



Sun Cluster Geographic Edition Installation Guide



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Preface

Sun Cluster Geographic Edition Installation Guide contains guidelines for planning a Sun™ Cluster Geographic Edition configuration, and provides procedures for installing, configuring, upgrading, and uninstalling the Sun Cluster Geographic Edition software.

This document is intended for experienced system administrators with extensive knowledge of Sun software and hardware. You should have already determined your system requirements and purchased the appropriate equipment and software before reading this document.

The instructions in this book assume knowledge of the Solaris™ Operating System (Solaris OS) and Sun Cluster software, expertise with the volume manager software that is used within Sun Cluster software, and the data replication software that is used with the Sun Cluster Geographic Edition software.

Note –

This release of Sun Cluster Geographic Edition software supports the following releases of Sun's Availability Suite software:

- Sun StorEdge™ Availability Suite 3.2.1 software
- Sun StorageTek™ Availability Suite 4 software

In this manual, references to Sun StorageTek Availability Suite software also apply to Sun StorEdge Availability Suite software unless specifically stated otherwise.

Using UNIX Commands

This document contains information about commands that are used to install, configure, or administer a Sun Cluster Geographic Edition configuration. This document might not contain complete information on basic UNIX® commands and procedures such as shutting down the system, booting the system, and configuring devices.

See one or more of the following sources for this information:

- Online documentation for the Solaris software system
- Other software documentation that you received with your system
- Solaris OS man pages

Documentation, Support, and Training

The Sun web site provides information about the following additional resources:

- [Documentation \(http://www.sun.com/documentation/\)](http://www.sun.com/documentation/)
- [Support \(http://www.sun.com/support/\)](http://www.sun.com/support/)
- [Training \(http://www.sun.com/training/\)](http://www.sun.com/training/)

Typographic Conventions

The following table describes the typographic conventions that are used in this book.

TABLE P-1 Typographic Conventions

Typeface	Meaning	Example
<i>AaBbCc123</i>	The names of commands, files, and directories, and onscreen computer output	Edit your <code>.login</code> file. Use <code>ls -a</code> to list all files. <code>machine_name% you have mail.</code>
AaBbCc123	What you type, contrasted with onscreen computer output	<code>machine_name% su</code> Password:
<i>abbcc123</i>	Placeholder: replace with a real name or value	The command to remove a file is <code>rm filename</code> .
<i>AaBbCc123</i>	Book titles, new terms, and terms to be emphasized	Read Chapter 6 in the <i>User's Guide</i> . A <i>cache</i> is a copy that is stored locally. Do <i>not</i> save the file. Note: Some emphasized items appear bold online.

Shell Prompts in Command Examples

The following table shows the default UNIX system prompt and superuser prompt for the C shell, Bourne shell, and Korn shell.

TABLE P-2 Shell Prompts

Shell	Prompt
C shell	machine_name%
C shell for superuser	machine_name#
Bourne shell and Korn shell	\$
Bourne shell and Korn shell for superuser	#

Related Documentation

Information about related Sun Cluster Geographic Edition topics is available in the documentation that is listed in the following table. All Sun Cluster Geographic Edition documentation is available at <http://docs.sun.com>.

Topic	Documentation
Overview	<i>Sun Cluster Geographic Edition Overview</i>
Glossary	<i>Sun Java Enterprise System Glossary</i>
Hardware administration	Individual hardware administration guides
Software installation	<i>Sun Cluster Geographic Edition Installation Guide</i>
System administration	<i>Sun Cluster Geographic Edition System Administration Guide</i> <i>Sun Cluster Geographic Edition Data Replication Guide for Sun StorageTek Availability Suite</i> <i>Sun Cluster Geographic Edition Data Replication Guide for Hitachi TrueCopy and Universal Replicator</i> <i>Sun Cluster Geographic Edition Data Replication Guide for EMC Symmetrix Remote Data Facility</i>
Command and function references	<i>Sun Cluster Geographic Edition Reference Manual</i>

For a complete list of Sun Cluster documentation, see the release notes for your Sun Cluster software at <http://docs.sun.com>.

Getting Help

If you have problems installing or using the Sun Cluster Geographic Edition system, contact your service provider and provide the following information:

- Your name and email address (if available)
- Your company name, address, and phone number
- The model and serial numbers of your systems
- The release number of the OS (for example, Solaris 9)
- The release number of the Sun Cluster Geographic Edition software (for example, 3.2 11/09)

Use the following commands to gather information about each node on your system for your service provider.

Command	Function
<code>prtconf -v</code>	Displays the size of the system memory and reports information about peripheral devices
<code>psrinfo -v</code>	Displays information about processors
<code>showrev -p</code>	Reports which patches are installed
<code>prtdiag -v</code>	Displays system diagnostic information
<code>geoadm -V</code>	Displays Sun Cluster Geographic Edition software release and package version information
<code>cluster status</code>	Provides a snapshot of the cluster status
<code>cluster show</code>	Lists cluster configuration information
<code>geoadm show</code>	Prints the Sun Cluster Geographic Edition runtime status of the local cluster

Also have available the contents of the `/var/adm/messages` file.

Planning the Sun Cluster Geographic Edition Installation

This chapter provides planning information and guidelines for installing a Sun Cluster Geographic Edition configuration. This chapter also describes how to plan the data replication between two clusters.

This chapter contains the following sections:

- “Installation Process” on page 9
- “Planning Cluster Hardware” on page 10
- “Planning Required Software” on page 11
- “Planning Resource and Resource Group Names” on page 13
- “Planning Required IP Addresses and Hostnames” on page 13
- “Planning the Sun Cluster Geographic Edition Environment” on page 14

Installation Process

To successfully install Sun Cluster Geographic Edition software, you must complete the following installation phases:

1. Planning your installation.
2. Connecting your hardware.
3. Installing Sun Cluster software.
4. Installing data replication products.
5. Installing and configuring the required software.
6. Installing Sun Cluster Geographic Edition software.
7. Configuring Sun Cluster Geographic Edition software.

This installation process progresses from the initial planning phase to the eventual startup of Sun Cluster Geographic Edition software. This guide provides information about phases 1, 6, and 7.

Note – You can also install Sun Cluster Geographic Edition software at the same time that you install Sun Cluster software.

