



Installation and Upgrading

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Introduction

This chapter describes how to install, upgrade, and uninstall the Cisco Service Control Management Suite Subscriber Manager.

Installing, Upgrading, and Uninstalling the Subscriber Manager

This module describes the procedures to install, upgrade, or uninstall the Subscriber Manager.

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Installing the Subscriber Manager

Subscriber Manager installation is an automated process. Cisco provides an installation script that is located at the root of the Subscriber Manager distribution files.

**Note**

If you are installing Subscriber Manager on the Solaris operating system, you must modify the file `/etc/system`. You can modify the file manually or by using an automated utility.

**Note**

If you are installing Subscriber Manager on the Linux operating system, first disable SELinux before attempting the installation. After you disable SELinux, you must modify the file `/etc/sysctl.conf`. You can modify the file manually or by using an automated utility. For the most recent information about SELinux, see the RedHat website.

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Installation Overview

The installation procedure installs the following components:

- Subscriber Manager and Command-Line Utilities (CLU)
- Subscriber Manager database and DSN
- Java Runtime Environment (JRE)
- Subscriber Manager Veritas Cluster Agents

The installation procedure also performs the following operations:

- Sets up a `pcube` user and group
- Adds startup and shutdown scripts
- Configures the system for Subscriber Manager database (performed manually or by using a script)
- Replicates scheme setting, which is accomplished by running a CLU (relevant only for cluster setups).

When the installation and configuration processes is completed, you can use the Subscriber Manager to introduce subscribers to the system.

**Note**

Login Event Generators and the Cisco SCA BB application are now installed by default on the Subscriber Manager.

Contents of the Distribution Files

The SCMS Subscriber Manager components are supplied in three distribution files:

- Subscriber Manager for Solaris
- Subscriber Manager for Linux
- Login Event Generators (LEGs)

Each distribution file is provided as a tar file, which is compressed by gzip and has the extension **.tar.gz**.

[Table 4-1](#) lists the contents of the Subscriber Manager distribution files for Solaris and Linux.

Table 4-1 Contents of Subscriber Manager Distribution Files

Path	Name	Description
DIST_ROOT	—	Cross-platform files
	dhcp_forwarder.tar.gz	DHCP Forwarder distribution
	hooks.sh	User-defined function for upgrade
	install	Typical installation procedure description
	install-forwarder.sh	Installation script for the DHCP Forwarder used in conjunction with DHCP Lease Query LEG
	install-sm.sh	Subscriber Manager installation script
	install-vcs-agents.sh	VCS agents installation script
	linux-def.sh	Linux-specific definitions (only in the Linux distribution file)
	solaris-def.sh	Solaris-specific definitions (only in the Solaris distribution file)
	MANIFEST	CD information
	p3sm.sh	Startup and shutdown script
	Prerequisites	System minimal requirements list
	sm-common.sh	General installation script
	sm-dist.tar.gz	Subscriber Manager distribution
	tt-sysconf.sh	Subscriber Manager database system kernel configuration script
	uninstall-sm.sh	Subscriber Manager uninstall script
	upgrade-sm.sh	Subscriber Manager upgrade script
	sm-db-conf.sh	Subscriber Manager database system memory configuration. Use this to configure PermSize and TempSize.
	vcs-agents-dist.tar.gz	VCS agents distribution.
	install-def.cfg	Contains definitions for several Subscriber Manager parameters that can be configured before Subscriber Manager installation or upgrade.
verify-subscriber.sh	Script to verify whether a subscriber exists without running the Subscriber Manager. Used when performing a cluster upgrade.	
cluster-upgrade.sh	Upgrade script for cluster installations.	
DIST_ROOT/Java/	—	Java Runtime Environment files.
	jre1.7.0_17-linux64.tar.gz	JRE for Linux 64-bit (only in the Linux 64-bit distribution file).
	jre1.7.0_17-solaris.tar.gz	JRE for Solaris
	LICENSE	JRE license.

Table 4-1 Contents of Subscriber Manager Distribution Files (continued)

Path	Name	Description
DIST_ROOT/TimesTen/	—	Subscriber Manager database files
	pqb_resp_uninst.txt	Response file for Subscriber Manager database uninstall
	pqb-odbc.ini.txt	Open DataBase Connectivity (ODBC) definitions
	pqb-response70.txt	Response file for Subscriber Manager database installation. When you install the database as part of Cisco Service Control Subscriber Manager installation, the installation process gets a response from this file for installing the SM database in silent mode. No manual changes are required.
	pqb-sys-odbc.ini.txt	Open DataBase Connectivity (ODBC) definitions
	timesten70520.linux86-64.tar.gz	Subscriber Manager database for Linux (only in the Linux 64-bit distribution file)
	timesten70500.sparc64.tar.Z	Subscriber Manager database for Solaris 64-bit (only in the Solaris distribution file)
DIST_ROOT/scripts	.bash_profile	User profile for bash
	.cshrc	User profile for C-Shell
	scmssm.sh	User profile utility file for bash
	scmssm.csh	User profile utility file for C-Shell
	dropRep.sql	SQL file used during the upgrade procedure
	install-dsn.sh	Subscriber Manager database DSN configuration script
	installjava.sh	JRE installation script
	install-tt.sh	Subscriber Manager database installation script
	get_name.sql	SQL file used during the upgrade procedure
	p3db	Utility file used by the installation/upgrade procedures
	deleteLastPqiInfo.sql	SQL file used during the upgrade procedure
	clu-common	Utility file used by the installation and upgrade procedures
upgrade.jar	Utility for upgrade procedures	

Table 4-2 lists the contents of the LEG distribution file.

Table 4-2 Contents of the LEG Distribution File

Path	Name	Description
DIST_ROOT	—	Cross-platform files
	MANIFEST	Distribution information
DIST_ROOT/bgp_leg	—	Border Gateway Protocol (BGP) LEG files
	bgp_leg.tar.gz	BGP LEG distribution
	Install	LEG installation procedure description
	install-bgp-leg.sh	BGP LEG installation script
	linux-def.sh	Linux-specific definitions
	sm-common.sh	General installation script
	solaris-def.sh	Solaris-specific definitions
DIST_ROOT/cnr_leg	—	Cisco Network Register (CNR) LEG files
	cnr-leg-dist.tar.gz	CNR LEG distribution
	Install	LEG installation procedure definitions
DIST_ROOT/sce_api	—	SCE Subscriber API files
	Readme	API setup procedure description
	sce-java-api-dist.tar.gz	API distribution
DIST_ROOT/sm_api	—	Subscriber Manager API files
	Readme	API setup procedure description
	sm-c-api-dist.tar.gz	C API distribution
	sm-java-api-dist.tar.gz	Java API distribution

Documentation

The Subscriber Manager installation distribution file contains the following documents:

- Manifest—Contains the version and build numbers for all components that are included in the distribution files
- Install—The SCMS Subscriber Manager installation procedures
- Prerequisites—Minimal system requirements for installation of the Subscriber Manager

System Requirements

You can install the Subscriber Manager on the following platforms:

- Sun SPARC machine (64-bit) running 64-bit versions of Solaris 10 Update 9 with a 64-bit version of the Java Virtual Machine. See [Table 4-3](#) and [Table 4-4](#).
- Intel machine (64-bit) running 64-bit versions of Red Hat Enterprise Linux 5.5 and later or Red Hat Enterprise Linux 6.x. See [Table 4-3](#) and [Table 4-5](#).



Note For IPv6 support, Solaris or 64-bit Red Hat Linux is required.

- Intel-based machine (64-bit) running 64-bit versions of CentOS with a 64-bit version of the Java Virtual Machine. See [Table 4-3](#) and [Table 4-6](#).
- VMware ESX 4i or 5i running as Guest OS on a 32-bit or 64-bit Intel-based machine.
- Cisco Unified Computing System (UCS) server model R210-2121605 with a Intel(R) Xeon(R) X5570 2.93-GHz CPU with eight Cores (minimum memory 4 GB).



Caution

The Subscriber Manager must run on its own machine. You cannot run it on the same machine as the Collection Manager.

The machine should conform to the system requirements listed in [Table 4-3](#), [Table 4-4](#), and [Table 4-5](#).



Note

The specifications listed in [Table 4-3](#) are minimal. Ensure that the minimal specifications are met to guarantee performance and capacity requirements.

Table 4-3 Minimal System Hardware Requirements

Item	Requirement
CPU	<ul style="list-style-type: none"> • SUN SPARC, 64-bit, minimum 500 MHz (for Solaris) • Intel processor, 64-bit, minimum 1 GHz (for Linux Red Hat)
RAM	Minimum 1 GB; see Table 4-7 or Table 4-10 .
Free Disk Space	Minimum 3 GB total, of which: <ul style="list-style-type: none"> • Minimum 1 GB free on partition where VARDIR (Subscriber Manager database repository) is installed • Minimum 0.5 GB free on partition where PCUBEDIR (Subscriber Manager files) is installed • Minimum 200 MB free on partition where <code>/tmp</code> is mounted
Network Interface	Depends on whether or not the configuration includes a cluster: <ul style="list-style-type: none"> • Without cluster—One (1) 100BASE-T Ethernet • With cluster—Six (6) 100BASE-T Ethernet
CD-ROM drive	Recommended

**Note**

For the hardware and software system requirements for the Veritas Cluster Server, see [Appendix E, “Veritas Cluster Server.”](#)

Table 4-4 *Solaris System Software Requirements*

Item	Requirement
Operating System	Solaris 5.10 Update 9 is supported. Solaris Core Installation
System Packages	Mandatory: <ul style="list-style-type: none"> • SUNWbash—GNU Bourne-Again shell (bash) • SUNWgzip—GNU Zip (gzip) compression utility • SUNWzip—Info-Zip (zip) compression utility • SUNWlibC—Sun Workshop Compilers Bundled libC • SUNWlibCx—Sun WorkShop Bundled 64-bit libC (not required for Solaris 10) • sudo (superuser do) package Optional: <ul style="list-style-type: none"> • SUNWadmap—system administration applications • SUNWadmc—system administration core libraries

**Note**

Apply the latest patches from SUN. You can download the latest patches from the SUN patches website.

