Oracle® Solaris Cluster Data Service for DHCP Guide

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Contents

Preface

Oracle Solaris Cluster Data Service for DHCP Guide explains how to install and configure HA for DHCP.

Note – This Oracle Solaris Cluster release supports systems that use the SPARC and x86 families of processor architectures: UltraSPARC, SPARC64, AMD64, and Intel 64. In this document, x86 refers to the larger family of 64-bit x86 compatible products. Information in this document pertains to all platforms unless otherwise specified.

This document is intended for system administrators with extensive knowledge of Oracle 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 Oracle Solaris Operating System and expertise with the volume-manager software that is used with Oracle Solaris Cluster software.

Using UNIX Commands

This document contains information about commands that are specific to installing and configuring Oracle Solaris 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 Oracle Solaris Operating System
- Oracle 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 shells that are included in the Oracle Solaris OS. Note that the default system prompt that is displayed in command examples varies, depending on the Oracle Solaris release.

TABLE P–2 Shell Prompts

Shell	Prompt
Bash shell, Korn shell, and Bourne shell	`$`
Bash shell, Korn shell, and Bourne shell for superuser	`#`
C shell	`machine_name%`
C shell for superuser	`machine_name#`

Related Documentation

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

Topic	Documentation
Data service administration	*Oracle Solaris Cluster Data Services Planning and Administration Guide*
	Individual data service guides
Concepts	*Oracle Solaris Cluster Concepts Guide*
Overview	*Oracle Solaris Cluster Overview*
Software installation	*Oracle Solaris Cluster Software Installation Guide*
System administration	*Oracle Solaris Cluster System Administration Guide*
Hardware administration	*Oracle Solaris Cluster 3.3 Hardware Administration Manual*
	Individual hardware administration guides
Data service development	*Oracle Solaris Cluster Data Services Developer's Guide*
Error messages	*Oracle Solaris Cluster Error Messages Guide*
Command and function reference	*Oracle Solaris Cluster Reference Manual*

For a complete list of Oracle Solaris Cluster documentation, see the release notes for your release of Oracle Solaris 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 – Oracle is not responsible for the availability of third-party web sites mentioned in this document. Oracle 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. Oracle 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

See the following web sites for additional resources:

- Documentation (http://docs.sun.com)
- Support (http://www.oracle.com/us/support/systems/index.html)
- Training (http://education.oracle.com) – Click the Sun link in the left navigation bar.

Oracle Welcomes Your Comments

Oracle welcomes your comments and suggestions on the quality and usefulness of its documentation. If you find any errors or have any other suggestions for improvement, go to http://docs.sun.com and click Feedback. Indicate the title and part number of the documentation along with the chapter, section, and page number, if available. Please let us know if you want a reply.

Oracle Technology Network (http://www.oracle.com/technetwork/index.html) offers a range of resources related to Oracle software:

- Discuss technical problems and solutions on the Discussion Forums (http://forums.oracle.com).
- Get hands-on step-by-step tutorials with Oracle By Example (http://www.oracle.com/technology/obe/start/index.html).
- Download Sample Code (http://www.oracle.com/technology/sample_code/index.html).

Getting Help

If you have problems installing or using Oracle Solaris 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 Oracle Solaris Operating System (for example, Oracle Solaris 10)
- The release number of Oracle Solaris Cluster (for example, Oracle Solaris Cluster 3.3)

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
prtdiag -v	Displays system diagnostic information
/usr/cluster/bin/clnode show-rev	Displays Oracle Solaris Cluster release and package version information

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

1 CHAPTER 1

Installing and Configuring HA for DHCP

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

This chapter contains the following sections.

HA for DHCP Overview

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

TABLE 1–1   Protection of Components

Component	Protected by
DHCP	HA for DHCP

Overview of Installing and Configuring HA for DHCP

The following table summarizes the tasks for installing and configuring 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 1–2   Tasks for Installing and Configuring HA for DHCP

Task	Instructions
Plan the installation	"Planning the HA for DHCP Installation and Configuration" on page 12
Install and configure the DHCP software	"How to Install and Configure DHCP" on page 13
Verify the installation and configuration	"How to Verify the Installation and Configuration of DHCP" on page 15
Install HA for DHCP packages	"How to Install the HA for DHCP Packages" on page 15
Register and configure HA for DHCP resources	"How to Register and Configure HA for DHCP" on page 17
Verify the HA for DHCP installation and configuration	"How to Verify the HA for DHCP Installation and Configuration" on page 19
Upgrade the HA for DHCP data service	"How to Upgrade to the New Version of HA for DHCP" on page 19
Tune the HA for DHCP fault monitor	"Understanding the HA for DHCP Fault Monitor" on page 20
Debug HA for DHCP	"How to turn on debug for HA for DHCP" on page 21

Planning the HA for DHCP Installation and Configuration

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

Configuration Restrictions

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

The 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 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 *Oracle Solaris Cluster Software Installation Guide* for information about creating a cluster file system and to *Oracle Solaris Cluster Data Services Planning and Administration Guide* 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
# 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.**

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

Installing the HA for DHCP Packages

If you did not install the HA for DHCP packages during your initial Oracle Solaris Cluster installation, perform this procedure to install the packages. To install the packages, use the `installer` program.

Note – You need to install the HA for DHCP packages in the global cluster and not in the zone cluster.

▼ How to Install the HA for DHCP Packages

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

You can run the `installer` 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.

Before You Begin Ensure that you have the Oracle Solaris Cluster installation media.

If you intend to run the `installer` program 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 Oracle Solaris Cluster installation media 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 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 installation wizard.

`# ./installer`

5 When you are prompted, accept the license agreement.

6 From the list of Oracle Solaris 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 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 installation wizard with the CLI, omit this step.

11 Exit the installation wizard.

12 Unload the installation media 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 to register HA for DHCP and to configure the cluster for the data service.

Registering and Configuring HA for DHCP

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

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

The HA for DHCP data service

▼ How to Register and Configure 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 Oracle Solaris Cluster installation.

If you did not install the HA for DHCP packages as part of your initial Oracle Solaris Cluster installation, go to .

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 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 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 HA for DHCP

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

▼ How to Upgrade to the New Version of 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 HA for DHCP to each cluster.**

    Refer to "How to Install the HA for DHCP Packages" on page 15 for more information.

4   **Delete the DHCP resource.**

    # `clresource delete` *dhcp-resource*

5   **Reregister the DHCP resource.**

    Refer to "How to Register and Configure HA for DHCP" on page 17 for more information.

6   **Enable the DHCP resource.**

    # `clresource enable` *dhcp-resource*

Understanding the HA for DHCP Fault Monitor

This section describes the 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 *Oracle Solaris Cluster Concepts Guide*.

Resource Properties

The 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 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 Solaris Cluster installations. Therefore, you should tune the 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 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 HA for DHCP

▼ How to turn on debug for 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 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.

```
# 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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