Internetwork Management

Cisco provides applications that centralize management, automate routine tasks, and can be integrated into customers' existing network management environments. This chapter contains the following sections:

- CiscoWorks
- CiscoWorks Blue Maps
- CiscoWorks Blue SNA View
- CiscoWorks Blue Native Service Point
- Cisco Hub/Ring Manager for Windows
- CiscoWorks Windows
- CiscoWorks for Switched Internetworks
- CiscoView
- Cisco Network Management Support CD-ROM

- NETSYS Connectivity and Performance Tools
- AtmDirector
- LightStream 2020 Network Management
  - ControlStream Traffic Management Software
  - StreamView Network Management Software
  - VirtualStream Virtual LAN Software
- TrafficDirector
- Total Control Manager/SNMP

A brief summary of the internetwork management applications is displayed in Table 25.

Table 25 Summary of Cisco's Internetwork Management Applications

Network Management Application	Devices Supported or Managed by the Application	Product Platform(s)
CiscoWorks	Various Cisco devices	SunNet Manager HP OpenView on SunOS/Solaris HP OpenView HP-UX IBM NetView for AIX
CiscoWorks Blue Maps	SNA-enabled Cisco routers	SunNet Manager HP OpenView HP-UX IBM NetView for AIX
CiscoWorks Blue SNA View	SNA-enabled Cisco routers and SNA devices managed by mainframe	SunNet Manager HP OpenView HP-UX IBM NetView for AIX
CiscoWorks Blue Native Service Point	Cisco routers	IBM NetView for MVS Sterling Netmaster
Cisco Hub/Ring Manager for Windows	Cisco 2517, 2518, 2519	PC with Microsoft Windows 3.1 and HP OpenView Windows
CiscoWorks Windows	Cisco routers, switches, access servers, concentrators, adapters, and ATM switches	PC with Microsoft Windows NT 3.51 or Windows 95 4.0 running CastleRock SNMPc (bundled with CiscoWorks Windows) or HP OpenView Windows (optional)
CiscoView	Cisco routers, switches, access servers, concentrators, adapters, and ATM switches (LightStream 100 and LightStream 2020)	Fully functional as a standalone product on UNIX workstations, or integrated with: SunNet Manager HP OpenView on SunOS/Solaris HP OpenView HP-UX IBM NetView for AIX Also bundled with CiscoWorks
NETSYS Connectivity Tools	Cisco routers	SunOS, Solaris, AIX, and HP-UX
NETSYS Performance Tools	Cisco routers	SunOS, Solaris, AIX and HP-UX (used with NETSYS Connectivity Tools)
AtmDirector	Cisco routers, switches, access servers, concentrators, adapters in ATM networks	Solaris
ControlStream StreamView VirtualStream	LightStream 2020	Sun SPARCstation with SunOS and HP OpenView
TrafficDirector	RMON console management	SunNet Manager HP OpenView IBM NetView for AIX PC Standalone on UNIX workstations. Also compatible with CiscoWorks
Total Control Manager/SNMP	Modem and T1 cards in Cisco 5100 access server	PC with Microsoft Windows 3.1
CiscoWorks for Switched Internetwork Solutions (includes VlanDirector, TrafficDirector, and CiscoView)	Comprehensive support for Cisco Catalyst switches	Fully functional as a standalone product on UNIX workstations, or integrated with: SunOS (4.1.3, 4.1.4) Solaris (2.4) IBM (AIX 3.2, 4.1) HP UNIX (10.x) Windows NT (3.5.1)

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.

CiscoWorks includes an extensive online help system with context-sensitive help. You can select highlighted text to open additional help windows and use context-sensitive help for accessing relevant information. The online help provides overviews, related information, procedures, and a glossary of terms. In addition, you can search for help topics by entering words or phrases in the search window.

Following are some of the applications included in CiscoWorks:

- AutoInstall Manager

  Allows you to remotely install a new router using a neighboring router. Performs AutoInstall tasks automatically and simplifies tasks that would otherwise be handled manually.

- CiscoConnect

  A new feature that allows you to provide Cisco and Cisco partners with debugging information, configurations, and topology information to speed resolution of network problems, as well as case submission for customers with Internet mail. CiscoConnect can also compile a profile of your networks for Cisco Connection (formerly CIO), so that Cisco Connection can notify you via customized news bulletins of new features and bug fixes relevant to your network.

- CiscoView

  Provides dynamic status, statistics, and comprehensive configuration information for Cisco's switched internetworking products (switches, routers, access servers, concentrators, and adapters). CiscoView graphically displays a physical view of Cisco devices. Additionally, this network management tool provides monitoring functions and offers basic troubleshooting. CiscoView is bundled with CiscoWorks and is also available as a standalone product.

- 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 enhances the capabilities of the CiscoView application within the CiscoWorks line of products.

- Configuration File Management

  Provides an audit trail for who made changes and when. It can also detect unauthorized configuration changes that occur on your network.

- Contacts

  Obtain information about the contact person for a specific device including the complete name, phone number, e-mail address, title, location, and address.

- Device Management

  Creates and maintains a database that holds a complete inventory of your network—hardware, software, release levels of operation components, individuals responsible for maintaining the devices, and associated locations.

- Global Command Facility

  Routers often share similar configuration parameters, such as passwords or access lists. With the Global Command Facility, you can create configuration Snap-Ins that can be applied automatically to groups of routers.

- Health Monitor

  Allows you to view information about the status of a device, including buffers, CPU load, memory available, and protocols and interfaces being used.

- Offline Network Analysis

  Collects historical network data for off-line analysis of performance trends and traffic patterns. The integrated Sybase SQL relational database server stores designated SNMP Management Information Base (MIB) variables (byte count, packet count, and so forth) from which you can create queries and generate graphs.

- Path Tool

  Allows you to view and analyze the path between two devices. Performs analysis on the path to collect utilization and error data.

- Security Manager

  Sets up authority checking procedures to protect selected CiscoWorks applications and your network devices from unauthorized individuals by setting up your CiscoWorks environment to require a login to access applications. This protection ensures that only users and groups with valid accounts and passwords can perform tasks such as configuring a router, deleting database device information, and defining polling procedures.

- Software Manager

  Minimizes upgrade costs by enabling administrators to centrally distribute and manage router software throughout the internetwork. Applications include the following:

  — The Software Library Manager. Provides a central repository for all Cisco IOS software and eliminates tedious tasks performed by users.

  — The Software Inventory Manager. Enables you to quickly and easily find the routers you want to upgrade. It automatically tracks software versions running on your network.

  — The Device Software Manager. Builds on the Flash memory capabilities of the Cisco routers, guiding users through a safe and simple upgrade process.

Table 26 lists CiscoWorks Internetwork Management software product numbers.