Table 4-5 Red Hat System Software Requirements

Item	Requirement
Operating System	Red Hat Enterprise Linux AS/ES 5.5 and later, or 6.x; only 64-bit version is supported. Red Hat Core Installation
System Packages	Mandatory: <ul style="list-style-type: none"> • GNU Bourne-Again shell (bash-2.05b-29.i386.rpm) • GNU Data Compression Program (gzip-1.3.3-9.i386.rpm) • File compression and packaging utility (zip-2.3-16.i386.rpm) • Standard C++ libraries for Red Hat Linux 6.2 backward compatibility (compat-gcc-7.3-2.96.122.i386.rpm) • sudo (superuser do) package For integrating with the C API: <ul style="list-style-type: none"> • GNU cc and gcc C compilers (gcc-3.2.3-20.i386.rpm) • C++ support for the GNU gcc compiler (gcc-3.2.3-20.i386.rpm)

**Note**

Use the latest version from Red Hat.

Table 4-6 CentOS System Software Requirements

Item	Requirement
Operating System	CentOS 64-bit version is supported.
System Packages	Mandatory: <ul style="list-style-type: none"> • GNU Bourne-Again shell (bash-2.05b-29.i386.rpm) • GNU Data Compression Program (gzip-1.3.3-9.i386.rpm) • File compression and packaging utility (zip-2.3-16.i386.rpm) • Standard C++ libraries for Red Hat Linux 6.2 backward compatibility (compat-gcc-7.3-2.96.122.i386.rpm) • sudo (superuser do) package For integrating with the C API: <ul style="list-style-type: none"> • GNU cc and gcc C compilers (gcc-3.2.3-20.i386.rpm) • C++ support for the GNU gcc compiler (gcc-3.2.3-20.i386.rpm)

**Note**

Use the latest version from CentOS.

Installation Procedures

You can perform all installations by executing an installation script located at the root of the Subscriber Manager distribution file. In most cases, the Subscriber Manager installation script is the only script you need to complete the installation.

The installation script displays messages that describe the steps that are being performed. These messages are also sent to the system log for future reference. See the [“Logging Script Messages” section on page 4-10](#) for more information about the system log messages.

If you try to install the Subscriber Manager on a machine on which the Subscriber Manager is currently running, or to a directory in which the Subscriber Manager is already installed (even if not running), the operation will fail. You will be asked to upgrade the Subscriber Manager. See the [“Upgrading the Subscriber Manager” section on page 4-23](#).

The specific installation procedure to be applied depends on the required Subscriber Manager topology.



Note

While installing the Subscriber Manager, the user file-creation mode mask (umask) for the root user must be 002/022. If you change the umask, the Subscriber Manager Database might not work.

For the installation procedure for the standalone topology, see the [“Installing the Subscriber Manager” section on page 4-13](#).

For the installation procedure for the cluster topology, see the [“Installing a Subscriber Manager Cluster” section on page 4-21](#).

Information About System Changes Made by Installation Scripts

This section describes the system changes that are applied automatically by the Subscriber Manager installation. The Subscriber Manager installation adds a dedicated user and group, and startup and shutdown scripts.

- [Logging Script Messages, page 4-10](#)
- [pcube User and Group, page 4-10](#)
- [Startup and Shutdown Scripts, page 4-11](#)
- [Bash and C-Shell Profiles for the User pcube, page 4-11](#)

Logging Script Messages

Script messages are logged into the system log in the following manner:

- For Solaris—The installation scripts log all messages into the system log, which is usually the file located at `/var/adm/messages`. The messages are logged to the `user.info` syslog category.
- For Linux—The installation scripts log all messages into the system log, which is usually the file located at `/var/log/messages`. The messages are logged to the `user.info` syslog category.

pcube User and Group

The installation creates a user named `pcube` (unless it already exists) with its own group. This user owns all installed Subscriber Manager and CLU files. The user home directory is the installation directory selected during installation. For security purposes, the user is initially created with a locked password. You must assign a new password.

Pcube user language is set as English (en_US) regardless of the user language settings.

Startup and Shutdown Scripts

The Subscriber Manager starts on boot to run level 2, and stops when it leaves this run level (for example, when the machine is shut down).

The installer script installs the following files for startup and shutdown:

- For Solaris:

```
-rwxr--r-- 1 root other /etc/init.d/p3sm
lrwxrwxrwx 1 root other /etc/rc0.d/K44p3sm ->/etc/init.d/p3sm
lrwxrwxrwx 1 root other /etc/rc1.d/K44p3sm ->/etc/init.d/p3sm
lrwxrwxrwx 1 root other /etc/rc2.d/S92p3sm ->/etc/init.d/p3sm
lrwxrwxrwx 1 root other /etc/rcS.d/K44p3sm ->/etc/init.d/p3sm
```

- For Linux:

```
-rwxr--r-- 1 root other /etc/init.d/p3sm
lrwxrwxrwx 1 root other /etc/rc0.d/K44p3sm ->/etc/init.d/p3sm
lrwxrwxrwx 1 root other /etc/rc1.d/K44p3sm ->/etc/init.d/p3sm
lrwxrwxrwx 1 root other /etc/rc2.d/S92p3sm ->/etc/init.d/p3sm
lrwxrwxrwx 1 root other /etc/rc3.d/S92p3sm ->/etc/init.d/p3sm
lrwxrwxrwx 1 root other /etc/rc5.d/S92p3sm ->/etc/init.d/p3sm
lrwxrwxrwx 1 root other /etc/rc6.d/K44p3sm ->/etc/init.d/p3sm
```

The Subscriber Manager database installer creates similar startup and shutdown scripts.

Bash and C-Shell Profiles for the User pcube

You control the Subscriber Manager by using the CLUs that are located in `~pcube/sm/server/bin`. If such shell-profiles do not exist, the installation and upgrade scripts create profiles setting the CLU directory in the user `pcube` path environment variable.

You can perform this operation manually or by copying the contents of these profile scripts (`scmssm * files`) from the Subscriber Manager distribution under `DIST_ROOT/scripts/`.

Information About Advanced System Memory Configuration

- [Configuring sys.odbc.ini, page 4-11](#)
- [Configuring the Subscriber Manager Process Memory Settings, page 4-12](#)

Configuring sys.odbc.ini

Some installations you might need to modify Subscriber Manager database parameters so that the database will run as desired. However, do not make any changes if the default values suit your requirements.

Setting the database size

If your system needs to support more than 100,000 subscribers, set the values of the **PermSize** and **TempSize** parameters in the [**Pcube_SM_Repository**] section in the **sys.odbci.ini** file. To configure the **TempSize** and **PermSize**, use **sm-db-conf.sh** script.

See [Step 2](#)—“Determine the system memory settings” in the “[Installing the Subscriber Manager](#)” section on page 4-13.

For example:

```
PermSize=500
TempSize=150
```



Note

If you change the database size, you must also make the following changes:

Solaris—Set the value of parameter **shmsys:shminfo_shmmax** in the **/etc/system** file to be larger than the sum of **PermSize** and **TempSize**.

Red Hat—Set the value of parameter **kernel.shmmax** in the **/etc/sysctl.conf** file to be larger than the sum of **PermSize** and **TempSize**.

Configuring the Subscriber Manager Process Memory Settings

By default, the Subscriber Manager process uses 256 MB of RAM memory. However, in certain application component configurations, the Subscriber Manager process needs additional memory to work correctly. Setting an environment variable called **PCUBE_SM_MEM_SIZE** with the desired memory size (in megabytes) instructs the Subscriber Manager start-up scripts to allocate the defined memory size for the Subscriber Manager process.

You can set the memory size value for this environment variable for the user **pcube**, or you can configure the desired process memory size in the **sm.sh** file located in the root directory of the user **pcube** (**~pcube/sm.sh**).

The following example, which shows a line in the **sm.sh** file, defines a memory size of 512 MB for the Subscriber Manager process:

```
PCUBE_SM_MEM_SIZE=512
```



Note

If the **PCUBE_SM_MEM_SIZE** environment variable does not exist, you must add this line to the **sm.sh** file.

You can configure **PCUBE_SM_MEM_SIZE** in the **install-def.sh** script file before running the installation script. This ensures that the Subscriber Manager will be installed with the correct value configured.

To prevent performance degradation because of memory swapping, ensure that the machine has enough RAM for the Subscriber Manager process, the Subscriber Manager database, and all of the other applications running on this machine.

To determine the correct memory values for your installation, see [Step 2](#)—“Determine the system memory settings” in the “[Installing the Subscriber Manager](#)” section on page 4-13.

Installing the Subscriber Manager

This section describes how to install the Subscriber Manager.



Note

In a high availability setup (see the “[Subscriber Manager Cluster](#)” section on page 2-14), you must install the Subscriber Manager Cluster VCS agents. (See the “[Installing Subscriber Manager Cluster Agents](#)” section on page 4-22.)

Prerequisites

Ensure that the disk space requirements listed in the “[System Requirements](#)” section on page 4-7 are satisfied.

Installation Procedure

Step 1 Extract the distribution files.

Before you can install the Subscriber Manager, you must first load and extract the distribution files on the installed machine or in a directory that is mounted to the installed machine.

