Sun Cluster Data Service for DHCP Guide for Solaris OS

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Preface

Sun Cluster Data Service for DHCP Guide for Solaris OS explains how to install and configure Sun™ Cluster HA for DHCP on both SPARC® based systems and x86 based systems.

Note – This Sun Cluster release supports systems that use the SPARC and x86 families of processor architectures: UltraSPARC, SPARC64, and AMD64. In this document, the label x86 refers to systems that use the AMD64 family of processor architectures.

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 book assume knowledge of the Solaris™ Operating System (Solaris OS) and expertise with the volume-manager software that is used with Sun Cluster software.

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.

Using 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 conventions that are used in this book.

TABLE P–1 Typographic Conventions

Typeface	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	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*. A *cache* is a copy that is stored locally. Do *not* 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 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 3.1 - 3.2 Hardware Administration Manual for Solaris OS*
	Individual hardware administration guides
Data service development	*Sun Cluster Data Services Developer's Guide for Solaris OS*
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.

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Documentation, Support, and Training

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

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

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 number and serial number of your systems
- The release number of the Solaris Operating System (for example, Solaris 10)
- The release number of Sun Cluster (for example, Sun Cluster 3.2)

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
SPARC: `prtdiag -v`	Displays system diagnostic information
`/usr/cluster/bin/clnode show-rev`	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 DHCP

This chapter explains how to install and configure Sun Cluster HA for DHCP.

This chapter contains the following sections.

- "Sun Cluster HA for DHCP Overview" on page 9
- "Overview of Installing and Configuring Sun Cluster HA for DHCP" on page 10
- "Planning the Sun Cluster HA for DHCP Installation and Configuration" on page 10
- "Installing and Configuring DHCP" on page 12
- "Verifying the Installation and Configuration of DHCP" on page 13
- "Installing the Sun Cluster HA for DHCP Packages" on page 13
- "Registering and Configuring Sun Cluster HA for DHCP" on page 15
- "Verifying the Sun Cluster HA for DHCP Installation and Configuration" on page 17
- "Upgrading Sun Cluster HA for DHCP" on page 18
- "Understanding the Sun Cluster HA for DHCP Fault Monitor" on page 18
- "Debug Sun Cluster HA for DHCP" on page 19

Sun Cluster HA for DHCP Overview

The Sun Cluster HA for DHCP data service provides a mechanism for the orderly startup and shutdown, fault monitoring, and automatic failover of the DHCP.

TABLE 1 Protection of Components

Component	Protected by
DHCP	Sun Cluster HA for DHCP

Overview of Installing and Configuring Sun Cluster HA for DHCP

The following table summarizes the tasks for installing and configuring Sun Cluster HA for DHCP and provides cross-references to detailed instructions for performing these tasks. Perform the tasks in the order that they are listed in the table.

TABLE 2 Tasks for Installing and Configuring Sun Cluster HA for DHCP

Task	Instructions
Plan the installation	"Planning the Sun Cluster HA for DHCP Installation and Configuration" on page 10
Install and configure the DHCP software	"How to Install and Configure DHCP" on page 12
Verify the installation and configuration	"How to Verify the Installation and Configuration of DHCP" on page 13
Install Sun Cluster HA for DHCP packages	"How to Install the Sun Cluster HA for DHCP Packages" on page 14
Register and configure Sun Cluster HA for DHCP resources	"How to Register and Configure Sun Cluster HA for DHCP" on page 15
Verify the Sun Cluster HA for DHCP installation and configuration	"How to Verify the Sun Cluster HA for DHCP Installation and Configuration" on page 17
Upgrade the Sun Cluster HA for DHCP data service	"How to Upgrade to the New Version of Sun Cluster HA for DHCP" on page 18
Tune the Sun Cluster HA for DHCP fault monitor	"Understanding the Sun Cluster HA for DHCP Fault Monitor" on page 18
Debug Sun Cluster HA for DHCP	"How to turn on debug for Sun Cluster HA for DHCP" on page 19

Planning the Sun Cluster HA for DHCP Installation and Configuration

This section contains the information you need to plan your Sun Cluster HA for DHCP installation and configuration.

Configuration Restrictions

The configuration restrictions in the subsections that follow apply only to Sun Cluster HA for DHCP.

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

Restriction for the supported configurations of Sun Cluster HA for DHCP

The Sun Cluster HA for DHCP data service can only be configured as a failover service.

DHCP must operate as a DHCP server and not as a relay host.

