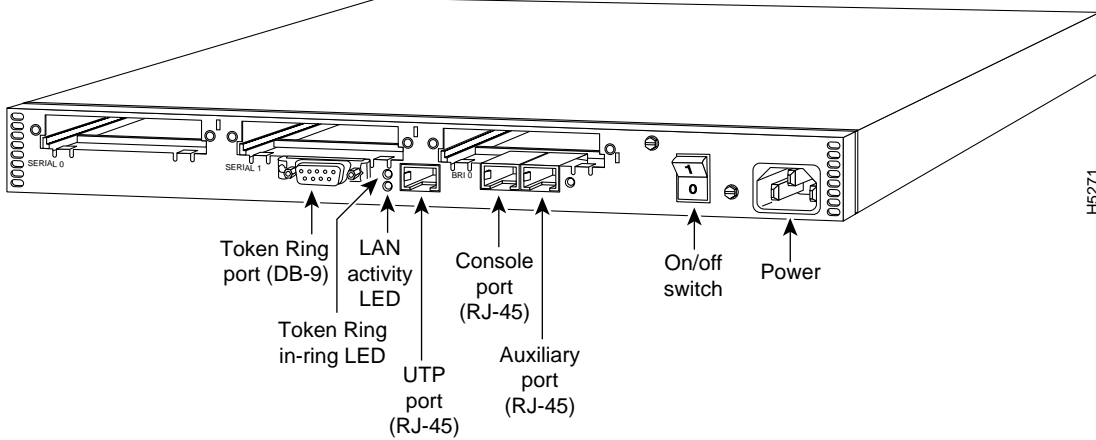


Figure 5-29: 2-Wire, Switched, 56-Kbps DSU/CSU WAN Module

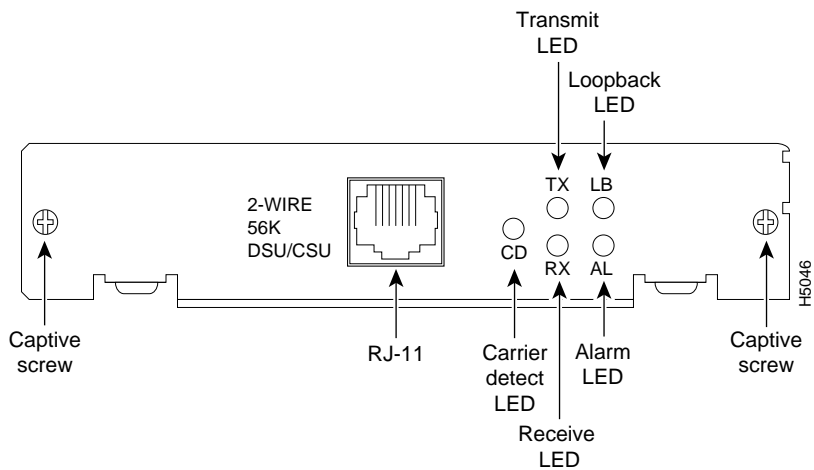


Figure 5-30: 4-Wire, 56/64-kbps DSU/CSU WAN Module

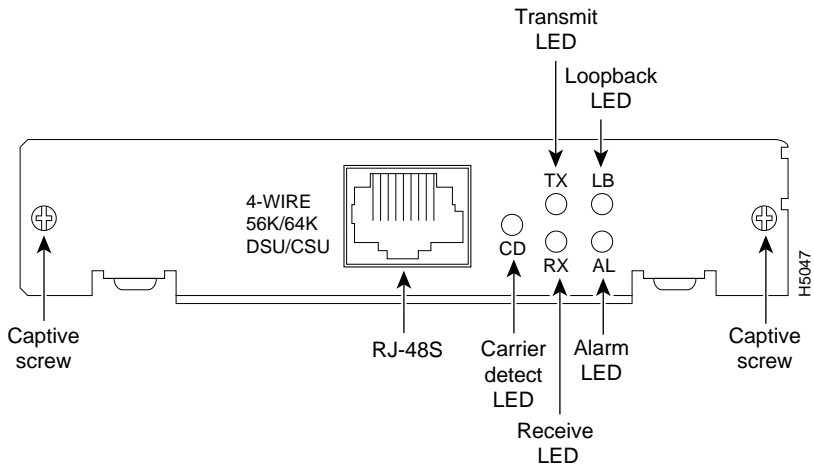


Figure 5-31: Fractional T1/T1 DSU/CSU WAN Module

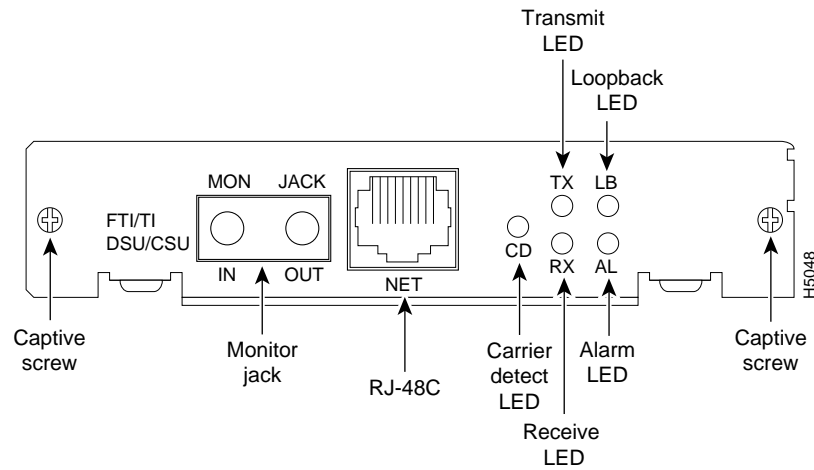


Figure 5-32: ISDN BRI WAN Module

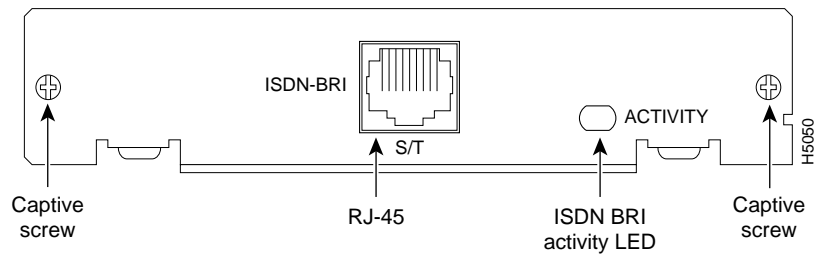


Figure 5-33: ISDN BRI with Integrated NT1 WAN Module

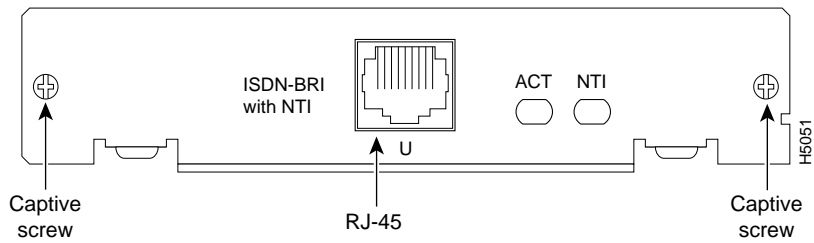


Figure 5-34: Five-in-One Synchronous Serial WAN Module

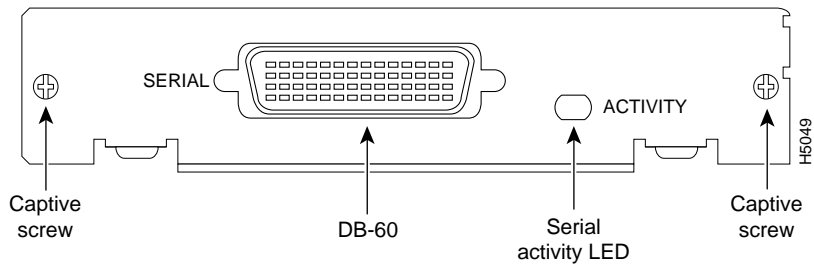
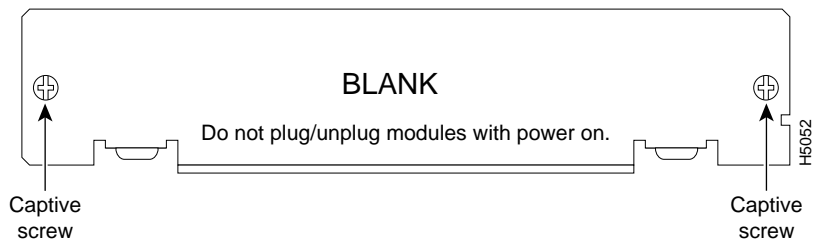


Figure 5-35: Blank Slot Cover



Refer to the "Cisco IOS Software" chapter for detailed software feature set information.

Ordering Information

Product Numbers

Note For more information, including cable illustrations, refer to the "Cables and Transceivers" chapter. The "Power Cords" chapter provides international power cord product numbers.

Table 5-60: Cisco 2500 Series Base Models Hardware Product Numbers

Model	Description	Product Number
Cisco 2501	1 Ethernet, 2 serial, AC power supply	CISCO2501
Cisco 2501-DC	1 Ethernet, 2 serial, DC power supply	CISCO2501-DC
Cisco 2501CF ¹	2 serial, CFRAD software, AC power supply	CISCO2501CF
Cisco 2501LF	1 Ethernet, 2 serial, LAN FRAD software, AC power supply	CISCO2501LF
Cisco 2502	1 Token Ring, 2 serial, AC power supply	CISCO2502