- a. Download the distribution files from the Cisco website.
- b. Use FTP to load the distribution files to the Subscriber Manager.
- c. Unzip the files using the **gunzip** command.

```
gunzip SM_dist_<version>_B<build number>.tar.gz
```

- d. Extract the tar file using the **tar** command:

```
tar -xvf SM_dist_<version>_B<build number>.tar
```

Step 2 Determine the system memory settings.

Set the system memory configuration requirements according to the maximum number of subscribers. Determine the system memory settings with the Quota Manager or without the Quota Manager.

[Table 4-7](#) and [Table 4-8](#) list the recommended memory configuration values based on the number of supported subscribers. The settings apply when the Quota Manager is disabled.



Note

For IPv6, a 15% of additional memory is required for the PermSize, the Temp Size, and the SM shared memory. This is applicable irrespective of whether the quota manager is enabled or not.

Table 4-7 *Memory Configuration Parameters Versus Number of Subscribers—without Quota Manager*

Maximum Number of Subscribers	(Subscriber Manager database Memory Settings) Shared Memory	(Subscriber Manager database Memory Settings) PermSize	(Subscriber Manager database Memory Settings) TempSize
100,000	512 MB	200 MB	100 MB
500,000	1024 MB	512 MB	256 MB

Table 4-7 *Memory Configuration Parameters Versus Number of Subscribers—without Quota Manager (continued)*

Maximum Number of Subscribers	(Subscriber Manager database Memory Settings) Shared Memory	(Subscriber Manager database Memory Settings) PermSize	(Subscriber Manager database Memory Settings) TempSize
1,000,000	1280 MB	768 MB	256 MB
2,000,000	2048 MB	1536 MB	256 MB
3,000,000	2560 MB	2048 MB	256 MB
4,000,000	3328 MB	2816 MB	256 MB
5,000,000	3840 MB	3328 MB	256 MB
10,000,000	6912 MB	6400 MB	256 MB
15,000,000	9984 MB	9472 MB	256 MB
20,000,000	13,312 MB	12,800 MB	256 MB

Table 4-8 *Subscriber Manager Process Memory Setting Versus Cache Size—without Quota Manager*

Cache Size	Subscriber Manager Process Memory Setting
100,000	256 MB
500,000	512 MB
1,000,000	768 MB
2,000,000	1280 MB
3,000,000	1792 MB
4,000,000	2048 MB
5,000,000	2560 MB
10,000,000	5120 MB
15,000,000	7680 MB
20,000,000	10,240 MB

**Note**

The maximum number of Cisco SCEs is 200.

The Subscriber Manager process RAM in the table is calculated according to the following requirements:

- 40 SCE connections per Subscriber Manager—For each additional SCE, you should add an additional 25 MB for the Subscriber Manager process memory setting.
- 20 PRPC (Subscriber Manager API/CNR LEG) connections to the Subscriber Manager—For each additional connection, you should add an additional 25 MB for the Subscriber Manager process memory setting.
- If you use the virtual-links capability of the service control solution, you should add an additional 60 MB to the Perm Size setting for each additional 100,000 subscribers.

The table columns include these contents:

- **Maximum Number of Subscribers**—The maximum number of subscribers that the Subscriber Manager has to support.
- **Cache Size**—The number of subscriber record references that the Subscriber Manager process maintains. The default value is 100,000 records.



Note You can increase the default cache size to improve performance; however, this does require additional memory. The default settings are suitable for most installations.

- **Subscriber Manager Process Memory Setting**—The required memory configuration for the Subscriber Manager process. For additional information about the Subscriber Manager process memory configuration, see [Table 4-9](#).
- The configuration required for Subscriber Manager database to run correctly. For additional information, see [Step 3](#)—“Configure the shared memory settings” in the “[Installation Procedure](#)” section.

If the previous tables do not list the maximum number of subscribers that you require, use the settings specified for the next higher value of Maximum Number of Subscribers. For example, for 1,200,000 subscribers, use the values specified for 2,000,000 subscribers.

If the login rate is above 4000 subscribers per second through a LEG without VSA, increase the Cisco Service Control Subscriber Manager shared memory by 30 percent and the Cisco Service Control Subscriber Manager process memory by 128 MB from the existing memory configuration.

Additionally, memory settings must be configured based on the number VSA attributes configured and whether or not quota is configured as shown in [Table 4-9](#) and the following example.

Table 4-9 *Memory Configuration Parameters Versus Number of VSA Attributes: Without and With Quota Manager Enabled*

Number of VSA Attributes	Without Quota Manager Enabled	With Quota Manager Enabled
5	2.5 * X	3.0 * X
10	3.5 * X	4.0 * X
15	4.5 * X	5.0 * X
20	5.5 * X	6.0 * X

Example:

To configure SM with 1M subscribers, 20 attributes, and without Quota Manager enabled, use the following values:

(Subscriber Manager database Memory Settings) Shared Memory = 7040 (1280 * 5.5)

(Subscriber Manager database Memory Settings) PermSize = 4224 (768 * 5.5)

SM Process Memory Setting = 4224 (768 * 5.5)

[Table 4-10](#) and [Table 4-11](#) list the recommended memory configuration values based on the number of supported subscribers. The settings apply when the Quota Manager is enabled.



Note

If you enable Cisco Service Control Quota Manager RDR feature, increase the Subscriber Manager process memory by 300 MB from the existing memory configuration.

Table 4-10 *Memory Configuration Parameters Versus Number of Subscribers—with Quota Manager*

Maximum Number of Subscribers	(Subscriber Manager database Memory Settings) Shared Memory	(Subscriber Manager database Memory Settings) PermSize	(Subscriber Manager database Memory Settings) TempSize
500,000	1280 MB	768 MB	256 MB
1,000,000	1792 MB	1280 MB	256 MB
2,000,000	3072 MB	2560 MB	256 MB
3,000,000	4096 MB	3584 MB	256 MB
4,000,000	5376 MB	4864 MB	256 MB
5,000,000	6400 MB	5888 MB	256 MB
10,000,000	12,032 MB	11,520 MB	256 MB
15,000,000	17,664 MB	17,152 MB	256 MB
20,000,000	23,552 MB	23,040 MB	256 MB

Table 4-11 *Subscriber Manager Process Memory Setting Versus Cache Size—with Quota Manager*

Cache Size	Subscriber Manager Process Memory Setting
100,000	512 MB
500,000	512 MB
1,000,000	768 MB
2,000,000	1280 MB
3,000,000	1792 MB
4,000,000	2048 MB
5,000,000	2560 MB
10,000,000	5120 MB
15,000,000	7680 MB
20,000,000	10,240 MB

**Note**

The maximum number of Cisco SCEs is 200.

The Subscriber Manager process RAM in the table is calculated according to the following requirements:

- 20 SCE connections per Subscriber Manager—For each additional SCE, you should add an additional 50 MB for the Subscriber Manager process memory setting.
- 20 PRPC (Subscriber Manager API/CNR LEG) connections to the Subscriber Manager—For each additional connection, you should add an additional 25 MB for the Subscriber Manager process memory setting.
- If you use the virtual-links ability of the service control solution, you should add an additional 60 MB to the Perm Size setting for each additional 100,000 subscribers.

Step 3 Configure the shared memory settings.

Subscriber Manager database requires you to make certain changes in the operating system kernel configuration file:

- For Solaris, modify file `/etc/system`.
- For Linux, modify file `/etc/sysctl.conf`.

These changes increase the shared memory and semaphore resources on the Subscriber Manager machine from their defaults. For additional information regarding these changes, refer to the Subscriber Manager database documentation.



Note

Review the `/etc/system` or the `/etc/sysctl.conf` file before running the `tt-sysconf.sh` script, because the script overwrites the current file settings with the values listed in the “Making the changes manually” procedure. If you want to keep some or all of the current file settings, edit the configuration file manually.

To make the required changes automatically, run the `tt-sysconf.sh` script.

The root user must invoke this script file, without arguments, as follows:

```
# tt-sysconf.sh
```

To make the required changes manually, perform the following actions:



Note

If you require support for more than 100,000 subscribers in the Subscriber Manager, you must edit the configuration file manually. Your system sizing requirements only affect the shared memory size. To determine the correct configuration values for your system, see the tables in [Step 2](#)—“Determine the system memory settings” in the “[Installation Procedure](#)” section.

- For Solaris, add the following lines to the `/etc/system` file and configure the shared memory size:

```
*---- Begin settings for SM Database
set semsys:seminfo_semmni = 20
set semsys:seminfo_semmnl = 100
set semsys:seminfo_semmns = 2000
set semsys:seminfo_semmnu = 2000
set shmsys:shminfo_shmmax = 0x20000000
*---- End of settings for SM Database
```

- For Linux, add the following lines to the `/etc/sysctl.conf` file and configure the shared memory size:

```
*---- Begin settings for SM Database
kernel.shmmax = 536870912
kernel.sem = 250 32000 100 100
*---- End of settings for SM Database
```

Step 4 Edit the **install-def.cfg** file.



Note

This step is optional when performing the Subscriber Manager installation. However, edit the file if one of the parameter values should be set to a value other than the default value.

The **install-def.cfg** file contains several parameters that you can configure before installation/upgrade of the Subscriber Manager. These parameters are copied by the install/upgrade routine to the relevant Subscriber Manager configuration files. By default, all of the parameters are commented out and the default values are used.

The file contains the following parameters:

- **max_subscribers_num**

Resides in the **[Subscriber Manager Definitions]** section. Defines the maximum number of subscribers that the Subscriber Manager supports. You can set the maximum number of subscribers by setting this parameter or by setting the **max_number_of_subscribers** parameter in **p3sm.cfg** configuration file. See the “[Data Repository Section](#)” section on page A-18.