Table 26 CiscoWorks Internetwork Management Software and Options

Description	Product Number
CiscoWorks 3.2.1 for HP OpenView HP-UX	CW-3.2.1-OVH
CiscoWorks 3.2.1 upgrade from 2.1 for HP OpenView HP-UX	CW-3.2.1-OVH-UPG
CiscoWorks 3.21 for HP OpenView on SunOS	CW-3.2.1-OVS
CiscoWorks 3.2.1 upgrade from 2.1 for HP OpenView on SunOS	CW-3.2.1-OVS-UPG
CiscoWorks 3.2.1 for SunNet Manager (SNM)	CW-3.2.1-SNM
CiscoWorks 3.2.1 upgrade for (SNM) from CiscoWorks 2.0(x)	CW-3.2.1-SNM-UPG
CiscoWorks 3.0.3 for NetView/ for AIX	CW-3.0.3-NV
CiscoWorks 3.0.3 upgrade from 2.1.2 for NetView for AIX	CW-3.0.3-NV-UPG

Table 27 lists product specifications for CiscoWorks for HP OpenView (HP-UX).

Table 27 CiscoWorks for HP OpenView (HP-UX) Specifications

Description	Specifications
Hardware requirements	HP 9000 System, Series 700 or 800 500-MB free hard disk space 64-MB RAM 128-MB swap space CD-ROM drive Color monitor
Software requirements	HP-UX A.09.03 to A.09.05, 10.01 HP OpenView 3.3 (for A.09.X1), 4.01, 4.1

Table 28 lists product specifications for CiscoWorks for HP OpenView (SunOS/Solaris)

Table 28 CiscoWorks for HP OpenView (SunOS/Solaris) Specifications

Description	Specifications
Hardware requirements	Sun SPARCstation 500-MB free hard disk space 64-MB RAM 128-MB swap space CD-ROM drive Color monitor
Software requirements	HP OpenView 3.3, 4.01, 4.1 SunOS4.1.3 or Solaris 2.4, 2.5

Table 29 lists product specifications for CiscoWorks for SunNet Manager.

Table 29 CiscoWorks for SunNet Manager Specifications

Description	Specifications
Hardware requirements	Sun SPARCstation 400-MB free hard disk space 64-MB RAM 128-MB swap CD-ROM drive Color monitor
Software requirements	SunNet Manager 2.3 SunOS 4.1.3 (Solaris 1.x/SunOS 4.1.4) Solaris 2.4, 2.5

Table 30 lists product specifications for CiscoWorks for NetView for AIX.

Table 30 CiscoWorks for NetView for AIX Specifications

Description	Specifications
Hardware requirements	RS/6000 system, Model 340 or higher 500-MB free hard disk space 64-MB RAM 128-MB swap space CD-ROM drive Color monitor
Software requirements	AIX 3.2.5 or 4.1 NetView for AIX 3.1 or 4.1

CiscoWorks Blue Maps

The CiscoWorks Blue Maps, Software Release 1.0, enables you to view logical maps of Cisco routers that are running Cisco IOS Release 11.0 or higher and configured with either remote source-routed bridging (RSRB), Data Link Switching (DLSw), or Advanced Peer-to-Peer Networking (APPN). Each application (RSRB, DLSw, or APPN Map) presents the network administrator with a dynamic, color-coded network map of routers that are enabled with a specific SNA-related protocol. CiscoWorks Blue Maps requires the related MIBs (RSRB, DLSw, and/or APPN) that are installed on the routers.

CiscoWorks Blue Maps also allows you to launch CiscoView, an application that provides device-level management by depicting the physical layout of Cisco devices. Key pieces of information (such as traffic statistics and error rates) can be obtained by clicking on the appropriate part of the diagram (such as the interface card).

You can manage an entire network from a single workstation by using both CiscoWorks and CiscoWorks Blue Maps.

Using the RSRB Map application, you can discover your network of RSRB-enabled routers and graphically view a map of physical rings, virtual rings, and RSRB peers. In addition, you can select a virtual ring or a peer router and get statistical information about network traffic. The graphical view of your RSRB network can speed problem isolation and help you quickly identify the link, router, or port.

Using the DLSw Map application, you can discover your network of DLSw-enabled routers, view a map of those routers, obtain details about any single router or statistics about any router as known by a neighbor, and display a list of circuits maintained by any router and details about each circuit.

Using the APPN Map, you can discover your network of APPN-enabled routers and graphically view a map of interchange nodes, network nodes, virtual routing nodes, end nodes, low-entry networking (LEN) nodes, and transmission groups. The graphical view of your APPN network can help you identify problems associated with connectivity, traffic, and session path.

After narrowing the source of a problem to a specific network element, you can use other network management tools or dispatch a technician to correct it. All CiscoWorks Blue Maps applications let you customize and store a map of a subset of routers in which you are interested.

CiscoWorks Blue Maps requires a network management platform (such as NetView for AIX, HP OpenView, or SunNet Manager), and CiscoWorks 3.0 or higher..

Table 31 lists CiscoWorks Blue Maps product numbers.

Table 31 CiscoWorks Blue Maps Product Numbers

Description	Product Numbers
CiscoWorks Blue Maps on AIX	BLU-MAP1.0-NV
CiscoWorks Blue Maps on Solaris	BLU-MAP1.0-SUN
CiscoWorks Blue Maps on HP-UX	BLU-MAP1.0-OVH

CiscoWorks Blue SNA View

CiscoWorks Blue SNA View looks beyond the network of routers by reaching into the mainframe for supplemental management data, and displays SNA network nodes in the network maps. You use a single workstation to manage and view both your SNA resources and IP-based routers in an RSRB or APPN network.

The CiscoWorks Blue Maps application must be installed for SNA View to operate. With CiscoWorks Blue Maps, SNA View provides the SNA control and correlation needed to manage SNA devices from a UNIX platform.

SNA View consists of two main elements:

- Pull-down menu items for the CiscoWorks Blue Maps applications to allow the investigation of SNA Physical Units (PUs) and Logical Units (LUs) on a map
- A mainframe software element that reports SNA management data to the workstation (either by LU6.2 or TCP protocol)

Resource information is dynamically updated to provide a snapshot of your network as it appears at any given time. This feature allows you to display a single map that depicts details from the host down to the PU name. This feature also allows you to activate and inactivate SNA resources.

CiscoWorks Blue Maps and CiscoWorks Blue SNA View co-exist with IP-related management tools like CiscoWorks and CiscoView, so the CiscoWorks Blue products can centralize the management of a multiprotocol network onto a single workstation.

Table 32 lists CiscoWorks Blue SNA View product numbers.

Table 32 CiscoWorks Blue SNA View Product Numbers

Description	Product Numbers
CiscoWorks Blue SNA View on AIX	BLU-SNA1.0-NV
CiscoWorks Blue SNA View on SunOS	BLU-SNA1.0-SUN
CiscoWorks Blue SNA View on HP-UX	BLU-SNA1.0-OVH

CiscoWorks Blue SNA View requires CiscoWorks 3.0 or higher, and CiscoWorks Blue Maps.

