



## Installing CMNM

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### Introduction to CMNM Installation

The CMNM installation program and installation software are found on a CMNM product CD. Cisco Media Gateway Controller Manager (CMM) or Voice Services Provisioning Tool (VSPT) are required for voice provisioning, depending on the network configuration. Both must be installed before CMNM. CMM is found on the CMNM CD, and Voice Services Provisioning Tool is downloaded from the Web.

### Before You Start

Before you install CMNM you must have the required hardware and software and access to the CMNM Installation site on the Web.

### Task Checklist

Perform the following steps before beginning installation of the CMNM:

- 
- Step 1 Check the web site for latest bulletins and updates.
  - Step 2 Check the minimum hardware requirements.
  - Step 3 Check the software requirement list to be sure that you have all the necessary software.
  - Step 4 Partition hard drives on the workstation.
  - Step 5 Install CEMF 3.1 and latest patches (Patch 1 is required).
  - Step 6 Make CEMF performance modifications.
  - Step 7 Install CMNM on client and manager workstations as appropriate.
  - Step 8 Install the relevant Cisco MGC host provisioning tool.
- 

### Hardware Requirements

Both client and server minimum hardware requirements must be met.

**Note**

CMNM supports a maximum of six users at a time.

The CMNM application runs on a separate machine than the Cisco MGC host. The requirements of this machine are described in Table 2-1 for the Cisco VSC 3000 and Table 2-2 for the Cisco SC2200.

**Table 2-1 Hardware Requirements for CMNM Host Machine—VSC3000**

	Small Network 1-3 Operators 1-5 Nodes 1 trap / sec	Medium Network 4-6 Operators 6-10 Nodes 2 traps / sec		Large Network 7-10 Operators 11-20 Nodes 4 traps / sec	
Configuration	1 machine	Application server	Management server	Application server	Management server
RAM (GB)	2	2	2	2	4
Swap (GB)	2	1	2	1	2
Disk drives (9 GB minimum)	4	1	4	1	8
CPU (MHz)	2 x 440	2 x 440	2 x 440	4 x 440	2 x 440

**Table 2-2 Hardware Requirements for CMNM Host Machine—SC2200**

	Small Network 1-3 Operators 1-5 Nodes 1 trap / sec	Medium Network 4-6 Operators 6-10 Nodes 2 traps / sec		Large Network 7-10 Operators 11-20 Nodes 4 traps / sec	
Configuration	1 machine	Application server	Management server	Application server	Management server
RAM (GB)	2	2	2	2	4
Swap (GB)	2	1	2	1	2
Disk drives (9 GB minimum)	4	1	4	1	8
CPU (MHz)	2 x 440	2 x 440	2 x 440	4 x 440	2 x 440

**Note**

Disk drive requirements are based on the number of drives. The CEMF host machine requires at least the number of drives indicated in Table 2-1 and Table 2-2.

**Note**

Using multiple disk drives to store the CEMF databases helps alleviate I/O bottlenecks and substantially aids in the performance of the software. If cooked file partitions are used, installing more than four drives does not yield any performance improvements, because the CEMF databases cannot span multiple partitions.

**Note**


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These are *recommendations*. The total amount of disk space required depends on the amount of alarm and performance data saved.

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## Hard Drive Partitioning

By default, the CEMF software is installed with standard UNIX cooked partitions (partitions with readable directory structures.) However, raw partitions (partitions without a readable directory structure) offer the following advantages over cooked partitions:

- A large performance gain
- The capability of having databases over 2 gigabytes in size

Listed below are the *suggested* partitioning layouts for both cooked and raw partitions. For detailed information on configuring CEMF with raw files systems, refer to the “ObjectStore Installation Options” section in the *Installing, Licensing, and Configuring Cisco EMF* manual. CEMF uses ObjectStore for its database. ObjectStore is installed with CEMF.

## Suggested Layout for Cooked Partitions (CEMF Default)

**Note**


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ObjectStore requires all raw partitions to be identical in size.

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**Note**


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For information about suggested performance enhancements for cooked partitions, see the “Performance Enhancements for Cooked Partitions” section on page 2-7.

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The following tables give the mount point and size for creating cooked partitions.