There is a limit to the maximum number of subscribers that can be stored in the Subscriber Manager database. The limits are:

- Linux (64 bit)—20 million subscribers.
- Solaris—20 million subscribers.

The Subscriber Manager default configuration supports a maximum of 200,000 subscribers.

- **sm_memory_size**

Resides in the **[Subscriber Manager Definitions]** section. Defines the amount of memory allocated for the Subscriber Manager process in MB. You can set this parameter here or edit the parameter **PCUBE_SM_MEM_SIZE** in the **sm.sh** file that resides under the `~pcube` folder.

- **database_perm_size**

Resides in the **[Database Definitions]** section. Defines the PermSize allocated for the database in MB. You can set this parameter or edit the PermSize parameter by using the **sm-db-conf.sh** script.

- **database_temp_size**

Resides in the **[Database Definitions]** section. Defines the TempSize allocated for the database in MB. You can set this parameter or edit the TempSize parameter by using the **sm-db-conf.sh** script.

Step 5 Execute the **install-sm.sh** script.



Note

You can customize the **install-sm.sh** script.



Note

You cannot run the script if the **/etc/motd** file exists. Move *or* removed the file prior to running the **install-sm.sh** script.

From your machine shell prompt, change to the directory into which the distribution file was extracted and run the **install-sm.sh** script:

```
# install-sm.sh [command options]
```

Table 4-12 lists the command options.

Table 4-12 Options for install-sm.sh

Options	Description
-d	Specifies the install directory for ~pcube . This directory must <i>not</i> be an existing directory. This directory must be specified as a complete path name beginning with “/”. The default is /opt/pcube .
-o	Specifies the existing home directory of user pcube as the install directory. Note The options -d and -o are mutually exclusive.
-v	Specifies the directory for data storage. This directory must <i>not</i> be an existing directory. This directory must be on a partition with at least 1 GB of free space. This directory must be specified as a complete path name beginning with “/”. The default is InstallDirectory/var .
-h	Shows this message.

The script performs the following steps:

- Checks for validity of arguments and sufficient disk space.
- Adds (or verifies the existence of) a user **pcube** and a group **pcube**.
- Populates the **pcube** home directory with the Subscriber Manager and CLU directory structure.
- Invokes the JRE installation script with **pcube** home as the target directory. The JRE installation does not affect any existing Java installations.
- Invokes the Subscriber Manager database installation script with **pcube** home as the target directory.
- Creates the Subscriber Manager DSN for Subscriber Manager database with **pcube** home as the target directory. It is possible to install the Subscriber Manager DSN for Subscriber Manager database in a specified directory by using the -v option.
- Creates startup and shutdown scripts in **/etc**.
- Creates the shell preamble **~pcube/sm.sh**, which contains environment variables that depend on the actual folder in which the Subscriber Manager was installed.

Examples for the install-sm.sh Script

These examples demonstrate how to use the **install-sm.sh** script to install the Subscriber Manager.

- [Installing the Subscriber Manager and CLU, page 4-20](#)
- [Installing the Subscriber Manager and CLU to a Default Directory, page 4-20](#)

Installing the Subscriber Manager and CLU

This following command installs the Subscriber Manager and CLU to a directory named `/usr/local/pcube` using the default data storage directory.

```
# install-sm.sh -d /usr/local/pcube
```

Installing the Subscriber Manager and CLU to a Default Directory

This section describes how to install the Subscriber Manager and CLU to default directory

Step 1 The following command installs the Subscriber Manager and CLU to the default directory of the user `pcube`.

```
# install-sm.sh -o
```

Step 2 Set the password for the `pcube` user

After the installation script has completed successfully, set the password for the `pcube` user by running the `# passwd pcube` command.



Note It is important to remember the password that you selected.

Step 3 Reboot the computer.

You must reboot the computer to complete the installation.

Step 4 (Optional) Install the MPLS/VPN BGP LEG.

For more information, see the *Cisco SCMS SM LEGs User Guide*.

Step 5 Add a user for PRPC authentication.

You must add a user for PRPC authentication because SCA BB requires a username and password when connecting to the Subscriber Manager.

To add a user for PRPC authentication, use the `p3rpc` command-line utility as in the following example:

```
-bash-3.1$ p3rpc --set-user --username=username --password=password
```

For cluster installations, use the `--remote` option, after both devices are installed, as in the following example:

```
-bash-3.1$ p3rpc --set-user --username=username --password=password
--remote=OTHER_SM_IP[:port]
```

For troubleshooting during installation, see [Appendix D, “Troubleshooting.”](#)

Verifying the Installation

To verify that the installation was successful, run a CLU utility, such as the `p3sm` command, to display general information about the Subscriber Manager.

Step 1 From your machine shell prompt, change to the `~pcube/sm/server/bin` directory.

Step 2 Run the `p3sm` command.

The following **p3sm** command displays the current status of the Subscriber Manager:

```
-bash-3.1$ p3sm --sm-status
```

**Note**

Wait a few minutes after the installation before running this command to allow the Subscriber Manager to become operational.

The output of this command should indicate that the Subscriber Manager is running.

In case of errors during installation, the command will output a description of these errors.

Configuring the Subscriber Manager

After installing the Subscriber Manager, you can configure the Subscriber Manager to meet your specific needs. In particular, you should address the following parameters at this point:

- `topology`—Cluster or standalone
- `introduction_mode`—Pull or push
- `support_ip_ranges`—Whether IP-ranges should be used in the installed setup

To configure the Subscriber Manager, edit the **p3sm.cfg** configuration file by using any standard text editor. The configuration file is described in detail in [Chapter 5, “Configuration and Management”](#) and in [Appendix A, “Configuration File Options.”](#) After you finish editing the **p3sm.cfg** configuration file, use the **p3sm** utility to update the Subscriber Manager with the new settings:

From your machine shell prompt, run the **p3sm** command.

The following **p3sm** command loads the configuration file and updates the Subscriber Manager configuration accordingly:

```
-bash-3.1$ p3sm --load-config
```

Performing Additional Installation Procedures

The following procedures complement the ones described in the [“Installing the Subscriber Manager” section on page 4-13](#):

- [Installing a Subscriber Manager Cluster, page 4-21](#)—For installing two Subscriber Manager nodes for the first time.
- [Installing Subscriber Manager Cluster Agents, page 4-22](#)—For installing a High Availability setup using Veritas Cluster Server (VCS).

Installing a Subscriber Manager Cluster

Installing a Subscriber Manager cluster is similar to installing the Subscriber Manager on two machines.

Step 1 Install the Veritas Cluster Server software on both machines.

Step 2 Install the Subscriber Manager on both machines.

For more information, see the “[Installing the Subscriber Manager](#)” section on page 4-13.

Step 3 Configure the Subscriber Manager topology parameter to cluster.

For more information, see the “[Configuring the Subscriber Manager](#)” section on page 4-21.

Step 4 Configure the replication scheme.

Configure the replication scheme for the data-store replication to the redundant machine by running the following CLU:

```
p3db --set-rep-scheme
```

Step 5 Install the Subscriber Manager VCS agents.

For more information, see the “[Installing the Subscriber Manager](#)” section on page 4-13.

Step 6 Configure the VCS.

For more information, see [Appendix E, “Veritas Cluster Server.”](#)

Installing Subscriber Manager Cluster Agents

The installation distribution file contains a set of customized Veritas Cluster Agents for supporting monitoring and controlling of Subscriber Manager-related resources in a cluster topology. You must install the cluster agents under the VCS **bin** directory.



Note

You cannot run the script if the `/etc/motd` file exists. Move *or* remove the file prior to running the `install-vcs-agents.sh` script.

From your machine shell prompt, run the `install-vcs-agents.sh` script.

```
# install-vcs-agents.sh [command-options]
```

[Table 4-13](#) lists the command options.

Table 4-13 Options for `install-vcs-agents.sh`

Options	Description
-d	Specifies the installation directory for the agents, which must be the bin directory of the VCS. This directory must be an existing directory. This directory must be specified as a complete path name that begins with '/'. Default: <code>/opt/VRTSvcs/bin</code>
-h	Prints a help message and exits.

The script performs the following actions:

- Checks that the installation directory exists.
- Extracts the agent distribution file to the specified directory.

- Copies the VCS default-script-agent-executable from the installation directory to all agent directories.
-

Upgrading the Subscriber Manager

The Subscriber Manager supports several types of upgrade procedures. The upgrade procedures depend upon the Subscriber Manager version that was previously installed and the requirement (or lack of requirement) for fail-over in the new installation.

There are three types of upgrade procedure:

- [Upgrading a Standalone Setup, page 4-24](#)
- [Upgrading from a Standalone Setup to a Cluster Setup, page 4-27](#)
- [Upgrading Cluster Setups, page 4-29](#)

**Note**

While upgrading the Subscriber Manager, the user file-creation mode mask (umask) for the root user must be 002/022. If you change the umask, the Subscriber Manager Database might not work.

Data Duplication Procedure

The data duplication procedure enables you to duplicate or copy the entire database from one machine to the other. Then synchronize the databases by running the replication agent at the end. Some of the upgrade procedures described in the previous sections use this procedure.

For details of the procedure, see the [“Database Duplication Recovery” section on page 3-6](#).

Automatic Upgrade of Subscribers with VLAN Mappings

**Note**

The following information is related to upgrading from releases earlier than Release 3.1.5.

The 3.1.5 release of the Subscriber Manager introduced a new managed entity—VPN. This new entity means that VLAN mappings are no longer related to a subscriber but to a VPN. During the upgrade procedure, the Subscriber Manager automatically creates a VPN with the VLAN-ID of the subscriber. The procedure also associates a subscriber with the full-range IP mapping in the new VPN.

