

CiscoView 4.1 CD Installation Instructions for Solaris and HP-UX

This instruction book provides information about installing and running CiscoView on your network management station. You can install CiscoView on a Hewlett Packard system or a Solaris workstation, either as a standalone application or on top of the system network management platform.

CiscoView is a GUI-based device management software application that enables you to access dynamic status, statistics, and comprehensive configuration information for Cisco Systems switch and internetworking products.

CiscoView lets you display a graphical representation of each network device, display configuration and performance information, perform minor troubleshooting tasks, and control and configure specific devices. There are also device-specific applications that further enhance your network management capabilities.

Table 1 and Table 2 explain where to find the procedures described in this booklet and when you should perform them.

Table 1 Upgrading CiscoView on Solaris

If you have this product installed	You need to
CiscoView 3.x, 4.0	Upgrade to CiscoView 4.1
CiscoWorks 3.2 or later	Upgrade to or install CiscoView 4.1
CiscoWorks for Switched Internetworks (CWSI) 1.1, 1.3	Upgrade to CiscoView 4.1

Table 2 Upgrading CiscoView on HP-UX

If you have this product installed	You need to
CiscoView 3.x, 4.0	Upgrade to CiscoView 4.1
CiscoWorks 3.2 or later	Upgrade to or install CiscoView 4.1
CiscoWorks for Switched Internetworks (CWSI) 1.1.1	Upgrade to CWSI 1.3 and then to CiscoView 4.1
CWSI 1.3	Upgrade to CiscoView 4.1

CiscoView requires device support packages to manage Cisco devices. You can selectively install device packages during installation. Alternatively, you can enhance the functionality of CiscoView by incrementally installing device packages at a later time. Refer to the

section “Downloading Device Packages” for more information on how to incrementally install device packages.

This booklet includes procedures for installing CiscoView and limited information about ongoing tasks that you might perform with CiscoView, including incrementally installing device packages, using and maintaining the software, and getting product support.

System Requirements for CiscoView

Before you install CiscoView, make sure that your system meets the system requirements shown in Table 3 and the hardware and software recommendations shown in Table 4.

Table 3 CiscoView Typical System Requirements

Operating System	Available Disk Space (MB)¹	RAM (MB)
Solaris 2.4, 2.5.1, and 2.6	90	32
HPUX 10.1, HPUX 10.2	85	32

1. Minimum requirement is 30 MB for both Solaris and HP-UX.

Table 4 CiscoView Hardware and Software Recommendations

Hardware	Software
Sun SPARCstation Color Monitor	Windowing system: X11R4 or X11R5, OpenWindows 3.0 or 3.3, Motif 1.2 Network management software (optional): HP OpenView 4.1, 4.11, 5.0, SunNet Manager 2.3, Solstice Site Manager 2.3, Solstice Domain Manager 2.3, Solstice Enterprise Manager 2.0 ¹
HP-UX system (9000 series/700)	Network management software (optional): HP OpenView 4.1, 4.11, 5.0

1. CiscoView 4.1 for Solaris supports HP OpenView, SunNet Manager, Domain Manager, and Enterprise Manager.

Mounting the CD-ROM

This section describes how to mount the CiscoView CD-ROM on Solaris or HP-UX workstations. There are various ways you can mount the CD-ROM, either locally or remotely. This section guides you to mount the CiscoView CD-ROM.

- On a local CD-ROM drive on a Solaris workstation
- On a local CD-ROM drive on an HP-UX workstation

- On a remote CD-ROM drive on a Solaris workstation (exporting the CD-ROM filesystem and mounting it on a Solaris or HP-UX workstation)
- On a remote CD-ROM drive on an HP-UX workstation (exporting the CD-ROM filesystem and mounting it on a Solaris or HP-UX workstation)

Mounting a Local CD-ROM Drive on Solaris

Insert the CiscoView CD-ROM into the CD-ROM drive, then perform the following steps:

- 1 Enter the **su** command and give the root password at the prompt, or log in as **root**. The prompt changes to the pound sign (#).
- 2 If the `/cdrom` directory does not already exist, enter the following command:


```
# mkdir /cdrom
```
- 3 Mount the CD-ROM drive. The *vold* daemon process manages the CD-ROM device and mounts the CD-ROM automatically onto the `/cdrom/cdrom0` directory.