CiscoWorks Blue Native Service Point

CiscoWorks Blue Native Service Point, Software Release 1.0, is a network management application that enables NetView or Netmaster operators to access and configure Cisco routers from a IBM NetView or Sterling Netmaster console. Operators access Cisco routers via Virtual Telecommunications Access Method (VTAM) and can view, edit, and save router configurations. Native Service Point allows you to issue RUNCMDs and receive responses in the form of NetView Network Management Vector Transports (NMVTs). Any NMVT alerts issued by the Cisco routers are also sent to NetView or Netmaster.

Table 33 lists CiscoWorks Blue Native Service Point product numbers.

Table 33 CiscoWorks Blue Native Service Point Product Numbers

Description	Product Numbers
Native Service Point for NetView	CW-BLU-NSP-1.0-NV
Native Service Point for Netmaster	CW-BLU-NSP-1.0-NM

Table 34 lists CiscoWorks Blue Native Service Point specifications.

Table 34 CiscoWorks Blue Native Service Point Specifications

Description	Specifications
Hardware requirements	PC required to upload software to the mainframe host. PC must have capability to run a 3270 session and provide file transfer capabilities (IND$FILE). Mainframe host running MVS, VM, or VSE operating systems (for NetView) or MVS (for Netmaster).
Software requirements	Host must be running NetView for MVS 1.3 or higher or Sterling Netmaster 3.1 or higher. Cisco routers managed by Native Service Point must be running Cisco IOS Release 11.0.

Cisco Hub/Ring Manager for Windows

The Cisco Hub/Ring Manager for Windows (Version 2.0) is a PC-based Windows application that enables you to graphically configure and monitor the Cisco 2517, 2518, and 2519 router/hubs. It runs within HP OpenView for Windows Network Node Manager on a 486-based IBM PC or compatible system.

This application can optionally be used in combination with CiscoWorks for Windows and provides tools for managing a Token Ring hub, Ethernet hub, and media access control (MAC) of the locally attached Token Ring or Ethernet network.

The Cisco Hub/Ring Manager for Windows includes the following features:

- Hub Manager—Provides a physical view of the supported Cisco hub devices. You can point and click to perform device and port-level monitoring, control, and configuration. Alerts are indicated visually through color changes.
- Ring Manager—For Token Ring, physical media management via the Ring Error Monitor (REM) collects and analyzes errors including soft and hard errors and beaconing. REM detects, reports, and corrects soft errors on the ring.
- Distributed Event Logging Facility—The SNMP agent within each hub independently collects and stores events in real-time, up to 500 events per agent. The Cisco Hub/Ring Manager for Windows retrieves events from agents for processing and display.

Table 35 lists CiscoHub/Ring Manager for Windows specifications.

Table 35 Cisco Hub/Ring Manager for Windows Specifications

Description	Specifications
Hardware requirements	486 IBM PC or compatible 8-MB RAM minimum (16 MB recommended) Color monitor Serial port or compatible network interface card
Software requirements	Microsoft Windows 3.1 or higher, or Windows 95 Windows for Workgroups 3.11 or higher Windows NT 3.5 or higher Winsock 1.1-compliant TCP/IP software HP OpenView for Windows (Version 7.2B) or higher Workgroup Node Manager 1.2 or higher
Product number	AS-HRM-PC-2.0

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. CiscoWorks Windows includes Configuration Builder, Show Commands, Health Monitor, and CiscoView applications.

CiscoWorks Windows is bundled with a complete NMS platform for mapping, graphing device statistics, and handling alarms and events of problem areas in customer networks.

As an option, you can choose to integrate CiscoWorks Windows with HP OpenView for Windows in order to take advantage of integrating with other HP OpenView third-party applications.

Configuration Builder and CiscoView can run as standalone applications without the requirements of a management platform.

CiscoWorks Windows includes the following features:

- Configuration Builder. Allows you to create configuration files for multiple Cisco routers, access servers, and hubs without requiring you to remember complicated command-line language or syntax for the devices. Using Configuration Builder, you can configure Cisco routers — Access Pro, IGS, CGS, MGS, AGS+, Cisco 2000, Cisco 2500, Cisco 3000, Cisco 4000, Cisco 4500, Cisco 7010, Cisco 7000—with the most common Cisco IOS features in Cisco IOS Release 10.0 through 11.0(3) and Cisco access servers with Cisco IOS Release 10.2 or higher. Advanced features can be configured by entering commands in the Add Commands window.

  Configuration Builder provides the following features:

  — Multiple device configuration windows

    Multiple devices can be configured simultaneously for remote source-route bridging and Synchronous Data Link Control (SDLC) Transport.

  — Configuration Snap-Ins

    Predefined priority queuing lists, IP or IPX access lists, IPX Service Advertisement Protocol (SAP) filters, and AppleTalk filters can be imported quickly into multiple configuration files.

  — Duplicate address and configuration checking

    Duplicate IP, IPX, AppleTalk, and DECnet addresses can be checked in all open configuration files.

  — Guided configuration

    Using the Guided Configuration option, users can move automatically through a sequence of relevant dialog boxes to create a configuration file for routers and router-related features in access servers or hubs.

  — Learn hardware capability

    A device's model type, software version, image type, and the number and types of installed interfaces can be detected. This information is automatically placed in the configuration file.

- Remote configuration capability

  A configuration file can be sent via a TCP/IP network to a remote device that is running a WINSOCK-compliant TCP/IP stack.

- Support for access servers and hubs

  Configuration Builder includes a new feature that allows you to configure chat scripts, enable routing protocols and terminal services for the access server, set up security, and configure dial-on-demand routing for IP and IPX and protocol translation.

- Show Commands. Allows you to quickly display detailed system and protocol information about Cisco routing devices without requiring you to remember complicated command-line language or syntax. Show Commands supports Cisco IOS Release 10.0 through Release 11.1.
- Health Monitor. A dynamic fault and performance management tool that provides real-time statistics on device characteristics, interface status, errors, and protocol utilization. It also provides CPU and environmental card status and indicates changes in conditions through color changes. This application uses SNMP to monitor and control the Cisco devices. Health Monitor supports Cisco IOS Release 10.0 through Release 11.1.
- CiscoView. Provides a physical view of a device's front and back panels with real-time status indicated through message feedback in the status bar area and through changes in port colors. This application uses SNMP to monitor and control the Cisco devices listed in Table 36. CiscoView supports Cisco IOS Releases 10.0 through Release 11.1.

  CiscoWorks Windows is bundled with the Cisco Network Management Support CD-ROM. This CD includes up-to-date Cisco device "package" files that provide management of the latest Cisco devices.

