Product Line Overview

Cisco Systems provides a complete line of products to meet the needs of your growing internetwork. Cisco's distributed processing architecture, software, and specialized high-performance network interfaces permit the construction of complex networks that can link thousands of network subsegments and connected devices.

This chapter contains the following sections:

- Network Management Tools
  - CiscoWorks
  - Cisco Works Blue Maps
  - Cisco Works Blue SNA View
  - CiscoWorks Blue Native Service Point
  - Cisco Hub/Ring Manager for Windows
  - Cisco Network Management Support CD-ROM
  - CiscoWorks Windows
  - CiscoView
  - NETSYS Connectivity Tools
  - NETSYS Performance Tools
  - AtmDirector
  - TrafficDirector
  - CiscoWorks Switched Internetwork Solutions
  - SwitchProbe Network Monitoring Probes
- Multimedia Networking
- LightStream Network Management
- Cisco Connection
- Products at a Glance

New Products

This catalog introduces the following new products:

- Cisco IOS Release 11.2
  - New features—see the section “Cisco IOS Software Features” in the chapter “Cisco IOS Software”
  - Cisco IOS software packaging—page 41
  - Cisco IOS Release 11.2 feature sets—page 42
  - Introduction to new Cisco IOS feature set tables—page 44
- Network Management Tools
  - AtmDirector—page 139
  - Cisco network management support CD-ROM—page 132
- StrataCom Products
  - BPX Service Node broadband Asynchronous Transfer Mode (ATM) switch—page 471
  - StrataCom AXIS Interface Shelf—page 476

Product Numbers

This catalog includes product numbers as a convenience; see the latest *Cisco Global Price List* for a complete list of products and prices.

If a Cisco 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. When you order a product as a spare, remember to include the equal sign. For example, a serial cable ordered as part of an original order uses product number CAB-232FC. The same cable ordered as a spare uses product number CAB-232FC=.

Routers

Cisco supports a full line of routers, from modular to fixed-configuration to routers on a PC card. These high-performance, intelligent routers can interconnect networks that use different protocols and media. Routers choose the optimal path for sending data across complex internetworks. In addition, Cisco routers can act as bridges by forwarding data packets from one network segment to another.

Cisco routers support the following media and interface types:

- Ethernet (IEEE 802.3 and Type II), 10 and 100 Mbps.
- Token Ring (IEEE 802.5), 4 and 16 Mbps.
- FDDI for single and dual attachment stations.
- Synchronous serial.

  Includes EIA-613 (High-Speed Serial Interface [HSSI]), V.35, EIA/TIA-232, EIA/TIA-449, EIA-530, G.703/G.704, and X.21.

Note 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).

- Asynchronous serial.
- Integrated Services Digital Network (ISDN) Interface.

  Includes both Basic Rate Interface (BRI) and Primary Rate Interface (PRI). BRI consists of two 64-kbps bearer (B) channels and one 16-kbps data (D) channel. PRI consists of twenty-three or thirty 64-kbps B channels and one 64-kbps D channel.
- Asynchronous Transfer Mode (ATM).

  Includes single-port DS3, T3, TAXI, and OC-3c single mode or multimode.
- Fractional T1/T1.
- Switched 56.

For a description of supported software protocols, refer to the chapter “Cisco IOS Software.” For a description of Cisco’s internetwork management applications, refer to the chapter “Internetwork Management.”

Modular Routers

With Cisco’s modular routers, you can customize your system with a choice of interface cards. The number of cards is limited by the size of the chassis. See Table 1 for a product comparison of supported interfaces. All modular routers run the industry-leading Cisco Internetwork Operating System (Cisco IOS) software.

Cisco's modular routers include the following:

- Cisco 7000 family (Cisco 7000 series, Cisco 7200 series, and Cisco 7500 series)

  Cisco's 7000 series and 7500 series routers provide advanced levels of reliability, serviceability, and performance. The Cisco 7000 series and 7500 series support the broadest set of media types in the industry, which includes the following:

  — One- or two port Fast Ethernet

  — Two-, four-, six-, eight-, ten- or sixteen-port Ethernet

  — Two-, four-, or eight- port Token Ring

  — One-port FDDI

  — Four- or eight-port serial

  — ATM (single port: DS3, T3, TAXI, and OC-3c single mode or multimode)

  — Single- or dual-port channelized T1 and E1

  — Fractionalized E1 (G.703/G.704)

  — Single- or dual-port ISDN PRI

  — Single- or dual-port channel interface for IBM mainframes

  Network interfaces reside on modular interface processors, which provide a direct connection between the high-speed bus—or buses, in the case of Cisco 7507 and Cisco 7513—and the external network. Online insertion and removal allows you to add, replace, or remove interface processors without the interruption to network services caused by rebooting. Flash memory is standard. All systems include rack-mounting hardware.

  The Cisco 7000 series and 7500 series routers feature a range of processor slots: from five in the Cisco 7010 and Cisco 7505 to thirteen in the Cisco 7513.

  Cisco's newest entry in the 7000 family of routers, the Cisco 7200 series, provides the same advanced levels of reliability, serviceability, and performance as the rest of the 7000 family. The Cisco 7200 series supports the broadest set of media types in the industry, which includes the following:

  — One-port Fast Ethernet

  — Four-, five-, or eight-port Ethernet

  — Four-port Token Ring

  — One-port FDDI

  — Four- or eight-port serial

  — HSSI (dual-port)

  — Dual-port ISDN PRI

- Cisco 4000 series

  Cisco 4000 series routers (models 4000-M, 4500-M, and 4700-M) are available with the following interface modules:

  — One-port Fast Ethernet

  — One-, two-, or six-port Ethernet

  — One- or two-port Token Ring

  — One-port multimode FDDI (both single and dual attachment station [DAS])

  — One-port single-mode FDDI (DAS)

  — Two- or four-port synchronous serial

  — Four- or eight-port ISDN BRI

  — One-port channelized T1/ISDN PRI

  — One-port channelized E1/ISDN PRI (balanced or unbalanced)

  — Four-port serial G.703 (balanced or unbalanced)

  — One-port ATM (single-mode or multimode) OC-3c

  — One-port ATM DS-3

  — One-port ATM E3

  You can mix and match these modules to create custom configurations. The router's modules support many variations of protocols, line speeds, and transmission media, so the Cisco 4000 series can accommodate all types of network computing environments. As Cisco introduces new modules, the Cisco 4000 series can be upgraded to keep pace with technological advances.

- Cisco 2500 series

  The Cisco 2500 series offers two modular routers, the Cisco 2524 and Cisco 2525. The Cisco 2524 includes an Ethernet (AUI or 10BaseT) LAN connection, and the Cisco 2525 includes a Token Ring (STP or UTP) LAN connection. Both routers can accommodate up to three WAN modules—two synchronous serial and one Integrated Services Digital Network (ISDN).

Fixed-Configuration Routers

Cisco's access routers provide a variety of preset configuration options, and they include the Cisco 2500 series, Cisco 1000 series, and Cisco 760 series routers.

Cisco 2500 Series

The Cisco 2500 series is designed to accommodate the internetworking requirements of small- to medium-sized sites, such as commercial retail establishments or remote sales offices. The Cisco 2500 series models support combinations of the following interfaces:

- Ethernet interfaces and hub ports
- Token Ring interfaces and hub ports
- Synchronous serial
- Asynchronous serial
- ISDN BRI

Standard Cisco 2500 series routers use Cisco IOS software feature sets, so you can choose a feature set that supports your specific protocol environment. Entry-level, mission-specific Cisco 2500 series routers come with a specific software image that is tailored for the router's application.

Note The Cisco 2500 series also offers two models in a modular router platform, the Cisco 2524 and Cisco 2525. See the previous section, "Modular Routers," for more information.

Cisco 1000 Series

The Cisco 1000 series routers include the Cisco 1003, Cisco 1004, and Cisco 1005. The router interfaces are as follows:

- Cisco 1003 and Cisco 1004 ISDN routers
  - One 10BaseT Ethernet LAN port
  - One BRI WAN port (the Cisco 1004 router includes integrated NT1 device)
  - One console port
  - One slot for a personal computer memory card international association (PCMCIA) Flash memory card
- Cisco 1005 synchronous serial router
  - One 10BaseT Ethernet LAN port
  - One synchronous serial WAN port that supports the following synchronous serial interfaces: EIA/TIA-232, EIA/TIA-449, V.35, X.21, and EIA-530
  - One console port
  - One slot for a PCMCIA Flash memory card
- Cisco 1005 asynchronous dial-on-demand services over basic telephone lines
  - Available with the Cisco IOS Release 11.1 feature set and later releases

Cisco 760 Series

The Cisco 760 series multiprotocol ISDN routers connect small offices or home offices that have Ethernet LANs to WANs using an ISDN BRI port.