Only one DHCP instance can be configured within the cluster, however you can have multiple DHCP networks within that DHCP instance.

Restriction for the location of DHCP files

The DHCP files is the network table that is created when you configure DHCP using the `/usr/sadm/admin/bin/dhcpmgr`.

The DHCP files must be placed on shared storage as either a cluster file system or a highly available local file system.

Configuration Requirements

The configuration requirements in this section apply only to Sun Cluster HA for DHCP.

Caution – If your data service configuration does not conform to these requirements, the data service configuration might not be supported.

Required `/etc/inet/dhcpsvc.conf` parameters.

The following parameters must be set within `/etc/inet/dhcpsvc.conf`

- `DAEMON_ENABLED` is always set to `true`.
- `PATH` points to the DHCP network table.
- `RUN_MODE` is always set to `SERVER`.
- `RESOURCE` is set to either `SUNWbinfiles` or `SUNWfiles`.

Installing and Configuring DHCP

This section contains the procedures you need to install and configure DHCP.

▼ How to Install and Configure DHCP

This section contains the procedures you need to install and configure DHCP.

1 On a cluster member, become superuser or assume a role that provides `solaris.cluster.modify` RBAC authorization.

2 Create a cluster file system or highly available local file system for the DHCP files.

Refer to *Sun Cluster Software Installation Guide for Solaris OS* for information about creating a cluster file system and to *Sun Cluster Data Services Planning and Administration Guide for Solaris OS* for information about creating a highly available local file system.

3 Mount the highly available local file system if used.

4 Configure DHCP.

As root, execute `/usr/sadm/admin/bin/dhcpmgr`.

```
# /usr/sadm/admin/bin/dhcpmgr
```

- Choose `Configure` as `DHCP Server`.
- Choose `Text files` or `Binary files`.
- Enter a path for the DHCP network table.
- Choose which name services to use to store host records.
- Choose `Length of Lease` and whether clients can renew their leases.
- If used, supply a `DNS` configuration for the DHCP client of this server.
- Add which network and network mask should provide IP Addresses.
- Choose `LAN` as `Network Type`.
- If used, supply a `NIS` configuration for the DHCP clients of this server.
- If used, supply a `NIS+` configuration for the DHCP clients of this server.
- Create your addresses and macros.

5 Ensure `/etc/inet/dhcpsvc.conf` is the same on all cluster nodes.

This can be done by either.

- Copying `/etc/inet/dhcpsvc.conf` to each cluster node.
- Moving your edited `/etc/inet/dhcpsvc.conf` to a cluster file system and create a symbolic link from `/etc/inet/dhcpsvc.conf` to `dhcpsvc.conf` on the cluster file system.

6 **Ensure DHCP is stopped on all nodes.**

```
# /usr/sadm/admin/bin/dhcpmgr
```

a. **If running Solaris 9**

```
# /etc/init.d/K21dhcp stop
```

b. **If running Solaris 10**

```
# svcadm disable dhcp-server
```

Verifying the Installation and Configuration of DHCP

This section contains the procedure you need to verify the installation and configuration.

▼ How to Verify the Installation and Configuration of DHCP

This procedure does not verify that your application is highly available because you have not yet installed your data service.

1 **Verify** `/etc/inet/dhcpsvc.conf`**.**

Ensure that the parameters are set to your requirements.

2 **Check** `/etc/inet/dhcpsvc.conf` **is consistent on all cluster nodes.**

3 **Check that DHCP startup on boot has been disabled.**

a. **If running Solaris 9**

```
# /etc/init.d/K21dhcp stop
```

b. **If running Solaris 10**

```
# svcadm disable dhcp-server
```

Installing the Sun Cluster HA for DHCP Packages

If you did not install the Sun Cluster HA for DHCP packages during your initial Sun Cluster installation, perform this procedure to install the packages. To install the packages, use the Sun Java™ Enterprise System Installation Wizard.

▼ How to Install the Sun Cluster HA for DHCP Packages

Perform this procedure on each cluster node where you are installing the Sun Cluster HA for DHCP packages.

You can run the Sun Java Enterprise System Installation Wizard 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.

Note – Install the packages for this data service in the global zone.

Before You Begin Ensure that you have the Sun Java Availability Suite DVD-ROM.

If you intend to run the Sun Java Enterprise System Installation Wizard with a GUI, ensure that your `DISPLAY` environment variable is set.