  Additionally, the latest device package files are also available in the Software Images Library section of the Cisco Connection Online (CCO). As new Cisco devices and CiscoView management functions are released, the appropriate package files will be posted on CCO.

Table 36 Devices Supported—CiscoWorks Windows 2.1

Category	Devices[1]
Cisco 760 series routers	Cisco 765, 766
Cisco 1000 series routers	Cisco 1003, 1004, 1005
Cisco 7000 family routers	Cisco 7000, Cisco 7010, Cisco 7206 and Cisco 7206 with port adapter cards, Cisco 7505, Cisco 7507, and Cisco 7513 Interface processors: FEIP, CIP, VIP (1FE, 4E, 4R, and 4T) Processors: RSP1, RSP2, and RSP7000
Access routers, servers, and router hubs	Cisco 2500 series: models 2501, 2502, 2503, 2504, 2505, 2507, 2509, 2510, 2511, 2512, 2513, 2514, 2515, 2516, 2522, 2523, 2524, 2525 Cisco 4000 series: models 4000, 4500, and 4700
Workgroup concentrators	Catalyst WS-C1400 Workgroup 1000 concentrator (MLT-2) and Workgroup 1200 concentrator
Workgroup switches	Catalyst switch models: 1200, 1600, 1700, 2100, 2600, 2800, 2900, 3000 (including modules WS-X3001–X3005), and 5000 (with FDDI/CDDI adapters)

Category	Devices[1]
Workgroup adapters	FDDI/CDDI adapters
ATM switches	LightStream 1010 LightStream 2020

1. Devices not currently supported by CiscoWorks Windows 2.1 will be supported in future incremental software releases. The releases will be distributed via CCO, as well as the Network Management Support CD-ROM.

Table 37 provides an overview of CiscoWorks Windows specifications.

Table 37 CiscoWorks Windows Specifications

Description	Specification
Compatible platforms	Intel 486/586 running Windows NT 3.51 (preferred platform) or Windows 95 (4.0)
Hardware requirements	SVGA graphics adapter and monitor recommended 24 MB RAM 45 MB free hard disk space required for standard installation
Network management platform compatibility	CastleRock SNMPc 4.1g (bundled with package) Hewlett-Packard OpenView 7.2 (C.02.17)
Network management protocol	SNMP (RFC 1157)

Table 38 lists CiscoWorks Windows software product numbers.

Table 38 CiscoWorks Windows Software Product Numbers

Description	Product Number
CiscoWorks Windows 2.1[1]	CWPC-2.1-WIN
CiscoWorks Windows 1.0 to 2.1 update	CWPC-2.1-WIN-UPD
CiscoWorks Windows 2.0 to 2.1 update	CWPC-2.1-UPD
CiscoWorks Windows 1.0 to 2.1 upgrade (includes SNMPc)	CWPC-1.0-2.1-UPG
SwitchVision to CiscoWorks Windows 2.1 upgrade (bundled with CastleRock SNMPc)	CWPC-2.1-WSV-UPG
Software subscription orders	SRV-CWPC-WIN

1. Requires WINSOCK 1.1-compliant TCP/IP software if users need to access devices via a TCP/IP network. Recommend using the TCP/IP stacks resident in Windows 95 and Windows NT 3.51.

CiscoWorks for Switched Internetworks

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 for Switched Internetworks (CWSI), 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.

CWSI provides the following features for network administrators:

- Autodiscovery and topology layout
  - Provides autodiscovery and automatic topology layout of Cisco interconnected switches and routers within the campus
  - Displays accurate representation of the physical network for VLAN design and configuration verification
  - Provides system-level VLAN topology capture for departmental and enterprise-wide switches
  - Provides physical and logical views of the network to make it easy to navigate and perform desired functions
  - Provides link information by simple mouse clicks
- Advanced VLAN management functions
  - Drag and drop port configuration functions
  - Provides rules-based configuration model for creating VLANs across a series of interconnected routers and switches within a campus
  - Provides automode capability of choosing the best VLAN path between switches based on bandwidth, number of hops, and assigned VLANs
  - Provides a method of adding, deleting, and modifying VLAN names within your campus
  - Provides name search functions, which make it easy to locate VLANs in a network with numerous other VLANs
  - Ability to easily obtain VLAN configuration information on a specific device or link interface by double-clicking on the screen icon
  - Displays discrepancy reports on conflicting configurations
  - Ability to troubleshoot and identify individual device configurations that are in error with system-level VLANs
  - Graphically represents and displays configured VLAN paths between switches
  - Provides load balancing of VLAN traffic across redundant links
  - Provides network change logs for auditing configuration status

- Performance and traffic management
  - Leverages embedded RMON in Catalyst switches and routers or standalone SwitchProbe devices
  - Provides detailed monitoring and analysis capabilities for troubleshooting on switched segments
  - Can easily troubleshoot protocol-related problems
  - Sets up proactive alarms to detect problems before they occur
  - Performs trend analysis for long-term planning
- Device configuration and monitoring
  - Provides realistic, graphical displays of Cisco switches and routers
  - Provides a common look and feel across all platforms that enables network administrators such as help desk and central MIS staff to look at the same view of device regardless of their location
  - Provides real-time graphs of statistics on a per-port, card, or chassis level
- Reporting tools and online help
  - Provides detailed reports of VLAN configurations
  - Provides reports for analyzing long-term traffic trends
  - Provides standard reports for segment status, host summary, conversations statistics, and other data
  - Can be integrated with popular SNMP management platforms including SunNet Manager, HP OpenView, and AIX.

Table 39 provides product numbers for CiscoWorks Switched for Internetworks, and Table 40 provides minimum system requirements.

Table 39 CiscoWorks Switched Internetwork Solutions Software Product Numbers

Description	Product Numbers
CWSI for SunOS, standalone, SunNet Manager, and OpenView	CWSI-1.0-SNM
CWSI for SunOS, standalone, SunNet Manager, and OpenView, upgrade	CWSI-1.0-SNM-UG
CWSI for Solaris, standalone, SunNet Manager, and OpenView	CWSI-1.0-Solar
CWSI for Solaris, standalone, SunNet Manager, and OpenView, upgrade	CWSI-1.0-Solar-UG
CWSI for Windows NT, standalone	CWSI-1.0-WIN-NT
CWSI for Windows NT, standalone, upgrade	CWSI-1.0-WIN-NT-UG
CWSI for HP-UX, standalone, and OpenView	CWSI-1.0-OVH
CWSI for HP-UX, standalone, and OpenView, upgrade	CWSI-1.0-OVH-UG

Description	Product Numbers
CWSI for AIX, standalone, and NetView	CWSI-1.0-NV
SMARTnet maintenance for all CWSI product numbers	CON-SNT-NMS-SI

Table 40 CiscoWorks Switched Internetwork Solutions Specifications

Description	Specifications
Hardware requirements—UNIX	Sun SPARCstation 5 or equivalent 150-MB available hard disk space 32-MB RAM 128-MB swap space CD-ROM drive access 17" SVGA color monitor
Hardware requirements—PC	Pentium-based system, 75 MHz or greater 150-MB available hard disk space 32-MB RAM CD-ROM drive access 17" SVGA color monitor

CiscoView

CiscoView is a GUI-based device management software application that provides dynamic status, statistics, and comprehensive configuration information for Cisco Systems' internetworking products (switches, routers, concentrators, and adapters). CiscoView graphically displays a physical view of Cisco devices. Additionally, this network management tool provides configuring and monitoring functions and offers basic troubleshooting. Using CiscoView, you 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.