**Table 2-3 Drive 1—Operating System Drive—9 GB or Larger**

Mount Point	Size
/ (root)	512 MB
<swap>	2.0 GB
/var	1.0 GB
/usr	4.0 GB
/home	Remainder

**Table 2-4 Drive 2**

Mount Point	Size
<swap>	2.0 GB
/opt	Remainder

*Table 2-5 Drive 3*

Mount Point	Size
/opt/CSCOcemf/db	Remainder

*Table 2-6 Drive 4*

Mount Point	Size
/ostore/transaction	1.0 GB
/ostore/cache	Remainder

## Suggested Layout for Raw Partitions

The following tables give the mount point and size for creating raw partitions.



Note

ObjectStore requires all raw partitions to be identical in size.



Note

For information about suggested performance enhancements for raw partitions, see the “Performance Enhancements for Raw Partitions” section on page 2-8.

*Table 2-7 Drive 1—Operating System Drive—9 GB or Larger*

Mount Point	Size
/ (root)	512 MB
<swap>	2.0 GB
/var	1.0 GB
/usr	4.0 GB
/home	Remainder

*Table 2-8 Drive 2*

Mount Point	Size
<swap>	2.0 GB
/opt	Remainder

*Table 2-9 Drives 3, 4, 5, and 6 (If Appropriate)*

Mount Point	Size
<Raw file system>	Remainder

## Configuring Raw File Systems in ObjectStore

Note the following:

- You must partition the hard drives when installing the Sun Solaris operating system.
- To get the installation directory for the CEMF software, use the command **/bin/pkgparam CSCOcemfm BASEDIR**.
- All raw partitions must be exactly the same size (in megabytes). ObjectStore does not use partitions of different sizes.
- The raw partition names (for example, /dev/rdisk/c0t1d0s3) must be available before starting the configuration session.
- Determine the name of the machine (for example, cemfserver).



### Caution

Adding, modifying, or deleting raw file systems resets the ObjectStore database and destroys any existing data.

To configure raw file systems in ObjectStore:

- 
- Step 1** Type **su - root** to become the root user.
  - Step 2** Stop the current CEMF processes (**/etc/init.d/cemf stop**).
  - Step 3** Shut down ObjectStore (for example, **/etc/rc2.d/S80ostore4 stop**).
  - Step 4** Shut down the AV License Manager (for example, **/etc/rc2.d/S98avlm stop**).
  - Step 5** Start a CEMF shell (for example, **/etc/rc2.d/S99cemf shell**).
  - Step 6** Change to the CEMF installation directory (for example, **/opt/CSCOcemf**).
  - Step 7** Change to the **./ODI/OS5.1/ostore/etc** directory (under **/opt/\$INSTALL\_DIR**).
  - Step 8** Edit the host name server parameter file (for example, **cemfserver\_server\_parameters**) and make the following modifications:
    - Put a comment character (**#**) at the beginning of the Log File line. (This places the transaction log in the raw partition.)
    - Add an entry for each raw partition that ObjectStore uses.
    - Each line must begin with **PartitionX:** (where **X** is a number starting with zero and incrementing by one). Do not forget the colon character.
    - Each line must have the word **PARTITION** as the second element.
    - Each line must have the raw partition listed as the last element. (Do not forget to use the **rdsk** partition identifier.)

For example (a **cemfserver\_server\_parameters** file):

```
unix-shell#> cd /opt/CSCOcemf/ODI/OS5.1/ostore/etc
unix-shell#> cat cemfserver_server_parameters
```

```
#Log File: /opt/transact.log
Partition0: PARTITION /dev/rdisk/c2t9d0s0
Partition1: PARTITION /dev/rdisk/c2t10d0s0
```

```
Partition2: PARTITION /dev/rdsk/c2t12d0s0
Partition3: PARTITION /dev/rdsk/c2t13d0s0

unix-shell#>
```

- Step 9** Change to the `CEMF_INSTALL/ODI/OS5.1/ostore/lib` directory (for example, `opt/CSCOcemf/ODI/OS5.1/ostore/lib`).
- Step 10** Run the command `./osserver -i` to reinitialize ObjectStore. Answer **yes** when prompted to reinitialize the database.
- Step 11** Run the command `/etc/init.d/cemf reset` to reset the CEMF database. Answer **yes** when prompted.
- Step 12** Run the command `/etc/init.d/cemf start` to start the ObjectStore and CEMF processes.

