



# System Requirements

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This chapter describes what is required to install CTM. It contains the following sections:

- 1.1 CTM Server Requirements, page 1-1
- 1.2 CTM Client Requirements, page 1-7
- 1.3 Oracle Licensing for CTM, page 1-8
- 1.4 Installation Prerequisites, page 1-11



**Note**

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Although Cisco makes every attempt to ensure the availability of third-party hardware and software platforms specified for CTM, Cisco reserves the right to change or modify system requirements due to third-party vendor product availability or changes that are beyond Cisco's control.

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## 1.1 CTM Server Requirements

The CTM server runs on Sun Solaris 8, hardware release 02/04 (or later), on a Sun SPARC-based server. Earlier releases of Solaris 8 can be updated by applying the latest recommended patch cluster available from Sun at <http://sunsolve.sun.com/pub-cgi/show.pl?target=patches/patch-access>.



**Note**

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Cisco tests certain simulated network configurations, which are listed in [Table 1-1](#). Your setup and performance might vary depending on the size of your network and the usage pattern of management tasks.

CTM is capable of using a nonlocal database, meaning the database is installed on a separate server. For information about this configuration, contact your Cisco account representative.

CTM is not validated against Network File System (NFS)-mounted drives. Their use might require more CPU, memory, and disk space than is specified in the following tables.



**Caution**

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During the Solaris 8 installation, you are prompted to select software to install. (The default is End User System Support—769 MB.) Select **Entire Distribution plus OEM support—1491 MB**. If you do not select this, the CTM installation will fail.

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**Caution**

Configure your file systems to allow large files. By default, no single file can be larger than 2 GB. This can be problematic for large database installations of the CTM server. Select **Include Solaris 64-bit support**.

To install the CTM server, it is required that you have:

- Sun Solaris patches 108528-29, 108652-90, 108714-08, 108773-18, 108921-23, 108940-68, 108987-13, 108989-02, 108993-45, 109147-24, 110386-03, 110934-23, 111023-02, 111111-03, 111308-03, 111310-01, 111327-05, 112396-02, 112438-03, and 117000-05 or later, available on SunSolve Online at <http://sunsolve.sun.com>.

**Note**

These Solaris patches might be superseded by more recent patches. Visit Sun's website for the most up-to-date patch information.

**Note**

While installing Solaris patches, you might receive a message saying "This patch is obsoleted by patch <number>, which has already been applied to this system." This message indicates that an updated version of the patch is already installed, and no action is required.

**Note**

Enter the **showrev -p | grep <patch\_number>** command to verify that the required Solaris patches are installed.

**Note**

Many of these patches are part of a Solaris patch cluster called J2SE\_Solaris\_8\_Recommended.zip, which you can download from <http://sunsolve.sun.com>. After downloading the patch cluster, enter the following commands as the root user to unzip the file to a local directory:

```
unzip J2SE_Solaris_8_Recommended.zip
./install_cluster
```

- Sun Microsystems Java Runtime Environment (JRE) (installed automatically for the CTM server and CTM GateWay/CORBA, and bundled with the CTM client).
- Sun Microsystems JRE Standard Edition version 1.4.2\_05.
- Oracle9i Release 2 software plus the 9.2.0.6 patch.
- Oracle9i licenses for Sun Solaris.

**Note**

Oracle licenses can be purchased by the server processor or by the named user. For more information on Oracle9i named users, see [1.3 Oracle Licensing for CTM, page 1-8](#).

- Available swap space (see [Table 1-4](#) and [Table 1-5, Part 2](#) for swap space requirements).
- CD-ROM drive.

If you are installing CiscoView in addition to CTM, the following Solaris patches are required:

- 109326-14, 110898-09, 110945-08, 111626-03

The following Solaris patches are recommended for CiscoView:

- 108964-06, 110286-02, 110615-11, 110662-12, 110951-05

## 1.1.1 Server Specifications

Table 1-1 shows recommended hardware requirements for installing the CTM server, and the resulting maximum number of NEs the server manages for each configuration. Table 1-1 also shows sample configurations when the CTM server and Oracle9i database are installed on the same workstation. The CTM server can run on any platform that supports Sun Solaris 8.

