Oracle® Enterprise Manager Ops Center

Recovering Logical Domains from a Failed Server

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This guide provides an end-to-end example for how to use Oracle Enterprise Manager Ops Center.

Introduction

Oracle Enterprise Manager Ops Center provides options to install and configure Oracle VM Server for SPARC systems, create logical domains, and provision Oracle Solaris operating systems on the logical domains. You can pool the Oracle VM Server for SPARC systems in a server pool which provides load balancing, high availability capabilities, and sharing resources with all the members of the pool.

The high availability capability for an Oracle VM Server for SPARC server pool is enhanced by allowing the automatic recovery of the logical domains on a failed server.

In Oracle Enterprise Manager Ops Center, you can recover the logical domains from failed and unreachable Oracle VM Server for SPARC systems. You can enable automatic recovery for the logical domains and set the priority of recovery. The automatic recovery priority decides the order of recovery of the logical domains. Zero (0) is the lowest automatic recovery priority while 100 is the highest, the logical domain with the highest priority is the first to recover.

When an Oracle VM Server control domain fails, each of its logical domains configured to automatically recover is started on another control domain in the server pool according to its priority. The selection of the control domain is done according to the placement policy of the server pool until no enough available resources exist in the server pool. If the recovery process fails for a logical domain, a critical incident is raised for the logical domain.

For a logical domain with redundant storage access, you can authorize to recover the logical domain without the redundant access configuration if no control domains in the server pool can provide it. If you authorize to recover a logical domain without the redundant access configuration, the logical domain is automatically recovered and a warning incident is raised for the logical domain to inform about the loss of the redundant configuration.

There are many scenarios and conditions that determine the recovery of the logical domains. In this example, two such scenarios are described:

- Automatic recovery of logical domains

- Manual recovery of logical domains

Some logical domains can not be automatically or manually recovered because they have one or more of the following conditions:

- They have non-shared storage.

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- They have non-shared metadata.
- They have attached I/O bus, PCI endpoint, or virtual functions.

In this example, the control domain is placed in a server pool and has logical domains running in it. When the control domain becomes unreachable, the logical domains that have been enabled for automatic recovery are recovered and started in another control domain in the server pool automatically. When the logical domains are not enabled for automatic recovery, the logical domains can be recovered from the failed control domain using the manual procedure described in this guide.

See Related Articles and Resources for links to related information and articles

What You Will Need?

You will need the following for showcasing the recovery of the logical domains:

- Two Oracle VM Server for SPARC servers installed and configured with the Oracle VM Server for SPARC agent.
- The Oracle VM Server for SPARC servers are placed in a server pool with the option to power-off a failed server on automatic recovery enabled. Both servers must use the same Oracle VM Server for SPARC version.
- Two logical domains installed and configured on one of the Oracle VM Server for SPARC system using Oracle Enterprise Manager Ops Center.

Hardware and Software Configuration

The Oracle VM Servers for SPARC are of the following configuration:

- In this example, the servers named as *smt4-14* and *smt4-15* are installed and configured with Oracle VM Server for SPARC 3.0.0.4 using Oracle Enterprise Manager Ops Center.

- Control domains are placed in a server pool with the following policies:
  - Place guest in Oracle VM Server with lowest relative load.
  - Do not automatically balance the server pool.
  - Power off a failed server from Service Processor, given capabilities, before automatic recovery of attached logical domains.
- Two logical domains, *guest1* and *guest2* are created in the control domain *smt4-15*.

Recovering Logical Domains

In this example, the following two scenarios are described:

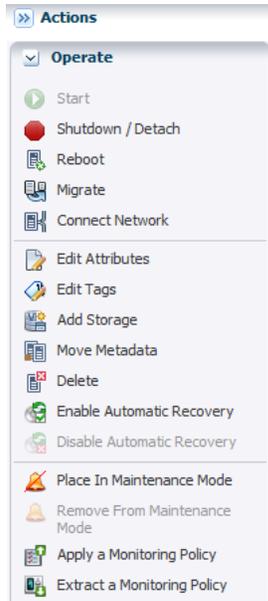- Automatic recovery
- Manual recovery

There are two logical domains *guest1* and *guest2* in this example. The logical domain *guest1* is designed for manual recovery and the logical domain *guest2* for an automatic recovery. The control domain *smt4-15* in which the logical domains resides becomes unreachable. Select a topic to see how the recovery procedures are executed:

- Automatic Recovery of Logical Domains
- Manual Recovery of Logical Domains

Automatic Recovery of Logical Domains

To recover the logical domains automatically, you must have enabled the automatic recovery of the logical domains. You can enable the automatic recovery of logical domains in the following ways:

- Set the automatic recovery option when you create the logical domain profile. Select the automatic recovery and the provide the priority value in the logical domain profile.
- Select the logical domain and use the option Enable Automatic Recovery in the Actions pane to trigger the recovery of logical domains automatically when a server fails. Edit the Automatic Recovery Priority using the Edit Attributes option for a logical domain. The Enable Automatic Recovery is shown in the figure below.

The option to enable automatic recovery is not be enabled for logical domains that are not recoverable.

In this example, the logical domain *guest2* is enabled for an automatic recovery with an Automatic Recovery Priority of 100, which is the highest priority for recovery.
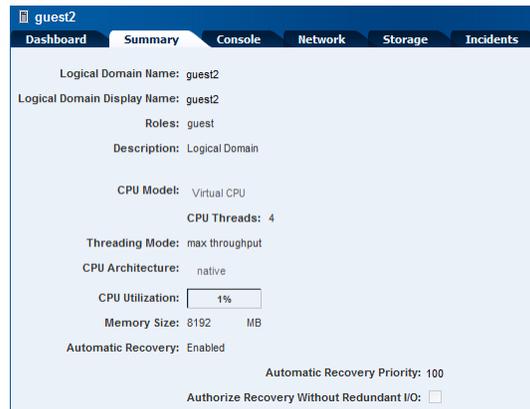
When an Oracle VM Server for SPARC in the server pool fails, the logical domains that have been enabled for automatic recovery are recovered and started on another Oracle VM Server in the server pool without any user intervention.

When the control domain *smt4-15* fails and becomes unreachable, the automatic recovery of the logical domain *guest2* is triggered. The status of *smt4-15* is unreachable as shown in the figure below. According to the server pool policy for this example, if Oracle Enterprise Manager Ops Center fails to power off the server, then you need to execute a manual recovery.

You can view the job running in the job pane.

Select the job and view the job details such as the task flow execution.

From the job details, you can view that the server *smt4-15* is powered off according to the server pool policy. The logical domain *guest2* recovery is initiated and created successfully on the control domain *smt4-14* in the server pool. When the logical domain *guest2* is recovered, the server pool status is as in the following figure:

You can view the logical domain *guest2* recovered and running on the control domain *smt4-14*. The control domain *smt4-15* is in unreachable status and the logical domain *guest1* has disappeared from the list.

When the logical domain is recovered on the other host in the server pool, Oracle Enterprise Manager Ops Center takes care to auto boot the operating system of the logical domain. Allow some time for the logical domain to get started on the new virtualization host as its operating system gets booted.

If there are no resources available in the server pool to recover the logical domains, Oracle Enterprise Manager Ops Center checks periodically for free resources to retry the automatic recovery mechanism.

When the failed server is repaired and restarted, the logical domains that were not recovered are started in the control domain. For the logical domains that are recovered and running on other servers, Oracle Enterprise Manager Ops Center cleans up the repaired server and removes those logical domains.

In a scenario where you cannot repair the failed server, you must manually recover the logical domains.

Manual Recovery of Logical Domains

When you have not enabled automatic recovery for logical domains or you do not have enough resources to recover the logical domains in a server pool, then use the manual procedure to recover the logical domains.