For example, subscriber 'sub1' with VLAN-ID=15 results in the creation of VPN 15 with VLAN-ID=15 and subscriber 'sub1' with the mapping 0.0.0.0/0@VLAN-ID.

Automatic Upgrade of RADIUS Listener

**Note**

The following information is related to upgrading from releases earlier than Release 3.1.5.

The Subscriber Manager Release 3.1.5 introduced new manipulation abilities to the RADIUS Listener.

During the upgrade procedure, the Subscriber Manager modifies the RADIUS sections in the configuration file according to the following rules:

- The **radius_attribute** and **radius_attribute_type** properties are moved to a new section.
- A new field property is added to replace the **radius_attribute** and **radius_attribute_type** properties.
- The **strip_type=remove_suffix** property is replaced with **field_manipulation.<field name>=(.*)<strip_character >.***.
- The **strip_type=remove_prefix** property is replaced with **field_manipulation.<field name>=.*<strip_character >(.*)**.
- The **use_default** property and default value are replaced with **mapping_table.^\$=<default>**.
- The **radius_attribute_vendor_id** and **radius_sub_attribute** properties are replaced with the format **radius_attribute(radius_attribute_vendor_id; radius_sub_attribute)**.

Upgrading a Standalone Setup



Note

To upgrade from Version 2.x to Version 3.6, you must first upgrade to Version 3.0 or 3.1. To upgrade from Version 3.5.5 to Version 3.7.0, you must first upgrade to Version 3.6.0 and then to 3.7.0. You can upgrade directly from Version 3.6.5 to Version 3.7.0. You can also directly upgrade to Version 4.0.0 from Version 3.7.2.

The following upgrade procedure is supported only by Release 3.x software versions. To upgrade the Subscriber Manager from a Release 2.x software version, you must first upgrade the Subscriber Manager environment to a Release 3.1.x software version and then perform an additional upgrade to Release 3.6.0.

For more information about how to upgrade from a Release 2.x software version to a Release 3.1.x software version, refer to the Release 3.1.x manuals.

This procedure applies to the Subscriber Manager 3.0.x and later. This upgrade procedure requires service downtime.



Note

For the upgrade procedure from a standalone setup to a cluster setup, see the [“Upgrading from a Standalone Setup to a Cluster Setup”](#) section on page 4-27.

Configuring the Required Memory Settings

To prepare the Subscriber Manager for the upgrade, configure the system kernel configuration file on the Subscriber Manager according to the procedure described in [Step 3](#)—“Configure the shared memory settings” in the [“Installation Procedure”](#) section.

Step 1 Extract the distribution files.

Before you can upgrade the Subscriber Manager, you must first load and extract the distribution files on the installed machine or in a directory that is mounted on the installed machine.

- Download the distribution files from the Cisco website.
- Use FTP to load the distribution files to the Subscriber Manager.
- Unzip the files using the **gunzip** command.


```
gunzip SM_dist_<version>_B<build number>.tar.gz
```
- Extract the tar file using the **tar** command.


```
tar -xvf SM_dist_<version>_B<build number>.tar
```

Step 2 Disable state exchange.

If upgrading from version 2.x, disable the state exchange between the Subscriber Manager and the SCE platform by editing the Subscriber Manager configuration file (**p3sm.cfg**) and set **save_subscriber_state=false**, then load the configuration file using the following command:

```
-bash-3.1$ p3sm --load-config
```

**Note**

You must use this CLU as user **pcube**.

Step 3 Edit the **install-def.cfg** file.

Edit the **install-def.cfg** configuration file and set the **PermSize** and **TempSize** parameters according to the recommendations described in [Step 3](#)—“Configure the shared memory settings” in the “[Installation Procedure](#)” section. For more information, see [Step 4](#)—“Edit the install-def.cfg file” in the “[Installation Procedure](#)” section.

Step 4 Run the **upgrade-sm.sh** script.

To upgrade from non-cluster setups, the Subscriber Manager distribution provides an upgrade script that implements an upgrade from previous versions. The upgrade procedure script preserves the subscriber database and the entire Subscriber Manager configuration, including network elements, domains, and application-specific components.

**Note**

For the Solaris operating system, previous versions of the Subscriber Manager used a 32-bit or 64-bit Java Virtual Machine (JVM) and database. The Subscriber Manager is currently installed with a 64-bit JVM and database. You must upgrade 64-bit machine.

**Note**

Linux operating system upgrades are only from Subscriber Manager 2.5.x and 3.x releases. The Linux platform supports 64-bit JVM and databases.

**Note**

You cannot run the script if the **/etc/motd** file exists. The file should be moved *or* removed prior to running the **upgrade-sm.sh** script.

- a. From your machine shell prompt, run the **upgrade-sm.sh** script.

```
# upgrade-sm.sh [command-options]
```

Table 4-14 Options for **upgrade-sm.sh**

Options	Description
-h	Shows the upgrade message.

The script performs the following steps:

Step 1 Detects existing Subscriber Manager version.

Step 2 Detects new Subscriber Manager version.

- Step 3** Verifies that Java is installed on the machine.
 - Step 4** Verifies that the user **pcube** exists.
 - Step 5** Verifies that a Subscriber Manager of version 3.0.x or later is present on the system.
 - Step 6** Stops the current Subscriber Manager (if running).
 - Step 7** Backs up existing contents of the subscriber database to an external file.
 - Step 8** Removes the Subscriber Manager database.
 - Step 9** Backs up Subscriber Manager configuration files.
 - Step 10** Installs the updated versions of Subscriber Manager and Subscriber Manager database.
 - Step 11** Invokes a separate program for upgrading the Subscriber Manager and database configuration files.
 - Step 12** Restores the backed up contents of the subscriber database.
 - Step 13** Starts the upgraded Subscriber Manager.
-

Upgrading the Subscriber Manager

This section describes how to upgrade the Subscriber Manager.

- Step 1** The following example command upgrades the Subscriber Manager and keeps the current database:

```
# upgrade-sm.sh
```



Note

You are not required to reboot the Subscriber Manager after the upgrade procedure.

- Step 2** Add a user for PRPC authentication.

If upgrading from a version of the Subscriber Manager prior to 3.0.5, you must add a user for PRPC authentication because SCA BB requires a username and password when connecting to the Subscriber Manager.

To add a user for PRPC authentication, use the **p3rpc** CLU, as in the example:

```
-bash-3.1$ p3rpc --set-user --username=username --password=password
```

- Step 3** Remove obsolete state information.

If upgrading from version 2.x, remove any obsolete subscriber state information, by running the Subscriber Manager CLU as **pcube** user:

```
-bash-3.1$ p3subsd --clear-all-states
```

- Step 4** Remove obsolete subscriber properties (Method A)

If upgrading from version 2.x, remove any obsolete subscriber properties.



Note

You must run all CLU commands as user **pcube**.

- a. Export any existing subscribers to a CSV file.

```
-bash-3.1$ p3subsd --export -o csv-file
```

- b. Clear the subscriber database.

```
-bash-3.1$ p3subsdb --clear-all
```

- c. Remove any obsolete properties from the csv-file.
See [Table 4-15](#) for a list of the properties to remove.
- d. Import the subscribers from the revised file.

```
-bash-3.1$ p3subsdb --import -f csv-file
```

Step 5 Remove obsolete subscriber properties (Method B)

If upgrading from version 2.x, remove any obsolete subscriber properties.



Note

You must run all CLU commands as user **pcube**.

- a. Remove the obsolete properties from the Subscriber Manager database by running the **p3subsdb** command.

```
-bash-3.1$ p3subsdb --remove-property --property=prop
```

The obsolete properties to remove are listed in [Table 4-15](#).

- b. Resynchronize all SCEs.

```
-bash-3.1$ p3sm --resync-all
```

Table 4-15 *Obsolete Properties to Remove*

QP Tunable	Applicable to Version
QpLimit[1]–QpLimit[16]	Version 2.5.5 or higher
QpSet[1]–QpSet[16]	Version 2.5.5 or higher
QpAdd	Versions of 2.5 prior to version 2.5.5 Versions of 2.1 prior to version 2.1.7
QpDelta[1]–QpDelta[16]	Versions of 2.5 prior to version 2.5.5 Versions of 2.1 prior to version 2.1.7

Step 6 Configure the SCE platforms.

If you are running a cascade SCE topology, configure the cascade SCE pair in the **p3sm.cfg** file as described in the “[SCE.XXX Section](#)” section on [page A-15](#).

Upgrading from a Standalone Setup to a Cluster Setup



Note

To upgrade from Version 3.5.5 to Version 3.7.0, you must first upgrade to Version 3.6.0 and then to 3.7.0. You can upgrade directly from Version 3.6.5 to Version 3.7.0. You can also directly upgrade from Version 3.7.2 to Version 4.0.0.

The following upgrade procedure is supported only from Release 3.x software versions. To upgrade Subscriber Manager from a Release 2.x software version, you must first upgrade the Subscriber Manager environment to a Release 3.1.x software version and then perform an additional upgrade to Release 3.6.0. From Version 3.6.0, you can upgrade to Version 3.7.0.

For more information about how to upgrade from Release 2.x software to Release 3.1.x software, the Release 3.1.x manuals. For details on how to upgrade to Version 3.6.0, see the Subscriber Manager 3.6.x manuals.

This section describes the procedure for upgrading from a standalone setup to a cluster setup. This procedure applies to the Subscriber Manager from version 3.0.x and later. This upgrade procedure requires service downtime.



