Sun Cluster Data Service for N1 Grid Service Provisioning System for Solaris OS

Adobe PostScript

050503@11223

Contents

Preface

Sun Cluster Data Service for N1 Grid Service Provisioning System for Solaris OS explains how to install and configure Sun™ Cluster HA for N1 Grid Service Provisioning System on both SPARC® and x86 based systems.

Note – In this document, the term "x86" refers to the Intel 32-bit family of microprocessor chips and compatible microprocessor chips made by AMD.

This document is intended for system administrators with extensive knowledge of Sun software and hardware. Do not use this document as a planning or presales guide. Before reading this document, you should have already determined your system requirements and purchased the appropriate equipment and software.

The instructions in this document assume knowledge of the Solaris™ Operating System and expertise with the volume manager software that is used with Sun Cluster.

Note – Sun Cluster software runs on two platforms, SPARC and x86. The information in this document pertains to both platforms unless otherwise specified in a special chapter, section, note, bulleted item, figure, table, or example.

UNIX Commands

This document contains information about commands that are specific to installing and configuring Sun Cluster data services. The document does *not* contain comprehensive information about basic UNIX® commands and procedures, such as shutting down the system, booting the system, and configuring devices. Information about basic UNIX commands and procedures is available from the following sources:

■ Online documentation for the Solaris Operating System
■ Solaris Operating System man pages
■ Other software documentation that you received with your system

Typographic Conventions

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

TABLE P–1 Typographic Conventions

Typeface or Symbol	Meaning	Example
AaBbCc123	The names of commands, files, and directories, and onscreen computer output	Edit your `.login` file. Use `ls -a` to list all files. `machine_name% you have mail.`
AaBbCc123	What you type, contrasted with onscreen computer output	`machine_name% `**`su`** `Password:`
AaBbCc123	Command-line placeholder: replace with a real name or value	The command to remove a file is `rm` *filename*.
AaBbCc123	Book titles, new terms, and terms to be emphasized	Read Chapter 6 in the *User's Guide*. Perform a *patch analysis*. Do *not* save the file. [Note that some emphasized items appear bold online.]

Shell Prompts in Command Examples

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

TABLE P–2 Shell Prompts

Shell	Prompt
C shell prompt	`machine_name%`
C shell superuser prompt	`machine_name#`
Bourne shell and Korn shell prompt	`$`
Bourne shell and Korn shell superuser prompt	`#`

Related Documentation

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

Topic	Documentation
Data service administration	*Sun Cluster Data Services Planning and Administration Guide for Solaris OS*
	Individual data service guides
Concepts	*Sun Cluster Concepts Guide for Solaris OS*
Overview	*Sun Cluster Overview for Solaris OS*
Software installation	*Sun Cluster Software Installation Guide for Solaris OS*
System administration	*Sun Cluster System Administration Guide for Solaris OS*
Hardware administration	*Sun Cluster 3.0-3.1 Hardware Administration Manual for Solaris OS*
	Individual hardware administration guides
Data service development	*Sun Cluster Data Services Developer's Guide for Solaris OS*

Topic	Documentation
Error messages	*Sun Cluster Error Messages Guide for Solaris OS*
Command and function reference	*Sun Cluster Reference Manual for Solaris OS*

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

Related Third-Party Web Site References

Third-party URLs that are referenced in this document provide additional related information.

Note – Sun is not responsible for the availability of third-party web sites mentioned in this document. Sun does not endorse and is not responsible or liable for any content, advertising, products, or other materials that are available on or through such sites or resources. Sun will not be responsible or liable for any actual or alleged damage or loss caused or alleged to be caused by or in connection with use of or reliance on any such content, goods, or services that are available on or through such sites or resources.

Documentation, Support, and Training

Sun Function	URL	Description
Documentation	`http://www.sun.com/documentation/`	Download PDF and HTML documents, and order printed documents
Support and Training	`http://www.sun.com/supportraining/`	Obtain technical support, download patches, and learn about Sun courses

Product Training

Sun Microsystems offers training in many Sun technologies through a variety of instructor-led courses and self-paced courses. For information about the training courses that Sun offers and to enroll in a class, visit Sun Microsystems Training at `http://training.sun.com/`.

Getting Help

If you have problems installing or using Sun Cluster, 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 Solaris Operating System (for example, Solaris 8)
- The release number of Sun Cluster (for example, Sun Cluster 3.0)

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

Command	Function
`prtconf -v`	Displays the size of the system memory and reports information about peripheral devices
`psrinfo -v`	Displays information about processors
`showrev –p`	Reports which patches are installed
`SPARCprtdiag -v`	Displays system diagnostic information
`scinstall -pv`	Displays Sun Cluster release and package version information

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

Installing and Configuring Sun Cluster HA for N1 Service Provisioning System

This chapter explains how to install and configure Sun Cluster HA for N1 Service Provisioning System.

This chapter contains the following sections.

- "Installing and Configuring Sun Cluster HA for N1 Service Provisioning System" on page 12
- "Sun Cluster HA for N1 Service Provisioning System" on page 13
- "Planning the Sun Cluster HA for N1 Service Provisioning System Installation and Configuration" on page 14
- "Installing and Configuring N1 Grid Service Provisioning System" on page 19
- "Verifying the Installation and Configuration of N1 Grid Service Provisioning System" on page 21
- "Installing the Sun Cluster HA for N1 Grid Service Provisioning System Packages" on page 24
- "Preparation of the N1 Grid Service Provisioning System Master Servers database" on page 26
- "Registering and Configuring Sun Cluster HA for N1 Service Provisioning System" on page 27
- "Verifying the Sun Cluster HA for N1 Service Provisioning System and Configuration" on page 33
- "Understanding the Sun Cluster HA for N1 Service Provisioning System Master Server Parameter File" on page 34
- "Understanding the fault monitor of the Sun Cluster HA for N1 Service Provisioning System" on page 36
- "How to debug Sun Cluster HA for N1 Service Provisioning System" on page 38

Installing and Configuring Sun Cluster HA for N1 Service Provisioning System

Table 1 list the tasks for installing and configuring Sun Cluster HA for N1 Service Provisioning System. Perform these tasks in the order they are listed.

