SPARC: Oracle® Solaris Cluster Data Service for Oracle VM Server for SPARC Guide

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Oracle Solaris Cluster Data Service for Oracle VM Server for SPARC Guide

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Using This Documentation

- **Overview** – Introduces the Oracle Solaris Cluster HA for Oracle VM Server for SPARC software.
- **Audience** – Experienced system administrators with extensive knowledge of Oracle software and hardware.
- **Required knowledge** – Knowledge of the Oracle Solaris operating system, of Oracle Solaris Cluster software, and expertise with the volume manager software that is used with Oracle Solaris Cluster software.

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♦ ♦ ♦ CHAPTER 1

SPARC: Installing and Configuring HA for Oracle VM Server

This chapter explains how to install and configure Oracle Solaris Cluster HA for Oracle VM Server for SPARC (HA for Oracle VM Server) software and contains the following sections:

- "Installing and Configuring HA for Oracle VM Server" on page 11
- "HA for Oracle VM Server Overview" on page 12
- "Planning the HA for Oracle VM Server Installation and Configuration" on page 13
- "Installing and Configuring Oracle VM Server for SPARC" on page 15
- "Installing the HA for Oracle VM Server Package" on page 16
- "Registering and Configuring HA for Oracle VM Server" on page 18
- "Verifying the Installation and Configuration of Oracle VM Server for SPARC" on page 23
- "Tuning the HA for Oracle VM Server Fault Monitor" on page 24
- "Debugging HA for Oracle VM Server" on page 26

Note - You can also use the Oracle Solaris Cluster Manager browser interface to configure this data service. In the Tasks panel of Oracle Solaris Cluster Manager, click Oracle VM Server for SPARC to start the configuration wizard. For log-in instructions, see Chapter 13, "Using the Oracle Solaris Cluster Manager Browser Interface" in *Oracle Solaris Cluster 4.3 System Administration Guide*.

This wizard requires that all cluster nodes have the same root password.

SPARC: Installing and Configuring HA for Oracle VM Server

The following table summarizes the tasks for installing and configuring HA for Oracle VM Server 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 Tasks for Installing and Configuring HA for Oracle VM Server

Task	Instructions
Plan the installation.	"Planning the HA for Oracle VM Server Installation and Configuration" on page 13
Install and configure the Oracle VM Server for SPARC software.	"Installing and Configuring Oracle VM Server for SPARC" on page 15
Install HA for Oracle VM Server packages.	"Installing the HA for Oracle VM Server Package" on page 16
Register and configure HA for Oracle VM Server resources.	"Registering and Configuring HA for Oracle VM Server" on page 18
Verify the HA for Oracle VM Server installation and configuration.	"Verifying the Installation and Configuration of Oracle VM Server for SPARC" on page 23
Tune the HA for Oracle VM Server fault monitor.	"Tuning the HA for Oracle VM Server Fault Monitor" on page 24
Debug HA for Oracle VM Server.	"Debugging HA for Oracle VM Server" on page 26

SPARC: HA for Oracle VM Server Overview

The Oracle Solaris Cluster HA for Oracle VM Server for SPARC (HA for Oracle VM Server) data service provides the ability to split a single physical system into multiple, independent virtual systems. This is archived by an additional software application in the firmware layer, interposed between the operating system and the hardware platform called the hypervisor. It abstracts the hardware and can expose or hide various resources, allowing for the creation of resource partitions that can operate as discrete systems, complete with virtual CPU, memory, and I/O devices.

You create the logical domain on any one of the nodes of the cluster. However the services configuration must be identical on all the potential primary nodes. The domain configuration is retrieved by the `ldm list-constraints -x` *ldom* command and stored in the CCR. This globally accessible information is used by the HA for Oracle VM Server agent to create or destroy the domain on the node where the resource group is brought online or offline.

HA for Oracle VM Server provides a mechanism for orderly startup and shutdown, fault monitoring, and automatic failover of the Oracle VM Server for SPARC logical domain service. The Oracle VM Server for SPARC component is protected by the HA for Oracle VM Server data service.