If the CD-ROM is not mounted, mount it by entering the following command:

```
# mount -F hsfs -r /dev/sr0 /cdrom
```

If you see a mount error, refer to your Solaris documentation for troubleshooting information.

You have mounted the CiscoView CD-ROM. To install CiscoView, go to the section “Installing CiscoView.”

Mounting a Local CD-ROM Drive on HP-UX

Insert the CiscoView CD-ROM into the CD-ROM drive, then perform the following steps:

- 1 Become the superuser by entering **su** and the root password at the prompt, or log in as **root**. The prompt changes to the pound sign (#).
- 2 If the */cdrom* directory does not already exist, enter the following command:

```
# mkdir /cdrom
```

- 3 Mount the CD-ROM drive by entering the following command:

```
# /usr/sbin/mount -rF cdfs device_name /cdrom
```

where *-r* mounts the CD-ROM in read-only mode, and *-F cdfs* indicates a CD filesystem. An example of a device name is */dev/dsk/c0t3d0*.

You have mounted the CiscoView CD-ROM. To install CiscoView, go to the section “Installing CiscoView.”

Mounting a Remote CD-ROM Drive on Solaris

This section is for users who plan to install CiscoView remotely; for example, if your local workstation does not have a CD-ROM drive and you need to install CiscoView using a remote CD-ROM drive. To mount the remote machine and export the CD-ROM, perform the following steps:

- 1 Log in to the remote Solaris workstation as root. The prompt changes to the pound sign (#).
- 2 Mount the CD-ROM on the remote machine by following the steps described in the “Mounting a Local CD-ROM Drive on Solaris” section.

- 3 Make sure that the remote workstation is enabled as an NFS server.
- (a) Determine if the remote workstation is enabled as an NFS server by entering the following command:

```
# ps -ef | grep nfs | grep -v grep
```

If the output of this command contains */usr/lib/nfs/nfsd* or */usr/lib/nfs/mountd*, the workstation is enabled as an NFS server.

- (b) If the remote workstation is not enabled as an NFS server, enter the following command:

```
# /etc/init.d/nfs.server start
```

- 4 Enter the following command as root to export the mounted CD-ROM drive:

```
# share -F nfs -o ro,anon=0 /cdrom
```

You have mounted and exported the CD-ROM drive. For directions on mounting the exported CD-ROM on a local workstation, refer to the section “Mounting an Exported CD-ROM Filesystem to a Local Workstation.” After mounting the CD-ROM on the local machine, go to the section “Installing CiscoView.”

Unexporting the CD-ROM Filesystem on Solaris

After you have finished installing CiscoView and the necessary device packages, you might want to unexport the exported CD-ROM filesystem. To unexport the CD-ROM filesystem, perform the following steps:

- 1 Log in to the local Solaris workstation as root.
- 2 Unmount the directory (for example, */local_dir*) from the local workstation by entering the following command:

```
# /usr/sbin/umount /local_dir
```
- 3 Log in to the remote Solaris workstation as root.
- 4 Enter the following command to unexport the CD-ROM filesystem:

```
# unshare /cdrom
```

Mounting a Remote CD-ROM Drive on HP-UX

This section is for users who plan to install CiscoView remotely; for example, if your local workstation does not have a CD-ROM drive and you need to install CiscoView using a remote CD-ROM drive.