## Suggested Layout for the CEMF Client

*Table 2-10 Single Drive for Client*

Mount Point	Size
/ (root)	512 MB
<swap>	2.0 GB
/var	1.0 GB
/usr	2.0 GB
/opt	Remainder

## Software Requirements

Both client and server minimum software requirements must be met.



**Caution**

Check the web site for the latest bulletins and upgrades for software before proceeding.

CMNM interacts with other software running on the various components of the Cisco MGC node. The software requirements for these components are described in Table 2-11.

*Table 2-11 External Software Versions*

External Software	Version
CEMF	3.1
Cisco MGC host software	Latest version of 7.4.10(B)/8.1(1.2)
Cisco SLT IOS SS7 image	12.0.7 XR
LAN switch code	5.4(4)

Table 2-11 External Software Versions

Voice Services Provisioning Tool	1.5
BAMS	2.63

## Recommended Performance Enhancements for CEMF

The following enhancements are designed to get the maximum performance from a CEMF installation. For cooked and raw partitions, select Option 1 or Option 2, based on the system's physical memory size.

### Performance Enhancements for Cooked Partitions



**Note** Databases should not be installed on the same drive as the CEMF software.



**Note** For more information about cooked partitions, see the “Hard Drive Partitioning” section on page 2-3.

#### Option 1

If physical memory is less than 1 gigabyte, then the cache files should reside on a separate physical drive.

- 
- Step 1** On a separate drive, add a partition and mount that partition to `/ostart_cache`.
- Step 2** Create the file `localhost.sh` in the *CEMF Directory*/`config/env` directory and add the lines:
- ```
OS-CACHE_DIR=/ostore_cache ; export OS_CACHE_DIR
OS_COMMSEG_DIR=/ostore_cache ; export OS_COMMSEG_DIR
```
- Step 3** For the changes to take effect, you must restart the CEMF processes using the following commands.
- ```
/etc/init.d/cemf stop
/etc/init.d/cemf start
```
- 

#### Option 2

If physical memory is greater than 1 gigabyte, then the cache files should reside in a memory file system (for example, `tmpfs`).

- 
- Step 1** Verify that `/etc/vfstab` has an entry for `tmpfs` mounted to `/tmp`. If not, perform the following steps:
- Type **su - root** to become the root user.
  - Change to the `/etc` directory.
  - Copy the `vfstab` file to a backup file.

- d. Edit the `vfstab` file and add the following line:
 

```
swap - /tmp tmpfs - yes -
```
  - e. Reboot for changes to take effect.
- Step 2** Create the file `localhost.sh` in the *CEMF Directory/config/env* directory and add these lines:
- ```
OS-CACHE_DIR=/tmp/ostore
OS_COMMSEG_DIR=/tmp/ostore
```
- Step 3** Verify that the entry for the database transaction log is correctly identified in the file `hostname_server_parameter`, where *hostname* is the host name of the workstation. Enter the command:
- ```
cat CEMF Directory/ODI/OS5.1/ostore/etc/hostname_server_parameter
```
- You should see the line:
- ```
Log File: /var/opt/cemf/logs/transact.log
```
- Step 4** If the `transact.log` file is not correctly identified, edit the `hostname_server_parameter` file.
- Step 5** For the changes to take effect, you must restart the CEMF processes using the following commands.
- ```
/etc/init.d/cemf stop
/etc/init.d/cemf start
```
- 

## Performance Enhancements for Raw Partitions



**Note** Raw partitions should be not be installed on the same drive as the CEMF software.

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**Note** For more information about raw partitions, see the “Hard Drive Partitioning” section on page 2-3.

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### Option 1

If physical memory is less than 1 gigabyte, then the cache files should reside on a separate physical drive and the database transaction log should be in the raw partition.