For information about installing Sun Cluster software, see the *Sun Cluster Software Installation Guide for Solaris OS*.

For information about configuring a cluster after startup, see the *Sun Cluster Geographic Edition System Administration Guide*.

Planning Cluster Hardware

This section helps you to plan your hardware for the primary cluster, the secondary cluster, and the inter-cluster communication.

The Sun Cluster Geographic Edition hardware configuration consists of the following elements:

- At least two separate clusters that are running Sun Cluster software with attached data storage. One of these clusters must be designated the primary cluster.

Note – While you can use a single-node cluster at both the primary and backup sites, a single-node cluster offers no internal redundancy. To ensure no single point of failure, you must have a minimum of two nodes in a cluster at the primary site. You can use a single-node cluster at the secondary site as a cost-effective backup solution, if the secondary site is used only for backup purposes and is not for running mission-critical applications.

- Internet connections for inter-cluster management communication between the clusters and for default inter-cluster heartbeats.
- Connections for either host-based or storage-based data replication.
- Connections for custom heartbeats, if any.

The hardware configurations that Sun Cluster Geographic Edition software supports are identical to the hardware configurations that the Sun Cluster product supports. For use of Sun Cluster Geographic Edition software with storage-based data replication mechanisms, the cluster hardware configurations are those configurations that support the related storage hardware. Partner clusters must be compatibly configured to support data replication between the clusters.

Use of the Sun Cluster Geographic Edition product with Hitachi TrueCopy and Universal Replicator data replication requires Sun Cluster configurations with Sun StorEdge™ 9970/9980 Array or Hitachi Lightning 9900 Series storage that supports the Hitachi TrueCopy and Universal Replicator command interfaces.

Internet access is required between partner clusters. The communication between partner clusters for inter-cluster management operations is through a logical-hostname IP address. The default inter-cluster heartbeat module also communicates through a logical-hostname IP address.

A cluster in a Sun Cluster Geographic Edition partnership conforms to the standard configuration rules of a cluster that is running Sun Cluster software.

Planning Required Software

This section helps you to adapt the configuration of your Sun Cluster software for the installation of Sun Cluster Geographic Edition software. This section also helps you to plan the installation of your data replication software.

Sun Cluster Geographic Edition software must be installed on a cluster that is running the Solaris Operating System and the Sun Cluster software. You can install Sun Cluster Geographic Edition software at the same time that you install Sun Cluster software or at any time afterwards. The Sun Cluster Geographic Edition software configuration is identical to the Sun Cluster software configuration.

Required Software

The following table lists the required software.

TABLE 1-1 Required Software

Software	Version
Minimum Operating System version	<ul style="list-style-type: none"> ■ Solaris 9 9/05 or Solaris 10 5/09 (SPARC® Platform Edition). ■ Solaris 10 5/09 (x64 Platform Edition).
Sun Cluster software	Sun Cluster 3.2 1/09 or 3.2 11/09
Volume management software	<ul style="list-style-type: none"> ■ For use with Solaris Volume Manager software: <ul style="list-style-type: none"> ■ Sun StorageTek Availability Suite software. ■ SPARC: For use with VERITAS Volume Manager software: <ul style="list-style-type: none"> ■ Sun StorageTek Availability Suite software. ■ Hitachi TrueCopy and Universal Replicator software. ■ EMC Symmetrix Remote Data Facility software.

TABLE 1-1 Required Software (Continued)

Software	Version
Data replication software	<ul style="list-style-type: none"> ■ Sun Availability Suite software, either Sun StorageTek Availability Suite 4 software on the Solaris 10 OS, or Sun StorEdge Availability Suite 3.2.1 software on the Solaris 9 OS ■ Hitachi TrueCopy and Universal Replicator RAID Manager/Solaris Version 01-18-03/03 or compatible. ■ EMC Symmetrix Remote Data Facility SymCLI 6.0.1 and microcode 5671 software.
Sun Cluster Geographic Edition	Sun Cluster Geographic Edition 3.2 11/09 software

Planning the Data Replication Software

A cluster that is using Sun Cluster Geographic Edition software with a data replication product is subject to the standard configuration rules of a cluster that is running the data replication product with Sun Cluster software. Partner clusters must have compatible software configurations to support data replication between the clusters.

The Sun Cluster Geographic Edition product supports the following data replication products:

- Sun StorageTek Availability Suite software.
- Hitachi TrueCopy software.
- Hitachi Universal Replicator software.
- EMC Symmetrix Remote Data Facility software.

The Sun StorageTek Availability Suite software is a host-based replication method. This method consists of software installed on a host that controls replication from one server to a secondary server.

The Hitachi TrueCopy and Universal Replicator and EMC Symmetrix Remote Data Facility replication use a storage-based method. These methods use replication that is built into the storage hardware.

If you use Hitachi TrueCopy and Universal Replicator RAID Manager software or EMC Symmetrix Remote Data Facility software, you must install the software on each node of the cluster.

Planning Resource and Resource Group Names

A partnership requires two clusters to be combined into one environment, and one cluster might be a running production system. Therefore, advance planning of resources and resource groups is essential for a successful installation.

Sun Cluster Geographic Edition software requires that resource-group names be identical on each partner cluster to ensure that a resource or resource group can be managed as a single entity across both clusters in the partnership.

Planning Required IP Addresses and Hostnames

You must have all the required IP addresses and hostnames before you begin the installation process. You must set up a number of IP addresses for various Sun Cluster Geographic Edition components, depending on your cluster configuration. Each node in the cluster configuration must have at least one public network connection to the same set of public subnets. You must have an IP address for the cluster name and for each cluster node. You might also need additional IP addresses for data replication products. For more information about requirements for configuring data replication, see the following data replication guides:

- [Sun Cluster Geographic Edition Data Replication Guide for Sun StorageTek Availability Suite](#)
- [Sun Cluster Geographic Edition Data Replication Guide for Hitachi TrueCopy and Universal Replicator](#)
- [Sun Cluster Geographic Edition Data Replication Guide for EMC Symmetrix Remote Data Facility](#)

See “Public-Network IP Addresses” in [Sun Cluster Software Installation Guide for Solaris OS](#) for a list of components that require IP addresses. Add these IP addresses to any naming services that are used. Also add these IP addresses to the local `/etc/inet/hosts` file on each cluster node after you install Solaris software.