The Cisco 760 series router is available in two models:

- Cisco 765, equipped with one Ethernet port, one ISDN BRI S/T port for connection to an external NT1 device, two RJ-11 analog ports, and one DB-9 console port
- Cisco 766, equipped with one Ethernet port, one RJ-45 ISDN BRI S/T port for connection to an external NT1 device or a digital device such as an ISDN telephone, one RJ-45 ISDN BRI U port, two RJ-11 analog ports, and one DB-9 console port

LAN Extenders

The Cisco 1001 LAN extender provides an Ethernet LAN and a synchronous serial (V.35 or X.21) interface. LAN extenders are remote access devices that connect to a Cisco host (Cisco 7000 family, AGS+, Cisco 4000 series, and Cisco 2500 series) running Cisco IOS Release 10.2(2) or later.

The Cisco 1001 LAN extender interfaces are as follows:

- One Ethernet port with AUI (DB-15) and 10BaseT (RJ-45) interfaces
- One synchronous serial WAN port that supports V.35 (Winchester)

Access Servers

Cisco's access servers provide single-user access and synchronous or asynchronous routing, and they function as a combination terminal server, remote node server, protocol translator, and router. They provide network access from terminals to computers, modems, and printers.

Cisco's access servers include the Cisco 2500 series, Cisco AS5100, and Cisco AS5200 access servers.

Cisco 2500 Series Access Servers

The Cisco 2500 series access servers include the following models: 2509, 2510, 2511, and 2512. These access servers provide combinations of Ethernet, Token Ring, high-speed serial, and asynchronous lines.

Cisco AS5100 Access Server

The Cisco AS5100 access server is a versatile data communications platform that combines in one chassis the functions of a router with analog and digital modems. The Cisco AS5100 access server is useful for organizations that need to centralize processing capabilities for remote offices and LAN. It enables organizations to aggregate modem traffic onto analog or digital telephone lines and route it through a packet-switched network to a host computer at a central site.

Cisco AS5200 Universal Access Server

The Cisco AS5200 access server provides connectivity to enterprise internetworks and the Internet for mobile- and home-based users. The Cisco AS5200 access server integrates the functionality of standalone CSUs, channel banks, modems, communication servers, switches, and routers in a single modular chassis. The access server offers complete digital and analog access server functionality for mixed-media dial-in environments. By terminating both analog and digital calls on the same chassis, from a single trunk line, the Cisco AS5200 access server provides you with a clear, simple, and easy migration path from today's predominantly analog dial-in services to tomorrow's digital dial-in services.

CiscoRemote Software

CiscoRemote is a scalable and comprehensive solution for remote access client software. There are two types of CiscoRemote software, CiscoRemote Lite and CiscoRemote Plus. Both products are optimized for easy installation and tuned for operation with Cisco access servers. CiscoRemote extends the benefits of Cisco IOS software capabilities to the desktop and provides a complete solution when used with Cisco access servers or remote node products, such as the Cisco 203 and Cisco 204.

CiscoSecure UNIX Server

CiscoSecure UNIX Server is a network security server that controls and secures access to a network via dial-up modems or ISDN. It can also secure internal or external access to routers within a network. Network Access security involves three sets of requirements: authentication, authorization, and accounting, referred to as AAA. CiscoSecure uses a central database to store user and group profiles of authentication and authorization information.

Routers on a PC Card

AccessPro PC cards are full-featured multiprotocol router cards that install in IBM-compatible PCs equipped with either an ISA bus or EISA bus. The cards support a variety of Cisco IOS software feature sets, so you can chose a feature set that supports your specific protocol environment.

PC-Based ISDN Remote Node Products

The Cisco 200 series products are remote note products that combine an Open Data-Link Interface (ODI) workstation driver (IPX and TCP/IP) with an ISDN adapter. The Cisco 200 series consists of the Cisco 201, Cisco 202, Cisco 203, and Cisco 204 products.

The products provide remote access to enterprise networks and the Internet over ISDN lines. The Cisco 200 series is ideal for telecommuters working from home or small single-user offices. The products provide transparent access to LAN resources, such as databases, hosts, printers, e-mail, and technical support. Using a high-speed ISDN connection, the Cisco 200 series products can also be used to connect a single desktop PC to the Internet. You can connect Cisco 200 series products to all Cisco ISDN routers.

ATM Switches

The Cisco LightStream 2020 is a multiservice ATM switch for campus and wide-area applications. The LightStream 2020 implementation of ATM supports trunks operating at digital rates as low as fractional T1/E1 while providing a migration path through T3/E3 and into SONET/SDH OC-3c trunking. LightStream 2020's intelligent edge modules support a variety of services, including Frame Forwarding, Frame Relay, ATM UNI, Ethernet and FDDI LAN internetworking, and T1/E1 circuit emulation.

The Cisco LightStream 1010 is a next-generation ATM switch designed for production workgroup and campus ATM deployment. This 5-gigabits per second (Gbps) switch features a five-slot, modular chassis with an optional dual power supply. One chassis slot supports an ATM switch processor module. Four additional chassis slots support up to four hot-swappable carrier modules that each support up to two hot-swappable port adapter modules. This architecture provides for a wide variety of customized and upgradeable ATM configurations.

StrataCom Products

Cisco and StrataCom have joined forces in the area of ATM solutions. The acquisition of StrataCom was approved as of July 1996. This section highlights some of StrataCom's current product offerings.

StrataCom BPX Service Node

The StrataCom BPX Service Node is StrataCom's most powerful broadband ATM switch. Designed to meet the demanding, high-traffic needs of a public service provider or large private enterprise, the BPX Service Node delivers high-performance ATM adaptation and aggregation for all types of user traffic.

The BPX Service Node offers 10 to 20 Gbps of high-throughput switching for multiple traffic types—voice, data, and images. The switch improves network and trunk utilization to more that 95 percent and supports a wide range of interfaces from Frame Relay to full broadband subscriber interfaces up to 622 Mbps. You can offer multiple services for LAN, X.25, SNA, Frame Relay, and ATM traffic from a single BPX Service Node platform.

StrataCom IGX

The StrataCom IGX is a standards-based, scalable ATM switch. Highly versatile, the IGX supports a wide range of narrowband and broadband applications for enterprise networks and public service providers. The IGX provides the same core ATM capabilities and advanced networking features of the BPX Service Node.

The IGX is available with 8-, 16-, or 32-slot configurations allowing you to add capacity as demand increases without facing high equipment replacement costs. In a multiservice public ATM environment, you can cost effectively launch new services and expand system capacity as market demand grows. The IGX lets you migrate from narrowband speeds to broadband ATM on the same platform providing unmatched WAN investment protection.

StrataCom Intelligent Network Server

The StrataCom Intelligent Network Server (INS) provides intelligent call processing for ATM WAN's. Running on a SparcStation, the INS supports three key applications:

- ISDN dial-up Frame Relay for cost-effective access to information across the virtual enterprise
- ATM and Frame Relay switched virtual circuits (SVCs) for true bandwidth-on-demand functionality
- Dynamic Network Switching (DNS) for switching private PBX voice and data traffic over a cell-based ATM WAN

The INS provides you with the instantaneous, any-to-any connectivity required by applications such as LAN internetworking, client/server and client/client computing, shared workspaces, remote access, and multimedia communications.

StrataCom StrataSphere

StrataSphere is an SNMP-based multiprotocol management environment designed specifically for ATM WANs. It provides integrated service management and process automation to simplify management of even the most complex networks. StrataSphere allows you to easily monitor usage, provision connections, prototype services, optimize traffic flow, model network design, and track network statistics.

StrataSphere consists of the following:

- StrataView Plus: The core of the StrataSphere product, it provides powerful fault, configuration, and performance management capabilities for StrataCom BPX Service Node and IGX switches.
- StrataSphere Service Agent: Provides network and service layer management views and control through an SNMP proxy agent.
- StrataSphere Statistics Agent: Collects comprehensive network statistics from your StrataCom WAN for billing, cost allocation, performance management, and capacity planning.
- StrataSphere BILLder: Captures data from the billing period that you define and formats it in a standard or customized billing record for cost allocation.
- StrataSphere Modeler: Lets you read, design, modify, and analyze networks online. You can quickly and easily design the best topology for your networks based on existing network configuration.
- StrataSphere Optimizer: Allows you to create "what-if" scenarios based on predefined parameters to analyze and use traffic patterns, optimize for least cost, and determine adequate redundancy.