1 On the cluster node where you are installing the data service packages, become superuser.

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

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

3 Change to the Sun Java Enterprise System Installation Wizard directory of the DVD-ROM.

- **If you are installing the data service packages on the SPARC® platform, type the following command:**

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

- **If you are installing the data service packages on the x86 platform, type the following command:**

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

4 Start the Sun Java Enterprise System Installation Wizard.

```
# ./installer
```

5 When you are prompted, accept the license agreement.

If any Sun Java Enterprise System components are installed, you are prompted to select whether to upgrade the components or install new software.

6 From the list of Sun Cluster agents under Availability Services, select the data service for DHCP.

7 If you require support for languages other than English, select the option to install multilingual packages.

English language support is always installed.

8. **When prompted whether to configure the data service now or later, choose Configure Later.**

   Choose Configure Later to perform the configuration after the installation.

9. **Follow the instructions on the screen to install the data service packages on the node.**

   The Sun Java Enterprise System Installation Wizard displays the status of the installation. When the installation is complete, the wizard displays an installation summary and the installation logs.

10. **(GUI only) If you do not want to register the product and receive product updates, deselect the Product Registration option.**

    The Product Registration option is not available with the CLI. If you are running the Sun Java Enterprise System Installation Wizard with the CLI, omit this step

11. **Exit the Sun Java Enterprise System Installation Wizard.**

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

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

    b. **Eject the DVD-ROM.**

       ```
       # eject cdrom
       ```

Next Steps See "Registering and Configuring Sun Cluster HA for DHCP" on page 15 to register Sun Cluster HA for DHCP and to configure the cluster for the data service.

Registering and Configuring Sun Cluster HA for DHCP

This section contains the procedures you need to configure Sun Cluster HA for DHCP.

Some procedures within this section require you to use certain Sun Cluster commands. Refer to the relevant Sun Cluster command man page for more information about these command and their parameters.

The Sun Cluster HA for DHCP data service

▼ How to Register and Configure Sun Cluster HA for DHCP

Perform this procedure on one node of the cluster only.

This procedure assumes that you installed the data service packages during your initial Sun Cluster installation.

If you did not install the Sun Cluster HA for DHCP packages as part of your initial Sun Cluster installation, go to "How to Install the Sun Cluster HA for DHCP Packages" on page 14.

1 On a cluster member, become superuser or assume a role that provides `solaris.cluster.modify` RBAC authorization.

2 Register the following resource types.

```
# clresourcetype register SUNW.HAStoragePlus
# clresourcetype register SUNW.gds
```

3 Create a failover resource group for DHCP.

```
# clresourcegroup create -n nodelist dhcp-resource-group
```

4 Create a resource for the DHCP Logical Hostname.

```
# clreslogicalhostname create -g dhcp-resource-group \
> -h logical-hostname \
> logical-hostname-resource
```

5 Create a resource for the DHCP Disk Storage.

a. If a ZFS highly available local file system is being used.

```
# clresource create -g dhcp-resource-group \
> -t SUNW.HAStoragePlus \
> -p Zpools=dhcp-zspool \
> dhcp-hastorage-resource
```

b. If a cluster file system or a non ZFS highly available local file system is being used.

```
# clresource create -g dhcp-resource-group \
> -t SUNW.HAStoragePlus \
> -p FilesystemMountPoints=dhcp-filesystem-mountpoint \
> dhcp-hastorage-resource
```

6 Enable the Resource Group.

```
# clresourcegroup enable -M dhcp-resource-group
```

7 Create and register a resource for DHCP.

Edit `/opt/SUNWscdhc/util/dhcp_config` and follow the comments within that file. After you have edited `dhcp_config`, you must register the resource.

```
# cd /opt/SUNWscdhc/util
# vi dhcp_config
# ./dhcp_register
```

The following example shows `dhcp_config` that has been edited for a two node cluster with `IPMP`. The entries for `Sun Cluster Carrier-Grade Edition` can be ignored.

```
RS=dhcp
RG=dhcp-rg
PORT=23
LH=dhcp-lh
NETWORK=192.168.100.0@sc_ipmp0@1/192.168.100.0@sc_ipmp0@2
HAS_RS=dhcp-has

# Options to Sun Cluster Carrier-Grade Edition

USE_CGTP=FALSE
USE_STATIC_DHCP=FALSE
TEST_CLIENTID=
TFTPTESTFILE=
```

8 Enable the DHCP resource.

```
# clresource enable dhcp-resource
```

Verifying the Sun Cluster HA for DHCP Installation 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 DHCP Installation and Configuration

1 On a cluster member, become superuser or assume a role that provides `solaris.cluster.modify` RBAC authorization.

2 Ensure the DHCP resource is online.

```
# cluster status
```

Enable the DHCP resource if it is not online.

```
# clresource enable dhcp-resource
```

3 Switch the DHCP resource group to another cluster node or node.

```
# clresourcegroup switch -n node dhcp-resource-group
```

Upgrading Sun Cluster HA for DHCP

Upgrade the Sun Cluster HA for DHCP data service if you are upgrading from an earlier version of the Sun Cluster HA for DHCP data service.