TABLE 1 Task Map: Installing and Configuring Sun Cluster HA for N1 Service Provisioning System

Task	For Instructions, Go To
1 Plan the installation.	"Planning the Sun Cluster HA for N1 Service Provisioning System Installation and Configuration" on page 14
2 Install and configure the N1 Grid Service Provisioning System.	"Installing and Configuring N1 Grid Service Provisioning System" on page 19
3 Verify installation and configuration.	"How to Verify the Installation and Configuration of N1 Grid Service Provisioning System Master Server" on page 21
4 Install Sun Cluster HA for N1 Service Provisioning System Packages.	"Installing the Sun Cluster HA for N1 Grid Service Provisioning System Packages" on page 24
5 Register and configure Sun Cluster HA for N1 Service Provisioning System components	"Registering and Configuring Sun Cluster HA for N1 Service Provisioning System" on page 27
5.1 Register and configure Sun Cluster HA for N1 Service Provisioning System Master Server as a failover data service.	"How to Register and Configure Sun Cluster HA for N1 Service Provisioning System Master Server as a failover data service" on page 27
5.2 Register and configure Sun Cluster HA for N1 Service Provisioning System Remote Agent as a failover data service.	"How to Register and Configure Sun Cluster HA for N1 Service Provisioning System Remote Agent as a failover data service" on page 30
5.3 Register and Configure Sun Cluster HA for N1 Service Provisioning System Local Distributor as a failover data service.	"How to Register and Configure Sun Cluster HA for N1 Service Provisioning System Local Distributor as a failover data service" on page 31
6 Verify Sun Cluster HA for N1 Service Provisioning System Installation and Configuration.	"How to Verify the Sun Cluster HA for N1 Service Provisioning System Installation and Configuration" on page 33

TABLE 1 Task Map: Installing and Configuring Sun Cluster HA for N1 Service Provisioning System *(Continued)*

Task	For Instructions, Go To
7 Understanding the Sun Cluster HA for N1 Service Provisioning System parameter file.	"Understanding the Sun Cluster HA for N1 Service Provisioning System Master Server Parameter File" on page 34
8 Understanding the Sun Cluster HA for N1 Service Provisioning System Fault Monitor.	"Understanding the fault monitor of the Sun Cluster HA for N1 Service Provisioning System" on page 36
9 How to debug Sun Cluster HA for N1 Service Provisioning System.	"How to turn debug on for a Sun Cluster HA for N1 Service Provisioning System component" on page 39

Sun Cluster HA for N1 Service Provisioning System

The N1 Grid Service Provisioning System is Sun Microsystems product for service (software) Distribution in the N1 environment. It consists of four components:

1. The Master Server which is the core component for the service distribution.
2. The client component is called Remote Agent. It has to run on every target host.
3. A proxy component called Local Distributor. The Local Distributor is used to minimize data transfer between datacenters.
4. A command line interface which can be installed on every host.

The Master Server is built upon Apache Tomcat and the PostgreSql Database. All other components are pure Java.

The Sun Cluster HA for N1 Service Provisioning System data service provides mechanisms for orderly startup and shutdown, fault monitoring, and automatic failover of the Master Server, the Remote Agent and the Local Distributor.

The following table describes the relation between the application components and the related Sun Cluster data service.

TABLE 2 Protection of Components

Component	Protected by
Master Server	Sun Cluster HA for N1 Service Provisioning System

TABLE 2 Protection of Components *(Continued)*

Component	Protected by
Remote Agent	Sun Cluster HA for N1 Service Provisioning System
Local Distributor	Sun Cluster HA for N1 Service Provisioning System

Planning the Sun Cluster HA for N1 Service Provisioning System Installation and Configuration

This section contains the information you need to plan your Sun Cluster HA for N1 Service Provisioning System installation and configuration.

Configuration Restrictions

This paragraph provides a list of software and hardware configuration restrictions that apply to Sun Cluster HA for N1 Service Provisioning System only.

For restrictions that apply to all data services, see the *Sun Cluster Release Notes*.

- **Sun Cluster HA for N1 Service Provisioning System can only be configured as a failover data service** — Each component of N1 Grid Service Provisioning System can operate as a failover data service only. Therefore, all the components of the Sun Cluster HA for N1 Service Provisioning System can only be configured to run as failover data services.

- **Install the N1 Grid Service Provisioning System components on shared storage** — The Master Server and the Local Distributor have to be installed on the shared storage. The remote agents which are configured to bind on the logical host have to be installed on the shared storage as well.

- **Configure a Sun Cluster resource for the N1 Grid Service Provisioning System Remote Agent for raw and ssl communication only** —The Master Server will start and stop the Remote Agent on every connection, as long as the Remote agent is configured for ssh communication. In this case, there is no Sun Cluster resource needed. In the ssh scenario, you have to install the N1 Grid Service Provisioning System Remote Agent on the shared storage and copy the ssh keys from one node to the remaining nodes of the cluster. This assures that all the cluster nodes have the same ssh personality.

Caution – Your data service configuration might not be supported if you do not adhere to these restrictions.

Configuration Requirements

These requirements apply to Sun Cluster HA for N1 Service Provisioning System only. You must meet these requirements before you proceed with your Sun Cluster HA for N1 Service Provisioning System installation and configuration.

Caution – Your data service configuration might not be supported if you do not adhere to these requirements.

Configure the N1 Grid Service Provisioning System base directory on shared storage on a failover file system

Create the N1 Grid Service Provisioning System base directory on the shared storage. The location for the base directory can reside on a Global File System (GFS) or it can reside on a Failover File System (FFS) with an HAStoragePlus resource. It is best practice to store it on a FFS.

The FFS is required because the Master Server uses the directory structure to store its configuration, logs, deployed applications, database and so on. The Remote agent and the Local Distributor store their caches below the base directory. It is not recommended to store the binaries on the local storage and the dynamic parts of the data on the shared storage.

Note – It is best practice to mount Global File Systems with the /global prefix and to mount Failover File Systems with the /local prefix.

N1 Grid Service Provisioning System components and dependencies –

You can configure the Sun Cluster HA for N1 Service Provisioning System data service to protect one or more N1 Grid Service Provisioning System instances or components. Each instance or component needs to be covered by one Sun Cluster HA for N1 Service Provisioning System resource. The dependencies between the Sun Cluster HA for N1 Service Provisioning System resource and other necessary resources are described in the following table.