**Table 1-1** Recommended Requirements for the CTM Server Installation

Network Size	Oracle Database Type	Processor	CPU Speed	RAM <sup>1</sup>	No. of Network Partitions	Max. No. of Optical NEs <sup>2</sup>	Max. No. of MGX NEs <sup>3</sup>	Max. No. of CRS-1 NEs <sup>4</sup>
Small	Standard Edition	2 x UltraSPARC-III or 2 x IIIi CPU	1.2 GHz	4 GB	1	200	5	5
Medium	Enterprise Edition	4 x UltraSPARC-III or 2 x UltraSPARC-IV CPU	1.2 GHz	16 GB	1	500	20	10
Large	Enterprise Edition	8 x UltraSPARC-III or 4 x UltraSPARC-IV CPU	1.2 GHz	32 GB	4	2000	50	20
High end	Enterprise Edition	8 x UltraSPARC-IV CPU with fiber-channel disk array	1.2 GHz	64 GB	6	3000	100	30

1. The memory required for the maximum number of NEs is for a single NE type. A network with multiple NE types might require additional memory.
2. These numbers assume you are using all optical NEs.
3. These numbers assume you are using all MGX NEs and performance monitoring (PM) data collection is not enabled. If PM data collection is enabled, the number of supported MGX NEs is half the number displayed in this column. Note that these numbers should be used as a guideline, and will vary depending on the configuration and the state of your network.
4. These numbers assume you are using all CRS-1 NEs with 16-slot chassis, 20,000 ACLs, and 2,000 IEPs. Note that these numbers should be used as a guideline, and will vary depending on the software and hardware configuration of your NEs.



**Note**

The installation procedure assumes that you are performing the installation directly from the workstation. X-terminal sessions are not supported for the CTM server installation.



**Note**

Oracle Enterprise Edition is recommended for small networks and required for medium or larger networks.

The following list details the server configuration parameters and particularly the effect of changes in each parameter on the maximum number of NEs the server can manage:

- Network Size: If the network size is increased from the size shown in Table 1-1, more resources are reserved for the higher number of NEs to be managed.

- Oracle Database Type: Standard Edition is allowed only in small configurations. In the small configuration, performance is identical whether Standard Edition or Enterprise Edition is used.
- CPUs: The server can manage more NEs as the number of CPUs increases above what is shown in [Table 1-1](#). The server can manage fewer NEs as the number of CPUs decreases.
- CPU Speed: The server can manage more NEs if the CPU speed is faster than what is shown in [Table 1-1](#). The server can manage fewer NEs as the CPU speed decreases.
- RAM: The server can manage more NEs if the RAM increases above what is shown in [Table 1-1](#). The server can manage fewer NEs as the RAM decreases.
- Number of Network Partitions: For each network partition, the server reserves resources for the higher number of NEs to be managed. The server can manage more NEs as the number of network partitions increases. The server can manage fewer NEs as the number of network partitions decreases.

## 1.1.2 Disk Space Specifications

[Table 1-2](#) shows disk space requirements based on network size and PM collection status when you are installing the CTM server and Oracle9i database on the same workstation.

**Table 1-2** *Disk Space Requirements for Installing the CTM Server and Oracle9i on the Same Workstation*

Network Size	Disk Space with PM Collection	Disk Space Without PM Collection
Small	104 GB	46 GB
Medium	215 GB	72 GB
Large	435 GB	133 GB
High end	925 GB	306 GB



### Note

The disk space values listed in [Table 1-2](#) are for new installations of CTM R6.0 only. If you are migrating from a previous release, you will need this amount of disk space in addition to the disk space used by the previous release.

