



Sun Cluster 3.1 Data Service for Domain Name Service (DNS)

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Contents

Preface 5

Installing and Configuring Sun Cluster HA for Domain Name Service (DNS) 11

Installing and Configuring Sun Cluster HA for DNS 11

Installing DNS 12

▼ How to Install DNS 12

Installing Sun Cluster HA for DNS Packages 15

▼ How to Install Sun Cluster HA for DNS Packages 15

Registering and Configuring Sun Cluster HA for DNS 16

▼ How to Register and Configure Sun Cluster HA for DNS 16

▼ How to Configure SUNW.HAStoragePlus Resource Type 19

Verifying Data Service Installation and Configuration 20

Configuring Sun Cluster HA for DNS Extension Properties 20

Sun Cluster HA for DNS Fault Monitor 22

Index 23

Preface

The Sun Cluster 3.1 Data Service for Domain Name Service (DNS) contains procedures to install and configure Domain Name Service (DNS) data service on your Sun Cluster servers.

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 environment and expertise with the volume manager software used with Sun Cluster.

UNIX Commands

This document contains information on commands specific to installing and configuring Sun Cluster data services. It might not contain information on basic UNIX® commands and procedures, such as shutting down the system, booting the system, and configuring devices. For that information, see one or more of the following:

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

Typographic Conventions

Typeface or Symbol	Meaning	Examples
AaBbCc123	The names of commands, files, and directories; on-screen computer output	Edit your file. Use <code>ls -a</code> to list all files. % You have mail.
AaBbCc123	What you type, when contrasted with on-screen computer output	% su Password:
<i>AaBbCc123</i>	Book titles, new words or terms, words to be emphasized	Read Chapter 6 in the <i>User's Guide</i> . These are called <i>class</i> options. You <i>must</i> be superuser to do this.
	Command-line variable; replace with a real name or value	To delete a file, type <code>rm filename</code> .

Shell Prompts

Shell	Prompt
C shell	<i>machine_name</i> %
C shell superuser	<i>machine_name</i> #
Bourne shell and Korn shell	\$
Bourne shell and Korn shell superuser	#

Related Documentation

Application	Title	Part Number
Installation	<i>Sun Cluster 3.1 Software Installation Guide</i>	816-3388
Data Services Installation and Configuration	<i>Sun Cluster 3.1 Data Service Planning and Administration Guide</i>	817-1526
	<i>Sun Cluster 3.1 Data Service for Apache</i>	817-1532
	<i>Sun Cluster 3.1 Data Service for BroadVision One-To-One Enterprise</i>	817-1542
	<i>Sun Cluster 3.1 Data Service for Domain Name Service (DNS)</i>	817-1533
	<i>Sun Cluster 3.1 Data Service for Netbackup</i>	817-1538
	<i>Sun Cluster 3.1 Data Service for Network File System (NFS)</i>	817-1534
	<i>Sun Cluster 3.1 Data Service for Oracle</i>	817-1527
	<i>Sun Cluster 3.1 Data Service for Oracle Parallel Server/Real Application Clusters</i>	817-1535
	<i>Sun Cluster 3.1 Data Service for SAP</i>	817-1536
	<i>Sun Cluster 3.1 Data Service for SAP liveCache</i>	817-1539
	<i>Sun Cluster 3.1 Data Service for Siebel</i>	817-1540
	<i>Sun Cluster 3.1 Data Service for Sun ONE Application Server</i>	817-1530
	<i>Sun Cluster 3.1 Data Service for Sun ONE Directory Server</i>	817-1529
	<i>Sun Cluster 3.1 Data Service for Sun ONE Message Queue</i>	817-1531
	<i>Sun Cluster 3.1 Data Service for Sun ONE Web Server</i>	817-1528
	<i>Sun Cluster 3.1 Data Service for Sybase ASE</i>	817-1537
<i>Sun Cluster 3.1 Data Service for WebLogic Server</i>	817-1537	
<i>Sun Cluster 3.1 Data Service for DHCP</i>	817-1716	
<i>Sun Cluster 3.1 Data Service for Samba</i>	817-1715	
<i>Sun Cluster 3.1 Data Service for WebSphere MQ</i>	817-1714	