StrataCom ForeSight

StrataCom ForeSight is a closed-loop traffic management and congestion avoidance system. It continuously monitors trunk utilization to dynamically allocate spare capacity. ForeSight allows you to improve network bandwidth utilization to 95 percent or better, increasing spare capacity and reducing networking costs.

ATM Inverse Multiplexing Network Module

The ATM Inverse Multiplexing Network Module enables Internet service providers, carriers, and enterprise customers to aggregate multiple T1 or E1 ATM communications links. This approach provides the benefits of ATM networking at speeds between T1/E1 and T3/E3 without the costs of broadband links.

Other ATM Solutions

In addition to ATM switches and adapters, Cisco offers a variety of products that support ATM solutions:

- Catalyst 5000 LAN switch equipped with an ATM LAN emulation module
- Cisco 7000 family of routers with the ATM Interface Processor (AIP)
- Cisco 4000 series routers (models 4500-M and 4700-M) with an ATM network processor module

Cisco plans future ATM support for products such as the Catalyst 1600, Catalyst 2000, and Catalyst 3000 switches.

Workgroup Products

Cisco addresses users' network challenges in their workgroup environments with a comprehensive product line consisting of the following products:

- Catalyst family of LAN switches
- CDDI/FDDI workgroup concentrators
- FastHub 100+ and 100 Series Hubs
- SwitchProbe network monitoring probes

Managing the evolving workgroup are new network management tools that leverage the embedded intelligence in Cisco's switching platforms. These tools, which include embedded remote monitoring (RMON) and switched port analyzer capabilities, provide users with graphical user interface (GUI)-based applications to control and manage the workgroup.

The Catalyst 5000 architecture supports high port density switching, virtual local-area networking with the functionality of embedded Cisco IOS software, and multilayer switching. The Catalyst 5000 architecture is technology independent and can support switched 10-Mbps Ethernet; 100-Mbps Fast Ethernet; 4 or 16 Token Ring interfaces; and CDDI/FDDI with backbone connections to Fast Ethernet, FDDI, and ATM. The modular chassis provides the flexibility to accommodate the network topologies of today, enhancing the performance of existing shared media hubs by supporting segment switching. The Catalyst 5000 series switching system is a modular 5-slot chassis that enables you to construct high-performance, cost-effective, and manageable switched networks by providing high-density Ethernet interfaces for dedicating bandwidth to single or multiple workstations. The Catalyst 5000 serves as a strategic switching platform in the wiring closet as today's networks migrate from shared-media hubs to switches.

The Catalyst 3000 series products deliver Layer 2, stackable software and VLAN switching for growing workgroup applications. The Catalyst 3000 series allows you to deploy switches in a variety of applications and protect your investment. Greater switching capacity or multilayer traffic management functions can be added through a unique, cost-effective, stackable architecture.

The following key elements make up the Catalyst 3000 series:

- Catalyst 3000 switch
- Catalyst 3200 switch
- Expansion modules
- Catalyst matrix switch

The Catalyst 2900 switch combines high-speed configuration flexibility with exceptional affordability for workgroup applications. Available for a very low cost per port, the Catalyst 2900 is ideal for Ethernet workgroups and individual users requiring increased performance and 100BaseT, or 100BaseF connectivity to servers and backbones.

The Catalyst 2820 is an Ethernet switch that provides high-speed configuration flexibility for workgroup applications. With 25 switched Ethernet ports for individual workstations and 10BaseT hubs and two high-speed expansion slots for servers and backbones, the Catalyst 2820 provides Ethernet switching to 100BaseT, Fiber Distributed Data Interface (FDDI), and future Asynchronous Transfer Mode (ATM) networks.

The Catalyst 2600 is a Token Ring switch that provides high-speed forwarding of frames among the segments attached to each of its ports. The Catalyst 2600 can forward frames among multiple, shared, or dedicated Token Ring LAN segments. Each of the ports on the switch can be connected to a port on any external Token Ring hub or concentrator using a customer-supplied cable. Alternatively, a Token Ring port on the Catalyst 2600 can be connected directly to a half-duplex (HDX) or full-duplex (FDX) Token Ring LAN station without an intervening Token Ring concentrator or hub.

The Catalyst 1900 is a standalone switch that boosts performance for Ethernet workgroups. With 25 switched Ethernet ports for individual workstations and 10BaseT hubs and two fixed 100BaseT ports for servers and backbones, the Catalyst 1900 provides Ethernet switching to 100BaseT networks. The Catalyst 1900 includes the following features:

- 25 switched Ethernet ports: 24 10BaseT and one AUI
- Two fixed 100BaseT ports (for server or backbone connectivity)
- CiscoView device-management support

The Catalyst 1800 is a Token Ring switch that dramatically increases performance, flexibility, and management of Token Ring installations. The Catalyst 1800 inserts into existing Token Ring topologies without disrupting operation of the network

The Catalyst 1200 workgroup switch is a high-performance system that enhances the network performance of Ethernet client/server workgroups. It allows homogeneous (Ethernet-to-Ethernet) and heterogeneous (Ethernet-to-CDDI/FDDI) connections. The switch solves client/server networking problems with a seamless, high-bandwidth, 100-Mbps interface to servers and existing dedicated Ethernet-to-desktop workstations.

The Catalyst 1600 Token Ring switch contains 8 or 12 Token Ring ports with optional FDDI and future ATM uplink functionality. It provides campus and building backbone segment switching as well as dedicated full-duplex connections to file servers. The Catalyst 1600 is the ideal solution for customers who need to replace slow, PC-based source-route bridges with a fast, cost-effective, manageable solution. Other target customers are those with existing router-based collapsed backbones who need to centralize servers and replace congested 16-Mbps backbone rings with a switch.

The FastHub 100+ series of 100BaseT hubs combines all the benefits of stackable hubs with unmatched configuration flexibility, exceptional affordability, and integrated Cisco IOS functionality. Alone or in conjunction with Cisco routers and switches, these cost-effective hubs deliver ten times the performance of 10BaseT hubs in a scalable, manageable, and resilient solution.

The FastHub 100+ series hubs are ideal high-performance alternatives to 10BaseT hubs, delivering affordable 100-megabits-per-second performance to workgroups and server farms. The FastHub 116T+ comes equipped with 16 100BaseTX ports for connecting your workstations and servers with inexpensive unshielded-twisted pair wiring; the FastHub 116C+ has 15 100BaseTX ports and 1 100BaseFX port for linking UTP devices to a fiber Fast Ethernet backbone.

The FastHub 100 series of standalone 100BaseT repeaters, used alone or with Cisco routers and Catalyst switches, provides affordable 100-Mbps performance for a variety of applications including power users, server farms, and high-speed local backbones for switch-based networks. Available in a range of port densities and supporting unshielded twisted-pair (UTP) or fiber cabling, these repeaters offer configuration and media flexibility.

The WS-C1400 CDDI/FDDI workgroup concentrator is a compact, cost effective workgroup concentrator with the versatility of modular hubs. The modular design allows from 4 to 32 connections of CDDI and/or FDDI ports in a single stackable or rack-mounted chassis.

CiscoFusion Architecture

Cisco supports the switched internetworking paradigm called CiscoFusion, which is an architecture for evolving networks that combines three independent, but synergistic technologies:

- LAN switching for bandwidth to the desktop

  Relieves congestion on growing Ethernet and Token Ring LANs, improving both application performance and user productivity.

- Routing for protocol intelligence

  Handles multiple protocols over a common network while minimizing bandwidth-hungry broadcast traffic and creating security firewalls.

- ATM for backbone support

  Provides scalable transport capacity for network backbones, improving performance and supporting network growth across the enterprise.