TABLE 3 Components and Dependencies

Component	Description
Storage Resource	This resource can be a *SUNW.HAStoragePlus* or a *SUNW.HAStorage* resource type.
N1 Grid Service Provisioning System component `(Mandatory)`	→ *SUNW.HAStoragePlus* / *SUNW.HAStorage* resource The Storage resource manages the N1 Grid Service Provisioning System File System mount points and ensures that N1 Grid Service Provisioning System component resource is not started until necessary file systems are mounted. The N1 Grid Service Provisioning System component resource can be the Master Server, the Remote Agent, or the Local Distributor.
Logical Host`(Mandatory)`	The N1 Grid Service Provisioning System has an implicit dependency on the logical hosts of the resource group, because it is based on the generic data service. Therefore, a logical host is required, but no explicit dependency is necessary.

Note – For more detailed information about N1 Grid Service Provisioning System, refer to the product documentation on the *docs.sun.com* webpage or the documentation delivered with the product.

Configuration and Registration Files

Each component of Sun Cluster HA for N1 Service Provisioning System has configuration and registration files in the directory /opt/SUNWscsps/*component-dir*/**util —** The term component-dir stands for the directory names master, localdist or remoteagent. These files let you register the N1 Grid Service Provisioning System component with Sun Cluster.

Within these files, you apply the appropriate dependencies.

EXAMPLE 1 N1 Grid Service Provisioning System master components configuration and registration file for Sun Cluster

```
# cd /opt/SUNWscsps/master
#
# ls -l util
total 6
-rwxr-xr-x   1 root      other        730 Nov 26 10:49 db_prep_postgres
-rwxr-xr-x   1 root      other        674 Nov 26 09:44 spsma_config
-rwxr-xr-x   1 root      other        579 Nov 26 11:06 spsma_register
# more util/spsma_config
#
# Copyright 2003 Sun Microsystems, Inc.  All rights reserved.
# Use is subject to license terms.
```

EXAMPLE 1 N1 Grid Service Provisioning System master components configuration and registration file for Sun Cluster   *(Continued)*

```
#
# This file will be sourced in by spsma_register and the parameters
# listed below will be used.
#
# These parameters can be customized in (key=value) form
#
#        RS - name of the resource for the application
#        RG - name of the resource group containing RS
#      PORT - name of the port number
#        LH - name of the LogicalHostname SC resource
#     PFILE - name of the parameter file for additional variables
#    HAS_RS - name of the HAStoragePlus SC resource
#

RS=
RG=
PORT=8080
LH=
PFILE=
HAS_RS=
```

The spsma_register script validates the variables of the spsma_config script and registers the resource for the master server.

The master server component has an additional script db_prep_postgres. The purpose of this script is to prepare the PostgreSql database of the Master Server for monitoring.

EXAMPLE 2 N1 Grid Service Provisioning System Remote Agent components configuration and registration file for Sun Cluster

```
# cd /opt/SUNWscsps/remoteagent
#
# ls -l util
total 4
-rwxr-xr-x   1 root     other        777 Dec  2 12:48 spsra_config
-rwxr-xr-x   1 root     other        568 Jan 7 16:56 spsra_register
# more util/spsra_config
# Copyright 2003 Sun Microsystems, Inc.  All rights reserved.
# Use is subject to license terms.
#
# This file will be sourced in by xxx_register and the parameters
# listed below will be used.
#
# These parameters can be customized in (key=value) form
#
#        RS - name of the resource for the application
#        RG - name of the resource group containing RS
#      PORT - name of the Remote Agents  port number
#        LH - name of the LogicalHostname SC resource
#      USER - name of the owner of the remote agent
#      BASE - name of the directry where the N1 Service Provisioning Server
```

EXAMPLE 2 N1 Grid Service Provisioning System Remote Agent components configuration and registration file for Sun Cluster   *(Continued)*

```
#              is installed
#    HAS_RS - name of the HAStoragePlus SC resource
#

RS=
RG=
PORT=22
LH=
USER=
BASE=
HAS_RS=
```

The spsra_register script validates the variables of the spsra_config script and registers the resource for the remote agent.

EXAMPLE 3 N1 Grid Service Provisioning System Local Distributors components configuration and registration file for Sun Cluster

```
# cd /opt/SUNWscsps/localdist
#
# ls -l util
total 4
-rwxr-xr-x   1 root     other       757 Dec  3 17:45 spsld_config
-rwxr-xr-x   1 root     other       609 Jan  7 16:56 spsld_register
# more util/spsld_config
#
# Copyright 2003 Sun Microsystems, Inc.  All rights reserved.
# Use is subject to license terms.
#
# This file will be sourced in by spsld_register and the parameters
# listed below will be used.
#
# These parameters can be customized in (key=value) form
#
#        RS - name of the resource for the application
#        RG - name of the resource group containing RS
#      PORT - name of the port number
#        LH - name of the LogicalHostname SC resource
#      USER - name of the owner of the local distributor
#      BASE - name of the directry where the N1 Service Provisioning Server
#             is installed
#    HAS_RS - name of the HAStoragePlus SC resource
#

RS=
RG=
PORT=22
LH=
USER=
BASE=
HAS_RS=
```

The `spsld_register` script validates the variables of the `spsld_config` script and registers the resource for the local distributor.

Installing and Configuring N1 Grid Service Provisioning System

This section contains the procedures for installing and configuring N1 Grid Service Provisioning System components. The components are the Master Server, the Remote Agent and the Local Distributor.

▼ Installation of the N1 Grid Service Provisioning System components

Steps 1. **Determine how N1 Grid Service Provisioning System will be deployed in the Sun Cluster**

- Determine which component of the N1 Grid Service Provisioning System you will use.

- Determine which user name will run N1 Grid Service Provisioning System component.

- Determine how many N1 Grid Service Provisioning System component versions and instances will be deployed.

- Determine which Cluster File System will be used by each N1 Grid Service Provisioning System component instance.