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- Step 1** On a separate drive, add a partition and mount that partition to `/ostart_cache`.
- Step 2** Create the file `localhost.sh` in the *CEMF Directory/config/env* directory and add the lines:
- ```
OS-CACHE_DIR=/ostore_cache ; export OS_CACHE_DIR
OS_COMMSEG_DIR=/ostore_cache ; export OS_COMMSEG_DIR
```
- Step 3** The transaction log should be in the raw partition. The file `hostname_server_parameter`, where *hostname* is the host name of the workstation, should not have an entry for the transaction log. If the `hostname_server_parameter` file has an entry for the transaction log, edit the file and remove the line (the file is located in *CEMF Directory/ODI/OS5.1/ostore/etc/*).
- Step 4** For the changes to take effect, you must restart the CEMF processes using the following commands.
- ```
/etc/init.d/cemf stop
```



```
/etc/init.d/cemf start
```

---

## Option 2

If physical memory is greater than 1 gigabyte, then the cache files should reside in a memory file system (for example, tmpfs) and the database transaction log should be in the raw partition.

---

- Step 1** Verify that `/etc/vfstab` has an entry for tmpfs mounted to `/tmp`. If not, perform the following steps:
- Type `su - root` to become the root user.
  - Change to the `/etc` directory.
  - Copy the `vfstab` file to a backup file.
  - Edit the `vfstab` file and add the following line:
 

```
swap - /tmp tmpfs - yes -
```
  - Reboot for changes to take effect.
- Step 2** Create the file `localhost.sh` in the *CEMF Directory*/`config/env` directory and add these lines:
- ```
OS-CACHE_DIR=/tmp/ostore
OS_COMMSEG_DIR=/tmp/ostore
```
- Step 3** The transaction log should be in the raw partition. The file `hostname_server_parameter`, where *hostname* is the host name of the workstation, should not have an entry for the transaction log. If the `hostname_server_parameter` file has an entry for the transaction log, edit the file and remove the line (the file is located in *CEMF Directory*/`ODI/OS5.1/ostore/etc`).
- Step 4** For the changes to take effect, you must restart the CEMF processes using the following commands.
- ```
/etc/init.d/cemf stop
/etc/init.d/cemf start
```
- 

## DNS Requirements

The following sections list requirements for configuring Domain Name System (DNS).

### Workstation Uses DNS

If the workstation uses DNS, you must configure DNS on the workstation before installing CEMF.



#### Note

If you change how DNS is configured after CEMF is installed, you must uninstall and reinstall CEMF.

---

If the CEMF workstation is set up to use DNS, then the host name of the workstation must also be configured on the DNS server. Just having the local host name in the `/etc/hosts` file is not sufficient—regardless of how `/etc/nsswitch.conf` is configured.

To verify that DNS is configured and that the CEMF workstation is in DNS, perform the following steps:

---

**Step 1** Verify that a valid DNS server and domain name are defined in `/etc/resolv.conf`.

**Step 2** Verify that the workstation is configured in DNS using the following command:

```
nslookup hostname
```




---

**Note** If the **nslookup** command fails, then CEMF cannot be installed until the CEMF workstation's host name is added to the DNS server.

---

## Workstation Does Not Use DNS

CEMF installs properly if a workstation does not use DNS. To verify this:

---

**Step 1** Verify that the file `/etc/resolv.conf` does not exist.

**Step 2** Verify that the hosts entry in the file `/etc/nsswitch.conf` looks exactly like the following line:

```
hosts:      files
```




---

**Note** If `/etc/resolv.conf` exists, or the `hosts:` line in `/etc/nsswitch.conf` has anything else configured, then CEMF does not install properly.

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## Installing the Cisco Element Manager Framework

If CEMF is not already installed, refer to the *Cisco Element Manager Framework Installation and Licensing Guide*.

## Installing CMNM




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**Note** You must install the CMNM software as root.

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The CEMF, and therefore CMNM software, has both a manager (server) and client portion. The client can be installed on the same workstation as the manager or a separate workstation. CMNM must be installed on the manager and all client workstations on which CEMF is installed.

The CMNM installation process automatically detects if the CEMF manager or CEMF client is installed and then installs the correct CMNM component.

**Note**

The CMNM software is shipped with the Element Managers in Table 2-12. CMNM has not been tested with any other Element Managers. If you install additional Element Managers, they are not supported by CMNM.