A cluster name must be suitable as a hostname because Sun Cluster Geographic Edition software creates the logical hostname by using the cluster name. Therefore, the cluster name must be in the naming system.

Also, cluster names must be unique. For example, if you have a cluster wholly within the domain `.france`, you can use hostnames like `paris` and `grenoble`. However, if you have a cross-domain cluster, you must specify the hostnames with enough qualification to identify the host on the network. You can link `paris` and `munich` with hostnames `paris.france` and `munich.germany`, and the cluster names remain `paris` and `munich`.

You cannot create a partnership between clusters `paris.france` and `paris.texas` because of a collision on the cluster name `paris`.

Planning the Sun Cluster Geographic Edition Environment

This section provides guidelines for planning and preparing the following components for Sun Cluster Geographic Edition software installation:

- [“Licensing” on page 14](#)
- [“Logical Hostnames” on page 14](#)

Licensing

Ensure that you have available all necessary license certificates before you begin software installation. Sun Cluster Geographic Edition software does not require a license certificate. However, each node that is installed with Sun Cluster Geographic Edition software must be covered under your Sun Cluster Geographic Edition software license agreement.

For licensing requirements for data replication software and application software, see the installation documentation for those products.

Logical Hostnames

Sun Cluster Geographic Edition software uses the logical hostname of a cluster for inter-cluster management communication and heartbeat communication. The IP address for a cluster name must be available for Sun Cluster Geographic Edition software to wrap a logical hostname around the IP address when the software is started by using the `geoadm start` command.

You can use the `cluster` command to find the name of the cluster when you need to verify that the cluster name is suitable for use as a hostname. To find the name of the cluster, run the following command:

```
# cluster list
```

For more information, see the `cluster(1CL)` man page.

Installing Sun Cluster Geographic Edition Software

This chapter describes how to install Sun Cluster Geographic Edition software on a pair of clusters. This chapter also provides a procedure to uninstall Sun Cluster Geographic Edition software.

This chapter contains the following sections:

- “Installation Overview” on page 15
- “Installing Sun Cluster Geographic Edition Software” on page 16
- “Installing Patches” on page 18

Installation Overview

You can install Sun Cluster Geographic Edition software on a running cluster without disruption. Because the Sun Cluster Geographic Edition software installation process does not require you to restart Sun Cluster software, the cluster remains in production with services running.

The installer program offers two interactive installation modes, graphical user interface (GUI) and text-based interface. The graphical mode provides a wizard that guides you, step by step, through the tasks that you need to perform to install the Sun Cluster Geographic Edition components. The text-based mode provides the same functions that the GUI provides. However, this mode prompts you for responses on a line-by-line basis, rather than by means of a wizard.

Note – Ensure that you have installed all the required patches for your cluster configuration on each node of every cluster before you start installing the software. See “Required Patches” in [Sun Cluster Geographic Edition 3.2 11/09 Release Notes](#) for the location of patches and installation instructions.

You must install Sun Cluster Geographic Edition software on all nodes of all clusters in a partnership.

Installing Sun Cluster Geographic Edition Software

You must install Sun Cluster Geographic Edition software on every node of each cluster in your geographically separated cluster by using the `installer` program.

▼ How to Install Sun Cluster Geographic Edition Software

This procedure explains how to install Sun Cluster Geographic Edition software.

Before You Begin Before you begin to install software, make the following preparations:

- Ensure that the Solaris OS is installed to support Sun Cluster Geographic Edition software.
If Solaris software is already installed on the node, you must ensure that the Solaris installation meets the requirements for Sun Cluster Geographic Edition software and any other software that you intend to install on the cluster.
- Read [Chapter 1, “Planning the Sun Cluster Geographic Edition Installation.”](#)
- Read the following manuals, which contain information that can help you plan your configuration and prepare your installation strategy:
 - [Sun Cluster Geographic Edition 3.2 11/09 Release Notes](#) – Restrictions, bug workarounds, and other late-breaking information.
 - [Sun Cluster Geographic Edition Overview](#).
 - Documentation for all third-party software products.

- 1 **To use the `installer` program with a GUI, ensure that the display environment of the cluster node to install is set to display the GUI.**

```
% xhost +  
% setenv DISPLAY nodename:0.0
```

If the display environment is not set to display the GUI, the `installer` program instead displays in test-based mode.

- 2 **Become superuser on a node where you intend to install the Sun Cluster Geographic Edition software.**

Note – Sun Cluster Geographic Edition software must be installed on all nodes of each cluster in the partnership.

3 Load the Sun Java Availability Suite installation DVD-ROM into the DVD-ROM drive.

If the volume management daemon `vol1M` is running and is configured to manage CD-ROM or DVD devices, the daemon automatically mounts the media on the `/cdrom/cdrom0/` directory.

4 Change to the installation wizard directory of the DVD-ROM.

- **For the SPARC platform, type the following command:**

```
# cd /cdrom/cdrom0/Solaris_sparc
```

- **For the x86 platform, type the following command:**

```
# cd /cdrom/cdrom0/Solaris_x86
```

5 Start the installer program.

```
# ./installer
```

The installer starts and displays the Welcome page. To exit the installer at any time, click Cancel. For more information about the installer program, see [Sun Java Enterprise System 5 Update 1 Installation Guide for UNIX](#).

6 Follow instructions on the screens to read and accept the Software License Agreement.

After you accept the license terms, the Choose Software Components menu is displayed.

7 Select Sun Cluster Geographic Edition 3.2 11/09 and press Return.

The Confirm Choices screen is displayed.

8 Press Return to confirm your choice.

The Sun Cluster Geographic Edition 3.2 11/09 submenu is displayed.

9 Follow onscreen instructions to select the following products from the Sun Cluster Geographic Edition submenu.

- Sun Cluster Geographic Edition 3.2 11/09.
- The data replication software that you want to use.
- (Optional) Sun Cluster Geographic Edition Manager.

10 When prompted, choose whether to install multilingual packages.

Note – If you choose to install multilingual packages, ensure that all nodes of the cluster have the same default locale.