2. **Mount the N1 Grid Service Provisioning Systems Cluster File Systems**

3. **Create user and group if required — If theN1 Grid Service Provisioning System is to run under a non root user, you have to create the appropriate user, and the appropriate group. For these tasks use the following commands on every node.**

   ```
   # groupadd –g 1000 sps
   # useradd –u 1000 –g 1000 –d /global/sps –s /bin/ksh sps
   ```

   Now you have to set up a resource group and the appropriate storage and logical host resources for the N1 Grid Service Provisioning System component. The component is either the Master Server, the Remote Agent, or the Local Distributor. These steps are required before proceeding with the N1 Grid Service Provisioning System resources. Perform the steps Step 4 to Step 9on one node only

4. **Register the SUNW.HAStoragePlus resource type.**

It is assumed that the file system of the N1 Grid Service Provisioning System component will be mounted as a failover file system.

```
# scrgadm -a -t SUNW.HAStoragePlus
```

5. Create a failover resource group.

```
# scrgadm -a -g N1sps-component-resource-group
```

6. Create a resource for the N1 Grid Service Provisioning System component Disk Storage.

```
# scrgadm -a -j N1sps-component-has-resource   \
> -g N1sps-component-resource-group      \
> -t SUNW.HAStoragePlus  \
> -x FilesystemMountPoints=N1sps-component-instance-mount-points
```

7. Create a resource for the N1 Grid Service Provisioning System Master component Logical Host name.

```
# scrgadm -a -L -j N1sps-component-logical-hostname   \
> -g N1sps-component-resource-group   \
> -l N1sps-component-logical-hostname
```

8. Enable the failover resource group, which now includes the N1 Grid Service Provisioning System Disk Storage and Logical Hostname resources.

```
# scswitch -Z -g   N1sps-component-resource-group
```

9. Install the N1 Grid Service Provisioning System components — Install the appropriate N1 Grid Service Provisioning System components on one node. Use a shared file system within Sun Cluster for the installation location.

It is recommended that you install N1 Grid Service Provisioning System onto shared disks. For a discussion of the advantages and disadvantages of installing the software on a local versus a cluster file system, see "Determining the Location of the Application Binaries" in the *Sun Cluster Data Services Installation and Configuration Guide*.

Note – Refer to the N1 Grid Service Provisioning System product documentation on *http://docs.sun.com* for instructions about installing N1 Grid Service Provisioning System. For more information about N1 Grid Service Provisioning System, refer to the *docs.sun.com* web page.

Verifying the Installation and Configuration of N1 Grid Service Provisioning System

This section contains the procedure you need for verifying the installation and configuration of N1 Grid Service Provisioning System.

This procedure does not verify that your applications are highly available because you have not installed your data service yet. Select the appropriate procedure for the N1 Grid Service Provisioning System application you installed.

▼ How to Verify the Installation and Configuration of N1 Grid Service Provisioning System Master Server

This procedure is for the installation verification of the master server.

Steps   1. **Start the N1 Grid Service Provisioning System Master Server.**

Switch to the N1 Grid Service Provisioning System Master Servers user name (in the following example, it is sps) and change to the directory where the software is located. In the following example the software version is 4.1.

Note – The output messages of the start and shutdown commands are highly version dependent.

```
 # su -  sps
$ cd N1_Service_Provisioning_System_4.1
$cd server/bin
$./cr_server start
*** Starting database
*** Starting cr_server
```

2. **Check the Installation**

Start a web browser and connect to the cluster node with *http://logical-hostname:port*. The port is the web administration port configured in the installation procedure of the master server. If you see the default N1 Grid Service Provisioning System login page everything is working correctly.

3. Stop the N1 Grid Service Provisioning System Master Server.

```
 $ ./cr_server stop
*** Stopping cr_server
Waiting for CR to complete shutdown...
*** Stopping database
waiting for postmaster to shut down.......done
postmaster successfully shut down
```

▼ How to Verify the Installation and Configuration of N1 Grid Service Provisioning System Remote Agent

This procedure is for the installation verification of the N1 Grid Service Provisioning System Remote Agent.

Steps **1. Start the N1 Grid Service Provisioning System Remote Agent.**

Switch to the N1 Grid Service Provisioning System Remote Agents user name (in the following example, it is sps) and change to the directory where the software is located. In the following example the software version is 4.1.

Note – The output messages of the start and shutdown commands are highly version dependent.

```
 # su -  sps
$ cd N1_Service_Provisioning_System
$cd agent/bin
$./cr_agent start
*** Starting cr_agent
```

2. Check the Installation

Check the process table with the following command:

```
$ /usr/ucb/ps -auxww |grep java|grep agent >/dev/null;echo $?
0
```

If the response is 0, everything is working correctly. You may omit the |**grep agent >/dev/null;echo $?** in this case you have to see a java process with agent in the process string.

3. Stop the N1 Grid Service Provisioning System Remote Agent.

```
 $ ./cr_agent stop
*** Stopping cr_agent
```

▼ **How to Verify the Installation and Configuration of N1 Grid Service Provisioning System Local Distributor**

This procedure is for the installation verification of the N1 Grid Service Provisioning System Local Distributor.

Steps   **1. Start the N1 Grid Service Provisioning System Local Distributor.**

Switch to the N1 Grid Service Provisioning System Remote Agents user name (in the following example, it is sps) and change to the directory the software is located. In the following example the software version is 4.1.

Note – The output messages of the start and shutdown commands are highly version dependent.

```
 # su -  sps
$ cd N1_Service_Provisioning_System
$cd ld/bin
$./cr_ld start
*** Starting cr_ld
```

2. Check the Installation

Check the process table with the following command:

```
$ /usr/ucb/ps -auxww |grep java|grep ld>/dev/null;echo $?
0
```

If the response is 0, everything is working correctly. You may omit the |**grep ld>/dev/null;echo $?** in this case you have to see a java process with ld in the process string.

3. Stop the N1 Grid Service Provisioning System Local Distributor.

```
 $ ./cr_ld stop
*** Stopping cr_ld
```

Installing the Sun Cluster HA for N1 Grid Service Provisioning System Packages

If you did not install the Sun Cluster HA for N1 Service Provisioning System packages during your initial Sun Cluster installation, perform this procedure to install the packages. Perform this procedure on each cluster node where you are installing the Sun Cluster HA for N1 Service Provisioning System packages. To complete this procedure, you need the Sun Cluster Agents CD-ROM.

If you are installing more than one data service simultaneously, perform the procedure in "Installing the Software" in *Sun Cluster Software Installation Guide for Solaris OS*.

Install the Sun Cluster HA for N1 Service Provisioning System packages by using one of the following installation tools:

- The Web Start program
- The `scinstall` utility

Note – The Web Start program is *not* available in releases earlier than Sun Cluster 3.1 Data Services 10/03.

If you are using Solaris 10, install these packages *only* in the global zone. To ensure that these packages are not propagated to any local zones that are created after you install the packages, use the `scinstall` utility to install these packages. Do *not* use the Web Start program.