- 
- Step 1** Locate the CMNM installation media.
- Step 2** Type **su - root** to become the root user.
- Step 3** Verify that the Volume Management daemon is running:
- a. Type the command **ps -ef | grep vold**.
    - If it is running, you see the following output:
 

```
root    363   1   0   May 23 ?   0:01 /usr/sbin/vold
```
    - If the Volume Management daemon is not running, start the daemon using the following command:
 

```
/etc/init.d/volmgt start
```
  - b. Verify that the Volume Management daemon is running with the command provided above. If it is still not running, contact your system administrator.
- Step 4** Place the CMNM installation media into the CD-ROM drive.
- Step 5** Type **cd /cdrom/cdrom0**.
- Step 6** Type **./installCSCOcmnm**.
- 

## Verifying the Installation of CMNM

Verify that CMNM software is installed properly before starting CMNM.

### Verifying Element Managers

- 
- Step 1** Verify that the CMNM Package is installed using the following command:
- ```
pkginfo CSCOcmmn
```
- The following message should appear:
- ```
application CSCOcmmn      Cisco MGC-Node Manager
```
- Step 2** Verify that the CMNM Element Managers have been installed. The CMNM software is shipped with the Element Managers in Table 2-12.

*Table 2-12 Element Managers*

mgxEM	Element Manager for Cisco MGX 8260 media gateway devices
mgcEM	Common Element Manager for Cisco MGC node devices
hostEM	Element Manager for Cisco MGC host signaling, trunking, and dial plan components

- Step 3** Run the following script to display the installed CMNM Element Managers and compare this with the list in the table above.

```
CEMF Basedir/bin/cmmversion -verbose
```

```
CSCOcmmn Tool Versions
```

Name	Version	Patch Level	Build Num	Build Type
CSCOcmmn	1.5	00	102300	REL
CSCOcmcv	5.1	00	092600	
CSCOcemfm	3.1	none		

```
CSCOcmmn Element Manager Versions
```

Name	Version	Patch Level	Build Num	Build Type
hostEMm	1.5	00	102300	REL
mgcEMm	1.5	00	102300	REL
mgxEMm	1.5	00	102300	REL

## Verifying the Installation of CiscoView 5.1



### Note

CiscoView is designed to work with CiscoWorks 2000. When installing CiscoView packages outside this environment, certain functions are not supported. The following CiscoView buttons do not work in the CMNM environment:

- Telnet
- CCO connection
- Preferences
- About
- Help

When running xdsu, the following exception is generated and can be ignored:

```
ERROR: exception occurred while examining Integration Utility
configuration: com.cisco.nm.nmim.nmic.IntgUtilCheckConfig
```

To verify the installation of CiscoView 5.1:

- Step 1** Verify that the CiscoView Application has been installed with the following command:

```
pkginfo CSCOcmcv
```

- If the package is installed, you see the following:  
application CSCOcmcv CiscoView 5.1 for Cisco MGC-Node Manager
- If the package is not installed, you see the following:  
ERROR: information for "CSCOcmcv" was not found

- Step 2** Verify that the CiscoView Packages have been installed. CiscoView is shipped with the packages in Table 2-13.

*Table 2-13 CiscoView Packages List*

CiscoView Packages	Version
Cat2900 XL	1.1
Cat5000	1.2
Cat5500	1.2
Cat8500	2.0
Rtr2600	2.0
StackMaker	1.0
SwitchAddlets	1.3

- Step 3** Run either of the following commands to determine if the CiscoView packages listed in Table 2-13 are installed:

```
CEMF Directory/ciscoview5.1/bin/dsu -query -all
```

The dsu application displays to STDOUT the installed CiscoView packages.

```
CEMF Directory/ciscoview5.1/bin/xdsu
```

The xdsu application displays a GUI that lists the installed CiscoView packages.

## Upgrading CMNM

For information about CMNM patches and upgrades, check the web site.