To mount the remote machine and export the CD-ROM, perform the following steps:

- 1 Log in to the remote HP-UX workstation as root. The prompt changes to the pound sign (#).
- 2 Mount the CD-ROM on the remote workstation by following the steps described in the “Mounting a Local CD-ROM Drive on HP-UX” section.
- 3 Add the following line to the */etc/exports* file. If the */etc/exports* file does not exist, create it and add the following line:

```
/cdrom -anon=0,ro
```

- 4 Make sure that the remote workstation is enabled as an NFS server.
 - (a) Determine if the remote workstation is enabled as an NFS server by entering the following command:
 - (b) If the output indicates that no *nfsd* daemons are running, enter the following command to start the NFS server:

```
# ps -ef | grep nfsd | grep -v grep
```

```
# /sbin/init.d/nfs.server start
```

- 5** Make sure that the `rpc.mountd` daemon is running.
- (a) Determine if the `rpc.mountd` daemon is running by entering the following command:
- ```
ps -ef | grep rpc.mountd | grep -v grep
```
- (b) If the `rpc.mountd` daemon is not running, enter the following command to start it:
- ```
# /usr/sbin/rpc.mountd -n
```
- 6** On the remote workstation, enter the following command as root to export the mounted CD-ROM drive:
- ```
/usr/sbin/exportfs -a
```

You have mounted and exported the CD-ROM drive. For directions on mounting the exported CD-ROM on a local workstation, refer to the section “Mounting an Exported CD-ROM Filesystem to a Local Workstation.” After mounting the CD-ROM on the local workstation, go to the section “Installing CiscoView.”

## Unexporting the CD-ROM Filesystem on HP-UX

After you have finished installing CiscoView and the necessary device packages, you might want to unexport the exported CD-ROM filesystem. To unexport the CD-ROM filesystem, perform the following steps:

- 1 Log in to the local HP-UX workstation as root.
- 2 Unmount the directory (for example, */local\_dir*) for the local workstation by entering the following command:

```
/usr/sbin/umount /local_dir
```

- 3 Log in to the remote HP-UX workstation as root.
- 4 Remove the following line from the */etc/exports* file:

```
/cdrom -anon=0,ro
```

- 5 Enter the following command to unexport the filesystem:

```
/etc/exportfs -a
```

## Mounting an Exported CD-ROM Filesystem to a Local Workstation

To mount the exported CD-ROM filesystem on to the local workstation for both Solaris and HP-UX, perform the following steps:

- 1 Log in to the local workstation as root.
- 2 Create a dummy directory, for example, */local\_dir*. If a directory by that name already exists, create a directory with a different name. The following steps use the filename */local\_dir*.
- 3 Verify that the directory is not already a mounted filesystem by entering the following command:

```
df /local_dir
```

If the output is similar to the following, the directory is not already a mounted file system

```
/local_dir (/dev/dsk/c0t3d0s5):328614 blocks 586775 files
```

If the output of the command is similar to the following, a file system is already mounted on the *local\_dir* directory

```
/local_dir (remote:/tmp): 3139134 blocks -1 files
```

- 4 If a file system is already mounted on the *local\_dir* directory, unmount the existing directory by entering the following command:

```
/usr/sbin/umount /local_dir
```

- 5 Mount the exported CD-ROM drive on the local workstation by entering the following command:

```
/usr/sbin/mount -r remote_machine:/cdrom /local_dir
```

## Installing CiscoView

This section describes how to install CiscoView on a Solaris workstation or an HP-UX workstation.

To install CiscoView, perform the following steps:

- 1 Change directories to the directory where you have mounted the CD, for example, */cdrom*.
- 2 Enter

```
./setup.sh
```

A series of prompts appears. You can press **Return** to accept the default value (shown first in parentheses) for each prompt. This procedure does not describe each prompt that appears.

- 3 When the copyright prompt appears, enter **y** to continue the installation.

If you have an older version of CiscoView installed, you are asked whether it is OK to remove this older version. You cannot install CiscoView 4.1(1) if you have an older CiscoView installed.

The screen displays a series of prompts about the following variables. You can press **Return** to accept the default responses, or you can enter different values.

- Installation location for CiscoView (you can change this when prompted)
- Integration of CiscoView with a network management system
- File owner and group
- Device options and *README* files. You must select which devices you want to install from the list (the default is all devices)

**Caution** You should *not* stop the installation (Ctrl-C) after the installation starts. If you stop the installation before it is complete, you might have to cleanup the aborted installation (by removing the partially installed package) and retry the installation. The aborted installation might leave the existing package in an invalid state.