▼ How to Install the Sun Cluster HA for N1 Service Provisioning System Packages Using the Web Start Program

You can run the Web Start program with a command-line interface (CLI) or with a graphical user interface (GUI). The content and sequence of instructions in the CLI and the GUI are similar. For more information about the Web Start program, see the `installer`(1M) man page.

Steps 1. **On the cluster node where you are installing the Sun Cluster HA for N1 Service Provisioning System packages, become superuser.**

2. **(Optional) If you intend to run the Web Start program with a GUI, ensure that your `DISPLAY` environment variable is set.**

3. **Insert the Sun Cluster Agents CD-ROM into the CD-ROM drive.**

   If the Volume Management daemon `vold`(1M) is running and configured to manage CD-ROM devices, it automatically mounts the CD-ROM on the `/cdrom/cdrom0` directory.

4. **Change to the Sun Cluster HA for N1 Service Provisioning System component directory of the CD-ROM.**

   The Web Start program for the Sun Cluster HA for N1 Service Provisioning System data service resides in this directory.

   ```
   # cd /cdrom/cdrom0/components/SunCluster_HA_N1G_SPS_3.1
   ```

5. **Start the Web Start program.**

   ```
   # ./installer
   ```

6. **When you are prompted, select the type of installation.**

   - To install only the C locale, select Typical.
   - To install other locales, select Custom.

7. **Follow the instructions on the screen to install the Sun Cluster HA for N1 Service Provisioning System packages on the node.**

   After the installation is finished, the Web Start program provides an installation summary. This summary enables you to view logs that the Web Start program created during the installation. These logs are located in the `/var/sadm/install/logs` directory.

8. **Exit the Web Start program.**

9. **Remove the Sun Cluster Agents CD-ROM from the CD-ROM drive.**

   a. **To ensure that the CD-ROM is not being used, change to a directory that does *not* reside on the CD-ROM.**

   b. **Eject the CD-ROM.**

      ```
      # eject cdrom
      ```

▼ How to Install the Sun Cluster HA for N1 Service Provisioning System Packages Using the `scinstall` Utility

You need the Sun Cluster Agents CD-ROM to perform this procedure. It is assumed that you did not install the data service during your initial Sun Cluster installation.

If you installed Sun Cluster HA for N1 Service Provisioning System as a part of your initial Sun Cluster installation, proceed to "Registering and Configuring Sun Cluster HA for N1 Service Provisioning System" on page 27.

Perform this procedure, on all nodes that can run Sun Cluster HA for N1 Service Provisioning System.

Steps   **1. Load the Sun Cluster Agents CD-ROM into the CD-ROM drive.**

2. **Run the `scinstall` utility with no options.**
   The `scinstall` utility prompts you for additional information.

3. **Chose the menu option, Add Support for New Data Service to this Cluster Node**
   This step starts the `scinstall` utility in interactive mode.

4. **Provide the pathname to the Sun Cluster Agents CD-ROM.**
   The utility refers to the CD as "data services cd."

5. **Chose the menu option, q) done.**

6. **Type yes for the question, Do you want to see more data services?**
   The utility refers to the CD as "data services cd."

7. **Specify the data service to install.**
   The `scinstall` utility lists the data service that you selected and asks you to confirm your choice.

8. **Exit the `scinstall` utility.**

9. **Unload the CD from the CD-ROM drive.**

Preparation of the N1 Grid Service Provisioning System Master Servers database

In this section you prepare the database of the N1 Grid Service Provisioning System Master Server. It needs to contain the user sc_test and the table sc_test. The user and the table are needed to monitor the PostgreSql database. The script db_prep_postgres is provided to create the user and the table.

▼ Preparation of the Master Servers database.

Steps   **1. Start the N1 Grid Service Provisioning System Master Server as described in** "How to Verify the Installation and Configuration of N1 Grid Service

2. **Remain within the user of the Master Server and prepare the database.**

   For the preparation of the database you need the N1 Grid Service Provisioning System Master Servers base directory. It is the directoy that contains the `server/bin` directory. You prepare the database with the following command:

   ```
   $/opt/SUNWscsps/master/util/db_prep_postgres <Base Directory of the master Server>
   CREATE USER
   CREATE
   ```

   An example for the Base Directory is:/global/sps/N1_Service_Provisioning_System_4.1.

3. **Stop the N1 Grid Service Provisioning System Master Server as described in**

Registering and Configuring Sun Cluster HA for N1 Service Provisioning System

This section contains the procedures you need to configure the Master Server, the Remote Agent, or the Local Distributor of Sun Cluster HA for N1 Service Provisioning System.

▼ How to Register and Configure Sun Cluster HA for N1 Service Provisioning System Master Server as a failover data service

This procedure assumes that you installed the data service packages.

If you did not install the Sun Cluster HA for N1 Service Provisioning System packages, go to "Installing the Sun Cluster HA for N1 Grid Service Provisioning System Packages" on page 24.

Steps   1. **Become superuser on one of the nodes in the cluster that will host N1 Grid Service Provisioning System Master Server.**

2. **Register the SUNW.gds resource type.**

   ```
   # scrgadm -a -t SUNW.gds
   ```

3. **Prepare the parameter file, which is required by the Sun Cluster HA for N1 Service Provisioning System Master Server.**

> **Caution –** The parameter files need to be available on every node that can host the N1 Grid Service Provisioning System Master Server data service. For a failover configuration store them on the shared storage. The parameter files cannot differ for a specific instance of N1 Grid Service Provisioning System Master Server on the various nodes.

```
# cd /opt/SUNWscsps/master/bin
# cp pfile desired place
```

Choose a location on the shared storage for the pfile. Edit the parameter file `pfile` and follow the comments within that file. For example:

```
#!/usr/bin/ksh
#
# Copyright 2003 Sun Microsystems, Inc.  All rights reserved.
# Use is subject to license terms.
#
# Set the N1 Grid Service Provisioning System Master Server
# specific environment variables which the start, stop and check fuctions will use
#
# User          Centerrun User
# Basepath      Absolute path to Centerrun Basedir directory
# Host          Hostname to test Apache Tomcat
# Tport         Port where the N1 Service Prosioning Systems Apache Tomcat instance
#               is configured to listen
# TestCmd       Apache Tomcat test command
# ReturnString  Use one of the strings below faccording to your Sun One Provisoning
#               Server Version.
#               Version 4.1 = SSL|Service
# Startwait     Sleeping $Startwait seconds after completion of the
#               start command
User=
Basepath=
Host=
Tport=
TestCmd="
ReturnString=
Startwait=
```

The following is an example for a N1 Grid Service Provisioning System 4.1 Master Server.

```
User=sps
Basepath=/global/sps/N1_Service_Provisioning_System_4.1
Host=N1spsma-lh
Tport=8080
TestCmd="get /index.jsp"
ReturnString="SSL|Service"
Startwait=20
```

This example is from an N1 Grid Service Provisioning System 4.1 Master Server. The Apache Tomcat is configured to listen on Port 8080. The default start page

contains the string `Service`, or the string `SSL` if you configured it to respond on the `SSL` Port.