Application	Title	Part Number
	<i>Sun Cluster 3.1 Data Service for WebSphere MQ Integrator</i>	817-1713
Hardware	<i>Sun Cluster 3.x Hardware Administration Manual</i>	817-0168
	Sun Cluster 3.x Data Service Collection at http://docs.sun.com/db/coll/1024.1	
API development	<i>Sun Cluster 3.1 Data Services Developer's Guide</i>	816-3385
Administration	<i>Sun Cluster 3.1 5/03 System Administration Guide</i>	816-3384
Cluster concepts	<i>Sun Cluster 3.1 Concepts Guide</i>	816-3383
Error Messages	<i>Sun Cluster 3.1 Error Messages Guide</i>	816-3382
Man Pages	<i>Sun Cluster 3.1 Reference Manual</i>	816-5251
Release notes	<i>Sun Cluster 3.1 Data Service 5/03 Release Notes</i>	817-1790
	<i>Sun Cluster 3.1 Release Notes</i>	816-5317
	<i>Sun Cluster 3.1 Release Notes Supplement</i>	816-3381

Sun Documentation Online

The docs.sun.comSM Web site enables you to access Sun technical documentation on the Web. You can browse the docs.sun.com archive or search for a specific book title or subject at <http://docs.sun.com>.

Help

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

- Your name and E-mail address (if available)
- Your company name, address, and phone number
- The model and serial numbers of your systems
- The release number of the operating environment (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
<code>prtconf -v</code>	Displays the size of the system memory and reports information about peripheral devices.
<code>psrinfo -v</code>	Displays information about processors.
<code>showrev -p</code>	Reports which patches are installed.
<code>prtdiag -v</code>	Displays system diagnostic information.
<code>scinstall -pv</code>	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 Domain Name Service (DNS)

This chapter describes the steps to install and configure the Sun Cluster HA for Domain Name Service (DNS) data service on your Sun Cluster servers.

This chapter contains the following procedures.

- “How to Install DNS” on page 12
- “How to Install Sun Cluster HA for DNS Packages” on page 15
- “How to Register and Configure Sun Cluster HA for DNS” on page 16
- “How to Configure SUNW.HAStoragePlus Resource Type” on page 19

You must configure Sun Cluster HA for DNS as a failover data service. See “Planning for Sun Cluster Data Services” in *Sun Cluster 3.1 Data Service Planning and Administration Guide* and the *Sun Cluster 3.1 Concepts Guide* document for general information on data services, resource groups, resources, and other related topics.

Note – You can use SunPlex Manager to install and configure this data service. See the SunPlex Manager online help for details.

Installing and Configuring Sun Cluster HA for DNS

The following table lists the sections that describe the installation and configuration tasks.

TABLE 1-1 Task Map: Installing and Configuring Sun Cluster HA for NFS

Task	For Instructions, Go To ...
Install DNS	"Installing DNS" on page 12
Install Sun Cluster HA for DNS packages	"Installing Sun Cluster HA for DNS Packages" on page 15
Configure and start Sun Cluster HA for DNS	"Registering and Configuring Sun Cluster HA for DNS" on page 16
Configure resource extension properties	"Configuring Sun Cluster HA for DNS Extension Properties" on page 20
View fault monitor information	"Sun Cluster HA for DNS Fault Monitor" on page 22

Installing DNS

This section describes the steps to install DNS and to enable DNS to run as Sun Cluster HA for DNS.

Sun Cluster HA for DNS uses the Internet Domain Name Server (`in.named`) software that is bundled with the Solaris 8 operating environment. See the `in.named(1M)` man page for information on how to set up DNS. The Sun Cluster configuration involves the following differences.

- The DNS database is located on the cluster file system, not a local file system.
- A network resource (relocatable IP address), not the name of a physical host, identifies the name of a DNS server.

▼ How to Install DNS

1. Become superuser on a cluster member.

2. Decide on the network resource that will provide the DNS service.

This name should be an IP address (logical hostname or shared address) that you set up when you install the Sun Cluster software. See the *Sun Cluster 3.1 Concepts Guide* document for details on network resources.

3. Ensure that the DNS executable (`in.named`) is in the directory `/usr/sbin`.

The DNS executable is bundled with the Solaris 8 operating environment and is located in the `/usr/sbin` directory before you begin the installation.

4. **Create directory structure `/global/dns/named` on the cluster file system to hold the DNS configuration and database files.**

See the *Sun Cluster 3.1 Software Installation Guide* for information on how to set up cluster file systems.

```
# mkdir -p /global/dns/named
```

5. **Place the configuration file for DNS, `named.conf` or `named.boot`, under the `/global/dns/named` directory.**

If you have already installed DNS, you can copy the existing `named.conf` or `named.boot` file to the `/global/dns/named` directory. Otherwise, create a `named.conf` file in this directory. See the `in.named(1M)` man page for information on the types of entries to place in `named.conf` or `named.boot`. One of the two files, `named.conf` or `named.boot`, must exist. Both files can exist.