▼ How to Upgrade to the New Version of Sun Cluster HA for DHCP

Note – Before performing this procedure you should consider if your current DHCP resource has been modified to have specific timeout values that suit your deployment. If timeout values were previously adjusted you should reapply those timeout values to your new DHCP resource.

1. **On a cluster member, become superuser or assume a role that provides `solaris.cluster.modify` RBAC authorization.**

2. **Disable the DHCP resource.**

   `# clresource disable` *dhcp-resource*

3. **Install the new version of Sun Cluster HA for DHCP to each cluster.**

   Refer to "How to Install the Sun Cluster HA for DHCP Packages" on page 14 for more information.

4. **Delete the DHCP resource.**

   `# clresource delete` *dhcp-resource*

5. **Reregister the DHCP resource.**

   Refer to "How to Register and Configure Sun Cluster HA for DHCP" on page 15 for more information.

6. **Enable the DHCP resource.**

   `# clresource enable` *dhcp-resource*

Understanding the Sun Cluster HA for DHCP Fault Monitor

This section describes the Sun Cluster HA for DHCP fault monitor probing algorithm or functionality, states the conditions, and recovery actions associated with unsuccessful probing.

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

Resource Properties

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

Probing Algorithm and Functionality

The Sun Cluster HA for DHCP fault monitor is controlled by the extension properties that control the probing frequency. The default values of these properties determine the preset behavior of the fault monitor. The preset behavior should be suitable for most Sun Cluster installations. Therefore, you should tune the Sun Cluster HA for DHCP fault monitor *only* if you need to modify this preset behavior.

- Setting the interval between fault monitor probes (`Thorough_probe_interval`)
- Setting the timeout for fault monitor probes (`Probe_timeout`)
- Setting the number of times the fault monitor attempts to restart the resource (`Retry_count`)

The Sun Cluster HA for DHCP fault monitor checks within an infinite loop. During each cycle the fault monitor will perform a check and report either a failure or success.

If the fault monitor is successful it returns to its infinite loop and continues the next cycle of probing and sleeping.

If the fault monitor reports a failure a request is made to the cluster to restart the resource. If the fault monitor reports another failure another request is made to the cluster to restart the resource. This behavior will continue whenever the fault monitor reports a failure.

If successive restarts exceed the `Retry_count` within the `Thorough_probe_interval` a request to failover the resource group onto a different node or zone is made.

DHCP Probe

Test whether `PNM` (Public Network Monitoring) has changed the active interface for the network that DHCP is using. If this fails, then the probe will restart the DHCP resource.

Debug Sun Cluster HA for DHCP

▼ How to turn on debug for Sun Cluster HA for DHCP

`/opt/SUNWscdhc/etc/config` allows you to turn on debug for a DHCP instance on a particular node within the cluster. If you require debug to be turned on for Sun Cluster HA for DHCP across the whole cluster, repeat this step on all nodes within the cluster.

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 `grep daemon /etc/syslog.conf`, shows that `daemon.debug` has been set.

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

Restart the syslog daemon.

a. **If running Solaris 9**

```
# pkill -1 syslogd
```

b. **If running Solaris 10**

```
# svcadm disable system-log
# svcadm enable system-log
```

2 **Edit** `/opt/SUNWscdhc/etc/config`.

Perform this step on each node of cluster as required.

Edit `/opt/SUNWscdhc/etc/config` and change `DEBUG=` to `DEBUG=ALL` or `DEBUG=`*sun-cluster-resource*.

```
# cat /opt/SUNWscdhc/etc/config
#
# Copyright 2006 Sun Microsystems, Inc.  All rights reserved.
# Use is subject to license terms.
#
# ident "@(#)config     1.1     06/03/06 SMI"
#
# Usage:
#       DEBUG=<RESOURCE_NAME> or ALL
#
DEBUG=ALL
```

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

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