Cisco 2502CF ¹	2 serial, CFRAD software, AC power supply	CISCO2502CF
Cisco 2502LF	1 Token Ring, 2 serial, LAN FRAD software, AC power supply	CISCO2502LF
Cisco 2503	1 Ethernet, 2 serial, 1 ISDN BRI, AC power supply	CISCO2503
Cisco 2503-DC	1 Ethernet, 2 serial, 1 ISDN BRI, DC power supply	CISCO2503-DC
Cisco 2503I ¹	1 Ethernet, 1 ISDN BRI, ISDN software, AC power supply	CISCO2503I
Cisco 2503I-DC ¹	1 Ethernet, 1 ISDN BRI, ISDN software, DC power supply	CISCO2503I-DC
Cisco 2504	1 Token Ring, 2 serial, 1 ISDN BRI, AC power supply	CISCO2504
Cisco 2504-DC	1 Token Ring, 2 serial, 1 ISDN BRI, DC power supply	CISCO2504-DC
Cisco 2504I ¹	1 Token Ring, 1 ISDN BRI, ISDN software, AC power supply	CISCO2504I
Cisco 2505	8 Ethernet UTP hub ports, 2 serial, AC power supply	CISCO2505
Cisco 2505-DC	8 Ethernet UTP hub ports, 2 serial, DC power supply	CISCO2505-DC
Cisco 2507	16 Ethernet UTP hub ports, 2 serial, AC power supply	CISCO2507
Cisco 2507-DC	16 Ethernet UTP hub ports, 2 serial, DC power supply	CISCO2507-DC
Cisco 2509 ²	1 Ethernet, 2 serial, 8 async serial, AC power supply	CISCO2509
Cisco 2509-DC ²	1 Ethernet, 2 serial, 8 async serial, DC power supply	CISCO2509-DC
Cisco 2510 ²	1 Token Ring, 2 serial, 8 async serial, AC power supply	CISCO2510
Cisco 2511 ²	1 Ethernet, 2 serial, 16 async serial, AC power supply	CISCO2511
Cisco 2511-DC ²	1 Ethernet, 2 serial, 16 async serial, DC power supply	CISCO2511-DC