11 When prompted, choose to upgrade shared components.

The installer begins to install the software packages. After the installation is finished, you can view any available installation log.

12 Unload the Sun Java Availability Suite installation DVD-ROM from the DVD-ROM drive.

13 Repeat this procedure on each node of each partner cluster.

Next Steps Install required patches. Go to [“Installing Patches”](#) on page 18.

Configure Sun Cluster Geographic Edition software on the clusters. Go to [Chapter 3, “Enabling and Configuring the Sun Cluster Geographic Edition Software.”](#)

Installing Patches

Observe the following guidelines and requirements to patch Sun Cluster Geographic Edition software:

- You must run the same patch levels for Sun Cluster software and the common agent container software on all nodes of both clusters.
- The patch level for each node on which you have installed Sun Cluster Geographic Edition software must meet the Sun Cluster patch-level requirements.
- All nodes in one cluster must have the same version of Sun Cluster Geographic Edition software and the same patch level. However, primary and secondary clusters can run different versions of Sun Cluster Geographic Edition software, provided that each version is correctly patched and the versions are no more than one release different. For example, if one cluster is running Sun Cluster Geographic Edition 3.2 software that has been fully patched, and the partner cluster is running Sun Cluster Geographic Edition 3.2 11/09 software that has been fully patched, then both clusters should be brought to the same patch level as soon as possible. Also, if both partner clusters are running Sun Cluster Geographic Edition 3.2 11/09, then both partner clusters should be brought to the same patch level as soon as possible.
- To ensure that the patches have been installed properly, install the patches on your secondary cluster before you install the patches on the primary cluster.
- For additional information about Sun Cluster Geographic Edition patches, see the patch README file.
- See “Required Patches” in [Sun Cluster Geographic Edition 3.2 11/09 Release Notes](#) for a list of required patches.

▼ How to Prepare the Cluster for Patch Installation

1 Ensure that the cluster is functioning properly.

To view the current status of the cluster, run the following command from any node:

```
% cluster status
```

See the `cluster(1CL)` man page for more information.

Search the `/var/adm/messages` log on the same node for unresolved error messages or warning messages.

2 Become superuser on a node of the cluster.

3 Remove all application resource groups from protection groups.

This step ensures that resource groups are not stopped when you later stop the protection groups.

```
# geopg remove-resource-group resourcegroup protectiongroup
```

See the `geopg(1M)` man page for more information.

4 Perform the preceding steps on all clusters that have a partnership with this cluster.

5 Stop all protection groups that are active on the cluster.

```
# geopg stop -e local protectiongroup
```

See the `geopg(1M)` man page for more information.

6 Stop the Sun Cluster Geographic Edition infrastructure.

```
# geoadm stop
```

Shutting down the infrastructure ensures that a patch installation on one cluster does not affect the other cluster in the partnership.

See the `geoadm(1M)` man page for more information.

7 On each node, stop the common agent container.

```
# /usr/sbin/cacaoadm stop
```

Note – You must use common agent container 2, which is located in the `/usr/sbin` directory. Use the `/usr/sbin/cacaoadm -V` command to check which version of common agent container you are using.

Next Steps Install the required patches for the Sun Cluster Geographic Edition software. Go to [“How to Install Patches”](#) on page 20.

▼ How to Install Patches

Perform this procedure on all nodes of the cluster.

Patch the secondary cluster before you patch the primary cluster, to permit testing.

Before You Begin Perform the following tasks:

- Ensure that the Solaris OS is installed to support Sun Cluster Geographic Edition software. If Solaris software is already installed on the node, you must ensure that the Solaris installation meets the requirements for Sun Cluster Geographic Edition software and any other software that you intend to install on the cluster.
- Ensure that Sun Cluster Geographic Edition software packages are installed on the node.
- Ensure that you completed all steps in [“How to Prepare the Cluster for Patch Installation” on page 19](#).

1 Ensure that all the nodes are online and part of the cluster.

To view the current status of the cluster, run the following command from any node:

```
% cluster status
```

See the `cluster(1CL)` man page for more information.

Search the `/var/adm/messages` log on the same node for unresolved error messages or warning messages.

2 Become superuser on each node.

3 On each node, install any necessary patches to support Sun Cluster Geographic Edition software by using the `patchadd` command.

If you are applying Sun Cluster patches, use the Sun Cluster methods on both clusters.

4 After you have installed all required patches on all nodes of the cluster, on each node start the common agent container.

```
# /usr/sbin/cacaoadm start
```

Note – You must use common agent container 2, which is located in the `/usr/sbin` directory. Use the `/usr/sbin/cacaoadm -V` command to check which version of common agent container you are using.

5 On one node, enable Sun Cluster Geographic Edition software.

```
# geoadm start
```

- 6 Add all application resource groups that you removed while you were preparing the cluster for a patch installation back to the protection group.**

```
# geopg add-resource-group resourcegroup protectiongroup
```

See the [geopg\(1M\)](#) man page for more information.

- 7 Start all the protection groups that you have added.**

```
# geopg start -e local [-n] protectiongroup
```

See the [geopg\(1M\)](#) man page for more information.

Next Steps After you patch the secondary cluster, perform a sanity test on the Sun Cluster Geographic Edition software, and then repeat this procedure on the primary cluster.

Configure Sun Cluster Geographic Edition software on the clusters. Go to [Chapter 3, “Enabling and Configuring the Sun Cluster Geographic Edition Software.”](#)

Enabling and Configuring the Sun Cluster Geographic Edition Software

This chapter describes the steps for enabling and configuring the Sun Cluster Geographic Edition infrastructure. This chapter contains the following sections:

- “[Enabling the Sun Cluster Geographic Edition Infrastructure](#)” on page 23
- “[Configuring Trust Between Partner Clusters](#)” on page 26

Enabling the Sun Cluster Geographic Edition Infrastructure

When Sun Cluster Geographic Edition software is enabled, the cluster is ready to enter a partnership with another enabled cluster. You can use the CLI or the GUI to create a cluster partnership.

For more information about setting up and installing Sun Cluster Geographic Edition, see [Chapter 3, “Administering the Sun Cluster Geographic Edition Infrastructure,”](#) in *Sun Cluster Geographic Edition System Administration Guide*.