In addition to hardware, CiscoFusion also encompasses advanced software and network management applications:

- Cisco Internetwork Operating System (Cisco IOS) Software

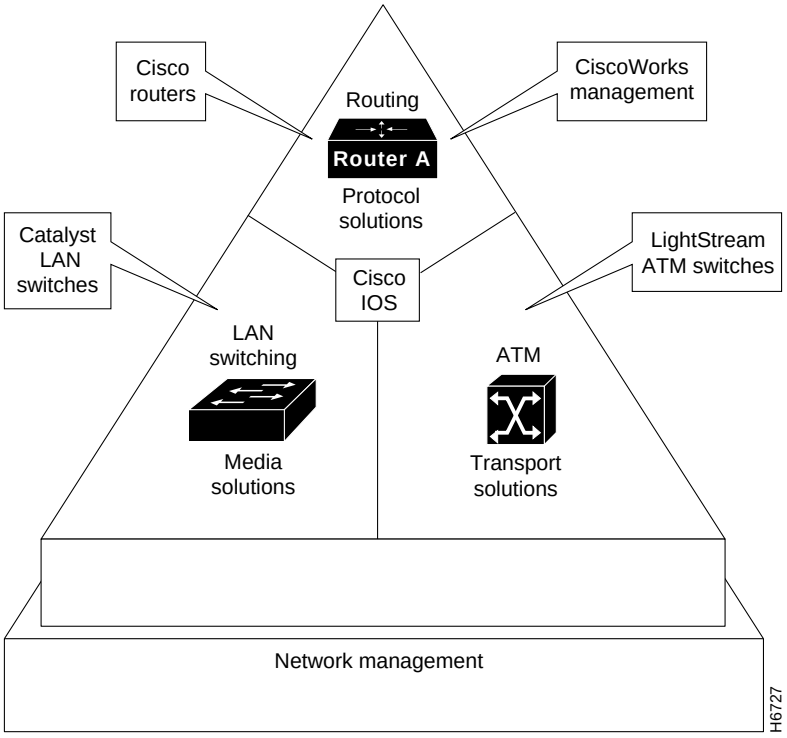
  Enables seamless interoperability among all Cisco components in an internetwork and provides features that allows powerful applications to take full advantage of the internetwork's capabilities

- CiscoWorks suite of management applications

  Delivers essential tools for monitoring, controlling, and optimizing switched internetworks.

Figure 1 illustrates the Cisco Fusion architecture.

Figure 1 Cisco Fusion Architecture



CiscoPro

CiscoPro resellers provide many products that feature tailored internetworking solutions for small- and medium-sized businesses. These products are available through two-tier distributors and their resellers. For information about becoming a CiscoPro reseller, contact 1-800-GO-CISCO, or, if outside North America, call your local Cisco sales office.

A CiscoPro product catalog is available on the World Wide Web URL http://www.cisco.

Note Most Kalpana, Combinet, Grand Junction, and Internet Junction products are now part of the CiscoPro line, or they have been incorporated into the Cisco product line described in this catalog, or both.

Internet and Intranet Solution Products

Fulfilling the vision of the Internet and corporate intranets requires tackling challenges such as end-to-end security, TCP/IP access for non-TCP/IP systems, server scalability, and managing an accelerating number of mobile systems. By providing products that augment and complement its router and switching products, Cisco provides complete and integrated end-to-end solutions to these challenging issues.

Benefits of Internet and Intranet Solutions

Cisco's Internet and intranet solution products focus on providing end-to-end solutions in the following areas:

- Internet and intranet security
  Based on the Cisco PIX Firewall and TCP/IP Suite 100 products
- Access to TCP/IP applications by Novell systems
  Based on the IPeXchange family of IPX-to-IP gateway products
- TCP/IP Networking for Digital's Open VMS Systems
  Based on Cisco MultiNet for OpenVMS and MultiNet Secure/IP products
- Scalability of TCP/IP application servers
  Based on Cisco LocalDirector and Cisco DistributedDirector
- Scalable management of plug and play TCP/IP environments
  Based on Cisco DNS/DHCP Manager and Cisco Server Suite 100

Network Management Tools

Cisco offers a wide variety of internetwork and network management applications for Cisco devices.

CiscoWorks

CiscoWorks is a series of SNMP-based internetwork management software applications. CiscoWorks applications are integrated on several popular network management systems including SunNet Manager on Sun workstations (SunOS and Solaris), HP OpenView on Sun or HP systems, and IBM NetView for AIX. CiscoWorks applications extend those industry-standard network management systems to allow device status monitoring, easy configuration, maintenance, and troubleshooting of Cisco devices.

Cisco Works Blue Maps

CiscoWorks Blue Maps permits you to retrieve logical views of both SNA and IP networks. These views are dynamically updated to provide a snapshot of the network as it appears at any given time. An entire router network can be managed from a single workstation when CiscoWorks, Cisco's premier network management solution, is

combined with CiscoWorks Blue Maps. Additionally, the CiscoView application has been enhanced to allow monitoring of Cisco SNA protocols. CiscoWorks Blue Maps permits you to retrieve logical views of both SNA and IP networks that are dynamically updated. The network administrator can then more easily solve and identify problems in the network or in the SNA environment, lowering costs and enhancing operations center productivity.

Cisco Works Blue SNA View

Adding to the CiscoWorks Blue series of products, SNA View provides SNA resource and IP information together on a single console. Previously, network administrators used an SNA console for management of SNA resources, and a Simple Network Management Protocol (SNMP) management platform for IP. CiscoWorks Blue Maps, together with CiscoWorks Blue SNA View, provides the SNA control and correlation needed to manage SNA devices from a UNIX platform, allowing the administrator to see beyond the routers and into the SNA resources.

By interacting with the mainframe, SNA View adds vital Physical Unit (PU) and Logical Unit (LU) information to the Maps created by CiscoWorks Blue Maps. Resource information is dynamically updated to provide a snapshot of a user's network as it appears at any given time. This allows the operator to display a single map that depicts details from the host down to the PU name.

CiscoWorks Blue Native Service Point

CiscoWorks Blue Native Service Point is a network management application that enables NetView or NetMaster operators to access and configure Cisco routers from a mainframe using IBM's Host NetView or Sterlings' NetMaster. Cisco router commands that are entered into the router configuration can be issued at the NetView or NetMaster console.

Cisco Hub/Ring Manager for Windows

Cisco Hub/Ring Manager for Windows is a PC-based Windows application that configures, controls, and monitors the Cisco 2517, Cisco 2518, and Cisco 2519 router/hubs. Cisco Hub/Ring Manager for Windows uses HP OpenView for Windows Network Node Manager and runs on any 486-based IBM-compatible PC or workstation. (HP OpenView for Windows software is not included and must be purchased separately.)

CiscoWorks Windows

CiscoWorks Windows is a suite of integrated PC-based network configuration and diagnostic tools for small to medium-sized networks or remote workgroups that use 5 to 50 Cisco devices. CiscoWorks Windows includes Configuration Builder, Show Commands, Health Monitor, and CiscoView applications. Configuration Builder can run as a standalone application or within the HP OpenView for Windows platform. For more information about CiscoWorks Windows, see the chapter "Internetwork Management."

Cisco Network Management Support CD-ROM

The Cisco Network Management Support CD-ROM contains the latest Cisco network management device and application support files. These files are organized into product "packages" and provide up-to-date management support for the latest Cisco devices. This initial release of the Cisco Network Management Support CD-ROM enhances the capabilities of the CiscoView application within the CiscoWorks line of network management products.

CiscoView

CiscoView is a GUI-based device management software application that provides dynamic status, statistics, and comprehensive configuration information for Cisco Systems' switched internetworking products (switches, routers, concentrators, and adapters). CiscoView graphically displays a physical view of Cisco and CiscoPro devices. Additionally, this network management tool provides monitoring functions and offers basic troubleshooting. Using CiscoView, users can more easily understand the tremendous volume of management data available for internetworking devices, because CiscoView organizes it into graphical device representations presented in a clear, consistent format.

NETSYS Connectivity Tools

NETSYS Connectivity Tools are the first in a series of simulation-based planning and problem-solving products for network managers, analysts, and designers. The Connectivity Tools assist network planners with problem solving, design, and planning activities focusing on network connectivity, route, and flow analysis.

NETSYS Performance Tools

Building on the actual network connectivity model provided by the NETSYS Connectivity Tools, the Performance Tools allow you to create a network baseline from performance and traffic data, and then analyze the interactions between traffic flow, topology, routing parameters, and Cisco Internetwork Operating System (Cisco IOS) features. You can also diagnose and solve operational problems, test "what if" scenarios, tune the network configurations for improved performance, and plan for incremental network changes.