Note the following points regarding support for the SR-IOV device in the HA for Oracle VM Server data service:

- An SR-IOV device is not supported for live migration of the HA for Oracle VM Server data service. This restriction exists as of initial release of the Oracle Solaris Cluster 4.2 software.

Contact your Oracle support representative to learn whether support for the SR-IOV feature becomes available.

- An SR-IOV device is supported for normal migration of the HA for Oracle VM Server data service. This support requires that the SR-IOV device path is identical on all potential primaries of the data service's resource group.

SPARC: Planning the HA for Oracle VM Server Installation and Configuration

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

Configuration Guidelines

Observe the following configuration guidelines that apply only to HA for Oracle VM Server.

For restrictions that apply to all data services, see the *Oracle Solaris Cluster 4.3 Release Notes*.

- **HA for Oracle VM Server configuration** –Oracle VM Server for SPARC can be configured only as a failover data service and not as a scalable data service. It can be configured only in the global zone.
- **HA for Oracle VM Server virtual disks** – The Oracle VM Server for SPARC virtual disk back end can be of any storage or file system that is supported by Oracle Solaris Cluster software. This includes cluster file systems, NFS, iSCSI, and SAN LUNs. The back end is exported through the virtual disk server of the control domain to a domain as a full disk and is visible to the Oracle Solaris installation software inside the logical domain. Virtual disks from non-control domains are not supported.
- **Live migration and cold migration** – HA for Oracle VM Server software supports Oracle VM Server for SPARC live migration and cold migration of guest domains that are configured with HA for Oracle VM Server. No other type of logical domain in this data service configuration is supported to use cold migration or live migration.

  Live migration is supported only for cluster file systems (UFS or raw disk), NFS, iSCSI, or SAN LUNs, as live migration requires that storage is accessible to all potential primary nodes simultaneously.

  In some cases where the cluster cannot determine the target node to which the HA for Oracle VM Server resource group is migrating, it uses an ordinary resource group

switchover instead of using live migration. In such cases, the logical domain shuts down on its current node and then boots on its new node. To achieve live migration, relocate the HA for Oracle VM Server resource group by using the `clresourcegroup switch` command explicitly on the resource group, rather than depending on node evacuation or strong resource group affinities to move the resource group.

▼ SPARC: How to Configure Oracle VM Server for SPARC to Reset for Control Domain Failures

The failure policy settings on the primary domain determine the action to be taken on the logical domain when there is a primary domain failures. When configured to `failure-policy=reset`, the logical domain would panic when the primary domain fails. If the failure policy is not set to `reset` on all the primary domains, the resource creation would fail. You must set the master-slave domain dependency and `auto-boot?` variable to appropriate values. Perform the following steps on the node where the `ldg0` logical domain is created:

1. **Set the domain failure policy to `reset`.**

```
# ldm set-domain failure-policy=reset primary
# ldm list -o domain primary
NAME             STATE      FLAGS   UTIL
primary          active       -n-cv-      0.6%

SOFTSTATE
Solaris running

HOSTID
0x84d4a2ce

CONTROL
failure-policy=reset

DEPENDENCY
master=
```

2. **Configure the master-slave domain dependency.**

```
# ldm set-domain master=primary ldg0
```

3. **Set the `auto-boot?` variable to `false`.**

```
# ldm set-var auto-boot?=false ldg0
```

```
# ldm list -o domain ldg0
NAME             STATE      FLAGS   UTIL
ldg0             active     n---  0.1%

SOFTSTATE
Solaris running

HOSTID
0x84f8a040

CONTROL
failure-policy=reset

DEPENDENCY
master=primary

VARIABLES
auto-boot?=false
boot-device=vdisk1
keyboard-layout=US-English
```

SPARC: Installing and Configuring Oracle VM Server for SPARC

This section contains the procedures you need to install and configure an Oracle VM Server for SPARC logical domain.

▼ SPARC: How to Install the Oracle VM Server for SPARC Software

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

2. **Go to `http://www.oracle.com/technetwork/server-storage/vm/downloads/index.html?ssSourceSiteId=ocomen`.**

   Follow instructions to download and install Oracle VM Server for SPARC software.