4. **Configure the registration scripts for each required N1 Grid Service Provisioning System Master Server instance.**

   ```
   # cd /opt/SUNWscsps/master/util
   # cp spsma_config desired place
   # cp spsma_register desired place
   ```

   Edit the `spsma_config` file and follow the comments within that file. For example:

   ```
   # These parameters can be customized in (key=value) form
   #
   # Copyright 2003 Sun Microsystems, Inc.  All rights reserved.
   # Use is subject to license terms.
   #
   # This file will be sourced in by spsma_register and the parameters
   # listed below will be used.
   #
   # These parameters can be customized in (key=value) form
   #
   #        RS - name of the resource for the application
   #        RG - name of the resource group containing RS
   #      PORT - name of the port number to satisfy GDS registration
   #        LH - name of the LogicalHostname SC resource
   #     PFILE - name of the parameter file for additional variables
   #    HAS_RS - name of the HAStoragePlus SC resource
   #

   RS=
   RG=
   PORT=
   LH=
   PFILE=
   HAS_RS=
   ```

   The following is an example for the Sun Cluster HA for N1 Service Provisioning System Master Server.

   ```
   RS=N1spsma-res
   RG=N1spsma-rg
   PORT=8080
   LH=N1spsma-lh
   PFILE=/global/mnt1/N1spsma-pfile
   HAS_RS=N1spsma-hastplus-res
   ```

   The PORT variable is needed to satisfy the requirements of the generic data service.

5. **After editing `spsma_config` register the resource.**

   ```
   # ./spsma_register
   Registration of resource N1spsma-rs succeeded
   Validate resource N1spsma-rs in resourcegroup spsma-rg
   Validation of resource spsma-rs succeeded
   &#
   ```

6. **Enable each N1 Grid Service Provisioning System Master Server resource.**

   ```
   # scstat -g
   ```

   ```
   # scswitch -e -j N1spsma-resource
   ```

7. **(Optional) Repeat Step 3 to Step 6 for each N1 Grid Service Provisioning System Master Server instance you need.**

▼ How to Register and Configure Sun Cluster HA for N1 Service Provisioning System Remote Agent as a failover data service

This procedure assumes that you installed the data service packages.

If you did not install the Sun Cluster HA for N1 Service Provisioning System packages, go to "Installing the Sun Cluster HA for N1 Grid Service Provisioning System Packages" on page 24.

Steps   1. **Become superuser on one of the nodes in the cluster that will host N1 Grid Service Provisioning System Remote Agent.**

   2. **Register the SUNW.gds resource type.**

      ```
      # scrgadm -a -t SUNW.gds
      ```

   3. **Configure the registration scripts for each required N1 Grid Service Provisioning System Remote Agents instance.**

      ```
      # cd /opt/SUNWscsps/remoteagent/util
      # cp spsra_config desired place
      # cp spsra_register desired place
      ```

      Edit the spsra_config file and follow the comments within that file. For example:

      ```
      #
      # Copyright 2003 Sun Microsystems, Inc.  All rights reserved.
      # Use is subject to license terms.
      #
      # This file will be sourced in by spsra_register and the parameters
      # listed below will be used.
      #
      # These parameters can be customized in (key=value) form
      #
      #        RS - name of the resource for the application
      #        RG - name of the resource group containing RS
      #      PORT - name of the port number to satisfy GDS registration
      #        LH - name of the LogicalHostname SC resource
      #      USER - name of the owner of the remote agent
      ```

```
#      BASE - name of the direcotry where the N1 Service Provisioning Server
#              is installed
#    HAS_RS - name of the HAStoragePlus SC resource
#

RS=
RG=
PORT=
LH=
USER=
BASE=
HAS_RS=
```

The following is an example for the N1 Grid Service Provisioning System 4.1 Remote Agent.

```
RS=N1spsra-res
RG=N1spsra-rg
PORT=22
LH=N1spsra-lh
USER=sps
BASE=/global/sps/N1_Service_Provisioning_System
HAS_RS=N1spsra-hastplus-res
```

The PORT variable is needed to satisfy the requirements of the generic data service.

4. **After editing `spsra_config` register the resource.**

```
# ./spsra_register
Registration of resource N1spsra-rs succeeded
Validate resource N1spsra-rs in resourcegroup N1spsra-rg
Validation of resource N1spsra-rs succeeded
```

5. **Enable each N1 Grid Service Provisioning System Remote Agent resource.**

```
# scstat -g
```

```
# scswitch -e -j N1spsra-resource
```

6. **(Optional) Repeat Step 3 to Step 6 for each N1 Grid Service Provisioning System Remote Agent instance you need.**

▼ How to Register and Configure Sun Cluster HA for N1 Service Provisioning System Local Distributor as a failover data service

This procedure assumes that you installed the data service packages.

If you did not install the Sun Cluster HA for N1 Service Provisioning System packages, go to "Installing the Sun Cluster HA for N1 Grid Service Provisioning System Packages" on page 24.

Steps 1. **Become superuser on one of the nodes in the cluster that will host N1 Grid Service Provisioning System Local Distributor.**

2. **Register the SUNW.gds resource type.**

   ```
   # scrgadm -a -t SUNW.gds
   ```

3. **Configure the registration scripts for each required N1 Grid Service Provisioning System Local Distributor instance.**

   ```
   # cd /opt/SUNWscsps/localdist/util
   # cp spsld_config desired place
   # cp spsld_register desired place
   ```

   Edit the spsld_config file and follow the comments within that file. For example:

   ```
   #
   # Copyright 2003 Sun Microsystems, Inc.  All rights reserved.
   # Use is subject to license terms.
   #
   # This file will be sourced in by spsld_register and the parameters
   # listed below will be used.
   #
   # These parameters can be customized in (key=value) form
   #
   #        RS - name of the resource for the application
   #        RG - name of the resource group containing RS
   #      PORT - name of the port number to satisfy GDS registration
   #        LH - name of the LogicalHostname SC resource
   #      USER - name of the owner of the local distributor
   #      BASE - name of the directory where the N1 Service Provisioning Server
   #             is installed
   #    HAS_RS - name of the HAStoragePlus SC resource
   #

   RS=
   RG=
   PORT=22
   LH=
   USER=
   BASE=
   HAS_RS=
   ```

   The following is an example for N1 Grid Service Provisioning System 4.1 Local Distributor.