[Table 1-3](#) shows disk space requirements based on network size and PM collection status when you are installing the CTM server and Oracle9i database on separate workstations.

**Table 1-3** *Disk Space Requirements for Installing CTM Server and Oracle9i on Separate Workstations*

CTM Server	
Network Size	Disk Space
Small	12 GB
Medium	18 GB
Large	54 GB
High end	202 GB

**Table 1-3 Disk Space Requirements for Installing CTM Server and Oracle9i on Separate Workstations (continued)**

Oracle9i Database Server		
Network Size	Disk Space with PM Collection	Disk Space Without PM Collection
Small	99 GB	38 GB
Medium	208 GB	62 GB
Large	398 GB	94 GB
High end	740 GB	118 GB

Note the following PM assumptions:

- In a small network, PM data collection assumes 30 days of storage for PM data collected across 200 optical NEs, assuming an average of 200 interfaces per NE, up to a maximum of 40,000 interfaces (includes logical and physical interfaces).
- In a medium network, PM data collection assumes 30 days of storage for PM data collected across 400 optical NEs, assuming an average of 200 interfaces per NE, up to a maximum of 80,000 interfaces (includes logical and physical interfaces).
- In a large network, PM data collection assumes 30 days of storage for PM data collected across 2000 optical NEs, assuming an average of 200 interfaces per NE, up to a maximum of 200,000 interfaces (includes logical and physical interfaces).
- In a high-end network, PM data collection assumes 30 days of storage for PM data collected across 3000 optical NEs, assuming an average of 200 interfaces per NE, up to a maximum of 500,000 interfaces (includes logical and physical interfaces).

**Note**

The disk space values listed in [Table 1-3](#) are for new installations of CTM R6.0 only. If you are migrating from a previous release, you will need this amount of disk space in addition to the disk space used by the previous release.

## 1.1.3 Partition Specifications

[Table 1-4](#) shows partition specifications for installing the CTM server and Oracle9i on the same workstation. [Table 1-5, Part 1](#) and [Table 1-5, Part 2](#) show partition specifications for installing the CTM server and Oracle9i on separate workstations.

**Table 1-4 Partition Sizing for Installing the CTM Server and Oracle9i on the Same Workstation**

Network Size	root	swap	oraclesw9i	db01	db02	db03 <sup>1</sup>	db04 <sup>2</sup>	db05 <sup>3</sup>	Total with PM Collection	Total Without PM Collection
Small	7 GB	6 GB	5 GB	5 GB	6 GB	40 GB	30 GB	8 GB	107 GB	46 GB
Medium	7 GB	12 GB	5 GB	8 GB	16 GB	90 GB	70 GB	10 GB	218 GB	72 GB
Large	7 GB	48 GB	5 GB	10 GB	26 GB	190 GB	140 GB	12 GB	438 GB	133 GB
High end	7 GB	196 GB	5 GB	12 GB	50 GB	360 GB	300 GB	18 GB	948 GB	326 GB

1. If PM collection is not enabled, the /db03 directory requires 5 GB for a small network, 8 GB for a medium network, 14 GB for a large network, and 20 GB for a high-end network.

## 1.1 CTM Server Requirements

- If PM collection is not enabled, the /db04 directory requires 4 GB for a small network, 6 GB for a medium network, 12 GB for a large network, and 18 GB for a high-end network.
- The /db05 directory is required only if you want to install the CTM database in ARCHIVELOG mode.

**Note**

The partition sizes listed in [Table 1-4](#) are for new installations of CTM R6.0 only. If you are migrating from a previous release, each partition will require this amount of disk space in addition to the size of the partitions used by the previous release. See [Table 2-1](#) for information about disk directories.