▼ SPARC: How to Enable the Oracle VM Server for SPARC Instances to Run in a Cluster

1. **Become superuser or assume a role that provides `solaris.cluster.admin` authorization on one of the nodes in the cluster that will host the Oracle VM Server for SPARC logical domain.**

2. **Register the `SUNW.HAStoragePlus` resource type.**

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

3. **Create a failover resource group.**

   ```
   # clresourcegroup create LDom-failover-rg
   ```

4. **(If using a cluster file system or a highly available local file system) Create an HAStoragePlus resource for the logical domain Virtual Disk Storage.**

   ```
   # clresource create -g LDom-failover-rg \
   -t SUNW.HAStoragePlus \
   -p FileSystemMountPoints=LDom-mount-points \
   LDom-has-resource
   ```

5. **Enable the failover resource group that now includes the logical domain disk storage resources.**

   ```
   # clresourcegroup online -M -n current-node LDom-failover-rg
   ```

Installing the HA for Oracle VM Server Package

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

▼ How to Install the HA for Oracle VM Server Package

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

1. **On the cluster node where you are installing the data service package, assume the `root` role.**

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/ha-ldom
# 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 Oracle VM Server software package.**

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

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

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

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*.

SPARC: Registering and Configuring HA for Oracle VM Server

▼ SPARC: How to Configure HA for Oracle VM Server

Before You Begin Install the data service packages during your initial Oracle Solaris Cluster installation.

If you did not install the HA for Oracle VM Server packages as part of your initial Oracle Solaris Cluster installation, go to "Installing the HA for Oracle VM Server Package" on page 16.

1. **Assume the `root` role or a role that provides `solaris.cluster.modify` and `solaris.cluster.admin` authorization on the node in the cluster that hosts the Oracle VM Server for SPARC logical domain.**

2. **Register the `SUNW.ldom` resource type.**

   ```
   # clresourcetype register SUNW.ldom
   ```

3. **(Optional) If you plan to use live migration, configure the password.**

   - **For the resource type version 6 or later, create a private string named *resourcegroup-resource-ldompasswd* to store the target host password that is required for guest domain migration.**

     Type the following command on any one node in the cluster:

     ```
     # /usr/cluster/bin/clpstring create -b resource-name \
     -t resource resourcegroup-resource-ldompasswd
     Enter string value:
     Enter string value again:
     ```

     where *resourcegroup* and *resource* are the resource group and resource name for the `SUNW.ldom` resource that is created.

   - **For resource type version 5 or earlier, the `Password_file` property is required during resource creation.**

     Create a password file owned by `root` with read only permission to store the target host password required for guest domain migration.

Type the following commands on each of the Oracle Solaris Cluster nodes that would host the logical domain resource, where `/var/cluster/.ldg1_passwd` is the password file for guest domain `ldg1`, and *password* is the target node root password used for live migration:

```
# echo password > /var/cluster/.ldg1_passwd
# /usr/bin/chown root:root /var/cluster/.ldg1_passwd
# /usr/bin/chmod 400 /var/cluster/.ldg1_passwwd
```

4. (Optional) Configure `password ssh` to the guest domain if you use `Plugin_probe` extension property.