AtmDirector

AtmDirector is a new network management application for Asynchronous Transfer Mode (ATM) networks. AtmDirector provides the tools you need to discover and view your ATM network, configure soft permanent virtual channel connections (SPVCs) and soft permanent virtual path connections (SPVPs), monitor devices and manage virtual circuits, manage faults and performance, interact with and configure the devices on your network through CiscoView, and check network connectivity.

TrafficDirector

TrafficDirector provides full-featured RMON console management to network administrators. TrafficDirector uses a GUI for monitoring RMON statistics and protocol analysis information. In addition, TrafficDirector provides extensive tools that simplify data collection, analysis, and reporting on a variety of platforms. For more information about TrafficDirector, see the chapter “Internetwork Management.”

CiscoWorks Switched Internetwork Solutions

As networks evolve from multiple shared segments to a switched infrastructure, new management applications are required to enable network administrators to more effectively manage their network. CiscoWorks Switched Internetwork solutions, which includes VlanDirector, TrafficDirector, and CiscoView, delivers a management system optimized for growing switched internetworks. The suite includes management applications for critical services such as autodiscovery and topology, VLAN management, and performance management, all integrated with Cisco’s CiscoView graphical device management application. For more information about CiscoWorks Switched Internetwork solutions, see the chapter “Internetwork Management.”

SwitchProbe Network Monitoring Probes

Cisco offers a complete family of standalone enhanced RMON probes for monitoring any segment, ring, or switch link in an enterprise network. Cisco SwitchProbes employ the powerful EnterpriseRMON agent technology. Unlike other RMON implementations, EnterpriseRMON monitors traffic at the physical, network, and application layers. A typical enterprise network can be equipped with multiple SwitchProbes with one probe connected to each critical network ring or switch link. SwitchProbes are managed and controlled from a centrally located network management console.

Multimedia Networking

Cisco’s solutions for networked multimedia applications demonstrate the strength and versatility of the Cisco product line.

Emerging multimedia applications make three major demands on a network: scalable bandwidth, multipoint packet delivery, and end-to-end quality of service guarantee.

- Scalable bandwidth

  In workgroup environments, many individual desktops often share a single LAN segment. The most cost-effective way to give these users more bandwidth is by microsegmenting the LAN with fewer users on each segment. Such microsegmentation can be implemented gradually or all at once, as application usage patterns evolve, using Catalyst switches.

At the campus or backbone level, Cisco supports both 100BaseT, FDDI and ATM routing and switching for increasing backbone bandwidth. Cisco 4000 series and Cisco 7000 family of routers feature FDDI and ATM interfaces; the Cisco 7000 family also supports 100BaseT interfaces; and Cisco offers two ATM switches—the LightStream 1010 next-generation ATM switch, and the LightStream 2020 ATM switch for enterprise and wide-area ATM connectivity.

For the WAN, Cisco offers a comprehensive set of technologies, including dedicated lines, Frame Relay, SMDS, ISDN, and ATM. Cisco's bandwidth-on-demand techniques, which enable a router to assign additional bandwidth when traffic requires it, are especially well suited to multimedia networking.

- Multipoint packet delivery

  Cisco is the first major networking vendor to support IP Multicast multiprotocol packet delivery on both router and switch platforms. With IP Multicast, the sending computer transmits a packet addressed to all intended recipients, and the network replicates the packet only when necessary.

  IP Multicast also is being used to build the multicast backbone (MBONE) experimental backbone running on the public Internet; the Internet Engineering Task Force (IETF) uses MBONE to disseminate proceedings of general sessions and technical forums, and for research on collaborative computing. Cisco worked with the IETF to define a scalable multicast routing protocol, Protocol Independent Multicast (PIM). Cisco is shipping full support for PIM today to allow networked devices to build efficient trees for multicast packets.

- End-to-end quality service

  Cisco IOS software includes priority queuing, which allows the user to place high-priority traffic at the head of the queue; and custom queuing, which guarantees minimum bandwidth to selected traffic. Weighted fair queuing further improves these features by automating configuration thereby eliminating manual configuration to distinguish data types.

Cisco’s plans for the future include additional technologies for multimedia, for example, Resource Reservation Protocol (end-to-end internetwork protocol that allows applications to dynamically reserve necessary resources for different classes of service); a weighted fair queuing algorithm (reduces latency and minimizes jitter); and Simple Multicast Routing Protocol (enhances multicast packet delivery in Apple Macintosh environments).

LightStream Network Management

The LightStream 2020 uses VirtualStream and StreamView network management tools, which are described in the “Software” section in the chapter “Cisco LightStream 2020.”

The LightStream 1010 uses CiscoView for LightStream 1010 and AtmDirector, which are described in the chapter “Cisco LightStream 1010.”

Cisco Connection

Cisco Connection is a family of interactive electronic services designed to enhance the business relationships between Cisco and its global customers, partners, prospects, suppliers, and employees.

The Cisco Connection family was created by leveraging and expanding the strengths of the service and support applications of Cisco Information Online (CIO) and the information delivery and retrieval capabilities of Cisco's CD-ROMs. We have created this family to better brand and communicate our world-class electronic services.

Cisco Connection is an example of how Cisco leverages electronic media to conduct interactive, engaging business relationships with our global customers, partners, suppliers, and employees. Cisco Connection improves productivity, lowers the costs of doing business, improves access to and immediacy of information and services, and allows users to customize their interactions.

With the launching of Cisco Connection, CIO, UniverCD, SynchroniCD, and ConsultanCD began the transition to a new, more consistent look and feel. In addition, the Web sites and CD-ROM names changed.

The Cisco Connection components follow:

- Cisco Connection Online (formerly called Cisco Information Online or CIO)
- Cisco Connection CD-ROMs:
  - Cisco Connection Documentation, Enterprise Series (formerly called UniverCD)
  - Cisco Connection Sales Tools (formerly called SynchroniciCD)
  - Cisco Connection Consultant Information (formerly called ConsultantCD)
  - Cisco Connection Training (for more information, see the section "Training Documentation" in the chapter "Documentation").
  - Cisco Connection Configuration, Pricing, and Order Agents
  - Cisco Connection Technical Assistance

To access Cisco Connection Online, use the World Wide Web URL http://www.cisco.com. For additional access information, see "Cisco Connection Online" in the chapter "Service and Support."

Products at a Glance

The following tables provide a comparison of features and a product line overview:

- Modular routers, see Table 1
- Fixed-configuration routers, see Table 2
- Access servers, see Table 3
- LAN Extenders, see Table 4
- ATM switches, see Table 5
- Workgroup products, see Table 6
- Routers on a PC card, see Table 7
- PC-based ISDN remote node products, see Table 8

Table 1 Cisco Modular Routers

System	Special Characteristics	Module Slots	Supported Media	Processor	Flash Memory
Cisco 7505 Cisco 7507 Cisco 7513	High-speed CyBus Online insertion and removal Optional redundant power system, Cisco 7507 and Cisco 7513 only Environmental monitoring Flash memory standard 1 Gbps (Cisco 7505) or 2 Gbps bandwidth (Cisco 7507 and Cisco 7513) Cisco IOS feature sets	7505: 5 7507: 7 7513: 13	Fast Ethernet—100 Mbps Ethernet (AUI) 10BaseT, 10BaseFL—10 Mbps Token Ring—4 or 16 Mbps FDDI—100 Mbps HSSI—52 Mbps Serial—EIA/TIA-232, EIA/TIA-449, EIA-530, V.35, X.21, E1, G.703 ATM—34, 45, 100, 155 Mbps Channelized T1 and E1 ISDN PRI IBM channel	MIPS RISC 16-128 MB DRAM	8 MB expandable to 40 MB
Cisco7206 Cisco7204	Peripheral Component Interconnect (PCI) bus Online insertion and removal Optional redundant power system Dual hot-swappable, load-sharing power supplies Environmental monitoring Downloadable software 1.6 Gbps bandwidth Cisco IOS feature sets	7206:6 7204:4	Fast Ethernet—100 Mbps Ethernet 10BaseT, 10BaseFL—10 Mbps Token Ring—4 or 16 Mbps FDDI—100 Mbps Serial—EIA/TIA-232, EIA/TIA-449, EIA-530, V.35, X.21	MIPS RISC 16-128 MB DRAM	8 MB expandable to 40 MB
Cisco 7000 Cisco 7010	High-speed CxBus Online insertion and removal Optional redundant power system, Cisco 7000 only Environmental monitoring Flash memory standard 533 Mbps bandwidth Cisco IOS feature sets Optional RSP7000 for increased performance and functionality	7000: 5 7010: 3	Fast Ethernet—100 Mbps Ethernet (AUI) 10BaseT, 10BaseFL—10 Mbps Token Ring—4 or 16 Mbps FDDI—100 Mbps HSSI—52 Mbps Serial—EIA/TIA-232, EIA/TIA-449, EIA-530, V.35, X.21, E1, G.703 ATM—34, 45, 100, 155 Mbps Channelized T1 and E1 ISDN PRI IBM channel	RP: 25-MHz 68040 16/64-MB RAM RSP7000: MIPS RISC 16-128 MB DRAM	RP: Standard: 4 MB Expandable to 16MB using Flash memory card RSP7000: 8 MB expandable to 40 MB