**Table 1-5, Part 1 Partition Sizing for the CTM Server When Installing the CTM Server and Oracle9i on Separate Workstations**

CTM Server									
Network Size	root	swap	oraclesw9i	db01	db02	db03	db04	db05	Total
Small	7 GB	6 GB	5 GB	—	—	—	—	—	18 GB
Medium	7 GB	12 GB	5 GB	—	—	—	—	—	24 GB
Large	7 GB	48 GB	5 GB	—	—	—	—	—	60 GB
High end	7 GB	196 GB	5 GB	—	—	—	—	—	208 GB

**Table 1-5, Part 2 Partition Sizing for the Oracle9i Database Server When Installing the CTM Server and Oracle9i on Separate Workstations**

Oracle9i Database Server										
Network Size	root	swap	oraclesw9i	db01	db02	db03 <sup>1</sup>	db04 <sup>2</sup>	db05 <sup>3</sup>	Total with PM Collection	Total Without PM Collection
Small	2 GB	4 GB	5 GB	5 GB	6 GB	40 GB	30 GB	8 GB	100 GB	39 GB
Medium	4 GB	6 GB	5 GB	8 GB	16 GB	90 GB	70 GB	10 GB	209 GB	63 GB
Large	4 GB	12 GB	5 GB	10 GB	26 GB	190 GB	140 GB	12 GB	399 GB	95 GB
High end	4 GB	12 GB	5 GB	12 GB	50 GB	360 GB	300 GB	18 GB	761 GB	139 GB

- If PM collection is not enabled, the /db03 directory requires 5 GB for a small network, 8 GB for a medium network, 14 GB for a large network, and 20 GB for a high-end network.
- If PM collection is not enabled, the /db04 directory requires 4 GB for a small network, 6 GB for a medium network, 12 GB for a large network, and 18 GB for a high-end network.
- The /db05 directory is required only if you want to install the CTM database in ARCHIVELOG mode.

**Note**

The partition sizes listed in [Table 1-5, Part 1](#) and [Table 1-5, Part 2](#) are for new installations of CTM R6.0 only. If you are migrating from a previous release, each partition will require this amount of disk space in addition to the size of the partitions used by the previous release. See [Table 2-2](#) for information about disk directories.

## 1.2 CTM Client Requirements

To install the CTM client, it is recommended that you have a Sun Solaris workstation or Microsoft Windows PC configured as shown in [Table 1-6](#).

**Table 1-6** Minimum Requirements for the CTM Client

Platform	Network Size	RAM <sup>1,2,3</sup>	CPUs	CPU Speed	Disk Space Without CEC <sup>4</sup>	Disk Space with CEC <sup>5</sup>	Other
Sun Ultra 5 workstation <sup>5</sup>	Small	256 MB	1	333 MHz	640 MB	710 MB	<ul style="list-style-type: none"> <li>Sun Solaris 8 hardware release 02/04 with Common Desktop Environment (CDE), with graphics support for 16-bit color or higher</li> <li>Mozilla 1.7.0, with JavaScript enabled</li> </ul>
	Medium	512 MB					
	Large	512 MB					
	High end	512 MB					
Pentium III or Pentium 4 class PC	Small	256 MB <sup>6</sup>	1	450 MHz	630 MB	700 MB	<ul style="list-style-type: none"> <li>Microsoft Windows 2000 Professional, Windows 2000 Terminal Server, or Windows XP Professional, each with graphics support for 16-bit color or higher</li> <li>Microsoft Internet Explorer 6.0 with Service Pack 1 (or later if available), Netscape 7.0, or Mozilla 1.7.1, with JavaScript enabled</li> </ul>
	Medium	512 MB					
	Large	512 MB					
	High end	512 MB					

1. If you are running multiple CTM client sessions (up to a maximum of five) on a single client workstation, add 128 MB of RAM for each additional CTM client.
2. If you are running more than two simultaneous Cisco Transport Controller (CTC) sessions on a single client workstation, add 64 MB of RAM for each CTC client.
3. It is recommended that you set the client virtual memory to two times the size of the physical memory (two times the amount of RAM).
4. Disk space requirements are for CTM and Cisco Edge Craft (CEC) client software only.
5. It is not mandatory that the CTM client run on a Sun Ultra 5 workstation. You can run the CTM client on other comparable Sun workstations.
6. If you have Cisco MGX nodes in your network, increase the RAM to 512 MB for a small network.