CiscoView can be integrated with several of the leading SNMP-based network management systems, providing a seamless, powerful network view. CiscoView is also bundled with CiscoWorks, Cisco's enterprise network management application suite. CiscoView can also be run on UNIX workstations as a fully functional, independent management application.

CiscoView is also available in Windows format on a PC and is included in the CiscoWorks Windows product.

CiscoView supports the following features:

- Graphically displays Cisco products from a centralized network management location, giving network managers a complete view of Cisco products without physically checking each device at remote sites.
- Oriented for exception reporting, enabling users to grasp essential inquiry information quickly.

- GUI shows a continuously updated physical picture of routers, hubs, switches, or adapters.
- Can be invoked several times in the same session to simultaneously support multiple switches, routers, hubs, or adapters.
- Can be integrated with the following network management platforms to provide a seamless, powerful system to manage Cisco devices:
  - Sun Microsystems SunNet Manager
  - Hewlett-Packard OpenView
  - IBM NetView for AIX
- Can control and configure the Cisco devices listed in Table 41.

Table 41 Devices Supported by CiscoView 3.2.1

Category	Devices[1]
Cisco 760 series routers	Cisco 765, 766
Cisco 1000 series routers	Cisco 1003, 1004, 1005
Cisco 7000 family routers	Cisco 7000, Cisco 7010, Cisco 7206 and Cisco 7204 with port adapter cards, Cisco 7505, Cisco 7507, and Cisco 7513 Interface processors: FEIP, CIP, VIP (1FE, 4E, 4R, and 4T) Processors: RSP1, RSP2, and RSP7000
Access routers, servers, and router hubs	Cisco 2500 series: models 2501, 2502, 2503, 2504, 2505, 2507, 2509, 2510, 2511, 2512, 2513, 2514, 2515, 2516, 2522, 2523, 2524, 2525 Cisco 4000 series: models 4000, 4500, and 4700 AS5200 Access Server AS5200 Modem Manager application
Workgroup concentrators	Catalyst WS-C1400 Workgroup 1000 concentrator (MLT-2) and Workgroup 1200 concentrator
Workgroup switches	Catalyst switch models: 1200, 1600, 1700, 2100, 2600, 2800, 2900, 3000 (including modules WS-X3001–X3005), and 5000 (with FDDI/CDDI adapters)
Workgroup adapters	FDDI/CDDI adapters
ATM switches	LightStream 1010 LightStream 2020

1. Devices not currently supported by CiscoView 3.2.1 will be supported in future incremental software releases. The latest device support files will also be available on the Software Images Library section on CCO.

Table 42 provides an overview of CiscoView specifications.

Table 42 CiscoView Specifications

Description	Specification
Compatible platforms	Sun SPARCstation running SunOS 4.1.3 or 4.1.4, or Solaris 2.4 or 2.5 HP/Apollo Series 700 running HP-UX 9.03, 9.04, 9.05, 10.01 or 10.10 IBM RS/6000 running AIX 3.2.5, 4.1.2
Hardware requirements	Color monitor recommended At least 32-MB main memory recommended
Network management platform compatibility	SunNet Manager Hewlett-Packard OpenView IBM NetView for AIX
Network management protocol	SNMP (RFC 1157)

Table 43 describes the software environments that CiscoView supports.

Table 43 Environments Supported by CiscoView

Platform	Operating System	NMS Platform	Version of X Windows
Sun	SunOS 4.1.3 Solaris 2.4	SunNet Manager 2.2.2, HP OpenView 3.3	OpenWindows 3.x, X11R5
	Solaris 2.5, 2.51	SNM 2.2.3, 2.3, HPOV 4.01, 4.1	OpenWindows 3.x
HP	HP-UX 9.03, 9.04, 9.05	HP OpenView 3.3	HP-VUE, X11R5
IBM	IBM AIX 3.2.5, 4.1.x	IBM NetView 3.1, 4.1	AIX Windows, X11R5

Table 44 provides CiscoView product numbers.

Table 44 CiscoView Software Product Numbers

Description	Product Number
CiscoView 3.2.1 for Solaris/SunNet Manager	CV-3.2.1-SNM
CiscoView 3.2.1 upgrade for Solaris/SunNet Manager	CV-3.2.1-SNM-UPG
CiscoView 3.2.1 for Solaris/HP OpenView	CV-3.2.1-OVS
CiscoView 3.2.1 upgrade for Solaris/HP OpenView	CV-3.2.1-OVS-UPG
CiscoView 3.2.1 for HP-UX/ HP OpenView	CV-3.2.1-OVH
CiscoView 3.2.1 upgrade for HP-UX/HP OpenView	CV-3.2.1-OVH-UPG
CiscoView 3.1.1 for AIX/NetView for AIX	CV-3.1.1-NV
CiscoView 3.1.1 upgrade for AIX/NetView for AIX	CV-3.1.1-NV-UPG
CiscoView device and application support for Windows 95, Windows NT, SunOS, Solaris, and AIX	CNMS-CD

Description	Product Number
CiscoView device and application support for HP-UX and HP OpenView	CNMS-CD-HPUX
Software subscription orders	SRV-CV-SNM SRV-CV-OVS SRV-CV-OVH SRV-CV-NV

Cisco Network Management Support CD-ROM

The Cisco Network Management Support CD-ROM (CNMS-CD) contains the latest Cisco network management device and application support files. These files provide up-to-date management support for the latest Cisco devices. This initial release of the CNMS-CD enhances the capabilities of the CiscoView graphical device management application.

CNMS-CD works with CiscoView 3.1.1 and later releases and CiscoWorks Windows 2.0 and later releases to provide real-time monitoring and configuration of the latest Cisco routing and switching products. This CD provides a timely alternative if you cannot access Cisco Connection Online (CCO).

The CNMS-CD provides the following features:

- Integration with the CiscoView 3.1.1 built-in incremental device installer technology

  All devices and applications provided on the CNMS-CD are compatible with CiscoView 3.1.1 and later versions. The CiscoView incremental device installer utility allows these device and application files to be added on an as needed basis. This capability is extremely beneficial if you acquire the latest Cisco internetworking products and technologies and cannot wait until the next management software release to support these new technologies.