To use the `geoadm` command to enable the local cluster for partnership membership, you must have superuser access.

▼ How to Enable Sun Cluster Geographic Edition Software

This procedure enables the Sun Cluster Geographic Edition infrastructure on the local cluster only. Repeat this procedure on all the clusters of your geographically separated cluster.

Before You Begin Ensure that the following conditions are met:

- The cluster is running the Solaris Operating System and Sun Cluster software.
- The Sun Cluster management-agent container for Sun Cluster Manager is running.

- Sun Cluster Geographic Edition software is installed.
- The cluster has been configured for secure cluster communication by using security certificates, that is, nodes within the same cluster must share the same security certificates. This is configured during Sun Cluster installation.

However, when you upgrade to Sun Cluster 3.2 11/09 software, you must copy the security certificates manually from one node of the cluster to the other nodes of the cluster. This action restores identical security certificates on all nodes. For more information about copying the security files for the common agent container, see the procedures in “[How to Finish Upgrade to Sun Cluster 3.2 11/09 Software](#)” in *Sun Cluster Upgrade Guide for Solaris OS*.

- 1 **Become superuser on a cluster node.**
- 2 **Ensure that the logical hostname, which is the same as the cluster name, is available and defined.**

```
# cluster list
```

If the cluster name is not the name that you want to use, change the cluster name with the following command:

```
# cluster rename -c newclustername clustername
```

-c newclustername Specifies the new cluster name.

clustername The cluster whose name you are changing.

For more information, see the [cluster\(1CL\)](#) man page.

Note – After you have enabled the Sun Cluster Geographic Edition infrastructure, you must not change the cluster name while the infrastructure is enabled.

- 3 **Confirm that the naming service and the local hosts files contain a host entry that matches the cluster name.**

The local hosts file, `hosts`, is located in the `/etc/inet` directory.

- 4 **On a node of the cluster, start the Sun Cluster Geographic Edition infrastructure.**

```
# geoadm start
```

The `geoadm start` command enables the Sun Cluster Geographic Edition infrastructure on the local cluster only. For more information, see the [geoadm\(1M\)](#) man page.

5 Verify that you have enabled the infrastructure and that the Sun Cluster Geographic Edition resource groups are online.

```
# geoadm show
# clresourcegroup status geo-clusterstate geo-infrastructure
# clresource status -g geo-clusterstate,geo-infrastructure
```

The output for the `geoadm show` command displays that the Sun Cluster Geographic Edition infrastructure is active from a particular node in the cluster.

The output for the `clresourcegroup status` and `clresource status` commands display that the `geo-failovercontrol`, `geo-hbmonitor`, and `geo-clustername` resources and the `geo-infrastructure` resource group is online on one node of the cluster. The `geo-clusterstate` resource group is online on both nodes.

For more information, see the `clresourcegroup(1CL)` and `clresource(1CL)` man pages.

Example 3-1 Enabling the Sun Cluster Geographic Edition Infrastructure on a Cluster

This example enables Sun Cluster Geographic Edition software on the `cluster-paris` cluster.

1. Start the Sun Cluster Geographic Edition infrastructure on `cluster-paris`.

```
phys-paris-1# geoadm start
```

2. Ensure that the Sun Cluster Geographic Edition infrastructure was successfully enabled.

```
phys-paris-1# geoadm show
```

```
--- CLUSTER LEVEL INFORMATION ---
```

```
Sun Cluster Geographic Edition is active on cluster-paris from node phys-paris-1
Command execution successful
```

```
phys-paris-1#
```

3. Verify the status of the Sun Cluster Geographic Edition resource groups and resources.

```
phys-paris-1# clresourcegroup status geo-clusterstate geo-infrastructure
```

```
=== Cluster Resource Groups ===
```

Group Name	Node Name	Suspended	Status
-----	-----	-----	-----
geo-clusterstate	phys-paris-1	No	Online
	phys-paris-2	No	Online
geo-infrastructure	phys-paris-1	No	Online
	phys-paris-2	No	Offline

```
phys-paris-1# clresource status -g geo-clusterstate,geo-infrastructure
```

```
=== Cluster Resources ===
```

Resource Name	Node Name	State	Status Message
geo-clustername	phys-paris-1	Online	Online - LogicalHostname online.
	phys-paris-2	Offline	Offline
geo-hbmonitor	phys-paris-1	Online	Online - Daemon OK
	phys-paris-2	Offline	Offline
geo-failovercontrol	phys-paris-1	Online	Online - Service is online.
	phys-paris-2	Offline	Offline

Next Steps Configure trust between partner clusters. Go to [“How to Configure Trust Between Two Clusters”](#) on page 26.

Configuring Trust Between Partner Clusters

Before you create a partnership between two clusters, you must configure Sun Cluster Geographic Edition software for secure communication between the two clusters. The configuration must be reciprocal. For example, you must configure the cluster `cluster-paris` to trust the cluster `cluster-newyork`, and you must also configure the cluster `cluster-newyork` to trust the cluster `cluster-paris`.

▼ How to Configure Trust Between Two Clusters

Before You Begin Ensure that the following conditions are met:

- The cluster on which you want to create the partnership is running.
- The `geoadm start` command has already been run on this cluster and the partner cluster. For more information about using the `geoadm start` command, see [“Enabling the Sun Cluster Geographic Edition Infrastructure”](#) on page 23.
- The cluster name of the partner cluster is known.
- The host information of the partner cluster is defined in the local hosts file. The local cluster needs to know how to reach the partner cluster by name.

1 Become superuser on a cluster node.

2 Import the public keys from the remote cluster to the local cluster.

Run the following command on one node of the local cluster to import the keys from the remote cluster to one node of the cluster.

```
# geops add-trust -c remotecluster
```

`-c remotecluster` Specifies the logical hostname of the cluster with which to form a partnership. The logical hostname is used by Sun Cluster Geographic Edition software and maps to the name of the remote partner cluster. For example, a remote partner cluster name might resemble the following:

```
cluster-paris
```

When you use this option with the `add-trust` or `remote-trust` subcommand, the option specifies the alias where the public keys on the remote cluster are stored. An alias for certificates on the remote cluster has the following pattern:

```
remotecluster.certificate[0-9]*
```

Keys and only keys that belong to the remote cluster should have their alias match this pattern.