CTM supports a maximum of:

- 30 simultaneous CTM client sessions for a small network
- 60 simultaneous sessions for a medium network
- 100 simultaneous sessions for a large network
- 100 simultaneous sessions for a high-end network

### 1.2.1 Using Remote Application Software with the CTM R6.0 Client

Client launch and operation are supported by the following remote application software:

- Windows 2000 Terminal Server
- Citrix MetaFrame
- Tarantella Enterprise Edition Version 4.0

**Note**

If you are using Tarantella, enable full-duplex autodetection on the GUI server interface to prevent performance slowdown.

**Note**

You cannot run more than five CTM client sessions on a single client workstation.

## 1.2.2 Java Heap Sizes

The CTM client startup script provides small and high-end memory allocation and identifies the maximum heap allocation for the client Java Virtual Machine (JVM) process. The CTM client launches with the appropriate minimum and maximum Java heap size based on the server configuration (small, medium, large, or high end). [Table 1-7](#) shows the Java heap memory values.

**Table 1-7** Java Heap Sizes

Network Size	Initial Heap Size	Maximum Heap Size
Small	100 MB	192 MB
Medium	128 MB	256 MB
Large	192 MB	512 MB
High end	256 MB	1024 MB

**Caution**

The client memory type should match (or exceed) the server memory type. If a client configured for a small network logs into a medium, large, or high-end server, the small client could crash due to memory limitations. Therefore, a warning dialog box appears if a client configured for a small network logs into a medium, large, or high-end server.

## 1.3 Oracle Licensing for CTM

This section explains how to calculate the total number of Oracle Named User Plus licenses required for your CTM R6.0 server and client installations. This section describes with examples the following Oracle database editions:

- [1.3.1 Oracle Enterprise Edition, page 1-10](#)
- [1.3.2 Oracle Standard Edition, page 1-10](#)
- [1.3.3 Oracle Standard Edition One, page 1-11](#)

**Note**

See the Oracle website for detailed information about Oracle licensing definitions and requirements.

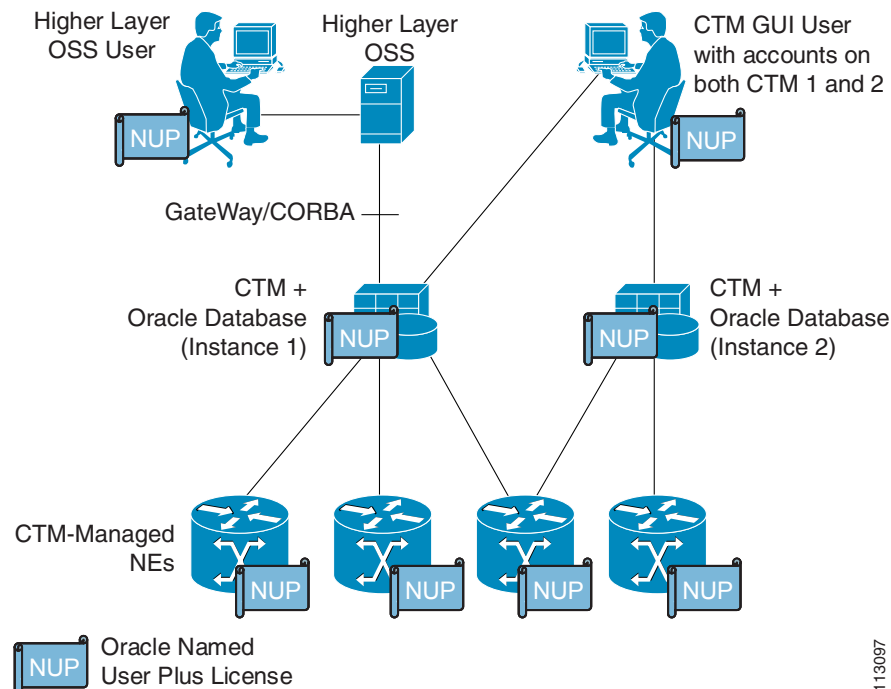
Oracle's technology products, including the Oracle database required for use with CTM, are licensed using one of two possible metrics. Which metric to use normally depends on which will result in a lower price for the database. If for some reason the number of database users cannot be counted, the Processor metric must be used. However, in the case of a CTM environment, database users normally can be counted:

- *Processor*: This metric is defined as the number of processors on the server on which the Oracle database is installed and/or running. This option must be used in environments in which software users cannot easily be identified or counted (not normally the case in a CTM environment).
- *Named User Plus*: This metric is used in environments in which users can be identified and counted. Named User Plus includes both human-operated and automated devices. All human-operated and automated devices that access the program must be licensed. A Named User Plus license may access the program on any instances on which it is deployed, provided that the minimum license requirement on each server is met.

In the context of a CTM environment, *human-operated device* means any device operated by a user who has direct or indirect access to CTM. Direct access is gained through a user account on CTM that allows access through the CTM client GUI. Indirect access is possible through a user account on a higher-layer OSS, which in turn communicates with CTM through either CTM GateWay/CORBA or CTM GateWay/TL1. Automated users include the NEs managed by CTM and the CTM server itself.

Figure 1-1 shows an example CTM environment to illustrate identifying the human and automated database users that must be counted.

**Figure 1-1 Example CTM Environment**



In the example shown in Figure 1-1 there are two independent CTM servers and Oracle database instances. There are four NEs, one of which is managed by both CTM servers. There is one direct CTM user and one indirect user. So in this example the total number of Oracle named users is as follows:

CTM servers: 2\*

NEs: 4\*\*

CTM Users: 1\*\*

Higher-layer OSS Users: 1

Total Named User Plus:  $8 = 2 + 4 + 1 + 1$

\*Because of the *self-monitor feature* of CTM, a CTM server itself is considered an automated user of the database and is therefore counted.

\*\*A Named User Plus license entitles the user to access Oracle on any instances where it is deployed. So if a user has access to multiple CTM servers, only a single license is needed per user. Also, if an NE is managed by multiple CTM servers, only a single license is needed per NE.

This example explains how to count the named users, but the number of named users required is the larger of either 1) the actual count or 2) the required minimum. The required minimum will vary depending on the edition of the Oracle database (for example, standard, enterprise, and so forth).

## 1.3.1 Oracle Enterprise Edition

Due to the scalability features included, Oracle Database Enterprise Edition (EE) is required for CTM servers managing medium to high-end CTM installations.

### 1.3.1.1 CTM with Oracle EE (Example A)

A service provider has 800 NEs and a data center with 10 CTM client workstations. 100 employees in the data center are authorized to use the CTM client. Some of the employees in the data center share the same CTM account (username/password). CTM is running on a Sun V880 with 8 processors and 32 GB of RAM.

- Named User Plus: 1) Minimum = 8 processors x 25 users/processor = 200 or 2) Count = 800 licenses for NEs + 100 licenses for data center personnel + 1 CTM server = 901  
Result: 901 Named User Plus licenses are required
- Processor: 8 Processor licenses

### 1.3.1.2 CTM with Oracle EE (Example B)

The same service provider customer as in [1.3.1.1 CTM with Oracle EE \(Example A\)](#) decides to enable CTM GateWay/CORBA and connect to a higher-layer OSS that handles inventory management. There are 20 employees in the data center authorized to access the inventory system; 5 of them are also CTM users (that is, they are a subset of the 100 CTM users identified in the previous example). In this case, the total number of human users is:

95 CTM-only users + 15 inventory system-only users + 5 CTM/inventory system users, or 115 human named users.

As a result of adding the OSS and related users, the total number of named users required has increased from 901 to 916.