  The device and applications provided on the CNMS-CD are in available in a “package” format. Cisco has developed a “device package” concept in which all of the necessary device support files, such as device definition, MIBs, Graphic Image Files (GIFs), and Applets, will be combined together to form a package file. The package files can easily be installed from CiscoView 3.1.1 and later and CiscoWorks Windows 2.0 and later products.

- Support for the latest Cisco internetworking products

  As new products are introduced, the latest Cisco network management device and application support files will be added to the CD. See Table 45 for the list of current supported products.

- Support for the industry leading operating systems and Network Management Systems

  CNMS-CD is compatible with the all operating systems and network management systems supported by the CiscoView 3.1.1 technology. See Table 46 for the specific platforms.

If you are an existing CiscoView 3.1.1 and CiscoWorks Windows 2.0 customer, the CNMS-CD is available to you. The CNMS-CD is also included in the CiscoView 3.2.1 and CiscoWorks Windows 2.1 product packages. The CD will be updated on a periodic basis to provide you with the latest Cisco network management support files.

Table 45 lists the latest Cisco devices supported by CNMS-CD, Table 46 lists the CNMS-CD supported platforms, and Table 47 lists the product numbers for CNMS-CD.

Table 45 Cisco Devices Supported by the Cisco Network Management Support CD

Product
Cisco Routers
Cisco 760 series routers (765, 766)
Cisco 1000 series routers (1003, 1004, 1005)
Cisco 252x series routers (2522, 2523, 2524, 2525)
Cisco 4000 series routers (4000, 4700 models with supporting adapter cards)
Cisco 4500 series routers (4500)
Cisco 7000 family routers (includes Cisco 7206 and Cisco 7204 models with port adapter cards)
Cisco 7000 family applet (Flash File System Manager applet)
AS5200 Access Server[1]
AS5200 Modem Manager application
Cisco Switches
Catalyst 1200 switch
Catalyst 2600 switch
Catalyst 2900 switch
Catalyst 3000 switch
Catalyst 5000 switch
LightStream 1010 (ATM switch)

1. The AS5200 package file contains the CiscoView device files as well as a Modem Manager application. This package however, currently supports only the SunNet Manager 2.2.2 NMS running on SunOS 4.1.3 or 4.14 and HP OpenView 3.3 NMS running on the SunOS 4.1.3, 4.1.4 and HP-UX 9.04 operating systems.

Table 46 Cisco Network Management Support CD Supported Platforms and Network Management Systems

Platform	Operating System	NMS Platform
Sun SPARCstation class	SunOS 4.1.3, SunOS 4.1.3_U1,	SunNet Manager 2.2.2, 2.2.3 HP OpenView 3.31
	Sun OS 4.1.4 Solaris 2.4	SunNet Manager 2.2.2, 2.2.3, 2.3 HP OpenView 3.31
	Solaris 2.5	SunNet Manager 2.2.2, 2.2.3, 2.3

Platform	Operating System	NMS Platform
HP 9000/700, 9000/800	HP-UX 9.04, 9.05	HP OpenView 3.31, 4.01
	Solaris 2.4, 2.5	HP OpenView 3.31, 4.01
	HP-UX 10.01, 10.10	HP OpenView 4.01, 4.1
IBM RS6000	IBM AIX 3.25, 4.1.4	IBM NetView for AIX 3.1, 4.1
Intel processor-based IBM PC or compatible	Microsoft Windows95 4.0 Windows NT 3.51	Castle Rock SNMPc4.1g HP OpenView for Microsoft Windows 7.2 (C.02.17)

Table 47 Cisco Network Management Support CD Product Numbers

Description	Product Number
Cisco Network Management Support CD-ROM for Castle Rock SNMPc and HP OpenView for Windows on Microsoft Windows 95/NT, SunNet Manager on SunSoft SunOS and Solaris, and IBM NetView for AIX on AIX operating systems	CNMS-CD
Cisco Network Management Support CD-ROM for HP OpenView on the HP-UX operating system	CNMS-CD-HPUX

NETSYS Connectivity and Performance Tools

The NETSYS Connectivity and Performance Tools consist of two products: NETSYS Connectivity Tools (Connectivity Baseliner and Solver) and NETSYS Performance Tools (Performance Baseliner and Solver).

NETSYS Connectivity Tools

The NETSYS Connectivity Tools assist network engineers with proactive design and planning activities focusing on network connectivity and route and flow problems. Building on the baseline connectivity map created with this product, network engineers can use the Tool simulation environment to study the potential impact of failed devices and links, access list configurations, and other configuration changes prior to implementing them in the network.

The NETSYS Connectivity Tools consist of two applications plus a CiscoWorks 3.0 interface. These applications include the following:

- NETSYS Connectivity Baseliner—Constructs a network topology map that depicts real-world connectivity learned from configuration files and routing tables. This baseliner map enables network engineers to troubleshoot problems by visualizing and automatically documenting the network configuration.
- NETSYS Connectivity Solver—Enables users to perform “what if” scenarios with the baseline. Using the simulation of failed links or nodes, network engineers can determine the impact of a variety of failure modes before they occur in the network. In addition, the NETSYS Connectivity Solver simulates problems such as protocol

mismatches, access list mismatches, and encapsulation and source-route bridging configuration problems. The Design Critic feature in the application allows users to specify acceptable connectivity and check to see if proposed access list changes violate the predefined constraints.

NETSYS Performance Tools

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

The NETSYS Performance Tools consist of the following two applications:

- NETSYS Performance Baseliner—Provides the input data for subsequent performance modeling. The baselining process begins by collecting router statistics and traffic information. Analysis of interface statistics, table sizes, buffer statistics, IP/IPX accounting, and Enterprise RMON information provides an observed performance snapshot of the current network. This view of network health can also indicate areas of high volume or potential trouble. Network managers can use this data to determine where to initially instrument the network for actual traffic capture.
- NETSYS Performance Solver—Enables users to evaluate utilization of network resources, and conduct what-if scenarios to assess the impact of changes and explore potential performance improvements. Summary performance analysis results enable users to quickly identify problem areas. More detailed analysis (utilization breakdowns and amount and type of overhead analysis, for example) allows users to diagnose the cause of problems and identify possible corrective actions. With Performance Solver, network engineers can understand which applications or subnets are motivating router or bandwidth upgrades and quickly identify under- and over-utilized resources and congestion areas. They can investigate whether congestion is due to connectivity or bandwidth problems and then evaluate alternative solutions.

The Performance Baseliner and Performance Solver must be used with NETSYS Connectivity Tools Version 2.0. The NETSYS Connectivity and Performance Tools do not require use of an SNMP management platform such as HP OpenView or SunNet Manager.

The NETSYS Tools also include a CiscoWorks interface that integrates the configuration auditing and control functions of CiscoWorks with the simulation and validation capabilities of the NETSYS Connectivity and Performance Solver. Proposed configuration changes that are validated by the simulation can be exported into CiscoWorks for implementation in the actual network. In addition, NETSYS Tools can import configuration information from the CiscoWorks database.