Note This procedure attempts to minimize the Subscriber Manager downtime. Therefore, if subscriber service is not an issue, use the procedure for installing and upgrading a new machine.

In the following procedure, Subscriber Manager-A is the original Subscriber Manager machine running Subscriber Manager version 3.0.x or later. Subscriber Manager-B is the new Subscriber Manager machine that is added for redundancy.

Step 1 Install the VCS on both machines.

Step 2 Install Subscriber Manager-B.

To install Subscriber Manager-B, follow the procedure described in the [“Installing the Subscriber Manager”](#) section on page 4-13.

Step 3 Upgrade Subscriber Manager-A.

To upgrade Subscriber Manager-A, follow the procedure described in the [“Upgrading a Standalone Setup”](#) section on page 4-24.



Note From this step until the upgrade procedure is completed, no Subscriber Manager is available to manage subscribers.

Step 4 Replicate the Subscriber Manager configuration from Subscriber Manager-A to Subscriber Manager-B (copy all the configuration files from the folder `~pcube/sm/server/root/config`).

Copy the `p3sm.cfg` configuration file from Subscriber Manager-A to Subscriber Manager-B. To load the configuration file, see the [“Reloading the Subscriber Manager Configuration \(p3sm\)”](#) section on page 5-15.

Step 5 Duplicate the subscriber database.

The data duplication procedure is described in the [“Data Duplication Procedure”](#) section on page 4-23. Configure the replication scheme for the data store replication to the redundant machine.



Note You must run this CLU on both machines as user `pcube`.

```
-bash-3.1$ p3db --set-rep-scheme
```

Step 6 Create a cluster.

- a. Configure Subscriber Manager-A and Subscriber Manager-B to support a cluster.
- b. Make Subscriber Manager-B standby.

Use the CLU command **p3cluster --standby**.

- c. Ensure that Subscriber Manager-A is active.

Use the CLU command **p3cluster --active**.

- d. Configure the VCS.
- e. Run the VCS on the setup.

Step 7 Configure the LEG applications to send logins to the cluster virtual IP.

Step 8 To test your environment, complete the following procedure:

- a. Create a subscriber on the active machine.

```
p3subs --add -s testCluster1
```

- b. Manually trigger a failover using the Veritas cluster manager and wait until the standby Subscriber Manager becomes active and the active Subscriber Manager becomes standby.

- c. Run the following VCS CLU command from /opt/VRTSvcs/bin.

```
# hagrps -switch service group name to System
```

- d. Verify that testCluster1 exists in the new active machine.

```
--p3subsdb --show-all
```

- e. Create a subscriber on the new active machine.

```
p3subs --add -s testCluster2
```

- f. Verify that testCluster1 exists in the new active machine.

```
--p3subsdb --show-all
```

Upgrading Cluster Setups

- [Upgrading from a Cluster Setup Version 3.x, page 4-29](#)
- [Upgrading from a Cluster Setup Version 2.x to Version 3.0 or 3.1, page 4-35](#)

Upgrading from a Cluster Setup Version 3.x

This section describes the procedure for upgrading from a cluster setup to a cluster setup without a service downtime. This section contains the following subsections:

- [Before You Start, page 4-29](#)
- [Upgrading a Cluster Setup, page 4-31](#)

Before You Start

- You can upgrade directly from Cisco SCMS Subscriber Manager (SM) Version 3.6.5 to SM Version 3.7.0. However, to upgrade from SM Version 3.5.5 or earlier to SM Version 3.7.0, you must first upgrade to SM Version 3.6.0 and then to SM Version 3.7.0. To upgrade from SM Version 2.x to SM Version 3.6, you must first upgrade to SM Version 3.0 or SM Version 3.1.
- Identify the devices in the cluster setup.

- Understand the Java Virtual Machine (JVM) used by the Cisco SCMS Subscriber Manager on your operating system:
 - Versions prior to 3.7.x of the Cisco SCMS Subscriber Manager on Solaris used a 32-bit or 64-bit JVM and database. From Subscriber Manager Version 3.0.3, the Subscriber Manager is installed with a 64-bit JVM and database. There is no choice as to whether to upgrade to 64-bit JVM.
 - The Linux platform is used only with a 32-bit JVM and database.
- Understand how to download and extract the distribution files. For details, see the [“Downloading and Extracting the Distribution Files”](#) section on page 4-30.
- Understand the scripts used while upgrading a cluster setup. For details, see the [“Understanding the Scripts Used During Upgrade”](#) section on page 4-30.

Downloading and Extracting the Distribution Files

Before you upgrade the Subscriber Manager, you must download and extract the distribution files on the installed machine or in a directory that is mounted to the installed machine.

-
- Step 1** Download the distribution files from Cisco.com.
- Step 2** Use an FTP to load the distribution files to the Subscriber Manager.
- Step 3** Unzip the files by using the **gunzip** command:

```
gunzip SM_dist_<version>_B<build number>.tar.gz
```

- Step 4** Extract the tar file using the **tar** command:

```
tar -xvf SM_dist_<version>_B<build number>.tar
```

Understanding the Scripts Used During Upgrade

During the process of upgrading a cluster, you might use the following scripts:

- cluster-upgrade.sh. For details, see the [“Understanding the cluster-upgrade.sh script”](#) section on page 4-30.
- install-vcs-agents.sh. For details, see the [“Understanding the install-vcs-agents.sh script”](#) section on page 4-31.

Understanding the cluster-upgrade.sh script

Use this script, which is provided with the Subscriber Manager, to upgrade a cluster setup with earlier versions of Cisco SCMS Subscriber Manager to a cluster setup with the latest version of the Cisco SCMS Subscriber Manager.

The cluster-upgrade.sh script preserves the subscriber database and the entire Subscriber Manager configuration, including network elements, domains, and application-specific components.

The script performs the following actions:

- Detects the current Subscriber Manager version.
- Detects the new version of the Subscriber Manager.
- Verifies whether Java is installed on the machine.
- Verifies whether the user **pcube** exists.
- Verifies whether Subscriber Manager Version 3.x or later is present on the system.
- Verifies the values, if any, configured in **install-def.cfg**.

- Stops the Subscriber Manager, if it is running.
- Backs up the contents in the subscriber database to an external file.
- Removes the Subscriber Manager database.
- Backs up the Subscriber Manager configuration files.
- Installs the updated version of the Subscriber Manager and the Subscriber Manager Database.
- Invokes a separate program for upgrading the Subscriber Manager and the database configuration files.
- Restores the contents of the subscriber database that were backed up.
- When activated on the second machine, the script copies the contents of the database from the currently active Subscriber Manager; because the currently active Subscriber Manager contains the latest data.

You do not have to start the Subscriber Manager after running the script.

Table 16 lists the command options for the cluster-upgrade.sh script.

Table 16 Command options for cluster-upgrade.sh

Options	Description
-h	Use this option to see the details on how to use the command options.
-1	Use this option when activating the script on the first machine.
-2	Use this option when activating the script on the second machine.

Understanding the install-vcs-agents.sh script

For details about the install-vcs-agents.sh script, see the *Cisco Service Control Management Suite Subscriber Manager User Guide*.

Upgrading a Cluster Setup

To upgrade a cluster setup, complete the following steps:

Step No.	Action	Notes
Step 1	Configure the system kernel configuration file on both the machines: <ol style="list-style-type: none"> Configure the system kernel configuration file on the standby Subscriber Manager. Reboot the standby SM. Manually trigger a failover by using the Veritas Cluster Manager and wait until the standby SM becomes active and the active SM shifts to the standby SM. Run the following VCS CLU command from /opt/VRTSvcs/bin: # <code>hagrp -switch service group name to System</code> Repeat Step a. and Step b. on the new standby Subscriber Manager. 	Before starting the upgrade procedure, configure the system kernel configuration file on both the machines. For details about the system kernel configuration procedure, see the <i>Cisco Service Control Guide to Upgrading to Cisco SCA BB 3.7.x</i> .
Step 2	Extract the distribution files on both the machines.	For details about downloading and extracting the distribution files, see the “ Downloading and Extracting the Distribution Files ” section on page 4-30.

Step No.	Action	Notes
Step 3	Stop VCS monitoring on the standby machine: <ol style="list-style-type: none"> Log in as the <i>root</i> user. Use the following VCS CLU command from <code>/opt/VRTSvcs/bin</code> to stop VCS monitoring of the Subscriber Manager: <pre># ./hastop -local</pre> 	—
Step 4	Edit the <code>install-def.cfg</code> file on both the machines and set the <code>PermSize</code> and <code>TempSize</code> parameters according to the recommendations described in the <i>Cisco Service Control Guide to Upgrading to Cisco SCA BB 3.7.x</i> .	For details about the required memory settings, see the <i>Cisco Service Control Product Installation Guide</i> .
Step 5	Pause database replication on the active machine: <ol style="list-style-type: none"> On the active machine, change the directory to the location where you extracted the distribution files. Run the <code>p3db --rep-pause</code> CLU command from the scripts directory. Run the <code>p3db --rep-status</code> CLU command from the scripts directory and verify that replication is in <i>pause</i> state. Return to the standby machine. 	This step is applicable only when upgrading the first Subscriber Manager machine.
Step 6	Run the <code>cluster-upgrade.sh</code> script on the standby machine: <pre># cluster-upgrade.sh [command-options]</pre> Do not start the SM after running <code>cluster-upgrade.sh</code> .	For details about the <code>cluster-upgrade.sh</code> script, see the “Understanding the Scripts Used During Upgrade” section on page 4-30
Step 7	Wait until the <code>cluster-upgrade.sh</code> script finishes all tasks.	—
Step 8	Stop the replication and start the SM on the standby machine. The following steps should be performed <i>only when performing upgrade on the first machine</i> . <ol style="list-style-type: none"> Stop the SM replication: <pre># ./p3db --rep-stop</pre> Start the SM: <pre># ./p3sm --start --wait</pre> Use the <code>p3sm</code> CLU command to verify the status of the SM. <pre>-bash-3.1\$ p3sm --sm-status</pre> 	Because the database schema was changed, there is a need to load the SM for the first time without replicating the changes to the standby machine. The SM boot time after the upgrade will be longer than usual due to the extra time taken to initialize the database indexes. If the <code>SMS-STATUS</code> indicates a failure, <i>stop the upgrade</i> . For details on troubleshooting the SM in failure mode, see the Appendix D , “Troubleshooting”.
Step 9	Run the <code>install-vcs-agents.sh</code> script on the standby machine: <pre># install-vcs-agents.sh [command-options]</pre>	—