## 1.3.2 Oracle Standard Edition

For small CTM installations, Oracle Database Standard Edition (SE) offers a low-cost alternative. Oracle Database SE cannot be licensed on machines with a capacity of greater than 4 processors.

### 1.3.2.1 CTM with Oracle SE (Example)

A large enterprise customer has 78 NEs and 5 CTM client workstations. 15 employees in the data center are authorized to use the CTM client. Some of the employees in the data center share the same CTM account (username/password). CTM is running on a Sun V240 with 2 processors and 4 GB RAM.

- Named User Plus: 1) Minimum = 2 processors x 5 users/processor = 10 or 2) Count = 78 licenses for NEs + 15 licenses for data center personnel + 1 CTM server = 94

Result: 94 Named User Plus licenses are required

- Processor: 2 Processor licenses

## 1.3.3 Oracle Standard Edition One

For very small CTM installations and extended lab use (25 or fewer NEs), a single-processor server is sufficient. In this case, Oracle Database Standard Edition One (SEO) provides the least expensive way to purchase the Oracle database. Oracle Database SEO cannot be licensed on machines with a maximum capacity of greater than 1 processor.

### 1.3.3.1 CTM with Oracle SEO (Example)

A customer is using CTM in a lab for long-term testing and evaluation with 5 NEs, and has 1 CTM client workstation. Two employees in the lab are authorized to use the CTM client. Both employees share the same CTM account (username/password). CTM is running on a Sun V120 with 1 processor and 2 GB RAM.

- Named User Plus: 1) Minimum = 5 or 2) 5 licenses for NEs + 2 licenses for lab employees + 1 CTM server = 8

Result: 8 Named User Plus licenses are required

- Processor: 1 Processor license

## 1.3.4 CTM High Availability Option

In the CTM High Availability (HA) architecture, the server nodes are configured in a *fail-over cluster*. In this configuration, the first node acts as a primary node. If the primary node fails, another node in the cluster acts as the primary node. In this type of environment, Oracle permits licensed Oracle database customers to run the database on an unlicensed spare computer for up to a total of ten separate days in any given calendar year. Any other use requires the environment to be fully licensed. Additionally, the same metric must be used when licensing the databases in a fail-over environment.

## 1.4 Installation Prerequisites

Before installing the CTM server and the Oracle9i database on your Sun Solaris 8 server, verify the following:

- You have the correct Solaris patches installed. (See [1.1 CTM Server Requirements, page 1-1.](#))
- You have the correct version of Oracle9i—Standard or Enterprise Edition, for Sun Solaris.



**Note** Enter the following command to determine what type of applications you can run on your operating system (OS):

```
isainfo -kv
```

If the output reads “64-bit sparcv9 kernel modules,” you can run both 64-bit and 32-bit applications. If the output reads “32-bit sparcv9 kernel modules,” you can run only 32-bit applications. It is recommended that you be able to run both 64-bit and 32-bit applications.

- You meet all of the system requirements described in this chapter.
- The **ping** command is included in your Path environment variable.
- Decide whether or not you want to install the CTM database in ARCHIVELOG mode. If you plan to perform hot database backups, ARCHIVELOG mode is required.
- Verify that your /ctm\_backup directory (the disk directory for the backed-up database and configuration files) is at least as big as the total sum of your database data files. If the /ctm\_backup directory is not equal to the total size of your database data files, you are prompted with a warning message that you might not have enough disk space.
- Decide which nonroot users you want to be able to run CTM UNIX commands. (See [1.4.1 Overview of Sudo Commands](#), page 1-12.)



**Note**

Network Address Translation (NAT) is not supported between the CTM server and the NEs. (Only the ONS 1580x supports NAT.)