Cisco 2512 ²	1 Token Ring, 2 serial, 16 async serial, AC power supply	CISCO2512
Cisco 2513	1 Ethernet, 1 Token Ring, 2 serial, AC power supply	CISCO2513
Cisco 2514	2 Ethernet, 2 serial, AC power supply	CISCO2514
Cisco 2514-DC	2 Ethernet, 2 serial, DC power supply	CISCO2514-DC
Cisco 2515	2 Token Ring, 2 serial, AC power supply	CISCO2515
Cisco 2516	14 Ethernet UTP hub ports, 2 sync serial, 1 ISDN BRI, AC power supply	CISCO2516
Cisco 2516-DC	14 Ethernet UTP hub ports, 2 sync serial, 1 ISDN BRI, DC power supply	CISCO2516-DC
Cisco 2520	1 Ethernet, 2 high-speed sync serial, 2 low-speed async/sync serial, 1 ISDN BRI interface, AC power supply	CISCO2520
Cisco 2520-DC	1 Ethernet, 2 high-speed sync serial, 2 low-speed async/sync serial, 1 ISDN BRI interface, DC power supply	CISCO2520-DC
Cisco 2520CF ¹	2 high-speed sync serial, 2 low-speed async/sync serial, CFRAD software, AC power supply	CISCO2520CF
Cisco 2520LF ¹	1 Ethernet, 2 high-speed sync serial, 2 low-speed async/sync serial, LAN FRAD software, AC power supply	CISCO2520LF
Cisco 2521	1 Token Ring, 2 high-speed sync serial, 2 low-speed async/sync serial, 1 ISDN BRI interface, AC power supply	CISCO2521
Cisco 2521-DC	1 Token Ring, 2 high-speed sync serial, 2 low-speed async/sync serial, 1 ISDN BRI interface, DC power supply	CISCO2521-DC
Cisco 2521CF ¹	2 high-speed sync serial, 2 low-speed async/sync serial, CFRAD software, AC power supply	CISCO2521CF

