Oracle® Solaris Cluster Data Service for DHCP Guide

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Using This Documentation

- **Overview** – Explains how to install and configure the Oracle Solaris Cluster HA for DHCP data service
- **Audience** – Technicians, system administrators, and authorized service providers
- **Required knowledge** – Advanced experience troubleshooting and replacing hardware

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♦ ♦ ♦ 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 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 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
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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

This section describes restrictions for HA for DHCP.

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

Restrictions for the Supported Configurations of HA for DHCP

Observe the following configuration restrictions:

- 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 for `/etc/inet/dhcpsvc.conf` Parameters

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

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

- `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, assume the `root` role or assume a role that provides `solaris.cluster.modify` authorization.**

2. **Create a cluster file system or highly available local file system for the DHCP files.**
   Refer to *Oracle Solaris Cluster 4.3 Software Installation Guide* for information about creating a cluster file system and to *Oracle Solaris Cluster 4.3 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.**
   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 using one of the following actions:

   - 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 Package

If you did not install the HA for DHCP package during your initial Oracle Solaris Cluster installation, perform this procedure to install the package.

▼ How to Install the HA for DHCP Package

Perform this procedure on each cluster node where you want the HA for DHCP software to run.

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

2. **Ensure that the data service package is available from the configured publisher and that the `solaris` and `ha-cluster` publishers are valid.**

```
# pkg list -a ha-cluster/data-service/dhcp
# pkg publisher
PUBLISHER                             TYPE     STATUS   P  LOCATION
solaris                               origin   online   F  solaris-repository
ha-cluster                            origin   online   F  ha-cluster-repository
```

For information about setting the `solaris` publisher, see "Adding, Modifying, or Removing Package Publishers" in *Adding and Updating Software in Oracle Solaris 11.3*.

Tip - Use the `-nv` options whenever you install or update to see what changes will be made, such as which versions of which packages will be installed or updated and whether a new BE will be created.

If you do not get any error messages when you use the `-nv` options, run the command again without the `-n` option to actually perform the installation or update. If you do get error messages, run the command again with more `-v` options (for example, `-nvv`) or more of the package FMRI pattern to get more information to help you diagnose and fix the problem. For troubleshooting information, see Appendix A, "Troubleshooting Package Installation and Update," in *Adding and Updating Software in Oracle Solaris 11.3*.

3. **Install the HA for DHCP software package.**

```
# pkg install ha-cluster/data-service/dhcp
```

4. **Verify that the package installed successfully.**

```
$ pkg info ha-cluster/data-service/dhcp
```

Installation is successful if output shows that `State` is `Installed`.

5. **Perform any necessary updates to the Oracle Solaris Cluster software.**
For instructions on updating your software, see Chapter 11, "Updating Your Software," in *Oracle Solaris Cluster 4.3 System Administration Guide* .

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 Oracle Solaris Cluster commands. Refer to the relevant Oracle Solaris Cluster command man page for more information about these command and their parameters.

▼ 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 "How to Install the HA for DHCP Package" on page 15.

1. **On a cluster member, assume the `root` role or assume a role that provides `solaris.cluster.modify` 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.**

   - **If a ZFS highly available local file system is being used, use the following command:**

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

   - **If a cluster file system or a non-ZFS highly available local file system is being used, use the following command:**

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

6. **Enable the resource group.**

```
# clresourcegroup online -emM 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
# pfedit dhcp_config
# ./dhcp_register
```

The following example shows `dhcp_config` that has been edited for a two node cluster with IPMP. The entries for `Oracle Solaris 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 Oracle Solaris 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, assume the `root` role or assume a role that provides `solaris.cluster.modify` 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.**

   ```
   # 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, assume the `root` role or assume a role that provides `solaris.cluster.modify` authorization.**

2. **Disable the DHCP resource.**

   ```
   # clresource disable dhcp-resource
   ```

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

Refer to "How to Install the HA for DHCP Package" 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 4.3 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 Oracle 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 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.

Debugging HA for DHCP

▼ How to Turn on Debugging for HA for DHCP

The `/opt/SUNWscdhc/etc/config` file allows you to turn on debugging for a DHCP instance on a particular node within the cluster. If you require debugging 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
#
```

2. **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
```

3. **Restart the `syslog` daemon.**

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

4. **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 2012 Oracle and/or its affiliates.  All rights reserved.
#
# ident "@(#)config     1.1     01/03/12 Oracle"
#
# Usage:
#       DEBUG=<RESOURCE_NAME> or ALL
#
DEBUG=ALL
```

Note - To turn off debugging, reverse the steps above.

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