For more information about the `geops` command, refer to the [geops\(1M\)](#) man page.

3 Repeat the preceding steps on a node of the remote partner cluster.

4 Verify trust from one node of each cluster.

```
# geops verify-trust -c remotecluster
```

Next Steps Configure and join the partnership. See [Chapter 5, “Administering Cluster Partnerships,”](#) in *Sun Cluster Geographic Edition System Administration Guide*.

See Also To remove a partnership between two clusters, see “[How to Remove Trust Between Two Clusters](#)” in *Sun Cluster Geographic Edition System Administration Guide*.

Upgrading the Sun Cluster Geographic Edition Software

This chapter describes how to upgrade Sun Cluster Geographic Edition software on a pair of clusters. You can upgrade an installation of Sun Cluster Geographic Edition software by uninstalling the existing version of Sun Cluster Geographic Edition software and installing the upgraded version of the software.

You can upgrade Sun Cluster Geographic Edition software on a running cluster without disruption. Because the Sun Cluster Geographic Edition software installation process does not require you to restart the Sun Cluster software, the cluster remains in production with services running. Sun Cluster Geographic Edition software configuration data is retained across the upgrade process. Highly available applications do not have downtime during Sun Cluster Geographic Edition software upgrade.

Upgrading a Sun Cluster Geographic Edition Configuration

This section provides the following information to upgrade a Sun Cluster Geographic Edition configuration:

- [“Upgrade Requirements and Software Support Guidelines” on page 29](#)
- [“How to Prepare the Cluster for an Upgrade” on page 30](#)
- [“How to Upgrade Sun Cluster Geographic Edition Software” on page 31](#)
- [“How to Verify Upgrade of Sun Cluster Geographic Edition Software” on page 34](#)

Upgrade Requirements and Software Support Guidelines

Observe the following requirements and software-support guidelines on all clusters that have a partnership with the cluster that you are upgrading when you upgrade a cluster to the Sun Cluster Geographic Edition 3.2 11/09 software:

- **Supported hardware** - The cluster hardware must be a supported configuration for Sun Cluster Geographic Edition 3.2 11/09 software. Contact your Sun representative for information about Sun Cluster Geographic Edition configurations that are currently supported.
- **Minimum Solaris OS** - The cluster must run on or be upgraded to at least Solaris 9 9/05 or Solaris 10 11/06 software, including the most current required patches.
- **Minimum Sun Cluster version** - The cluster must run on or be upgraded to either Sun Cluster 3.2 1/09 or Sun Cluster 3.2 11/09 software.
- **Cluster partnerships** - You must upgrade Sun Cluster Geographic Edition software on all nodes of all clusters that have a partnership with the cluster you are upgrading.

▼ How to Prepare the Cluster for an Upgrade

Perform this procedure on all clusters that have a partnership with the cluster you are upgrading to remove the Sun Cluster Geographic Edition layer from production. On the Solaris 10 OS, perform all steps from the global zone only.

Before You Begin Perform the following tasks:

- Ensure that the configuration meets the requirements for the upgrade. See [“Upgrade Requirements and Software Support Guidelines” on page 29](#).
- Have available the installation media, documentation, and patches for all software products that you are upgrading, including Solaris OS, Sun Cluster software, and Sun Cluster Geographic Edition 3.2 11/09 software.
- Ensure that you have installed all the required patches for your cluster configuration on each node of every cluster before you start upgrading the software. See [“Required Patches” in Sun Cluster Geographic Edition 3.2 11/09 Release Notes](#) for the location of patches and installation instructions.

Note – If you want to upgrade the Solaris OS or other applications during the Sun Cluster Geographic Edition software upgrade process, you must remove the Sun Cluster Geographic Edition packages before you upgrade the Solaris OS or other applications. For information about uninstalling Sun Cluster Geographic Edition software, see [“Uninstalling Sun Cluster Geographic Edition Software” on page 38](#) to determine the proper method of uninstallation.

1 Ensure that the cluster is functioning properly.

a. From any node, view the current status of the cluster.

- On Sun Cluster 3.1 8/05 software, use the following command:

```
% scstat
```

- On Sun Cluster 3.2 software, use the following command:

```
% cluster status
```

See the [scstat\(1M\)](#) or [cluster\(1CL\)](#) man page for more information.

- b. Search the `/var/adm/messages` log on the same node for unresolved error messages or warning messages.
- c. Check the volume manager status.

2 Become superuser on a node of the cluster.

3 Remove all application resource groups from protection groups.

Highly available applications do not have downtime during the Sun Cluster Geographic Edition software upgrade.

```
# geopg remove-resource-group resourcegroup protectiongroup
```

See the [geopg\(1M\)](#) man page for more information.

4 Perform the preceding steps on all clusters that have a partnership with this cluster.

5 Stop all protection groups that are active on the cluster.

```
# geopg stop protectiongroup -e local
```

See the [geopg\(1M\)](#) man page for more information.

6 Stop the Sun Cluster Geographic Edition infrastructure.

```
# geoadm stop
```

See the [geoadm\(1M\)](#) man page for more information.

Next Steps Upgrade the Sun Cluster Geographic Edition software on the clusters. Go to [“How to Upgrade Sun Cluster Geographic Edition Software”](#) on page 31.

▼ How to Upgrade Sun Cluster Geographic Edition Software

Perform this procedure on all nodes of the cluster. You can perform this procedure on more than one node at the same time.



Caution – If the cluster is in a partnership, both partners must be upgraded to Sun Cluster Geographic Edition 3.2 11/09 software before the Sun Cluster Geographic Edition 3.2 11/09 software can start.

- 1 **To use the `uninstall` program with a GUI, ensure that the display environment of the cluster node to uninstall is set to display the GUI.**

```
% xhost +
% setenv DISPLAY nodename:0.0
```

If the display environment is not set to display the GUI, the `uninstall` program instead runs in text-based mode.