Table 48 lists the product numbers for the NETSYS Connectivity and Performance Tools software.

Table 48 NETSYS Connectivity and Performance Tools Product Numbers

Description	Product Numbers
NETSYS Connectivity Tools for up to 25 routers for SunOS or Solaris	CONN-2.0-25-SUN
NETSYS Connectivity Tools for up to 50 routers for SunOS or Solaris	CONN-2.0-50-SUN
NETSYS Connectivity Tools for up to 100 routers for SunOS or Solaris	CONN-2.0-100-SUN
100-Router Extender for NETSYS Connectivity Tools for SunOS or Solaris (option for CONN-2.0-100-SUN)[1]	CONN-2.0-EXT-SUN=
100-Router Extender for NETSYS Connectivity Tools for SunOS or Solaris[1]	CONN-2.0-EXT-SUN
NETSYS Connectivity Tools for up to 25 routers for AIX	CONN-2.0-25-AIX
NETSYS Connectivity Tools for up to 50 routers for AIX	CONN-2.0-50-AIX
NETSYS Connectivity Tools for up to 100 routers for AIX	CONN-2.0-100-AIX
100-Router Extender for NETSYS Connectivity Tools for AIX (option for CONN-2.0-100-AIX)[1]	CONN-2.0-EXT-AIX=
100-Router Extender for NETSYS Connectivity Tools for AIX [1]	CONN-2.0-EXT-AIX
NETSYS Connectivity Tools for up to 25 routers for HP	CONN-2.0-25-HP
NETSYS Connectivity Tools for up to 50 routers for HP	CONN-2.0-50-HP
NETSYS Connectivity Tools for up to 100 routers for HP	CONN-2.0-100-HP
100-Router Extender for NETSYS Connectivity Tools for HP	CONN-2.0-EXT-HP=
100-Router Extender for NETSYS Connectivity Tools for HP	CONN-2.0-EXT-HP
NETSYS Performance Tools for up to 25 routers for SunOS or Solaris[2]	PERF-1.0-25-SUN
NETSYS Performance Tools for up to 50 routers for SunOS or Solaris[2]	PERF-1.0-50-SUN
NETSYS Performance Tools for up to 100 routers for SunOS or Solaris[2]	PERF-1.0-100-SUN
100-Router Extender for NETSYS Performance Tools for SunOS or Solaris (option for PERF-1.0-100-SUN)[1]	PERF-1.0-EXT-SUN=
100-Router Extender for NETSYS Performance Tools for SunOS or Solaris[1]	PERF-1.0-EXT-SUN
NETSYS Performance Tools for up to 25 routers for AIX	PERF-1.0-25-AIX
NETSYS Performance Tools for up to 50 routers for AIX	PERF-1.0-50-AIX
NETSYS Performance Tools for up to 100 routers for AIX	PERF-1.0-100-AIX
100-Router Extender for NETSYS Performance Tools for AIX	PERF-1.0-EXT-AIX=
100-Router Extender for NETSYS Performance Tools for AIX	PERF-1.0-EXT-AIX
NETSYS Performance Tools for up to 25 routers for HP	PERF-1.0-25-HP
NETSYS Performance Tools for up to 50 routers for HP	PERF-1.0-50-HP
NETSYS Performance Tools for up to 100 routers for HP	PERF-1.0-100-HP
100-Router Extender for NETSYS Performance Tools for HP	PERF-1.0-EXT-HP=
100-Router Extender for NETSYS Performance Tools for HP	PERF-1.0-EXT-HP

1. Only applicable when used with the 100-router license.
2. Requires NETSYS Connectivity Baseliner and Connectivity Solver 2.0.

For networks larger than 100 routers, extensions may be added in 100-router increments, up to a maximum of 1000 routers.

Table 49 lists the product numbers for the NETSYS Tools software version upgrades.

Table 49 NETSYS Tools Software Version Upgrade Product Numbers

Description	Product Numbers
Upgrade NETSYS Connectivity Baseliner 1.x->Tools 2.0, for up to 25 routers, SunOS or Solaris[1]	CBCT-2.0-25-S-UPG
Upgrade NETSYS Connectivity Baseliner 1.x->Tools 2.0, for up to 50 routers, SunOS or Solaris[1]	CBCT-2.0-50-S-UPG
Upgrade NETSYS Connectivity Baseliner 1.x->Tools 2.0, for up to 100 routers, SunOS or Solaris[1]	CBCT-2.0-100-S-UPG
Upgrade NETSYS Connectivity Tools 1.x for up to 75 routers to 2.0 for 100 routers for SunOS or Solaris	CSCT-2.0-SM-S-UPG
Upgrade NETSYS Connectivity Tools 1.x for up to 200 routers to 2.0 for 200 routers for SunOS or Solaris	CSCT-2.0-MD-S-UPG
Upgrade NETSYS Connectivity Tools 1.x for up to 750 routers to 2.0 for 800 routers for SunOS or Solaris	CSCT-2.0-LG-S-UPG
Upgrade NETSYS Connectivity Tools 1.x for up to 75 routers to 2.0 for 100 routers for AIX	CSCT-2.0-SM-A-UPG
Upgrade NETSYS Connectivity Tools 1.x for up to 200 routers to 2.0 for 200 routers for AIX	CSCT-2.0-MD-A-UPG
Upgrade NETSYS Connectivity Tools 1.x for up to 750 routers to 2.0 for 800 routers for AIX	CSCT-2.0-LG-A-UPG

1. Use these part numbers if you have purchased only the NETSYS Connectivity Baseliner 1.0 and need to upgrade to the NETSYS Connectivity Baseliner and Solver 2.0.

Table 50 lists software license upgrade product numbers by network size. These upgrades are useful when you need to manage more routers than your original software license permits.

Table 50 NETSYS Tools Software License Upgrade Product Numbers

Description	Product Numbers
Upgrade NETSYS Connectivity Tools from 25 to 50 router license	CONN-25-50-UPG
Upgrade NETSYS Connectivity Tools from 50 to 100 router license	CONN-50-100-UPG
Upgrade NETSYS Connectivity Tools from 25 to 100 router license	CONN-25-100-UPG
Upgrade NETSYS Performance Tools from 25 to 50 router license	PERF-25-50-UPG
Upgrade NETSYS Performance Tools from 50 to 100 router license	PERF-50-100-UPG
Upgrade NETSYS Performance Tools from 25 to 100 router license	PERF-25-100-UPG

Table 51 lists the product specifications for NETSYS Connectivity and Performance Tools.