6. **Place all of the DNS database files (listed in the `named.conf` file) under the `/global/dns/named` directory.**

7. **On all of the clients of Sun Cluster HA for DNS, create an entry for the network resource of the DNS service in the `/etc/resolv.conf` file.**

On all of the nodes, edit the `/etc/resolv.conf` file to contain the network resource. The following example shows the entries for a four-node configuration (`phys-schost-1`, `phys-schost-2`, `phys-schost-3`, and `phys-schost-4`) with the logical hostname `schost-1.eng.sun.com`.

```
domain eng.sun.com

; schost-1.eng.sun.com

(Only entry to be added if the file is already present.)

nameserver 192.29.72.90

; phys-schost-2.eng
nameserver 129.146.1.151

; phys-schost-3.eng
nameserver 129.146.1.152

; phys-schost-4.eng
nameserver 129.144.134.19

; phys-schost-1.eng
nameserver 129.144.1.57
```

Make the network resource the first entry after the domain name. DNS attempts to use the addresses in the order that they are listed in the `resolv.conf` file to access the server.

Note – If the `/etc/resolv.conf` is already present on the nodes, just add the first entry that shows the logical hostname in the preceding example. The order of the entries determines the order in which DNS tries to access the server.

8. On all of the cluster nodes, edit the `/etc/inet/hosts` file to create an entry for the network resource of the DNS service.

In the following example, perform these steps.

- Replace the `IPAddress` variable with your actual IP address, such as `129.146.87.53`.
- Replace the `logical-hostname` variable with your actual network resource (logical hostname or shared address).

```
127.0.0.1                localhost
IPAddress                logical-hostname
```

9. On all of the cluster nodes, edit the `/etc/nsswitch.conf` file to add the string `dns` after `cluster` and `files` to the `hosts` entry.

Example:

```
hosts:                cluster files dns
```

10. Run the `scswitch(1M)` command to complete the following tasks.

- Enable the resource and fault monitoring.
- Move the resource group into a `MANAGED` state.
- Bring the resource group online.

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

`-Z` Enables the resource and monitor, moves the resource group to the `MANAGED` state, and brings the resource group online.

`-g resource-group` Specifies the name of the resource group.

11. Test DNS.

Be sure to stop the `in.named` executable before you proceed. The following example shows how to test DNS.

```
# cd /global/dns
# /usr/sbin/in.named -c /global/dns/named.conf
# nslookup phys-schost-1
# pkill -x /usr/sbin/in.named
```

Where to Go From Here

If you installed the Sun Cluster HA for DNS packages during your Sun Cluster installation, go to “Registering and Configuring Sun Cluster HA for DNS” on page 16. Otherwise, go to “Installing Sun Cluster HA for DNS Packages” on page 15.

Installing Sun Cluster HA for DNS Packages

You can use the `scinstall(1M)` utility to install `SUNWscdns`, the Sun Cluster HA for DNS package, on a cluster. Do not use the `-s` option to non-interactive `scinstall` to install all of the data service packages.

If you installed the `SUNWscdns` data service package during your initial Sun Cluster installation, proceed to “Registering and Configuring Sun Cluster HA for DNS” on page 16. Otherwise, use the following procedure to install the `SUNWscdns` package.

▼ How to Install Sun Cluster HA for DNS Packages

You need the Sun Cluster Agents CD-ROM to complete this procedure. Perform this procedure on all of the cluster nodes that can run Sun Cluster HA for DNS.

- 1. Load the Sun Cluster Agents CD-ROM into the CD-ROM drive.**
- 2. Run the `scinstall` utility with no options.**
This step starts the `scinstall` utility in interactive mode.
- 3. Choose the menu option, Add Support for New Data Service to This Cluster Node.**
The `scinstall` utility prompts you for additional information.
- 4. Provide the path to the Sun Cluster Agents CD-ROM.**
The utility refers to the data services “`cd.`”
- 5. Specify the data service to install.**
The `scinstall` utility lists the data service that you selected and asks you to confirm your choice.
- 6. Exit the `scinstall` utility.**

7. Unload the CD from the drive.

Where to Go From Here

See “Registering and Configuring Sun Cluster HA for DNS” on page 16 to register Sun Cluster HA for DNS and to configure the cluster for the data service.