   ```
   RS=N1spsld-res
   RG=N1spsld-rg
   PORT=22
   LH=N1spsld-lh
   USER=sps
   BASE=/global/sps/N1_Service_Provisioning_System_4.1
   HAS_RS=N1spsld-hastplus-res
   ```

   The PORT variable is needed to satisfy the requirements of the generic data service.

4. **After editing `spsld_config` register the resource.**

   ```
   # ./spsld_register
   Registration of resource N1spsld-rs succeeded
   Validate resource N1spsld-rs in resourcegroup N1spsld-rg
   Validation of resource N1spsld-rs succeeded
   ```

5. **Enable each N1 Grid Service Provisioning System Local Distributor resource.**

   ```
   # scstat -g
   ```

   ```
   # scswitch -e -j N1spsra-resource
   ```

6. **(Optional) Repeat Step 3 to Step 5 for each N1 Grid Service Provisioning System Local Distributor instance you need.**

Verifying the Sun Cluster HA for N1 Service Provisioning System and Configuration

This section contains the procedure you need to verify that you installed and configured your data service correctly.

▼ How to Verify the Sun Cluster HA for N1 Service Provisioning System Installation and Configuration

Steps   1. **Become superuser on one of the nodes in the cluster which will host the N1 Grid Service Provisioning System component. A component can be the Master Server, the Remote Agent or the Local Distributor.**

2. **Ensure all the N1 Grid Service Provisioning System resources are online with the command `scstat`.**

   ```
   # scstat -g
   ```

   For each N1 Grid Service Provisioning System resource which is not online, use the `scswitch` command as follows.

   ```
   # scswitch -e -j N1sps-resource
   ```

3. **Run the `scswitch` command to switch the N1 Grid Service Provisioning System resource group to another cluster node, such as *node2* with the command described below.**

   ```
   # scswitch -z -g N1sps-resource-group -h node2
   ```

Understanding the Sun Cluster HA for N1 Service Provisioning System Master Server Parameter File

Use the information to understand the contents of the Sun Cluster HA for N1 Service Provisioning System Master Server parameter file. This section describes the structure and the content of the Sun Cluster HA for N1 Service Provisioning System Master Server parameter file, as well as the strategy to chose some of its variables.

Structure of the Sun Cluster HA for N1 Service Provisioning System Master Servers parameter file

Sun Cluster HA for N1 Service Provisioning Systemfor the master server uses a parameter file to pass parameters to the start, stop and probe command. This parameter file needs to be a valid Korn shell script which sets several variables. The structure of this file appears in Table 4. For examples of the parameter file refer to "Registering and Configuring Sun Cluster HA for N1 Service Provisioning System" on page 27.

TABLE 4 Structure of the Sun Cluster HA for N1 Service Provisioning System Master Servers parameter file

Variable	Explanation
User	The owner of the N1 Grid Service Provisioning System Master Server instance.
Basepath	Basepath is the absolute pathname to the directory where the N1 Grid Service Provisioning System/server/bin directory resides. It is the directory you specified at installation time.
Host	The Host variable is the Host to test the functionality of the Apache Tomcat component of the N1 Grid Service Provisioning System Master Server. The test is done via a connection to Host:Tport.
Tport	A Port where the N1 Grid Service Provisioning Systems Apache Tomcat component is serving. This Port is used together with the Host to test the functionality of the Apache Tomcat server process of the N1 Grid Service Provisioning System Master Server.

TABLE 4 Structure of the Sun Cluster HA for N1 Service Provisioning System Master Servers parameter file   *(Continued)*

Variable	Explanation
TestCmd	This variable represents the command which is passed to the N1 Grid Service Provisioning Systems Apache Tomcat server process to do a sanity check.
ReturnString	The variable ReturnString represents the string which **must** be present in the answer to the TestCmd. It can not be "Connection refused" because this string is in the answer when the N1 Grid Service Provisioning Systems Apache Tomcat server process is not running.
Startwait	This variable stands for the number of seconds to wait after the N1 Grid Service Provisioning System Master Server start command is completed. It lasts until the Apache Tomcat server process of the N1 Grid Service Provisioning System Master Server is fully operational. The absolute number of seconds depends on the speed and the load of the Hardware. A good strategy is to start with 60 seconds.

The parameters in Table 4 can be changed at any time. The only difference is when changes take effect.

The following parameters of the Sun Cluster HA for N1 Service Provisioning System parameter file are used for starting and stopping the Master Server. Changes to these parameters take effect at every restart or disabling and enabling of a N1 Grid Service Provisioning System Master Server resource.

- `User`
- `Basepath`
- `Startwait`

The following parameters of the Sun Cluster HA for N1 Service Provisioning System Master Server parameter file are used within the fault monitor. Changes to these parameters take effect at every `Thorough_probe_interval`.

- `Host`
- `Tport`
- `TestCmd`
- `ReturnString`

Strategy to Chose the TestCmd and the ReturnString Variable

The ReturnString has to be present on the page you query with the test command TestCmd.

- Take the start page of your application and set the `TestCmd` to `get /index.jsp`. Set the `ReturnString` to a string contained in the startpage. With this strategy, you are monitoring that the Apache Tomcat process of the N1 Grid Service Provisioning System Master Server is operational.

- If the N1 Grid Service Provisioning System Master Server is configured for SSL on the administrative port. The only request on the http port is a page containing the string SSL. In this case configure the ReturnString to SSL and the TestCmd to `get /index.jsp`.

- If you expect changes in the configurations, configure the test command to `get /index.jsp` and the RetunString to *SSL|Service*. This expression is true if the startpage contains SSL or Service.

- If none of the above is appropriate, set the `TestCmd` to `get /a-page-which-does-not-exists`. In this case, set the `ReturnString` to a string contained in the Error Page. With this strategy, you are monitoring that the Apache Tomcat process of the N1 Grid Service Provisioning System Master Server is operational, because it registers that it must deliver a page that does not exist.