Table 51 NETSYS Connectivity and Performance Tools Specifications

Platform	Description	Specification
Sun	Hardware requirements	Sun SPARCstation 5 100-MB hard disk space recommended 64-MB RAM recommended 150+ MB swap space CD-ROM drive Color monitor
	Software requirements	SunOS 4.1.3_U1/4.1.4, or Solaris 2.4/2.5 OpenWindows or Motif 1.2+ X11 Release 4+ Netscape/Mosaic browser (optional)
AIX	Hardware requirements	IBM RS/6000 model 340 or higher 100-MB hard disk space recommended 64-MB RAM 150+ MB swap space CD-ROM drive Color monitor
	Software requirements	AIX version 3.25 or 4.1 Motif 1.2+ X11 Release 4+ Netscape/Mosaic browser (optional)
HP	Hardware requirements	HP9000 System Series 700 or 800 100-MB free hard disk space 64-MB RAM 150+ MB swap space CD-ROM drive Color monitor
	Software requirements	HP-UX A.09.03 to A.10.0 Motif 1.2+ X11 Release 4+ Netscape/Mosaic browser (optional)

AtmDirector

AtmDirector is a network management application for Asynchronous Transfer Mode (ATM) networks. AtmDirector provides the tools you need to perform the following tasks:

- 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
- Check network connectivity using OAM pings

Table 52 lists the product numbers for AtmDirector.

Table 52 AtmDirector Product Numbers

Description	Product Number
AtmDirector—standalone	CWSI-ATM-SOLAR
AtmDirector—upgrade to CWSI 1.0	CWSI-ATM-UPGR

LightStream 2020 Network Management

The LightStream 2020 multiservice ATM switch offers the following options for network management:

- ControlStream traffic management software
- StreamView network management software
- VirtualStream virtual LAN software

ControlStream Traffic Management Software

ControlStream software, which is a mandatory component of the platform software, provides sophisticated traffic management capabilities. Primarily, this consists of a variety of mechanisms that operate to provide multiple classes of service and quality of service (QOS), and enforce these traffic contracts even in the presence of overload. Additionally, ControlStream includes a congestion avoidance and control mechanism for monitoring trunk and egress port loading, feeding back this loading information to all sources, and discarding excess traffic, fairly, at the edges of the network. Through ControlStream, traffic can be managed from the sources in such a way that trunk congestion events can be avoided before they occur. ControlStream is purchased on a per-chassis basis.

StreamView Network Management Software

The StreamView software option includes three graphical network management tools:

- A configuration tool
- A monitor for viewing the status of each LightStream 2020 node in the network
- A topology map for displaying the ATM topology of the network

StreamView requires a Sun SPARCstation platform. The topology map must be used in conjunction with HP OpenView management software. At least one copy of StreamView should be purchased for each LightStream 2020 network.

VirtualStream Virtual LAN Software

The VirtualStream software option operates in conjunction with the bridging service available for FDDI and Ethernet users and provides four value-added virtual LAN services:

- The Workgroup feature allows the definition of port-based closed user groups that span the network and allow a LightStream 2020 network manager to control how LAN users access one another.
- The Application Specific Quality of Service (AS/QOS) feature allows the definition of ATM types of service for LAN flows.
- The High Performance Multicast Service (HPMS) allows the use of ATM point-to-multipoint virtual circuits for wire-speed delivery of multicast traffic over an arbitrary and geographically distributed set of LAN ports.
- The Custom Filters feature lets you tag LAN flows to block, forward, or associate traffic with AS/QOS or HPMS using Boolean expressions. The following header fields can be used in filters:
  - MAC layer
  - TCP/IP
  - IPX

The software license for VirtualStream is purchased per LAN card. That is, a separate license for VirtualStream is required for each Ethernet module or access card and for each FDDI module or access card.

TrafficDirector

TrafficDirector is a powerful and flexible enhanced remote monitoring (RMON) console application that analyzes traffic and enables proactive management of switched internetworks. TrafficDirector provides an intuitive, easy-to-use graphical user interface (GUI) for analyzing RMON data for any level of user. Network traffic information is collected from RMON agents in Cisco's Catalyst switches, Cisco IOS embedded RMON agents in routers and SwitchProbe standalone network monitoring probes, or any RMON standards-compliant agent. TrafficDirector advanced packet filters enable users to monitor all seven layers of network traffic including link, network, transport, or application layers.

Performance and fault management are greatly simplified using TrafficDirector's multilayer traffic analysis, proactive alarms, and remote packet capture features. TrafficDirector enables users to proactively monitor their enterprise networks from a central site, ensuring high network reliability and availability. TrafficDirector's protocol analysis tool provides rapid, centralized troubleshooting for most protocol-related network problems. TrafficDirector supports full seven-layer decodes for the AppleTalk, DECnet, IP, ISO, Novell, SNA, Sun-NFS, Banyan VINES, and XNS protocol suites.

Table 53 lists operating systems, product numbers, and memory requirements for TrafficDirector.

Table 53 TrafficDirector Specifications

Description	OS Support	SNMP Platforms	Memory	Free Hard Disk Space	Product Number
TrafficDirector for PC Windows, on CD media	Windows 95 or Windows 3.1x with a WINSOCK IP stack	–	8 MB	15 MB	TRAFFDIR3.3-PC
TrafficDirector for SunOS, Solaris, on CD media	SunOS 4.1.3[1], Solaris 2.3 or higher with OpenWindows v3.3 and Motif v1.2.4	SunNet Manager, Open View	48 MB	80 MB	TRAFFDIR3.3-SUN
TrafficDirector for HP-UX, on CD media	HP-UX v9.9 or higher	Open View	48 MB	40 MB	TRAFFDIR3.3-HP
TrafficDirector for IBM-AIX, on CD media	IBM-AIX v3.2.4 or higher with Motif v1.2.4	NetView	48 MB	40 MB	TRAFFDIR3.3-IBM
SMARTnet for TrafficDirector (PC Windows)	–	–	–	–	CON-SNT-TD-PC
SMARTnet for TrafficDirector (SunOS, Solaris)	–	–	–	–	CON-SNT-TD-SUN
SMARTnet for TrafficDirector (HP-UX)	–	–	–	–	CON-SNT-TD-HP
SMARTnet for TrafficDirector (IBM-AIX)	–	–	–	–	CON-SNT-TD-IBM

1. OpenWindows on SunOS 4.1.3 compatibility requires Sun Microsystems patch 100444-xx. (Contact Sun Microsystems for this.)

Total Control Manager/SNMP

Total Control Manager /SNMP (AS51-NMSW-1) is a Windows-based SNMP host software package that runs on any IBM-compatible 486 PC. The application enables you to set up, manage, and monitor the modem and T1 cards installed in the Cisco AS5100 access server. TCM/SNMP is compatible for use with all cards except the Access Server card set (AS51-16A-E), which must be configured as a Cisco 2500 series access server.

TCM/SNMP communicates with the Network Management CARD (NMC) installed in the Cisco AS5100 access server via SNMP.