- 4 The installation program displays a summary of your answers before you confirm the installation. Review this summary to check your responses to the installation prompts.

If your responses are correct, enter **y** or press **Return** to perform the installation. If your responses are incorrect, enter **n** and enter the correct values. When asked again if your responses are correct, enter **y** to continue the installation.

- 5 Check the `/tmp/ciscoinstall.log` to make sure no errors occurred. Save this file because it can help you with troubleshooting if you have problems with the installation.

After the installation is complete, messages similar to the following are shown on the screen.

```
INSTALLATION COMPLETE A complete logfile is located in
/tmp/ciscoinstall.log. Update your PATH to include
/opt/CSC0cv/bin.
```



## 6 To update the path:

For C shell, source the *CVinstall.cshrc* file by adding the following line to the *.login* (for each CiscoView user) or *.cshrc* file, log out, and log back in:

```
source /opt/CSC0cv/etc/CVinstall.cshrc
```

For Bourne/Korn shell, source the *CVinstall.sh* file or add the following line to the *.profile* file, log out, and log back in:

```
. /opt/CSC0cv/etc/CVinstall.sh
```

## 7 Set the NMSROOT environment variable to the following values to enable loading of MIB files. This variable should be set to the directory where CiscoView is installed. The default is */opt/CSC0cv*.

For C shell

```
setenv NMSROOT /opt/CSC0cv; export NMSROOT
```

For Bourne shell or Korn shell

```
NMSROOT=/opt/CSC0cv
```

## Unmounting the CD-ROM Drive

To unmount the CD-ROM, perform the following steps:

- 1 Unmount the CD-ROM drive by entering the following commands as superuser:

For Solaris

```
umount /cdrom (for a remote CD)
```

or

```
umount /cdrom/./cdrom0 (for a local CD)
```

For HP-UX

```
cd /
```

```
umount /cdrom
```

- 2 Eject the CD-ROM from the workstation.

(a) For a Solaris workstation, enter the following command:

```
eject
```

- (b) For an HP-UX workstation, press the eject button on the workstation.

**3** Remove the CD-ROM and store it in a safe place.

## **Loading the Management Information Base (MIB)**

This section describes how to load MIB files for CiscoView. This is a required task.

### **Network Management Software MIB files**

If you are using SunNet Manager (SNM), Solstice Site Manager, or Solstice Domain Manager, MIB files are automatically copied into the correct SNM directory.

Before installing CiscoView, you should save your SNM, Solstice Site Manager, or Solstice Domain Manager maps. After CiscoView is installed, run the network management software with the **-i** option (for example, for SNM, enter **snm -i**) so that all MIB schema, CiscoView application registration, and device registration information is taken into account.

Optionally, you can run the network management software with the **-q** option (for example, **snm -i -q**). This option displays information about each schema as it is loaded.

If you are using Enterprise Manager, you can perform the following steps to set your PATH and SNMHOME variables:

- 1 If you are using C shell, add the following lines to your *.cshrc* file:

```
setenv SNMHOME /opt/SUNWconn/snm
set path = ($path $SNMHOME/bin)
```

- 2 If you are using Bourne/Korn shell, add the following lines to your *.profile* file:

```
SNMHOME=/opt/SUNWconn/snm; export SNMHOME
PATH=$PATH:$SNMHOME/bin; export PATH
```

When you log in the next time, the variables PATH and SNMHOME are set properly.

To start CiscoView, go to the section “Starting CiscoView.”

## HP OpenView MIB Files

If you chose to integrate with HP OpenView during the CiscoView installation, you were asked whether you wanted to load MIBs into HP

OpenView at that time. If you did not load MIBs into HP OpenView, you can do it at any time after the installation is completed.

Load the MIB files by entering the following command:

```
$NMSROOT/bin/cvinstall -f
```

Note that the system takes 15 to 20 minutes to load all MIB files.