You can evaluate the different pages by connecting using a browser with hostname:port and specifying the different pages.

Understanding the fault monitor of the Sun Cluster HA for N1 Service Provisioning System

This section describes the Sun Cluster HA for N1 Service Provisioning System fault monitor's probing algorithm and functionality, states the conditions, messages, recovery actions, and states the conditions and messages associated with unsuccessful probing.

For conceptual information on fault monitors, see the *Sun Cluster Concepts Guide*.

Resource Properties

The Sun Cluster HA for N1 Service Provisioning System fault monitor uses the same resource properties as the resource type `SUNW.gds`. Refer to the `SUNW.gds(5)` man page for a complete list of resource properties used.

Probing Algorithm and Functionality for the N1 Grid Service Provisioning System Master Server

The probing of the Master Server consists of two parts. One to probe the Apache Tomcat and a second part to probe the database.

The following steps are executed to monitor the sanity of the N1 Grid Service Provisioning System Master Server.

1. Sleeps for *Thorough_probe_interval*.

2. Pings the *Host*, which is configured in the Sun Cluster HA for N1 Service Provisioning System Master Server parameter file.

3. Connects to the Apache Tomcat via *Host* and *Port*. If the connection is successful it sends the *TestCmd* and tests whether the *ReturnString* comes back. If it fails, it is rescheduled after 5 seconds. If this fails again, then the probe will restart the Sun Cluster HA for N1 Service Provisioning System.

Caution – The ReturnString cannot be **Connection refused** because this string will be returned if no connection is possible.

---

4. If the Apache Tomcat is operational, the probe manipulates the database table sc_test. If the connection to the database or the table manipulation is unsuccessful, the N1 Grid Service Provisioning System Master server will be restarted.

5. If the Apache Tomcat process and all the database processes died, pmf will interrupt the probe to immediately restart the N1 Grid Service Provisioning System Master Server.

6. If the N1 Grid Service Provisioning System Master Server is repeatedly restarted and subsequently exhausts the Retry_count within the Retry_interval, then a failover is initiated for the resource group onto another node. This is done if the resource property Failover_enabled is set to TRUE.

Probing Algorithm and Functionality for the N1 Grid Service Provisioning System Remote Agent

The probing of the Remote Agent is done by pmf only.

The following steps are executed to monitor the N1 Grid Service Provisioning System Remote Agent.

1. If the process of the Remote Agent has died, pmf will immediately restart the N1 Grid Service Provisioning System Remote Agent.

2. If the N1 Grid Service Provisioning System Remote Agent is repeatedly restarted and subsequently exhausts the Retry_count within the Retry_interval, then a failover is initiated for the resource group onto another node. This is done if the

resource property `Failover_enabled` is set to `TRUE`.

Probing Algorithm and Functionality for the N1 Grid Service Provisioning System Local Distributor

The probing of the Local Distributor is done by pmf only.

The following steps are executed to monitor the N1 Grid Service Provisioning System Local Distributor.

1. If the process of the Local Distributor has died, pmf will immediately restart the N1 Grid Service Provisioning System Local Distributor.

2. If the N1 Grid Service Provisioning System Local Distributor is repeatedly restarted and subsequently exhausts the `Retry_count` within the `Retry_interval`, then a failover is initiated for the resource group onto another node. This is done if the resource property `Failover_enabled` is set to `TRUE`.

How to debug Sun Cluster HA for N1 Service Provisioning System

Sun Cluster HA for N1 Service Provisioning System can be used by multiple N1 Grid Service Provisioning System instances. However, it is possible to turn debug on for all N1 Grid Service Provisioning System instances or a particular N1 Grid Service Provisioning System instance. This has to be done for each component (Master Server, Remote Agent, or Local Distributor) on its own.

The Sun Cluster HA for N1 Service Provisioning System component has a `DEBUG` file under `/opt/SUNWscsps/`*component-dir*`/etc`. The directories of these components are `master` for the Master Server, `remoteagent` for the Remote Agent, and `localdist` for the Local Distributor.

This file allows you to switch debug on for all instances of a N1 Grid Service Provisioning System component, or for a specific instance of a N1 Grid Service Provisioning System component on a particular node in a Sun Cluster. If you require debug to be switched on for Sun Cluster HA for N1 Service Provisioning System across the whole Sun Cluster, you will need to repeat this step on all nodes within Sun Cluster.

▼ How to turn debug on for a Sun Cluster HA for N1 Service Provisioning System component

Perform these steps for the Sun Cluster HA for N1 Service Provisioning System component that requires debug output, on each node of Sun Cluster as required.

Steps   **1. Edit /etc/syslog.conf and change daemon.notice to daemon.debug.**

```
# grep daemon /etc/syslog.conf
*.err;kern.debug;daemon.notice;mail.crit          /var/adm/messages
*.alert;kern.err;daemon.err                       operator
#
```

Change the daemon.notice to daemon.debug and restart syslogd. Note that the output below, from the command grep daemon /etc/syslog.conf, shows that daemon.debug has now been set.

```
# grep daemon /etc/syslog.conf
*.err;kern.debug;daemon.debug;mail.crit           /var/adm/messages
*.alert;kern.err;daemon.err                        operator
#
# pkill -1 syslogd
```

2. Edit /opt/SUNWscsps/*component-dir*/etc/config and change DEBUG= to DEBUG=ALL or DEBUG=*resource*

```
# cat /opt/SUNWscsps/component-dir/etc/config
#
# Copyright 2003 Sun Microsystems, Inc.  All rights reserved.
# Use is subject to license terms.
#
# Usage:
#       DEBUG=<RESOURCE_NAME> or ALL
#
DEBUG=ALL
#
```

Possible values for the component-dir are master for the Master Server, remoteagent for the Remote Agent, and localdist for the Local Distributor.

Note – To turn off debug, reverse the steps above.

Index

registration files (Continued)
   spsma_config, 29
   spsra_config, 30
registration scripts, 17
requirements, 15-19
restrictions, 14-15
   zones, 24

S
`scinstall -pv` command, 9
`showrev –p` command, 9
strategy, 35
Sun Cluster HA for N1 Service Provisioning
   System
   installing
      by using Web Start program, 24-25

T
training, 9

V
`/var/sadm/install/logs` directory, 25

W
Web Start program, 24-25

Z
zones, 24