- 2 **Become superuser on a node where you intend to uninstall Sun Cluster Geographic Edition software.**
- 3 **Uninstall the current Sun Cluster Geographic Edition software.**

Version of Sun Cluster Geographic Edition Software	Version of Solaris OS	Method of Uninstallation
3.1 8/05	8 or 9	The <code>uninstall</code> program that is provided with Sun Cluster Geographic Edition 3.1 8/05. For more information, see Chapter 4, “Uninstalling the Sun Cluster Geographic Edition Software,” in <i>Sun Cluster Geographic Edition Installation Guide</i> .
	10	The <code>pkgrm</code> command. For more information, see “Limitations on Running Sun Cluster Geographic Edition Software on Solaris OS 10” in <i>Sun Cluster Geographic Edition 3.1 8/05 Release Notes</i> .
3.1 2006Q4	8	The <code>pkgrm</code> command. For more information, see “Uninstalling Sun Cluster Geographic Edition Software on Solaris OS 8” in <i>Sun Cluster Geographic Edition Installation Guide</i> .
	9 or 10	The <code>uninstall</code> program. For more information, see “Uninstalling Sun Cluster Geographic Edition Software on Solaris OS 9 and 10” in <i>Sun Cluster Geographic Edition Installation Guide</i> .
3.2	9 or 10	The <code>uninstall</code> program. For more information, see “Uninstalling Sun Cluster Geographic Edition Software on Solaris OS 9 and 10” in <i>Sun Cluster Geographic Edition Installation Guide</i> .

- 4 **Ensure that the cluster is functioning properly and that all nodes are online and part of the cluster.**
 - a. **From any node, view the current status of the cluster.**
 - On Sun Cluster 3.1 8/05 software, use the following command:


```
% scstat
```

- On Sun Cluster 3.2 software, use the following command:

```
% cluster status
```

See the `scstat(1M)` or `cluster(1CL)` man page for more information.

- b. Search the `/var/adm/messages` log on the same node for unresolved error messages or warning messages.
 - c. Check the volume manager status.
- 5 Upgrade to either Sun Cluster 3.2 1/09 or Sun Cluster 3.2 11/09 software.
See *Sun Cluster Software Installation Guide for Solaris OS* for more information.
 - 6 Install Sun Cluster Geographic Edition software as described in [Chapter 2, “Installing Sun Cluster Geographic Edition Software.”](#)
 - 7 Install all the required patches as described in [“Installing Patches” on page 18.](#)
 - 8 Perform the preceding steps on all nodes of the cluster.

Note – All clusters in a partnership must run either Sun Cluster 3.2 1/09 or Sun Cluster 3.2 11/09 software. If a cluster is already running on Sun Cluster 3.2 1/09 software, you are not required to upgrade it to Sun Cluster 3.2 11/09 software to upgrade that cluster to Sun Cluster Geographic Edition 3.2 11/09 software.

- 9 On one node of each partner cluster that you upgraded, enable Sun Cluster Geographic Edition software.
`geoadm start`
- 10 Update the public keys on all nodes on both partner clusters.

- a. On each node in the local cluster, remove the public keys.

```
localnode# geops remove-trust -c remotecoluster
```

- b. On each node in the remote cluster, remove the public keys.

```
remotenode# geops remove-trust -c localcluster
```

- c. On one node of the local cluster, import the public keys from the remote cluster.

```
localnode# geops add-trust -c remotecoluster
```

- d. On one node of the remote cluster, import the public keys from the local cluster.

```
remotenode# geops add-trust -c localcluster
```

e. On each node of each cluster, verify trust.

```
# geops verify-trust -c partnercluster
```

For a complete example of how to configure and join a partnership, see “[How to Join a Partnership](#)” in *Sun Cluster Geographic Edition System Administration Guide*.

11 If you upgraded from Sun Cluster Geographic Edition 3.1 8/05 software, remove the ICRM plug-in from all the heartbeats on both partner clusters.

In the following commands, the cluster names `cluster-paris` and `cluster-newyork` and the heartbeat identifiers `hb_paris~newyork` and `hb_newyork~paris` are used to provide clarity.

```
phys-paris-1# geohb remove-plugin pluginname hb_cluster-paris~cluster-newyork
phys-paris-1# geohb remove-plugin pluginname hb_cluster-newyork~cluster-paris
phys-newyork-1# geohb remove-plugin pluginname hb_cluster-paris~cluster-newyork
phys-newyork-1# geohb remove-plugin pluginname hb_cluster-newyork~cluster-paris
```

12 From one node in one of the partner clusters, add back to the protection group all application resource groups that you removed while you were preparing the cluster for upgrade.

```
# geopg add-resource-group resourcegroup protectiongroup
```

See the [geopg\(1M\)](#) man page for more information.

13 Start all the protection groups that you added.

```
# geopg start protectiongroup -e local [-n]
```

See the [geopg\(1M\)](#) man page for more information.

Next Steps Go to “[How to Verify Upgrade of Sun Cluster Geographic Edition Software](#)” on page 34.

▼ How to Verify Upgrade of Sun Cluster Geographic Edition Software

Perform this procedure to verify that the cluster is successfully upgraded to Sun Cluster Geographic Edition 3.2 11/09 software. On the Solaris 10 OS, perform all steps from the global zone only.

Before You Begin Ensure that all upgrade procedures are completed for all cluster nodes that you are upgrading.

1 Become superuser on each node.**2 On each upgraded node, view the installed levels of Sun Cluster Geographic Edition software.**

```
# geoadm -V
```

The last line of output states which version of Sun Cluster Geographic Edition software the node is running. This version should match the version to which you just upgraded.

Note – The version number that the `geoadm -v` command returns does not coincide with the marketing release version numbers. The version number for Sun Cluster Geographic Edition 3.2 11/09 software is 1.5.

3 Ensure that the cluster is running properly.

```
# geoadm status
```

4 (Optional) Perform a switchover to ensure that Sun Cluster Geographic Edition software was installed properly.

```
# geopg switchover remotecluster protectiongroup
```

You must test your geographically separated cluster properly, so that no problems prevent a switchover. Upgrading the secondary cluster first and switching over to it enables you to verify that switchover still works. If the switchover fails, the primary site is untouched and you can switch back. If switchover works on the secondary site, then after a certain 'soak time' you can upgrade the primary site as well.

Note – A switchover might interrupt the services that are running on the cluster. You should carefully plan the required tasks and resources before you perform a switchover.