Some errors are reported while integrating CiscoView MIBs into HP OpenView. Refer to the following URL for more information and workaround suggestions:

[http://www.cisco.com/public/mibs/app\\_notes/mib-compilers](http://www.cisco.com/public/mibs/app_notes/mib-compilers)

You should also consult the CiscoView Release Notes for more information.

## Starting CiscoView

This section describes how to start CiscoView from the supported network management software, HP OpenView, or the UNIX command prompt on either Solaris or HP-UX.

If you are using HP OpenView, skip to the section “Starting CiscoView from HP OpenView.” To start CiscoView from the UNIX command line, skip to “Starting CiscoView from the Command Line.”

## Starting CiscoView from SunNet Manager, Site Manager, and Domain Manager

You start CiscoView from SunNet Manager, Site Manager, and Domain Manager the same way. In the following example, SunNet Manager is used. Follow these steps for Site Manager and Domain Manager.

You can start CiscoView from the SunNet Manager Tools menu. To access it, you need to restart SunNet Manager by performing the following steps (this procedure assumes that CiscoView is in your path):

- 1 Save your existing SunNet Manager database and exit the program.
- 2 Restart SunNet Manager by entering the following command at the system prompt:

```
% snm -i
```

The SunNet Manager main window appears.

- 3 To start CiscoView, select **Tools>CW–CiscoView**.

For information on displaying devices in CiscoView, refer to the section “Displaying a Device with CiscoView.”

## Starting CiscoView from Solstice Enterprise Manager

After installing CiscoView, you can start CiscoView from the Enterprise Manager Tools Menu by performing the following steps:

- 1 Save your existing Enterprise Manager database and exit Enterprise Manager.
- 2 Log in as root.
- 3 Reinitialize Enterprise Manager by entering the following command:

```
/opt/SUNWconn/em/bin/em_services -r
```

- 4 Start Enterprise Manager by entering the following command:

```
/opt/SUNWconn/em/bin/em
```

- 5 Select a device in the Enterprise Manager viewer.
- 6 To start CiscoView, select **Tools>CW–CiscoView**.

For information on displaying devices in CiscoView, refer to the “Displaying a Device with CiscoView” section.

## Starting CiscoView from the Device Icon on SunNet Manager or Enterprise Manager

You can start CiscoView from SunNet Manager or Enterprise Manager by selecting a device icon and selecting **CW–CiscoView** in the popup menu. The procedure is similar for both. To start CiscoView from SunNet Manager, perform the following steps:

- 1 In the SunNet Manager Properties sheet for the device, enter the Read community string for the device you want to view.
- 2 In the SunNet Manager network map, display the popup menu for the device by clicking on the device.
- 3 Select **CW–CiscoView** from the popup menu.

The CiscoView window is displayed with a graphical representation of the specified device (also referred to as a *panel*).

For information on displaying devices in CiscoView, go to the section “Displaying a Device with CiscoView.”

## Starting CiscoView from HP OpenView

Before starting HP OpenView Windows, make sure the HP OpenView daemons are running. For more information, refer to your HP OpenView



documentation. To start CiscoView from HP OpenView, perform the following steps:

- 1 Start HP OpenView Windows by entering the following command:

```
/opt/OV/bin/ovw
```

- 2 Select a Cisco device that is supported by CiscoView.
- 3 Select **Monitor>CiscoView** from the HP OpenView menu to start CiscoView on that device. You must install the device package to manage the device.

## **Starting CiscoView from the Command Line**

Make sure that the PATH environment variable includes the path to the CiscoView executables.

To start CiscoView from the UNIX command line, enter the following at the system prompt:

```
% nmcview -host device_name -rd read_community_string
```

For example, the following command starts CiscoView and displays the device named “charlie” with the Read community string “over.”

```
% nmcview -host charlie -rd over
```

The CiscoView window is displayed with a graphical representation of the specified device (also referred to as a *panel*).

For information on displaying devices in CiscoView, go to the section “Displaying a Device with CiscoView.”

## Displaying a Device with CiscoView

After you start CiscoView, you see the CiscoView main window. To display a device, perform the following steps:

- 1 Select **File>Open Device**.