System	Special Characteristics	Module Slots	Supported Media	Processor	Flash Memory
Cisco 4000-M Cisco 4500-M Cisco 4700-M Cisco 4700-M-DC[1]	Modular router Flash memory standard Cisco IOS software feature sets (Cisco 4000-M, Cisco 4500-M, and Cisco 4700-M)	3	Ethernet (AUI/10BaseT)—10 Mbps Token Ring—4 or 16 Mbps FDDI—100 Mbps Serial—to 8 Mbps (X.21, V.35, EIA/TIA-232, EIA/TIA-449, EIA-530) Serial—to 2 Mbps (G.703), 4 ports ISDN BRI—4 or 8 ports Channelized E1/ISDN PRI—1 port Channelized T1/ISDN PRI—1 port ATM OC-3c—1 port ATM DS-3—1-port ATM E3—1-port	Cisco 4000-M: 40-MHz 68030, 8-MB DRAM Cisco 4500-M: 100-MHz IDT Orion RISC, 8-MB DRAM Cisco 4700-M: 133-MHz IDT Orion RISC, 16-MB DRAM	Standard: 4 MB, expandable to 8 MB/16 MB Standard: 4 MB, expandable to 8 or 16 MB Standard: 4 MB, expandable to 8 or 16 MB
Cisco 2524 Cisco 2524-DC[1] Cisco 2525	Modular router—chassis accommodates up to three WAN modules Flash memory standard Cisco IOS software feature sets	3	Ethernet (AUI or 10BaseT) Token Ring (STP or UTP) ISDN BRI (with or without integrated NT1) Serial (X.21, V.35, EIA/TIA-232, EIA/TIA-449, EIA-530) Switched 56 56/64-kbps (for leased or circuit-switched lines) Fractional T1/T1	20-MHz 68030 Standard DRAM: 2, 4, or 6 MB[2] Optional DRAM: Up to 18 MB	Standard: 4 or 8 MB[2] Optional: 8 or 16 MB

1. Available with a DC power supply.
2. The amount of memory required depends on the Cisco IOS software feature set ordered.

Table 2 Cisco Fixed-Configuration Routers

System	Special Characteristics	Supported Media	Processor	Flash Memory
Cisco 2500	2501—1 Ethernet, 2 serial 2501-DC[1]—1 Ethernet, 2 serial 2501CF[2]—2 serial, CFRAD software 2501LF—1 Ethernet, 2 serial, LAN FRAD software 2502—1 Token Ring, 2 serial 2502CF[2]— 2 serial, CFRAD software 2502LF—1 Token Ring, 2 serial, LAN FRAD software 2503—1 Ethernet, 2 serial, 1 ISDN BRI 2503-DC[1]—1 Ethernet, 2 serial, 1 ISDN BRI 2503I[2]—1 Ethernet, 1 ISDN BRI 2504—1 Token Ring, 2 serial, 1 ISDN BRI 2504I[2]—1 Token Ring,1 ISDN BRI 2505—8 Ethernet UTP hub ports, 2 serial 2505-DC[1]—8 Ethernet UTP hub ports, 2 serial 2507—16 Ethernet UTP hub ports, 2 serial 2507-DC[1]—16 Ethernet UTP hub ports, 2 serial 2509—1 Ethernet, 2 serial, 8 async 2509-DC[1]—1 Ethernet, 2 serial, 8 async 2510—1 Token Ring, 2 serial, 8 async 2511—1 Ethernet, 2 serial,16 async 2511-DC[1]—1 Ethernet, 2 serial,16 async 2512—1 Token Ring, 2 serial,16 async 2513—1 Ethernet, 1 Token Ring, 2 serial 2514—2 Ethernet, 2 serial 2514-DC[1]—2 Ethernet, 2 serial 2515—2 Token Ring, 2 serial 2516—14 Ethernet UTP hub ports, 2 serial, 1 ISDN BRI 2516-DC[1]—14 Ethernet UTP hub ports, 2 serial, 1 ISDN BRI 2517—11 Token Ring UTP hub ports, 2 serial, 1 ISDN BRI 2518—23 Ethernet UTP hub ports, 2 serial, 1 ISDN BRI 2519—23 Token Ring UTP hub ports, 2 serial, 1 ISDN BRI 2520—1 Ethernet (AUI or 10BaseT), 2 high-speed sync serial, 1 ISDN BRI, 2 low-speed sync/async serial, AC power supply 2520-DC—1 Ethernet (AUI or 10BaseT), 2 high-speed sync serial, 1 ISDN BRI, 2 low-speed sync/async serial 2520CF—2 high-speed sync serial, 2 low-speed sync/async serial, CFRAD software 2520LF—1 Ethernet, 2 high-speed sync serial, 2 low-speed sync/async serial, LAN FRAD software 2521—1 Token Ring, 2 high-speed sync serial, 1 ISDN BRI, 2 low-speed sync/async 2521-DC—1 Token Ring, 2 high-speed sync serial, 1 ISDN BRI, 2 low-speed sync/async 2521CF—2 high-speed sync serial, 2 low-speed sync/async, CFRAD software 2521LF—1 Token Ring, 2 high-speed sync serial, 2 low-speed sync/async, LAN FRAD software	Ethernet (AUI)—10 Mbps Token Ring—4 or 16 Mbps Serial—EIA/TIA-232, EIA/TIA-449, V.35, X.21, EIA-530 ISDN BRI 10BaseT Ethernet hub ports UTP Token Ring hub ports	20-MHz 68030 Standard DRAM: 2, 4, or 6 MB[3] Optional DRAM: Up to 18 MB	Standard: 4 or 8 MB[3] Optional: 8 or 16 MB

System	Special Characteristics	Supported Media	Processor	Flash Memory
Cisco 2500, continued	2522—1 Ethernet (AUI or 10BaseT), 2 high-speed sync serial, 1 ISDN BRI, 8 low-speed sync/async 2522-DC—1 Ethernet (AUI or 10BaseT), 2 high-speed sync serial, 1 ISDN BRI, 8 low-speed sync/async serial 2522CF—2 high-speed sync serial, 8 low-speed sync/async serial, CFRAD software 2522LF—1 Ethernet, 2 high-speed sync serial, 8 low-speed sync/async serial, LAN FRAD software 2523—1 Token Ring, 2 high-speed sync serial, 1 ISDN BRI, 8 low-speed sync/async 2523-DC—1 Token Ring, 2 high-speed sync serial, 1 ISDN BRI, 8 low-speed sync/async 2523CF—2 high-speed sync serial, 8 low-speed sync/async, CFRAD software 2523LF—1 Token Ring, 2 high-speed sync serial, 8 low-speed sync/async serial, LAN FRAD software 2524—See Table 1. 2525—See Table 1. Cisco 2500 series routers support Cisco IOS software feature sets. Mission-specific models contain less memory and less hardware functionality to support a subset of protocols.	Ethernet (AUI)—10 Mbps Token Ring—4 or 16 Mbps Serial—EIA/TIA-232, EIA/TIA-449, V.35, X.21, EIA-530 ISDN BRI 10BaseT Ethernet hub ports UTP Token Ring hub ports	20-MHz 68030 Standard DRAM: 2, 4, or 6 MB[3] Optional DRAM: Up to 18 MB	Standard: 4 or 8 MB[3] Optional: 8 or 16 MB
Cisco 1003 and Cisco 1004	Dial-on-demand ISDN routers	1 10BaseT Ethernet LAN 1 ISDN BRI (Cisco 1004 router includes an integrated NT1 device, the Cisco 1003 does not) 1 Type-2 PCMCIA Flash memory card slot	25-MHz Motorola 68360 processor	Standard: None Optional: 2- or 4-MB Flash ROM card
Cisco 1005	Synchronous serial router Cisco IOS asynchronous feature set (optional)[4]	1 10BaseT Ethernet 1 synchronous serial port 1 Type-2 PCMCIA Flash memory card slot	25-MHz Motorola 68360 processor	Standard: None Optional: 2- or 4-MB Flash ROM card
Cisco 760 series	Dial-on-demand ISDN routers	ISDN BRI (U and S interfaces) 10BaseT 10Base2 10Base5 RJ-11 basic telephone port	25-MHz 80386	512 KB

1. Available with a DC power supply.
2. Mission-specific router. The Cisco 2501CF and Cisco 2502CF are field upgradeable to enable the Ethernet and Token Ring interfaces included with the product. The Cisco 2503I and Cisco 2504I are field upgradeable to enable the two synchronous serial interfaces included with the product.
3. The amount of memory required depends on the Cisco IOS software feature set ordered.
4. This option enables dial-on-demand over asynchronous basic telephone lines. Bridging, AppleTalk, and remote node functionality are not supported.