Assume you have two nodes that could host the guest domain, `node1` and `node2`. Setup a passwordless login through SSH between `node1` and the LDom Guest (`ldg1`) and `node2` and the LDom Guest (`ldg1`), or a user of your choice. The example below uses `root` as the user.

```
root@node1:~# id
uid=0(root) gid=0(root)
root@node1:~# pwd
/root
root@node1:~# mkdir .ssh
root@node1:~# chmod 700 .ssh
root@node1:~# cd .ssh
.
Repeat the above for node2.
.
Then on node1.
.
Note: we will NOT specify a passphrase.
.
root@node1:~# pwd
/root/.ssh
root@node1:~#
root@node1:~# ssh-keygen -t rsa
Generating public/private rsa key pair.
Enter file in which to save the key (/root/.ssh/id_rsa):
Enter passphrase (empty for no passphrase):
Enter same passphrase again:
Your identification has been saved in /root/.ssh/id_rsa.
Your public key has been saved in /root/.ssh/id_rsa.pub.
The key fingerprint is:
e6:63:c9:71:fe:d1:8f:71:77:70:97:25:2a:ee:a9:33 root@node1
root@node1:~#
root@node1:~# cat id_rsa.pub >> authorized_keys
root@node1:~# chmod 600 authorized_keys
root@node1:~# scp authorized_keys node2:/root/.ssh
The authenticity of host `pnode2 (n.n.n.n )' can't be established.
```

```
RSA key fingerprint is 4d:d3:84:72:44:fe:0c:48:a7:76:fb:7d:65:c4:da:a9.
Are you sure you want to continue connecting (yes/no)? yes
Warning: Permanently added ¿node2,n.n.n.n' (RSA) to the list of known hosts.
Password:
authorized_keys 100%
|*****************************************************************************
************| 223 00:00
root@node1:~#
.
Then on node2.
.
root@node2:~# pwd
/root/.ssh
root@node2:~#
root@node2:~# ssh-keygen -t rsa
Generating public/private rsa key pair.
Enter file in which to save the key (/root/.ssh/id_rsa):
Enter passphrase (empty for no passphrase):
Enter same passphrase again:
Your identification has been saved in /root/.ssh/id_rsa.
Your public key has been saved in /root/.ssh/id_rsa.pub.
The key fingerprint is:
e6:63:c9:71:fe:d1:8f:71:77:70:97:25:2a:ee:a9:33 root@node1
root@node2:~#
root@node2:~# cat id_rsa.pub >> authorized_keys
root@node2:~# chmod 600 authorized_keys
.
Then copy authorized_keys from node2 to the LDom guest domain, which here is
named ldg1.
.
root@node2:~# scp authorized_keys ldg1:/root/.ssh
The authenticity of host `ldg1 (n.n.n.n )' can't be established.
RSA key fingerprint is 4d:d3:84:72:44:fe:0c:48:a7:76:fb:7d:65:c4:da:a9.
Are you sure you want to continue connecting (yes/no)? yes
Warning: Permanently added ¿node2,n.n.n.n' (RSA) to the list of known hosts.
Password:
authorized_keys 100%
|*****************************************************************************
************| 223 00:00
root@node2:~#
.
Then verify that both node1 and node2 can login using SSH without a password.
.
root@node1:~# ssh -l root -i /root/.ssh/id_rsa ldg1 svcs -H -o state
multi-user-server
online
root@node1:~#
.
```

```
root@node2:~# ssh -l root -i /root/.ssh/id_rsa ldg1 svcs -H -o state
multi-user-server
online
root@node2:~#
```

5. **Create an Oracle VM Server for SPARC logical domain resource in the failover resource group.**

Note - The `Plugin_probe` extension property shown in the examples tests if the multi-user-service state is online before the resource is brought online. The probe also periodically checks if the multi-user-service state is online. Otherwise, the probe attempts to restart the guest domain.

- **If you are not using live migration, set `Migration_type=NORMAL` during resource creation and do not specify the `Password_file` property.**

```
# clresource create -g ldg1-rg \
-t SUNW.ldom \
-p Domain_name=ldg1 \
-p Migration_type=NORMAL \
-p Resource_dependencies_offline_restart=ldg1-hasp-rs \
[-p Plugin_probe="/opt/SUNWscxvm/bin/ppkssh -P
root:/root/.ssh/id_rsa:ldg1:multi-user-server:online"] \
ldg1
```

- **If you are using live migration, set `Migration_type=MIGRATE` during resource creation and specify `Password_file` for resource type version 5 or earlier.**

Note - The `Password_file` property is obsolete for resource type version 6 or later.