The File - Open Device window is displayed.

- 2 Complete the fields in the File - Open Device window as follows:

In the Host field, enter the host name or IP address of the device you want to display.

In the Read Community field, enter the read community string specified by your network administrator (*public* is the default).

In the Write Community field, enter the write community string specified by your network administrator (*public* is the default). The correct write community string allows you to change certain device settings.

- 3 Click **OK** to display the panel of the specified device.

## Downloading Device Packages

This section provides a quick reference to downloading device packages from CCO.

If you do not have Internet access, skip this section. To receive updated packages, you can order the Cisco Network Management Support CD-ROM.

For the detailed description of downloading from CCO or additional information about the Cisco Network Management Support CD-ROM, see the “Downloading Device Packages” chapter in the *Overview for CiscoView*.

**Note** You need to be root or the owner (as specified in the installation) to perform the download.

To download device packages from CCO, perform the following steps:

- 1 Verify that you are running CiscoView Version 4.1(1) or later by entering **nmcview** from any directory on your workstation.
- 2 Select **Help>About CiscoView**.
- 3 Close CiscoView by selecting **File>Exit**.
- 4 Create a directory to store the *cv\_pkgs* by entering the following commands:

```
mkdir /usr/nms/cv_pkgs
cd /usr/nms/cv_pkgs
```

- 5 Access CCO.

You can access CCO as a registered user or as a guest.

To access as a registered user, do the following:

- (a) Access the Software Center by entering the following URL in your Web browser: <http://www.cisco.com/kobayashi/sw-center/>
- (b) At the prompts, enter your CCO user ID and password.

To be granted special file access as a guest do the following:

- (a) Call the Technical Assistance Center (TAC) at 1-800-553-2447 or 1-408-526-7209, state the name of the product you are downloading, and you are transferred to the appropriate person to obtain your special access code.
  - (b) Enter the following URL in your Web browser:  
<http://www.cisco.com/public/library>
  - (c) Enter your special access code in the Other Software Products/Special Files section.
  - (d) Select the device tar file and a download option.
- 6 Download the device tar file into the *cv\_pkgs* directory.

There are two methods for downloading: from CCO and by FTP. For information on downloading by FTP, see the Software Library Web page or the *Overview for CiscoView*.

- (a) In the Network Management Products section, select the CiscoView Upgrade Planner pointer to the CiscoView packages. To review the package *README*, click on the *README* filename and select a download option. To select a device tar file, click on the device filename and select a download option.

- (b) Reenter your password, if required.
- (c) If required, click **Save File** or **File>Save As**, depending on the browser you are using.
- (d) If a filter window appears, enter the complete destination pathname in the Selection section of the filter window for the downloaded device, for example,  
*/usr/nms/cv\_pkgs/device\_name.*
- (e) Close the Web browser.

## 7 Unzip the device tar file.

CiscoView packages are saved on CCO as tar files. You can open the tar files using WinZip, which is also available on CCO.

- (a) Enter **tar -xvf *file\_name*** in the *cv\_pkgs* directory, where *file\_name* is the name of your device package.
- (b) Add the package file to CiscoView.
- (c) Check the environment variable by entering **env**. It should include NMSROOT.

(d) If NMSROOT does not appear, set it by entering

```
setenv NMSROOT install_directory
```

where *install\_directory* is the name of the directory where CiscoView is installed, */opt/CSCCv*.

Enter **su root** to log in as root and enter the following command to add the package file to CiscoView in the *cv\_pkgs* directory:

```
$NMSROOT/bin/cvinstall /usr/nms/cv_pkgs/device_name.pkg
```

The downloading is complete. If there are any problems, check the *cvinstall.log* file in your install directory for an explanation of errors or see the *Overview for CiscoView* for more detail.

## Removing CiscoView

If you encounter problems during installation, you might want to reinstall CiscoView. Before reinstalling CiscoView, you must first remove it.