### Upgrading CiscoView 5.1

- Step 1** Check the CiscoView web site for the latest supported version of the package.
- Step 2** Download the latest CiscoView packages and place in a temporary directory; for example, /scratch/cvUpgrade.
- Step 3** Make sure that the package files are readable by the root user. If not, the packages do not appear in the CiscoView upgrade tool.
- Step 4** Type **su - root** to become the root user.
- Step 5** Change the directory to /scratch/cvUpgrade.
- Step 6** To run the CiscoView upgrade tool, type:
- ```
CEMF Directory/ciscoview5.1/bin/xdsu
```
- Step 7** Click **Install**. Ignore the following exception:

```
ERROR: exception occurred while examining Integration Utility
configuration: com.cisco.nm.nmim.nmic.IntgUtilCheckConfig
```

- Step 8** Type in the exact location of the CiscoView packages in the Directory box and press **Enter**. Or click **Browse**, navigate to your CiscoView packages' temporary directory, and click **Select**.
- Step 9** Select the CiscoView packages that you want to upgrade, click **Install**, and click the appropriate confirmation button.
- 

## Uninstalling CMNM

Before uninstalling the CMNM software, be sure to back up your CEMF databases. See “Backing Up Your Databases” below.

## Backing Up Your Databases

See the “Cisco EMF Database Backup and Restore Procedures” section in the *Installing, Licensing, and Configuring Cisco EMF* manual.

## Uninstalling the CMNM Software

To uninstall the CMNM software, type the following command:

```
CEMF Directory/uninstall/uninstallCSCOcmnm
```

## Verifying Uninstallation of CMNM

- Step 1** To verify that the CMNM package is not installed, type **pkginfo CSCOcmmn**.
- The following message should appear:
- ```
ERROR: information for "CSCOcmmn" was not found
```
- Step 2** Type **pkginfo | grep EM** to verify that no CMNM Element Managers are installed.
- Step 3** Type **pkginfo CSCOcmev** to verify that CiscoView is not installed.
- The following message should appear:
- ```
ERROR: information for "CSCOcmev" was not found
```
- 

## Installing the Cisco MGC Host Provisioning Tool

There are two different Cisco VSC3000 and Cisco SC2200 provisioning tools, depending on what network architecture you are running. If you are running the Cisco SS7 PRI Gateway Solution or the Cisco Tandem Offload Solution, install the Voice Services Provisioning Tool (VSPT). For all other architectures, install CMM.

- For information on installing and upgrading VSPT, refer to the Cisco VSPT web site.

- For information on installing and upgrading CMM, refer to the *Cisco Media Gateway Controller Software Release 7 Installation and Configuration Guide*.

## Configuring Reflection

CMNM has been tested with the following Xserver software package:

- Reflection 7.20

## Creating an XDMCP Connection

For Reflection to display CMNM correctly, Reflection must be run in XDMCP mode.

- 
- Step 1** Start Reflection.
- Step 2** From the Connection menu, select **New XDMCP Connection**.
- Step 3** From the Method pull-down menu, select **Broadcast** or **Direct**, then continue with one of the following set of steps:
- For Broadcast method:
- a. Click **Connect**.
  - b. Select the appropriate XDMCP computer. If you do not know which computer to select, contact your system administrator.
- For Direct method:
- a. In the Host Name field, enter the host name of an XDMCP computer.
  - b. Click **Connect**.
- 

## Fixing the Insufficient Colors Problem

To fix the "... insufficient colors available for CEMF Manager" problem, obtain a copy of the Sun Solaris file `rgb.txt`, download it to your Winxx workstation, and configure Reflection to use the UNIX `rgb.txt` file as opposed to the Reflection default `rgb.txt` file.

- 
- Step 1** Change directory to your Reflection user directory using the following command:
- ```
cd Reflection Directory/user
```
- Step 2** Back up your original `rgb.txt` file using the following command:
- ```
cp rgb.txt rgb.txt.orig
```
- Step 3** Copy the UNIX file, `/usr/openwin/lib/X11/rgb.txt`, from your Sun Solaris workstation to your Winxx Reflection directory. You can use either FTP or RCP. If you are unable to use FTP or RCP to copy the `rgb.txt` file, contact your system administrator.
- To use FTP, type the following commands:
- ```
ftp your_workstation
```

```
cd /usr/lib/X11
get rgb.txt rgb_unix.txt
```

**Step 4** Configure Reflection:

- Bring up Reflection X Manager.
- From the Settings menu, select **Color**.
- Look for the RGB Color File frame and change the setting from *Reflection Directory*\user\rgb.txt to *Reflection Directory*\user\rgb\_unix.txt.

**Step 5** Stop Reflection and restart Reflection.



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**Note** Just resetting the Reflection Xserver does not work; you must stop and restart Reflection.

---