Table 3 Cisco Access Servers

System	Special Characteristics	Supported Media	Processor	Flash Memory
Cisco 2500 series access servers	2509—1 Ethernet, 2 serial, 8 async 2509-DC[1]—1 Ethernet, 2 serial, 8 async 2510—1 Token Ring, 2 serial, 8 async 2511—1 Ethernet, 2 serial,16 async 2511-DC[1]—1 Ethernet, 2 serial,16 async 2512—1 Token Ring, 2 serial,16 async	Ethernet (AUI)—10 Mbps Serial—EIA/TIA-232, EIA/TIA-449, V.35, X.21, EIA-530 115.2 kbps asynchronous	20-MHz 68030 2- to 18-MB DRAM	Standard: 4 MB Optional: 8 or 16 MB
Cisco AS5100 access server	17 card slots Up to 16 network application cards (support hot swapping) Redundant AC or DC power supplies	Up to 48 V.32*bis* or V.34 modems T1 interface—internal mapping of individual DS0s to modems Up to 48 asynchronous serial ports Up to 3 synchronous serial ports Up to 3 10BaseT Ethernet ports	20-MHz 68030 2- to 18-MB DRAM	Standard: 4 MB Optional: 8 or 16 MB
Cisco AS5200 universal access server	1 Ethernet, 2 serial Up to 3 feature cards that provide either channelized T1, PRI, or modem support AC or DC power supply	Ethernet Synchronous serial PRI/T1	20-MHz 68030	Standard: 8 MB

1. Available with a DC power supply.

Table 4 Cisco LAN Extender

Product	Special Characteristics	Interface
Cisco 1001	Multiprotocol LAN extender Connects to Cisco 7000 series, Cisco 4000 series, Cisco 2500 series, or AGS+ host router Cisco IOS LAN extension software	10BaseT and AUI Ethernet LAN V.35 synchronous serial

Table 5 Cisco ATM Switches and Adapters

Product	Special Characteristics	Interface
Cisco LightStream 2020 ATM Switch	Multiservice ATM switch 12-slot chassis Hot swappable and scalable Redundant subsystems 2 management tools: StreamView (SNMP-based) CiscoView for Lightstream 2020 Sophisticated LAN/WAN traffic and congestion management including large buffers LAN services: workgroups, application specific QOS, and high-performance multicast Interface timing: Loop timing, Stratum accuracy clock for self-timing, master clock distribution port	ATM: T3 E3 (G.804) STS-3c/STM-1 SM STS-3c/STM-1 MM LAN: Ethernet Fiber Ethernet FDDI WAN: Frame Relay Frame forwarding Circuit emulation: Clear channel T1 and Clear channel E1 (G.703) Serial: EIA/TIA-449, X.21, or V.35
Cisco LightStream 1010 ATM switch	Desktop or campus ATM switch 5-slot chassis contains: ATM Switch Processor module Up to 4 carrier modules Up to 2 port adapter modules per carrier module Optional redundant power supply 2 management tools: AtmDirector CiscoView for the LightStream 1010 Interface timing: Loop timing, Stratum accuracy clock for self-timing, master clock distribution port Available bit rate congestion control PNNI ATM routing	SONET STS3c/SDH STM1 multimode fiber ports, SC connectors SONET STS3c/SDH STM1 single-mode fiber ports, SC connectors SONET STS3c/SDH STM1 UTP-5 ports, SC connectors SONET STS12c/SDH STM4c single-mode fiber port, SC connector DS3 ports, BNC connectors E3 ports, BNC connectors Standard Ethernet and dual EIA/TIA 232 serial ports on ASP module
StrataCom BPX Service Node	15 module slots Switch capacity of 20 Gbps Twelve 800-Mbps switch ports support up to OC-12 cell rate Up to 16 programmable queues	T3 (44.736 Mbps) with PLCP per TA-TY-000773 OC-3 (155.520 Mbps) with SONET framing E3 (34.368 Mbps) per ITU-T Rec. G.804 STM-1 (155.520 Mbps) with SDH framing OC12/STM-4
StrataCom IGX	16- to 32-slot chassis 1.2 Gbps cell switching bus Circuit switched data service modules Frame Relay service modules Network trunking modules	V.35, RS 422, RS 449, X.21/V.36, and T1/E1 (channelized and nonchannelized) interfaces
StrataCom Intelligent Network Server	Intelligent call processing for ATM WANs Runs UNIX on a SparcStation	Protocol feature software: AT&T 4/5 ESS NTI DMS ETSI EUROISDN NTT (Japan) AUSTEL (Australia)

Table 6 Cisco Workgroup Products

Product	Special Characteristics	Network Interfaces	Supported Media	Processors and Memory
Catalyst 5000 switching system	High-performance 1.2 Gbps switching backplane supports over 1 million pps Hot-swappable modules Redundant AC power supply First slot: Supervisor Engine Remaining 4 slots for: 24 to 192 10BaseT 12 to 48 10BaseFL 12 to 50 10/100BaseTX 12 to 50 100BaseFX 1 to 4 CDDI/FDDI 1 to 3 ATM OC-3c Supervisor Engine with dual embedded 100BaseTX/FX Unique traffic management capabilities include: tri-level priority on the backplane, embedded four group of RMON and Ethernet MIB in the ASIC Switched Port Analyzer (SPAN) 1000 virtual LANs for enterprise network supporting trunking over fast Ethernet, FDDI and ATM Load balancing on Fast Ethernet using 802.1d spanning-tree, and VLANS Advanced ATM software capabilities: UNI 3.1, PVC, SVC, LANE Flush, Redundant LECS/LES/BUS CiscoWorks for Switched Internetworks Applications: CiscoView, VlanDirector, TrafficDirector	Modules: 24-port 10BaseT 48-port 10BaseT 12-port 10BaseFL 12-port 10/100BaseTX 12-port 100BaseFX DAS CDDI/FDDI Dual UTP OC-3c ATM	Ethernet (RJ-21) Telco, 10BaseT—10 Mbps Ethernet (ST) 10BaseFL—10 Mbps Fast Ethernet (RJ-45) 100BaseTX—100 Mbps 10/100BaseTX—100 Mbps Fast Ethernet (MII) 100BaseT—100 Mbps (Supervisor Engine only) Fast Ethernet (SC) 100BaseFX—100 Mbps CDDI (RJ-45)—100 Mbps FDDI (MIC, ST)—100 Mbps ATM (RJ-45)—155 Mbps ATM (SC)—155 Mbps	Motorola 68EC040 256-KB NVRAM 8-MB RAM 4-MB Flash memory