Registering and Configuring Sun Cluster HA for DNS

This procedure describes how to use the `scrgadm(1M)` command to register and configure Sun Cluster HA for DNS.

Note – Other options also enable you to register and configure the data service. See “Tools for Data Service Resource Administration” in *Sun Cluster 3.1 Data Service Planning and Administration Guide* for details about these options.

▼ How to Register and Configure Sun Cluster HA for DNS

To perform this procedure, you need the following information about your configuration.

- The name of the resource type for Sun Cluster HA for DNS. This name is `SUNW.dns`.
- The names of the cluster nodes that master the data service.
- The network resource that clients use to access the data service. You normally set up this IP address when you install the cluster. See the *Sun Cluster 3.1 Concepts Guide* document for details on network resources.
- The path to the DNS configuration files, which you must install on a cluster file system. This path maps to the `Config_dir` resource property that is configured in this procedure.

Note – Perform this procedure on any cluster member.

1. Become superuser on a cluster member.

2. Register the resource type for the data service.

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

-a Adds the data service resource type.

-t SUNW.dns Specifies the predefined resource type name for your data service.

3. Create a resource group for network and DNS resources to use.

You can use the -h option to optionally select the set of nodes on which the data service can run.

```
# scrgadm -a -g resource-group [-h nodelist]
```

-g resource-group Specifies the name of the resource group. This name can be your choice but must be unique for the resource groups within the cluster.

[-h nodelist] Specifies an optional comma-separated list of physical node names or IDs that identify potential masters. The order here determines the order in which the nodes are considered as primary during failover.

Note – Use the -h option to specify the order of the node list. If all of the cluster nodes are potential masters, you do not need to use the -h option.

4. Verify that all of the network resources that you will use have been added to your name service database.

You should have performed this verification during the Sun Cluster installation. See the planning chapter in the *Sun Cluster 3.1 Software Installation Guide* for details.

Note – To avoid any failures because of name service lookup, verify that all of the network resources are present in the server's and client's `/etc/inet/hosts` file. Configure name service mapping in the `/etc/nsswitch.conf` file on the servers to first check the local files before trying to access NIS or NIS+.

5. Add network resources to the resource group.

For example, run the following command to add a logical hostname to a resource group.

```
# scrgadm -a -L -g resource-group -l logical-hostname [logical-hostname] \  
[-n netiflist]
```

- l *logical-hostname* Specifies a comma-separated list of network resources (logical hostname or shared address).
- n *netiflist* Specifies an optional, comma-separated list that identifies the IP Networking Multipathing groups that are on each node. Each element in *netiflist* must be in the form of *netif@node*. *netif* can be given as an IP Networking Multipathing group name, such as *sc_ipmp0*. The node can be identified by the node name or node ID, such as *sc_ipmp0@1* or *sc_ipmp@phys-schost-1*.

Note – Sun Cluster does not currently support using the adapter name for *netif*.

6. Add a DNS application resource to the resource group.

- ```
scrgadm -a -j [resource] -g resource-group \
-t SUNW.dns -y Network_resources_used=network-resource, ... \
-y Port_list=port-number/protocol -x DNS_mode=config-file \
-x Confdir_list=config-directory
```
- j *resource*  
Specifies the DNS application resource name.
  - t *SUNW.dns*  
Specifies the name of the resource type to which this resource belongs. This entry is required.
  - y *Network\_resources\_used=network-resource, ...*  
Specifies a comma-separated list of network resources (logical hostnames or shared addresses) that DNS will use. If you do not specify this property, the value defaults to all of the network resources that are contained in the resource group.
  - y *Port\_list=port-number/protocol*  
Specifies a port number and the protocol to be used. If you do not specify this property, the value defaults to *53/udp*.
  - x *DNS\_mode=config-file*  
Specifies the configuration file to use, either *conf* (*named.conf*) or *boot* (*named.boot*). If you do not specify this property, the value defaults to *conf*.
  - x *Confdir\_list=config-directory*  
Specifies the location of the DNS configuration directory paths, which must be on the cluster file system. Sun Cluster HA for DNS requires this extension property.

## 7. Run the `scswitch(1M)` command to complete the following tasks.

- Enable the resource and fault monitoring.
- Move the resource group into a managed state.