For resource type version 5 or earlier, type the following command:

```
# clresource create -g ldg1-rg \
-t SUNW.ldom \
-p Domain_name=ldg1 \
-p Migration_type=MIGRATE \
-p Password_file=/var/cluster/.ldg1_passwd \
-p Resource_dependencies_offline_restart=ldg1-hasp-rs \
[-p Plugin_probe="/opt/SUNWscxvm/bin/ppkssh -P
root:/root/.ssh/id_rsa:ldg1:multi-user-server:online"] \
ldg1
```

For resource type version 6 or later, type the following command:

```
# clresource create -g ldg1-rg \
```

```
-t SUNW.ldom \
-p Domain_name=ldg1 \
-p Migration_type=MIGRATE \
-p Resource_dependencies_offline_restart=ldg1-hasp-rs \
[-p Plugin_probe="/opt/SUNWscxvm/bin/ppkssh -P
root:/root/.ssh/id_rsa:ldg1:multi-user-server:online"] \
ldg1
```

6. **For resource type version 5 or earlier, if an encrypted password is required for the logical domain migration, you must do the following:**

   a. **Insert the word `encrypted` into the file you specify with the `Password_file` extension property when creating the resource.**

   ```
   # echo "encrypted" > /var/cluster/.ldg1_passwd
   ```

   b. **Assume the root role and create an encrypted password.**

   In the following example, the `root` password for the primary domain, *password*, is being encrypted and `ldg1` reflects the logical domain name.

   ```
   node1# dd if=/dev/urandom of=/var/cluster/ldom_key bs=16 count=1
   node1# chmod 400 /var/cluster/ldom_key
   node1# echo password | /usr/sfw/bin/openssl enc -aes128 -e \
   -pass file:/var/cluster/ldom_key -out /opt/SUNWscxvm/.ldg1_passwd
   node1# chmod 400 /opt/SUNWscxvm/.ldg1_passwd
   ```

   c. **Verify that the encrypted password can be decrypted.**

   ```
   node1# /usr/sfw/bin/openssl enc -aes128 -d -pass file:/var/cluster/ldom_key \
   -in /opt/SUNWscxvm/.ldg1_passwd
   ```

   d. **Repeat the preceding steps on all Oracle Solaris Cluster nodes that host the logical domain service.**

   e. **Create or update the resource and set the `Password_file` property to the path provided in Step a.**

   Note - You can perform this step only when the resource is disabled.

   ```
   # clresource set -p Password_file=/var/cluster/.ldg1_passwd LDom-guest-domain-resource
   ```

7. **Enable each logical domain resource.**

   Repeat this step for each logical domain instance, if multiple instances were created.

```
# clresource status
# clresource enable logical-guest-domain-resource
```

▼ SPARC: How to Remove an HA for Oracle VM Server Resource From a Failover Resource Group

1. **Assume the `root` role or assume a role that provides `solaris.cluster.modify` and `solaris.cluster.admin` RBAC authorizations.**

2. **Disable and remove the resource that is used by the HA for Oracle VM Server data service.**

   ```
   # clresource disable resource
   # clresource delete resource
   ```

SPARC: Verifying the Installation and Configuration of Oracle VM Server for SPARC

▼ SPARC: How to Verify the HA for Oracle VM Server Installation and Configuration

1. **As the `root` role, log in to the node that currently hosts the resource group that contains the Oracle VM Server for SPARC logical domain resource.**

2. **Switch the logical domain resource group to another cluster member.**

   ```
   # clresourcegroup switch -n node logical-domain
   ```

3. **Verify the status of the logical domain instance.**

   ```
   # ldm list-domain logical-domain
   NAME             STATE      FLAGS   CONS    VCPU  MEMORY   UTIL  UPTIME
   ldg              active     n---    5000    4     2G        25%  2s
   ```

4. **Repeat the preceding steps until you have tested all the potential nodes on which the logical domain can run.**

SPARC: Tuning the HA for Oracle VM Server Fault Monitor

This section describes the HA for Oracle VM Server fault monitor's probing algorithm or functionality, and states the conditions, messages, and recovery actions associated with unsuccessful probing.

Note - For any maintenance or modification activities on the domain, you must disable monitoring, perform maintenance tasks, and then re-enable the resource monitor.

For conceptual information about fault monitors, see the *Oracle Solaris Cluster 4.3 Concepts Guide*.