Model	Description	Product Number
Cisco 2521LF ¹	1 Token Ring, 2 high-speed sync serial, 2 low-speed async/sync serial, LAN FRAD software, AC power supply	CISCO2521LF
Cisco 2522	1 Ethernet, 2 high-speed sync serial, 8 low-speed async/sync serial, 1 ISDN BRI interface, AC power supply	CISCO2522
Cisco 2522-DC	1 Ethernet, 2 high-speed sync serial, 8 low-speed async/sync serial, 1 ISDN BRI interface, DC power supply	CISCO2522-DC
Cisco 2522CF ¹	2 high-speed sync serial, 8 low-speed async/sync serial, CFRAD software, AC power supply	CISCO2522CF
Cisco 2522LF ¹	1 Ethernet, 2 high-speed sync serial, 8 low-speed async/sync serial, LAN FRAD software, AC power supply	CISCO2522LF
Cisco 2523	1 Token Ring, 2 high-speed sync serial, 8 low-speed async/sync serial, 1 ISDN BRI interface, AC power supply	CISCO2523
Cisco 2523-DC	1 Token Ring, 2 high-speed sync serial, 8 low-speed async/sync serial, 1 ISDN BRI interface, DC power supply	CISCO2523-DC
Cisco 2523CF ¹	2 high-speed sync serial, 8 low-speed async/sync serial, CFRAD software, AC power supply	CISCO2523CF
Cisco 2523LF ¹	1 Token Ring, 2 high-speed sync serial, 8 low-speed async/sync serial, LAN FRAD software, AC power supply	CISCO2523LF
Cisco 2524	1 Ethernet (AUI or 10BaseT) with 3 slots for WAN modules, AC power supply	CISCO2524
Cisco 2524-DC	1 Ethernet (AUI or 10BaseT) with 3 slots for WAN modules, DC power supply	CISCO2524-DC
Cisco 2525	1 Token Ring (STP or UTP) with 3 slots for WAN modules, AC power supply	CISCO2525

1. Mission-specific router. Mission-specific routers are based on standard Cisco 2500 hardware, but they contain less memory and run reduced Cisco IOS images that disable unused ports and support a subset of protocols. By adding software, and possibly memory, mission-specific routers can be upgraded to full standard router functionality.