To remove CiscoView from a Solaris workstation, enter the following command:

```
pkgrm CSCCv
```

To remove CiscoView from an HP-UX 10.x workstation, enter the following command:

```
swremove -v CISCOVIEW
```

## **Cleaning Up Standalone CiscoView Files**

To clean up CiscoView standalone files on either a Solaris or HP-UX workstation, verify whether any user files exist in the directory tree. If you do not find any user files, you can delete the directory. For example, enter the following to determine that no user files exist, and delete the directory tree:

```
find /opt/CSC0cv -type f -print
rm -rf /opt/CSC0cv
```

where */opt/CSC0cv* is the location of the CiscoView files.



## Troubleshooting

If you cannot open the specified device in CiscoView, you receive a message that the device is unmanageable. This message indicates one of the following conditions:

- The SNMP server is not set in the device. You can still ping the device from the management station.
- You have entered an incorrect community string in the File - Open Device window.
- The management station cannot reach the device and cannot successfully ping the device.
- The timeout value is too low. To change the timeout value, select **Options>Properties** and enter a new timeout value. Doubling the existing timeout value is a good starting point.
- The device package is not up to date. Check your device package and compare the date to the CCO device package version. Upgrade your device package to the latest version, if required.

## Service and Support

This section describes how to contact Cisco Systems to order documentation and receive service and support.

### Cisco Connection Documentation

Cisco documentation and additional literature are available in a CD-ROM package, which ships with your product. The Documentation CD-ROM, a member of the Cisco Connection Family, is updated monthly. Therefore, it might be more up to date than printed documentation. To order additional copies of the Documentation CD-ROM, contact your local sales representative or call customer service. The CD-ROM package is available as a single package or as an annual subscription. You can also access Cisco documentation on the World Wide Web at <http://www.cisco.com>, <http://www-china.cisco.com>, or <http://www-europe.cisco.com>.

If you are reading Cisco product documentation on the World Wide Web, you can submit comments electronically. Click **Feedback** in the toolbar, select **Documentation**, and click **Enter the feedback form**. After you complete the form, click **Submit** to send it to Cisco. We appreciate your comments.

## Cisco Connection Online

Cisco Connection Online (CCO) is Cisco Systems' primary, real-time support channel. Maintenance customers and partners can self-register on CCO to obtain additional information and services.

Available 24 hours a day, 7 days a week, CCO provides a wealth of standard and value-added services to Cisco's customers and business partners. CCO services include product information, product documentation, software updates, release notes, technical tips, the Bug Navigator, configuration notes, brochures, descriptions of service offerings, and download access to public and authorized files.

CCO serves a wide variety of users through two interfaces that are updated and enhanced simultaneously: a character-based version and a multimedia version that resides on the World Wide Web (WWW). The character-based CCO supports Zmodem, Kermit, Xmodem, FTP, and Internet e-mail, and it is excellent for quick access to information over lower bandwidths. The WWW version of CCO provides richly formatted documents with photographs, figures, graphics, and video, as well as hyperlinks to related information.

You can access CCO in the following ways:

- WWW: <http://www.cisco.com>

- WWW: <http://www-europe.cisco.com>
- WWW: <http://www-china.cisco.com>
- Telnet: [cco.cisco.com](http://cco.cisco.com)
- Modem: From North America, 408 526-8070; from Europe, 33 1 64 46 40 82. Use the following terminal settings: VT100 emulation; databits: 8; parity: none; stop bits: 1; and connection rates up to 28.8 kbps.

For a copy of CCO's Frequently Asked Questions (FAQ), contact [cco-help@cisco.com](mailto:cco-help@cisco.com). For additional information, contact [cco-team@cisco.com](mailto:cco-team@cisco.com).

**Note** If you are a network administrator and need personal technical assistance with a Cisco product that is under warranty or covered by a maintenance contract, contact Cisco's Technical Assistance Center (TAC) at 800 553-2447, 408 526-7209, or [tac@cisco.com](mailto:tac@cisco.com). To obtain general information about Cisco Systems, Cisco products, or upgrades, contact 800 553-6387, 408 526-7208, or [cs-rep@cisco.com](mailto:cs-rep@cisco.com).