## 1.4.1 Overview of Sudo Commands

Sudo software (freeware) version 1.6.6 is bundled with the CTM R6.0 software. The sudo software enables nonroot UNIX users to run the following UNIX commands:

- **ctms-start**
- **ctms-abort**
- **ctms-stop**
- **ctms-stop-service**
- **showctm**
- **getinfo.sh**
- **prune\_auditlog.sh**
- **prune\_errlog.sh**
- **prune\_audittrail.sh**
- **prune\_fm.sh**
- **prune\_pm.sh**
- **prune\_ne.sh**
- **prune\_server\_monitor.sh**
- **prune\_admin\_job\_table.sh**

- **prune\_ne\_ip\_address.sh**

During the CTM server installation, the setup program prompts you to specify the name of the UNIX group to which you want to assign administrator privileges. By default, this group is set to the root group. If you specify a group other than root, the setup program verifies that the UNIX group exists on the system and adds entries to the `/etc/sudoers` file. Entries in this file reflect the commands that the specified UNIX group can run by using the **sudo** command.

The following entries in the `/etc/sudoers` file reflect the commands that can be run as nonroot:

```
%CTM_UNIX_group
hostname=(root) NOPASSWD: \
/opt/CiscoTransportManagerServer/bin/ctms-start, \
/opt/CiscoTransportManagerServer/bin/ctms-abort, \
/opt/CiscoTransportManagerServer/bin/ctms-stop, \
/opt/CiscoTransportManagerServer/bin/ctms-stop-service, \
/opt/CiscoTransportManagerServer/bin/showctm, \
/opt/CiscoTransportManagerServer/bin/getinfo.sh, \
/opt/CiscoTransportManagerServer/bin/prune_auditlog.sh, \
/opt/CiscoTransportManagerServer/bin/prune_errlog.sh, \
/opt/CiscoTransportManagerServer/bin/prune_audittrail.sh, \
/opt/CiscoTransportManagerServer/bin/prune_fm.sh, \
/opt/CiscoTransportManagerServer/bin/prune_pm.sh, \
/opt/CiscoTransportManagerServer/bin/prune_ne.sh, \
/opt/CiscoTransportManagerServer/bin/prune_server_monitor.sh, \
/opt/CiscoTransportManagerServer/bin/prune_admin_job_table.sh, \
/opt/CiscoTransportManagerServer/bin/prune_ne_ip_address.sh
```

## 1.4.2 Explanation of the `ctms-start` Command

A complete set of administrative command scripts is added to the application during installation. One command automatically starts the CTM server processes every time the server is started. The server processes can also be started or stopped manually as necessary; the scripts are located in the `/opt/CiscoTransportManagerServer/bin` directory.

The **ctms-start** command sets the appropriate environment variables and starts the CTM server. The amount of time it takes for the CTM server to start varies based on the number of NEs in the configuration and the size of the database. Use **ctms-start** only when the CTM server has stopped.

---

**Step 1** Log into the CTM server workstation as the root user.

**Step 2** On the command line, enter the following command:

```
ctms-start
```



**Note** It can take from 0 to 5 minutes for the server processes to start after the **ctms-start** command has finished execution. This is because NE services and gateway services (if enabled) are still initializing for all of the NEs that are deployed. Wait 5 minutes after entering the **ctms-start** command; then, enter the **showctm** command. The NE service corresponding to all the deployed NEs should have started.

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### 1.4.3 Explanation of the `ctms-stop` Command

The `ctms-stop` command stops the CTM server gracefully. The stop procedure shuts down the server and cleans all memory and connections. The overall process approximately 5 minutes.

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**Step 1** Log into the CTM server workstation as the root user.

**Step 2** On the command line, enter the following command:

```
ctms-stop
```

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### 1.4.4 Explanation of the `ctms-abort` Command

The `ctms-abort` command kills all of the running processes immediately and stops the CTM server. The overall process takes less than 2 to 3 minutes.

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**Step 1** Log into the CTM server workstation as the root user.

**Step 2** On the command line, enter the following command:

```
ctms-abort
```

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