Resource Properties

The HA for Oracle VM Server logical domain fault monitor uses the resource properties specified in the resource type `SUNW.ldom`. Refer to the `SUNW.ldom(5)` man page for a complete list of resource properties used.

Probing Algorithm and Functionality

HA for Oracle VM Server 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 and are suitable for most Oracle Solaris Cluster installations. You can modify this preset behavior by performing the following actions:

- 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 Oracle VM Server fault monitor checks the domain status within an infinite loop. During each cycle, the fault monitor checks the domain state and reports 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 continues whenever the fault monitor reports a failure. If successive restarts exceed the `Retry_count` within the `Thorough_probe_interval`, a request is made to fail over the resource group onto a different node.

Operations of the Oracle VM Server for SPARC Probe

- The probe checks the domain state every 60 seconds by using the `ldm list-domain` command.
- The `ldm list-domain` command produces a status line for the domain and is accurate at the instant that the command executes.
- The status modes that are considered to be normal operational modes are as follows: active, suspending, resuming, suspended, and starting. Whenever the `ldm` command reports these status modes, the probe considers that the domain is operating in an acceptable mode.
- The status modes that are considered to be restartable modes are as follows: inactive and stopping. These modes are not considered acceptable and if one of these modes is encountered, the probe requests a restart of the resource.
- The probe also requests a resource to restart if any unknown status modes are reported by the `ldm` command.
- If the logical domain configuration has changed, the probe updates this information to the CCR in the next probe cycle. Alternatively, you can perform the following steps to update the changed configuration to the CCR immediately:

  1. Make a dummy update to the resource. For example:

     ```
     # clresource set \
     -p R_DESCRIPTION="Oracle Solaris Cluster HA for Oracle VM Server SPARC Guest
      Domains - Modified" \
     ldg1-rs
     ```

  2. Verify whether the configuration change was successfully done.

     From the node where the guest domain is online, type the following commands, where `ld1-rs` is the logical domain resource name and `ldg1` is the guest domain name:

     ```
     # (/usr/cluster/lib/sc/ccradm showkey --key xml_ldg1-rs ldom_domain_config | \
     xmllint --format -) > /var/tmp/ldg1_ccr.xml
     # ldm list-constraints -x ldg1 > /var/tmp/ldg1_current.xml
     # diff /var/tmp/ldg1_current.xml /var/tmp/ldg1_ccr.xml
     ```

- The probe runs the user-supplied script or binary provided for `plugin_probe`. If this process fails, then the probe will restart the logical domain resource. The exit status of the

plugin_probe command is used to determine the severity of the failure of the application. This exit status, called the plugin_probe status, must be an integer between 0 (for success) and 100 (for complete failure). The plugin_probe status can also be a special value of 201 which results in immediate failover of the application unless Failover_enabled is set to FALSE.

- If the logical domain resource is repeatedly restarted and subsequently exhausts the Retry_count within the Retry_interval, then a failover is initiated for the resource group onto another node if Failover_enabled is set to TRUE.

SPARC: Debugging HA for Oracle VM Server

HA for Oracle VM Server has a extension property named Debug_level that enables you to activate debugging for Oracle VM Server for SPARC logical domain resources.

▼ SPARC: How to Activate Debugging for HA for Oracle VM Server

1. **Determine whether debugging for HA for Oracle VM Server is active.**

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

If debugging is active, daemon.debug is set in the file /etc/syslog.conf.

If debugging is inactive, daemon.notice is set in the file /etc/syslog.conf of the appropriate node.

2. **If debugging is inactive, edit the /etc/syslog.conf file in the appropriate node to change daemon.notice to daemon.debug.**

3. **Confirm that debugging for HA for Oracle VM Server is active.**

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

4. **Restart the syslogd daemon in the global zone.**

```
# svcadm refresh svc:/system/system-log:default
```

5. **Set the property `Debug_level` to level 2.**

```
# clresource set -p Debug_level=2 logical-domain-resource
```

For more information about the `Debug_level` extension property and permissible values, see the `SUNW.ldom`(5) man page.

Note - To deactivate debugging, repeat these steps, changing `daemon.debug` to `daemon.notice` and changing the `Debug_level` property to 0.

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