Step No.	Action	Notes
Step 10	<p>Restart Veritas Cluster Server (VCS) monitoring on the standby machine:</p> <ol style="list-style-type: none"> Run the following VCS CLU command from /opt/VRTSvcs/bin: <pre># ./hastart</pre> <p>VCS monitoring starts the SM process automatically in the initialization state.</p> Use the <code>p3sm</code> CLU command to check whether the SM is up: <pre>-bash-3.1\$ p3sm --sm-status</pre> Use the <code>p3cluster</code> CLU command to set the SM to the standby state: <pre>-bash-3.1\$ p3cluster --standby</pre> 	<p>The <code>./hastart</code> command starts the replication agent that updates the database schema on the active machine.</p> <p>After this operation is performed, you cannot downgrade to an earlier version.</p>
Step 11	<p>Continue database replication on the active machine:</p> <ol style="list-style-type: none"> On the <i>Active</i> machine, change the directory to the location where you extracted the distribution files. Run the <code>scripts/p3db --rep-continue</code> CLU command. Run the <code>~pcube/sm/server/bin/p3db --rep-status</code> CLU command and verify that replication is in the <i>start</i> state. Return to the standby workstation. 	<p>This step is applicable only when upgrading the first machine and only if Step 5 was performed.</p>
Step 12	<p>Verify that the changed data has been replicated.</p> <p>Wait until the replication of all the data that was changed while the upgrade script was running.</p> <ul style="list-style-type: none"> On the active Subscriber Manager add a dummy subscriber using the <code>p3subs</code> CLU: <pre>-bash-3.1\$ p3subs --add -s dummySub</pre> On the standby Subscriber Manager, login as <i>root</i> user, and run the <code>p3subs show</code> command: <pre># p3subs --show -s dummySub</pre> 	<p>When upgrading the second Subscriber Manager, add a subscriber with a name other than <i>dummySub</i> because you have already added a subscriber with this name while upgrading the first Subscriber Manager.</p>
Step 13	<p>(Optional) Install the MPLS/VPN BGP LEG.</p>	<p>For more information, see the Cisco SCMS SM LEGs User Guide.</p>
Step 14	<p>Manually trigger a failover using the Veritas Cluster Manager and wait until the standby SM becomes active and the active SM becomes the standby:</p> <p>Run the following VCS CLU command from /opt/VRTSvcs/bin:</p> <pre># hagr -switch service group name -to System</pre>	<p>For more information about the <code>hagr</code> CLU command, refer to your Veritas Cluster Server documentation.</p> <p>After performing the manual failover, the standby SM on which you perform the upgrade procedure becomes the active SM. The previously active SM becomes the new standby SM.</p>
Step 15	<p>Repeat the upgrade procedure on the standby SM.</p> <p>To upgrade the second SM, repeat the procedure from Step 2 . But, do not perform Step 5, Step 8, and Step 11.</p>	<p>—</p>

Step No.	Action	Notes
Step 16	<p>Upgrade the database replication protocol version:</p> <ol style="list-style-type: none"> Stop VCS monitoring of the standby SM. Use the following VCS CLU command from /opt/VRTSvcs/bin: <code>#!/hastop -local</code> Change the replication protocol. On the standby SM, run the following CLU command: <code># p3db --upgrade-rep-protocol</code> Restart VCS monitoring. From the /opt/VRTSvcs/bin folder, run the following VCS CLU command: <code>#!/hastart</code> VCS monitoring starts the SM process automatically in the initialization state. Use the <code>p3cluster</code> CLU command to set the SM to the standby state: <code>-bash-3.1\$ p3cluster --standby</code> Manually trigger a failover using the Veritas Cluster Manager and wait until the standby SM becomes active and the active SM becomes the standby one. Run the following VCS CLU command from /opt/VRTSvcs/bin: <code># hagrps -switch service group name -to System</code> Repeat Step a. to Step f. on the new standby SM. 	<p>Perform this operation after both the SMs are upgraded.</p> <p>Run the commands described in this step as the <i>admin</i> user on <i>both</i> the machines to upgrade the database replication protocol version.</p> <p>The <code>p3db --upgrade-rep-protocol</code> CLU command performs the following actions:</p> <ul style="list-style-type: none"> Removes the DB security flag Stops the SM Restarts the DB daemon Starts the SM Starts SM replication <p>For more information about the <code>hagrps</code> command, refer to your Veritas Cluster Server documentation.</p>
Step 17	<p>Add a user for PRPC authentication using the <code>p3rpc</code> CLU, for example:</p> <pre>-bash-3.1\$ p3rpc --set-user --username=username --password=password --remote=OTHER_SM_IP[:port]</pre>	<p>If you are upgrading from a version of the SM prior to Version 3.0.5, it is necessary to add a user for PRPC authentication because Cisco SCA BB requires a username and password to connect to the SM.</p>
Step 18	<p>Configure the Cisco SCE platforms.</p>	<p>If you have a cascade SCE setup, configure the cascade SCE pair in the <code>p3sm.cfg</code> file. For details, see the “SCE.XXX Section” section on page A-15.</p>
Step 19	<p>Remove the dummy subscribers.</p> <p>On the new active SM, run the following CLU:</p> <pre>-bash-3.1\$ p3subs --remove -subscriber=first dummy subscriber name -bash-3.1\$ p3subs --remove -subscriber=second dummy subscriber name</pre>	<p>After successfully upgrading both the SMs we recommend that you remove the dummy subscribers that were added in order to verify replication during the upgrade.</p>

Upgrading from a Cluster Setup Version 2.x to Version 3.0 or 3.1

This section describes the basic procedure for upgrading from a cluster setup to a cluster setup, from SM versions 2.x.



Note

This procedure requires service down time.

The upgrade procedure for upgrading from a cluster setup includes three complex parts:

1. Perform the upgrade procedure on the standby machine.
2. Perform a manual failover on the Subscriber Manager that was upgraded.
3. Perform the upgrade procedure on the Subscriber Manager that became standby after performing the failover.

To perform the upgrade on the standby machine, complete the following steps:

-
- Step 1** Configure the system kernel configuration file on both machines.
- Before starting the upgrade procedure, configure the system kernel configuration file on both machines.
- a. Configure the system kernel configuration file on the *standby* Subscriber Manager.

The configuration procedure is described in [Step 3](#)—“Configure the shared memory settings.”
 - b. Reboot the *standby* Subscriber Manager.
 - c. Manually trigger a failover by using the Veritas cluster manager. Wait until the standby Subscriber Manager becomes active and the active Subscriber Manager becomes standby.

Run the following VCS CLU command from **/opt/VRTSvcs/bin**:

```
# hagrps -switch service group name to System
```
 - d. Repeat steps a and b on the new *standby* Subscriber Manager.
- Step 2** Extract the distribution files.
- Before you can upgrade the Subscriber Manager, you must first load and extract the distribution files on the installed machine or to a directory that is mounted on the installed machine.
- a. Download the distribution files from the Cisco website.
 - b. Use FTP to load the distribution files to the Subscriber Manager.
 - c. Unzip the files using the **gunzip** command.


```
gunzip SM_dist_<version>_B<build number>.tar.gz
```
 - d. Extract the tar file using the **tar** command.


```
tar -xvf SM_dist_<version>_B<build number>.tar
```
- Step 3** Uninstall the VCS agents and stop VCS monitoring.
- a. Log in as the *root* user.
 - b. Uninstall the VCS agents.

Uninstalling the VCS agents is described in the [“Uninstalling VCS Agents”](#) section on page 4-41. The resource names to use are PcubeSm, OnOnlyProcess, and TimesTenRep.
 - c. Stop the VCS monitoring of the Subscriber Manager.

Issue the following VCS CLU command from **/opt/VRTSvcs/bin** to stop VCS monitoring:

```
#./hastop -local
```

Step 4 Disable state exchange.

Disable the state exchange between the Subscriber Manager and the SCE platform by editing the Subscriber Manager configuration file (**p3sm.cfg**) and set **save_subscriber_state=false**. Then load the configuration file by issuing the following command:



Note You must run this CLU as user **pcube**.

```
-bash-3.1$ p3sm --load-config
```

Step 5 Drop the old replication scheme.

Use the following CLU:



Note You must run this CLU as user **pcube**.

```
-bash-3.1$ p3sm --drop-rep-scheme
```

Step 6 Edit the **install-def.cfg** file.

Edit the **install-def.cfg** configuration file and set the **PermSize** and **TempSize** parameters according to the recommendations described in [Step 3](#)—“Configure the shared memory settings.” For more information, see [Step 4](#)—“Edit the **install-def.cfg** file.” Run the **upgrade-sm.sh** script.

For more information, see [Step 4](#)—“Run the **upgrade-sm.sh** script.”

Step 7 Upgrade the application and LEGs.

Perform the specific upgrade instructions for your application or LEGs.