2. See the "Access Servers" chapter later in this catalog, for more information.

Product and Part Numbers

Part Numbers for the Rack-Mount Kits

Part Description	Part Number
19-in. rack-mount kit ¹	ACS-2500RM-19=
24-in. rack-mount kit	A25-2500RM-24=

Memory Options

Boot ROM upgrade	BOOT-2500=
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DRAM Memory Options

4-MB DRAM SIMM (spare)	MEM-1X4D=
4-MB to 8-MB DRAM SIMM Factory Upgrade	MEM2500-4U8D
8-MB DRAM SIMM (spare)	MEM-1X8D=
4-MB to 16-MB DRAM SIMM Factory Upgrade	MEM2500-4U16D
16-MB DRAM SIMM (spare)	MEM-1X16D=
8-MB to 16-MB DRAM SIMM Factory Upgrade	MEM2500-8U16D

Flash Memory Options

4-MB Flash SIMM (spare)	MEM-1X4F=
8-MB to 16-MB Flash SIMM Factory Upgrade	MEM2500-8U16F
8-MB Flash SIMM (spare)	MEM-1X8F=

Modules

2-wire switched 56-kbps DSU/CSU module (for Cisco 2524 and Cisco 2525 routers only)	SM25-56K2
4-wire 56/64-kbps DSU/CSU module (for Cisco 2524 and Cisco 2525 routers only)	SM25-56K4
Fractional T1/T1 DSU/CSU module (for Cisco 2524 and Cisco 2525 routers only)	SM25-T1
Five-in-one synchronous serial module (for Cisco 2524 and Cisco 2525 routers only)	SM25-5IN1
ISDN BRI module (for Cisco 2524 and Cisco 2525 routers only)	SM25-BRI-S/T
ISDN with integrated NT1 device module (for Cisco 2524 and Cisco 2525 routers only)	SM25-BRI-U
Blank slot cover (for Cisco 2524 and Cisco 2525 routers only)	SM25-BLANK

Redundant Power Systems

600W redundant AC power system for the Cisco 2500 series routers	PWR-600-AC-RPS
Redundant power supply 22/18 OIR Y-load cable	CAB-RPSY-2208
Redundant power supply 22/18 load cable	CAB-RPS-2218=
Redundant power supply 22/08 load cable	CAB-RPS-2208=
Redundant power supply field upgrade for Cisco 2500 series routers	ACS-2500RPS=

Cables

Part Description	Part Number
EIA/TIA-232 male DTE interface, 10 ft (3 m)	CAB-232MT
EIA/TIA-232 female DCE interface, 10 ft (3 m)	CAB-232FC
EIA/TIA-449 male DTE interface, 10 ft (3 m)	CAB-449MT
EIA/TIA-449 female DCE interface, 10 ft (3 m)	CAB-449FC
EIA-530 male DTE interface, 10 ft (3 m)	CAB-530MT
V.35 male DTE interface, 10 ft (3 m)	CAB-V35MT
V.35 female DCE interface, 10 ft (3 m)	CAB-V35FC
X.21 male DTE interface, 10 ft (3 m)	CAB-X21MT
X.21 female DCE interface, 10 ft (3 m)	CAB-X21FC
Ethernet AUI adapter cable	CAB-3CE18=
Auxiliary/console cable kit ²	ACS-2500ASYN
RJ-45-to-DB-25 management card console cable	CAB-MGMT-RH
Shielded power cable, United States	CABS-AC
Shielded power cable, Australia	CABS-ACA
Shielded power cable, Italy	CABS-ACI
Shielded power cable, Europe	CABS-ACE
Shielded power cable, United Kingdom	CABS-ACU

1. The 19-inch rack-mount kit can only be ordered as a spare; a 19-inch rack-mount kit is included with all Cisco 2500 series routers. An optional 24-inch rack-mount kit can be ordered from Cisco Systems.
2. The auxiliary/console cable kit includes an RJ-45-to-RJ-45 roll-over console cable, an RJ-45-to-DB-25 male DCE adapter, an RJ-45-to-DB-25 female DTE adapter, and an RJ-45-to-DB-9 adapter.