- Bring the resource group online.

```
scswitch -Z -g resource-group
```

**-Z** Enables the resource and monitor, moves the resource group to the managed state, and brings the resource group online.

**-g resource-group** Specifies the name of the resource group.

## Example – Registering Failover Sun Cluster HA for DNS

The following example shows how to register Sun Cluster HA for DNS on a two-node cluster. Note that at the end, the `scswitch` command starts Sun Cluster HA for DNS.

*Cluster Information*

*Node names: phys-schost-1, phys-schost-2*

*Logical hostname: schost-1*

*Resource group: resource-group-1 (for all of the resources),*

*Resources: schost-1 (logical hostname), dns-1 (DNS application resource)*

*(Register the DNS resource type.)*

```
scrgadm -a -t SUNW.dns
```

*(Add the resource group to contain all of the resources.)*

```
scrgadm -a -g resource-group-1
```

*(Add the logical hostname resource to the resource group.)*

```
scrgadm -a -L -g resource-group-1 -l schost-1
```

*(Add DNS application resources to the resource group.)*

```
scrgadm -a -j dns-1 -g resource-group-1 -t SUNW.dns \
-y Network_resources_used=schost-1 -y Port_list=53/udp \
-x DNS_mode=conf -x Confdir_list=/global/dns
```

*(Bring the failover resource group online.)*

```
scswitch -Z -g resource-group-1
```

## ▼ How to Configure SUNW.HAStoragePlus Resource Type

The `SUNW.HAStoragePlus` resource type was introduced in Sun Cluster 3.0 5/02.

This new resource type performs the same functions as `SUNW.HAStorage`, and synchronizes actions between HA storage and Sun Cluster HA for NFS.

`SUNW.HAStoragePlus` also has an additional feature to make a local file system highly available. Sun Cluster HA for DNS is not disk-intensive and is not scalable, and therefore, setting up the `SUNW.HAStoragePlus` resource type is optional.

See the `SUNW.HAStoragePlus(5)` man page and “Relationship Between Resource Groups and Disk Device Groups” in *Sun Cluster 3.1 Data Service Planning and Administration Guide* for background information. See “Synchronizing the Startups Between Resource Groups and Disk Device Groups” in *Sun Cluster 3.1 Data Service Planning and Administration Guide* for the procedure. (If you are using a Sun Cluster 3.0 version prior to 5/02, you must set up `SUNW.HAStorage` instead of `SUNW.HAStoragePlus`. See “Synchronizing the Startups Between Resource Groups and Disk Device Groups” in *Sun Cluster 3.1 Data Service Planning and Administration Guide* for the procedure.)

---

## Verifying Data Service Installation and Configuration

To verify that you have correctly installed and configured Sun Cluster HA for DNS, run the following command after you complete the procedure “How to Register and Configure Sun Cluster HA for DNS” on page 16.

```
nslookup logical-hostname logical-hostname
```

In this example, *logical-hostname* is the name of the network resource that you have configured to service DNS requests—for example, `schost-1`—as shown in the previous registration example. The output should indicate that the network resource that you specified answered (served) the query.

---

## Configuring Sun Cluster HA for DNS Extension Properties

The only required extension property for creating a DNS resource is the `Confdir_list` property. Typically, you use the command line `scrgadm -x parameter=value` to configure extension properties when you create the DNS resource. You can also use the procedures in “Administering Data Service Resources” in *Sun Cluster 3.1 Data Service Planning and Administration Guide* to configure them later.

See “Standard Properties” in *Sun Cluster 3.1 Data Service Planning and Administration Guide* for details on all of the Sun Cluster properties.

Table 1–2 describes the Sun Cluster HA for DNS extension properties. You can update some extension properties dynamically. You can update others, however, only when you create the resource. The Tunable entries indicate when you can update the property.

**TABLE 1–2** Sun Cluster HA for DNS Extension Properties

| Name/Data Type                | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|-------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Confdir_list (string array)   | <p>A comma-separated list of path names, each of which points to the directory that contains the conf directory for a DNS instance.</p> <p><b>Default:</b> None</p> <p><b>Range:</b> None</p> <p><b>Tunable:</b> At creation</p>                                                                                                                                                                                                                                                                                               |
| DNS_mode                      | <p>The DNS configuration file to use, either conf (named.conf) or boot (named.boot).</p> <p><b>Default:</b> conf</p> <p><b>Range:</b> None</p> <p><b>Tunable:</b> At creation</p>                                                                                                                                                                                                                                                                                                                                              |
| Monitor_retry_count (integer) | <p>The number of times that the process monitor facility (PMF) restarts the fault monitor during the time window that the Monitor_retry_interval property specifies. This property refers to restarts of the fault monitor itself rather than to the resource. The system-defined properties Retry_interval and Retry_count control restarts of the resource.</p> <p><b>Default:</b> 4</p> <p><b>Range:</b> 0 – 2, 147, 483, 641</p> <p>–1 indicates an infinite number of retry attempts.</p> <p><b>Tunable:</b> Any time</p> |