Step 8 Configure the replication scheme.

Configure the replication scheme for the data store replication on the redundant machine by using the following CLU:



Note You must run this CLU as user **pcube**.

```
-bash-3.1$ p3sm --set-rep-scheme
```

Step 9 Install the VCS agents and then configure and restart VCS monitoring.

a. Install the Subscriber Manager VCS agents.

Installing the Subscriber Manager VCS agents is described in the “[Installing Subscriber Manager Cluster Agents](#)” section on page 4-22.

b. Configure the VCS.

Configuration of the VCS is described in [Appendix E](#), “Veritas Cluster Server.”

c. Restart VCS monitoring.

Run the following VCS CLU command from **/opt/VRTSvcs/bin**:

```
#./hastart
```

Step 10 Remove obsolete state information.

Remove any obsolete subscriber state information by running the Subscriber Manager CLU as **pcube** user:

```
-bash-3.1$ p3subsdb --clear-all-states
```

Step 11 Remove obsolete subscriber properties. (Method A)

Remove any obsolete subscriber properties.



Note You must run all CLU commands as user **pcube**.

- a. Export any existing subscribers to a CSV file.


```
-bash-3.1$ p3subsdb --export -o csv-file
```
- b. Clear the subscriber database.


```
-bash-3.1$ p3subsdb --clear-all
```
- c. Remove any obsolete properties from the csv-file.
See [Table 4-15](#) for a list of properties to remove.
- d. Import the subscribers from the revised file.


```
-bash-3.1$ p3subsdb --import -f csv-file
```

Step 12 Remove obsolete subscriber properties. (Method B)

If upgrading from version 2.x, remove any obsolete subscriber properties.



Note You must run all CLU commands as user **pcube**.

- a. Remove the obsolete properties from the Subscriber Manager database by running the **p3subsdb** command.


```
-bash-3.1$ p3subsdb --remove-property --property=prop
```

The obsolete properties to remove are listed in [Table 4-15](#).
- b. Resynchronize all SCEs.


```
-bash-3.1$ p3sm --resync-all
```

Step 13 Manually trigger a failover.

Manually trigger a failover using the Veritas cluster manager and wait until the standby Subscriber Manager becomes active and the active Subscriber Manager becomes standby.

Run the following VCS CLU command from **/opt/VRTSvcs/bin**:

```
# hagrps -switch service group name to System
```

Step 14 Repeat the upgrade procedure on the standby Subscriber Manager.

After performing the manual failover (see [Step 13](#)—“Manually trigger a failover.”), the standby Subscriber Manager on which you perform the upgrade procedure becomes the active Subscriber Manager. The previously active Subscriber Manager becomes the new standby Subscriber Manager.

To upgrade the second Subscriber Manager, repeat the procedure from [Step 2](#)—“Extract the distribution files” by [Step 11](#)—“Remove obsolete subscriber properties.”

Step 15 Add a user for PRPC authentication.

Add a user for PRPC authentication because SCA BB requires a username and password when connecting to the Subscriber Manager.

To add a user for PRPC authentication, run the **p3rpc** CLU as in the following example:

```
-bash-3.1$ p3rpc --set-user --username=username --password=password
--remote=OTHER_SM_IP[:port]
```

Step 16 Configure the SCE platforms

If you are using a cascade SCE topology, configure the cascade SCE pair in the **p3sm.cfg** file as described in the “[SCE.XXX Section](#)” section on page A-15.

Additional Upgrade Procedures

Upgrading SubscriberID Maximum Length to 64 Characters

In version 3.0.5, the length of the SubscriberID was increased to 64 characters. For new installations, the maximum length of the SubscriberID is 64 characters. However, when upgrading from earlier versions, the length is not increased automatically.

Step 1 Export the subscriber database by running the **p3subsdB** CLU.

```
-bash-3.1$ p3subsdB --export --output=output filename
```

Step 2 Destroy the database by running the **p3dB** CLU.

```
-bash-3.1$ p3dB --destroy-rep-dB
```

Step 3 Restart the Subscriber Manager.

```
-bash-3.1$ p3sm --restart
```

Step 4 Import the subscribers back into the database by running the **p3subsdB** CLU.

```
-bash-3.1$ p3subsdB --import --file=file name from Step 1
```

**Note**

This procedure requires system downtime because the Subscriber Manager database is deleted. Moreover, after the restart, all the Cisco SCE devices automatically lose all the subscriber information; this information gets restored only after the subscribers are imported back into the Subscriber Manager database.

Database Performance Recommendations

In Cisco SCE Release 3.8.0, a Subscriber Manager database guideline pertaining to the checkpoint-data-source and checkpoint-transaction-logs files is available to prevent disk contention between them. Placing these two files in two separate disks enables faster processing of login and logout events in LEG, and other SM processes. To configure the new feature, follow these steps:

-
- Step 1** Place the checkpoint-data-source file and the checkpoint-transaction-logs files on two different disks that are different from the one in which SM is installed:
- Change the location of the checkpoint-transaction-logs file using the LogDir parameter in the /var/TimesTen/sys.odbc.ini file.
Add the LogDir parameter if it does not already exist in the sys.odbc.ini file.
 - Change the location of the checkpoint-data-source file using the Datastore parameter in the /var/TimesTen/sys.odbc.ini file.
Changing the location of the checkpoint-transaction-logs file and the checkpoint-data-source file will prevent the occurrence of disk contention between these files and allow the transaction log buffer to write to the disk faster.
- Step 2** Increase the size of SM log file from 20 MB to 64 MB by modifying the LogFileSize parameter in the /var/TimesTen/sys.odbc.ini file.
-

This example shows how to edit the /var/TimesTen/sys.odbc.ini file:

```
[PCube_SM_Repository]
...
DataStore=/checkpoint/PCube_SM_Repository
LogDir=/TimesTenLog
LogFileSize=64
...
[PCube_SM_Local_Repository]
...
DataStore=/checkpoint/PCube_SM_Local_Repository
LogDir=/TimesTenLog
LogFileSize=64
```

Downgrading Subscriber Manager

This section describes the procedure for downgrading the Subscriber Manager to a previous version.

-
- Step 1** Perform the uninstall procedure described in the “[Uninstalling Subscriber Manager](#)” section on [page 4-40](#).
- Step 2** Perform the installation procedure described in “[Installing the Subscriber Manager](#)” section on [page 4-13](#).



Note The `upgrade-sm.sh` and `cluster-upgrade.sh` upgrade scripts do not support Subscriber Manager downgrade.

Uninstalling Subscriber Manager

- [Uninstalling Subscriber Manager, page 4-40](#)
- [Uninstalling VCS Agents, page 4-41](#)

Uninstalling Subscriber Manager

uninstall-sm.sh Script

To execute the `uninstall-sm.sh` script, from your machine shell prompt, enter the following command:

```
# uninstall-sm.sh [command-options]
```

[Table 4-17](#) lists the command options.

Table 4-17 Options for `uninstall-sm.sh` Script

Options	Description
-n	Do not remove Subscriber Manager database.
-h	Shows the help message

The script performs the following actions:

- Stops the Subscriber Manager.
- Stops the replication agent (in cluster setups) if the `-n` flag is not used.
- Destroys the data-stores if the `-n` flag is not used.
- Uninstalls the Subscriber Manager database.
- Removes the Subscriber Manager directories and boot files.
- Removes the Java that was installed as part of the Subscriber Manager installation.

-
- Step 1** If you are using a cluster topology, stop the VCS monitoring of the Subscriber Manager.
Stop the VCS monitoring by running the following VCS CLU command from `/opt/VRTSvcs/bin`:
- ```
./hastop -local
```
- Step 2** Run the `uninstall-sm.sh` script from the distribution root directory.
- ```
# ./uninstall-sm.sh
```
- For more information, see the [“uninstall-sm.sh Script” section on page 4-40](#)
- Step 3** If you are using a cluster topology, start the VCS monitoring.
Start the VCS monitoring by running the following VCS CLU command from `/opt/VRTSvcs/bin`:
- ```
./hastart
```
- Step 4** If you are using a cluster topology, remove the Veritas Cluster agents.  
Removal of the Veritas Cluster agents is described in the [“Uninstalling VCS Agents” section on page 4-41](#).  
Remove the following resource names: `OnOnlyProcess`, `SubscriberManager`, and `TimesTenRep`.
- Step 5** Remove the `pcube` user by running the `userdel` command as follows:
- ```
# userdel -r pcube
```



Note If you chose to keep Subscriber Manager database installed, do not remove the `pcube` user.

Uninstalling VCS Agents

Repeat the following procedure for each Veritas Cluster agent that you want to remove.

-
- Step 1** Remove the VCS agents by using the Veritas Cluster Manager or by using the `hares` CLU.
You can remove the VCS agents by using the Veritas Cluster Manager or the following CLU:
- ```
hares -delete TimesTenDaemon
hares -delete SM
hares -delete ReplicationAgent
hares -delete Network-NICs
hares -delete Network-VIP
```
- The resource names in your system might have different names. Issue the command `hares -list command` to see the existing resource names.
- Step 2** Remove the VCS resource types by running the `hatype` CLU.  
The type names in your system might have different names. Issue the command `hatype -list` to see the existing type names.
- ```
# hatype -delete OnOnlyProcess
# hatype -delete SubscriberManager
# hatype -delete TimesTenRep
```

Step 3 Delete the VCS agent from the disk.

Issue the following command to delete the VCS agent:

```
# rm -rf /opt/VRTSvcs/bin/OnOnlyProcess
# rm -rf /opt/VRTSvcs/bin/SubscriberManager
# rm -rf /opt/VRTSvcs/bin/TimesTenRep
```