If you have added your application resource groups back into the protection groups, performing a switchover shuts down the applications on the original primary cluster and migrates the applications to the secondary cluster.

Uninstalling Sun Cluster Geographic Edition 3.2 11/09 Software

When you uninstall Sun Cluster Geographic Edition 3.2 11/09 software, the node or cluster is no longer a part of the geographically separated cluster.

This chapter contains the following sections:

- “Uninstallation Overview” on page 37
- “Uninstalling Sun Cluster Geographic Edition Software” on page 38

Uninstallation Overview

This chapter describes uninstalling Sun Cluster Geographic Edition 3.2 software. For information about uninstalling previous versions of Sun Cluster Geographic Edition software, use the following table to determine the required method.

Version of Sun Cluster Geographic Edition Software	Version of Solaris OS	Method of Uninstallation
3.1 8/05	8 or 9	The <code>uninstall</code> program that is provided with Sun Cluster Geographic Edition 3.1 8/05. For more information, see Chapter 4, “Uninstalling the Sun Cluster Geographic Edition Software,” in <i>Sun Cluster Geographic Edition Installation Guide</i> .
	10	The <code>pkgrm</code> command. For more information, see “Limitations on Running Sun Cluster Geographic Edition Software on Solaris OS 10” in <i>Sun Cluster Geographic Edition 3.1 8/05 Release Notes</i> .

Version of Sun Cluster Geographic Edition Software	Version of Solaris OS	Method of Uninstallation
3.1 2006Q4	8	The <code>pkgrm</code> command. For more information, see “Uninstalling Sun Cluster Geographic Edition Software on Solaris OS 8” in <i>Sun Cluster Geographic Edition Installation Guide</i> .
	9 or 10	The <code>uninstall</code> program. For more information, see “Uninstalling Sun Cluster Geographic Edition Software on Solaris OS 9 and 10” in <i>Sun Cluster Geographic Edition Installation Guide</i> .

You can remove Sun Cluster Geographic Edition software without stopping applications or data replication. For more information about how to keep applications and data replication online, see one of the following data replication guides:

- “How to Deactivate a Sun StorageTek Availability Suite Protection Group” in *Sun Cluster Geographic Edition Data Replication Guide for Sun StorageTek Availability Suite*
- “Deactivating a Hitachi TrueCopy or Universal Replicator Protection Group” in *Sun Cluster Geographic Edition Data Replication Guide for Hitachi TrueCopy and Universal Replicator*
- “Deactivating an EMC Symmetrix Remote Data Facility Protection Group” in *Sun Cluster Geographic Edition Data Replication Guide for EMC Symmetrix Remote Data Facility*

For more information about disabling the local cluster for partnership membership, see “Disabling the Sun Cluster Geographic Edition Software” in *Sun Cluster Geographic Edition System Administration Guide*.

Uninstalling Sun Cluster Geographic Edition Software

Sun Java Availability Suite provides an uninstallation program for removing components that were installed on your system by using the Sun Java Availability Suite `installer` program. Like the `installer` program, the `uninstall` program can be run in graphical or text-based mode. The `uninstall` program is located at `/var/sadm/prod/SUNWent$ver`, where `ver` is the version number of the Sun Java Availability Suite distribution from which you installed Sun Cluster Geographic Edition software.

Note – You must uninstall Sun Cluster Geographic Edition software before you uninstall Sun Cluster software.

The `uninstall` program might behave differently depending on which component products you installed and how the products are interrelated. Remember the following when you run the `uninstall` program:

- Run the `uninstall` program separately on each node that contains Sun Cluster Geographic Edition components.
- The `uninstall` program removes only component products that were installed by the Sun Java Availability Suite installer program.
- The `uninstall` program does not check product dependencies for the system.
- The `uninstall` program does not remove configuration and user data files.

▼ How to Uninstall Sun Cluster Geographic Edition Software

Remove Sun Cluster Geographic Edition software from all nodes in the cluster, unless you are removing the software from node that you are also removing from the cluster. You can continue to run applications during the uninstallation of Sun Cluster Geographic Edition software.

- 1 **To use the `uninstall` program with a GUI, ensure that the display environment of the cluster node to uninstall is set to display the GUI.**

```
% xhost +
% setenv DISPLAY nodename:0.0
```

If the display environment is not set to display the GUI, the `uninstall` program instead displays in test-based mode.

- 2 **Become superuser on the node where you intend to uninstall Sun Cluster Geographic Edition software.**

- 3 **Stop the Sun Cluster Geographic Edition infrastructure on the local cluster.**

```
# geoadm stop
```

For more information about disabling the Sun Cluster Geographic Edition software on a cluster, see “Disabling the Sun Cluster Geographic Edition Software” in *Sun Cluster Geographic Edition System Administration Guide*.

- 4 **Change to the directory where the `uninstall` program for this software version resides.**

In the following path, *ver* is the version number of the Sun Java Availability Suite distribution from which you installed Sun Cluster Geographic Edition software.

```
# cd /var/sadm/prod/SUNWentsys $ver$ 
```

5 Start the `uninstall` program.

```
# ./uninstall
```

The Welcome page is displayed.

6 Click Next to proceed.

The Select Components page is displayed.

7 Select the components that you want to uninstall, and click Next.

To exit the `uninstall` program at any time, click Cancel.

8 Review the uninstallation selections you have made.

- If changes are needed, click Back through successive pages until the Component Selection page is displayed.
- Make changes as needed on the Component Selection page.
- Click Next to proceed again through the uninstaller pages.

The `uninstall` program remembers previously-specified values. You can modify any value that you previously specified.

9 Click Next when you are satisfied with your selections.

The `uninstall` program begins removing software from your system and displays the following:

- A progress bar that displays the overall completion percentage.
- The name of the package that is currently being removed.
- After all component software has been removed, the uninstaller displays the Uninstallation Complete page.

10 Click View Summary or View Log for information about the uninstallation.

- Uninstallation summary shows the components that were uninstalled and a list of configuration information for the components.
- Uninstallation log shows all messages that were generated by the uninstaller during uninstallation.
- You can also review the uninstallation summary and log files in `/var/sadm/install/logs`.

11 Click Close to exit the `uninstall` program.

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