Product	Special Characteristics	Network Interfaces	Supported Media	Processors and Memory
Catalyst 3000 series	Fault-tolerant stackable switching Plug'n play, automatic self-learning Ethernet switch Full-duplex support Stackable architecture managed as a single entity Expandable Supports 64 virtual LANs Supports up to 1,700 addresses per port, 10,000 addresses per system SwitchProbe monitoring port EtherChannel support Spanning-tree Telnet support Flash memory software upgrades Optional redundant logic and power 1.12 Gbps throughput capacity	16 fixed 10BaseT ports 1 AUI 2 expansion slots: 1-port 100BaseTX 3-port 10BaseFL 1-port 100BaseFL 4-port 10BaseT 1-port ATM (future) 1-port VG-AnyLAN (future)	100BaseTX (RJ-45) 10BaseFL (ST) 100BaseFX (ST) 10BaseT (RJ-45) VG-AnyLAN (RJ-45) ATM (SC) in future	Intel i960
Catalyst 2900	High-performance 1.2 Gbps switching backplane supports over 1 million pps Interfaces: 12-port 10/100BaseTX 12-port 100BaseFX Supervisor Engine with dual embedded 100BaseTX Unique traffic management capabilities include: tri-level priority on the backplane, embedded statistics group of RMON and Ethernet MIB in the ASIC, 192K packet buffers per port Embedded RMON: statistics, history, alarms, events groups 1024 virtual LANs for enterprise network supporting IEEE802.1d spanning-tree Switch Management applications: CiscoView, VlanDirector, TrafficDirector	Supervisor Engine 14 Fast Ethernet ports fixed configurations	Fast Ethernet (RJ-45) 10/100BaseTX—10/100 Mbps Fast Ethernet (MII) 100BaseT—100 Mbps (Supervisor Engine only) Fast Ethernet (SC) 100BaseFX—100 Mbps	Motorola 68EC040 128-KB NVRAM 8-MB RAM 4-MB Flash memory

Product	Special Characteristics	Network Interfaces	Supported Media	Processors and Memory
Catalyst 2820	25 switched Ethernet ports 2 high-speed expansion slots Multiple MAC address support CollisionFree operation for full-duplex 100BaseT, providing up to 200-Mbps bandwidth CiscoView device-management support Up to 320-Mbps maximum forwarding bandwidth and 450,000 packets per second (pps) aggregate packet-forwarding rate	1-port UTP 8-port UTP 1-port fiber 4-port fiber 1-port DAS 1-port SAS	100BaseTX 100BaseFX FDDI fiber FDDI UTP (CDDI)	486 management CPU 3-MB RAM Custom-designed ASK
Catalyst 2600	16 Token Ring ports Supports a maximum of 1790 active Token Ring MAC addresses per port	4-port UTP/STP Token Ring 2-port fiber Token Ring	UTP/STP Token Ring Fiber Token Ring	Intel i960SA 4 MB DRAM
Catalyst 1900	25 switched Ethernet ports 2 fixed 100BaseT ports Multiple MAC address support CollisionFree operation for full-duplex 100BaseT, providing up to 200-Mbps bandwidth CiscoView device-management support Up to 320-Mbps maximum forwarding bandwidth and 450,000 packets per second (pps) aggregate packet-forwarding rate	25 switched Ethernet ports: 24 10BaseT and one AUI 2 fixed, switched 100BaseT ports	100BaseTX 100BaseFX	486 management CPU 3 MB RAM Custom-designed ASK
Catalyst 1800	Autosensing and autoconfiguring ports for 4-Mbps or 16-Mbps ring speeds	8 or 16 Token Ring or 12 Token Ring with 1 FDDI	RJ-45 connectors, supporting either UTP or STP cabling	1 MB of Flash memory
FastHub 100+ series 100BaseT hubs	Choice of 2 models Connects to 100BaseT port on Cisco routers or Catalyst switches Four FastHub 100+ hubs can be stacked to create a single logical repeater of up to 128 ports Two FastHub 100+ stacks can be interconnected to create a single collision domain of up to 254 ports	16-port 100BaseTX 16-port 100BaseTX with 15 100BaseTX ports and 1 100BaseFX port 16-port 100BaseTX expansion module	100BaseTX ports: Two-pair Category 5 UTP wiring RJ-45 connectors 100BaseFX ports: 62.5/125 or 50/125-micron multimode fiber-optic cabling SC connectors	486 management CPU 3 MB RAM Custom-designed ASK

Product	Special Characteristics	Network Interfaces	Supported Media	Processors and Memory
FastHub 100 series 100BaseT repeaters	Choice of 3 models Connects to 100BaseT port on Cisco routers or Catalyst switches Two interconnected FastHub 100s can support workgroups of up to 22 nodes on each router or switch port	4-port 100BaseTX 8-port 100BaseTX 12-port 100BaseFX	100BaseTX ports: Two-pair Category 5 UTP wiring RJ-45 connectors 100BaseFX ports: 62.5/125 or 50/125-micron multimode fiber-optic cabling ST connectors	Custom-designed ASICs
Catalyst 1600 Token Ring switch	Cut-through Token Ring switching VLANs Full-duplex Token Ring SNMP and Telnet management	8 or 12 switched Token Ring ports per chassis	IEEE 802.5 Token Ring, 4 and 16 Mbps Optional FDDI adapter Optional OC-3c (Q4 1996) Support for Category 3 and 5 UTP cable or Type 1 and 2 STP cable	8-MB RAM Intel i486 management CPU
SwitchProbe monitoring probes	Plug ‘n Play installation Supports all applicable standard RMON MIB groups as defined in RFC 1757 and 1513) Virtual analyzer for 7-layer concurrent monitoring of multiple network parameters	CDDI FDDI Ethernet Token Ring	CDDI: RJ-45 accepts Category 5 UTP or sheath-shielded cable with MIC connector FDDI: single or dual SC connectors accept SC-to-SC or SC-to-MIC multimode cable Ethernet: AUI, 10BaseT, BNC Token Ring: 9-pin D STP, RJ-45 socket UTP	CDDI: 100-MHz Pentium, 8-32 MB RAM FDDI: 100-MHz Pentium, 16-32 MB RAM Ethernet: 90-MHz 80486 4-16 MB RAM Token Ring: 90-MHz 80486 8-16 MB RAM

Product	Special Characteristics	Network Interfaces	Supported Media	Processors and Memory
CDDI/FDDI workgroup WS-C1400 concentrator	Traffic generation utility SMT window Scheduled insertion Advanced Telnet Software configuration of ports	2 slots for 4 to 32 CDDI/FDDI interfaces	Multimode or single-mode FDDI—100 Mbps CDDI (FDDI over Category 5 UTP)—100 Mbps	68030 2-MB Flash memory
Catalyst 1200 series workgroup switches: WS-C1201 WS-C1202 WS-C1211 WS-C1212 WS-C1221 WS-C1241 WS-C1251 WS-C1261	APaRT IP fragmentation Bridge groups Virtual IP Access lists IP multicast Broadcast suppression Switched port analyzer Embedded RMON software VLANs (802.10) Admin. port	WS-C1201: Multiples of 8 10BaseT: 1,024 addresses WS-C1202: Multiples of 8 10BaseT: 4,096 addresses WS-C1211: Multiples of 8 10BaseFL: 1,024 addresses WS-C1212: Multiples of 8 10BaseFL: 4,096 addresses WS-C1221: 1,024 addresses, 8 10BaseT with bundled FDDI A/B (MIC) WS-C1241: 1,024 addresses, 8 10BaseT with bundled CDDI A/B (MLT-3) WS-C1251: 4096 addresses, 8 10Base-FL with bundled FDDI A/B (MIC) WS-C1261: 4096 addresses, 8 10Base-FL with bundled CDDI A/B (MLT-3)	Ethernet—10 Mbps Optional media: multimode or single-mode FDDI—100 Mbps CDDI (FDDI over Category 5 UTP): 100 Mbps Ethernet over Fiber (10BaseFL)	20-MHz 68EC030 40-MHz RISC CPU, 4-MB RAM 3-MB Flash memory

Table 7 Cisco Routers on a PC Card

Product	Special Characteristics	Interface
AccessPro PC card Model AP-EC	Multiprotocol router card for ISA or EISA bus-based PCs	Ethernet 10BaseT port Synchronous serial port Auxiliary port
AccessPro PC card Model AP-RC	Multiprotocol router card for ISA or EISA bus-based PCs	Token Ring (4 or 16 Mbps) port Synchronous serial port Auxiliary port
AccessPro PC card Model AP-EBC	Multiprotocol router card for ISA or EISA bus-based PCs	Ethernet 10BaseT port ISDN (BRI) port 2 synchronous serial ports Auxiliary port
AccessPro PC card Model AP-RBC	Multiprotocol router card for ISA or EISA bus-based PCs	Token Ring (4 or 16 Mbps) port ISDN (BRI) port 2 synchronous serial ports Auxiliary port

Table 8 Cisco PC-Based ISDN Remote Node Products

Product	Special Characteristics	Interface
Cisco 200 series	ISDN NIC with ODI workstation driver software (IPX and TCP/IP) for ISA bus-based PC	ISDN (BRI) port