**TABLE 1-2** Sun Cluster HA for DNS Extension Properties (Continued)

| Name/Data Type                   | Description                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|----------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Monitor_retry_interval (integer) | <p>The time (in minutes) over which failures of the fault monitor are counted. If the number of times that the fault monitor fails exceeds the value that is specified in the extension property Monitor_retry_count within this period, the PMF does not restart the fault monitor.</p> <p><b>Default:</b> 2</p> <p><b>Range:</b> 0 – 2, 147, 483, 641</p> <p>–1 indicates an infinite retry interval.</p> <p><b>Tunable:</b> Any time</p> |
| Probe_timeout (integer)          | <p>The time-out value (in seconds) that the fault monitor uses to probe a DNS instance.</p> <p><b>Default:</b> 120</p> <p><b>Range:</b> 0 – 2, 147, 483, 641</p> <p><b>Tunable:</b> Any time</p>                                                                                                                                                                                                                                            |

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## Sun Cluster HA for DNS Fault Monitor

The probe uses the `nslookup` command to query the health of DNS. Before the probe actually queries the DNS server, a check is made to confirm that network resources are configured in the same resource group as the DNS data service. If no network resources are configured, an error message is logged, and the probe exits with failure.

The probe executes the following steps.

1. Run the `nslookup` command using the time-out value that the resource property `Probe_timeout` specifies.

The result of this `nslookup` command can be either failure or success. If DNS successfully replied to the `nslookup` query, the probe returns to its infinite loop, waiting for the next probe time.

If the `nslookup` fails, the probe considers this scenario a failure of the DNS data service and records the failure in its history. The DNS probe considers every failure a complete failure.

2. Based on the success/failure history, a failure can cause a local restart or a data service failover. “Sun Cluster Data Service Fault Monitors” in *Sun Cluster 3.1 Data Service Planning and Administration Guide* further describes this action.

# Index

---

## A

adding  
    *See* modifying

## C

changing  
    *See* modifying  
commands  
    prtconf -v, 9  
    prtdiag -v, 9  
    psrinfo -v, 9  
    showrev -p, 9  
configuring, Sun Cluster HA for DNS, 16

## D

deleting  
    *See* modifying  
disabling  
    *See* stopping  
displaying  
    *See* listing  
DNS  
    *See also* Sun Cluster HA for DNS  
    installation  
        installing software, 12

Domain Name Service

*See* DNS  
    *See* Sun Cluster HA for DNS

## E

editing  
    *See* modifying  
enabling  
    *See* starting  
executing  
    *See* starting  
extension properties  
    Sun Cluster HA for DNS  
        Confdir\_list, 22  
        DNS\_mode, 22  
        Monitor\_retry\_count, 22  
        Monitor\_retry\_interval, 22  
        Probe\_timeout, 22

## F

fault monitor, Sun Cluster HA for DNS, 22

## I

installing  
    DNS, 12  
    Sun Cluster HA for DNS, 15

## P

printing

*See* listing

prtconf -v command, 9

psrinfo -v command, 9

-pv command, 9

## R

registering, Sun Cluster HA for DNS, 16

running

*See* enabling

## S

Sun Cluster HA for DNS

*See also* DNS

extension properties

Confdir\_list, 22

DNS\_mode, 22

Monitor\_retry\_count, 22

Monitor\_retry\_interval, 22

Probe\_timeout, 22

fault monitor, 22

installation

Sun Cluster HA for DNS packages, 15

verifying, 20

registering and configuring, 16

SUNW.HAStoragePlus resource type, 19

task map, 12

SUNW.HAStoragePlus resource type, Sun

Cluster HA for DNS, 19

## T

task map, Sun Cluster HA for DNS, 12

turning off

*See* disabling

turning on

*See* enabling

## U

/usr/cluster/bin/scinstall -pv, 9

## V

verifying, Sun Cluster HA for DNS

installation, 20