When the control domain *smt4-15* becomes unreachable, do not try to remove it from the server pool using the option Remove from Server Pool. You cannot remove a control domain with running guests from a server pool.
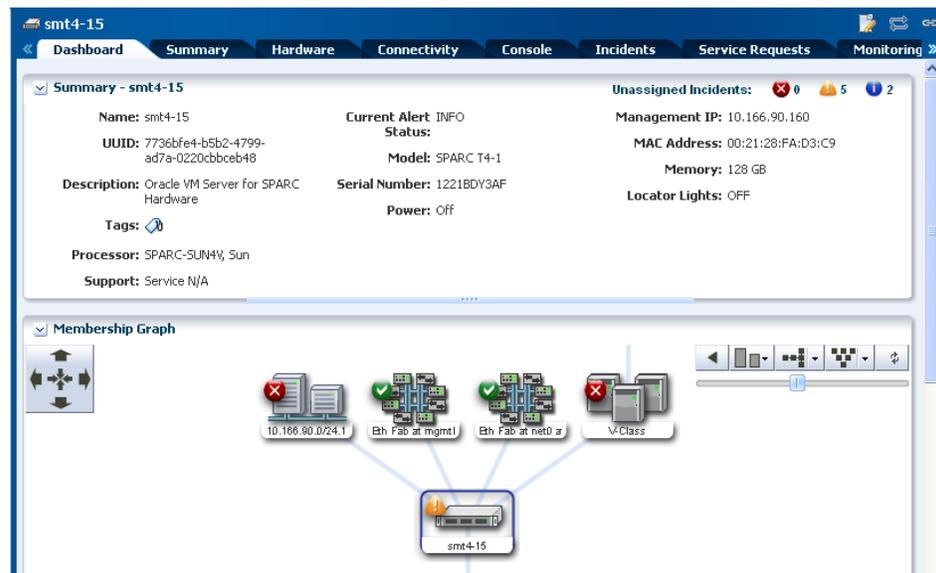
As described in the previous section, the logical domain *guest1* was not enabled for automatic recovery. Use the following procedure to manually recover the logical domain.

1. Isolate the failed server.

    You can log in to the ALOM or ILOM of the physical server and shut down the server.

2. Power-off the failed server.

3. Check whether the failed server is flagged as unavailable in Oracle Enterprise Manager Ops Center UI. This status is updated within 5 minutes approximately.

4. Select All Assets as filter in the Navigation pane.

5. Select Managed Assets tab in the center pane.

6. Select the unreachable control domain from the list. Ensure that you select the control domain and not the operating system of the control domain. Verify the value of the Description column is *Oracle VM Server for SPARC*.

7. Click **Delete Assets** to delete the asset.
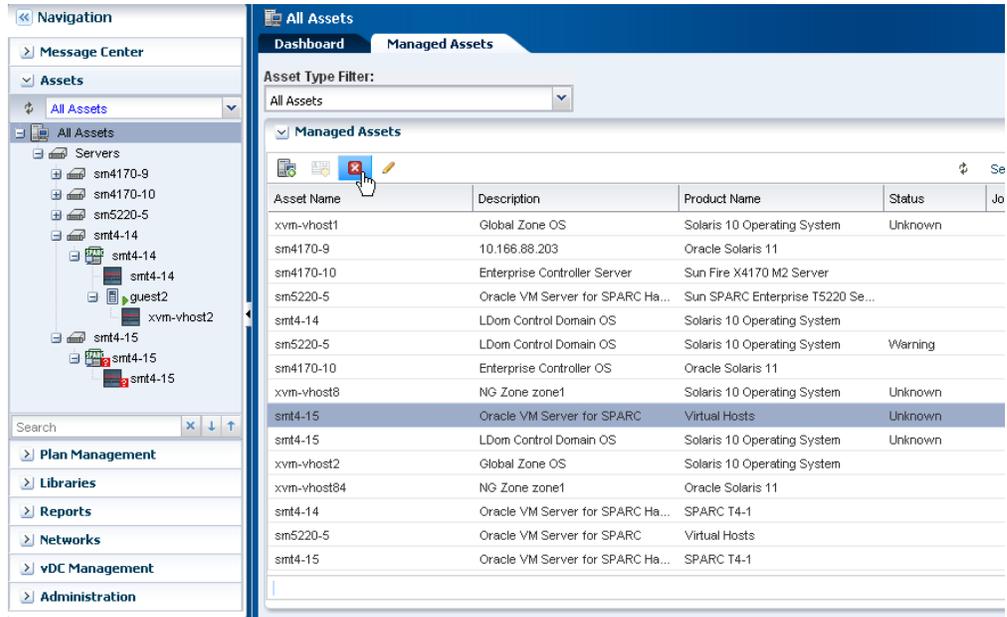
8. Click **Delete** to confirm the delete action.

After the delete asset job completes, the service processor and the control domain disappear from the assets tree.

9. Select the server pool in which the control domain was originally placed. Verify that the logical domain *guest1* appears in the server pool under the Shutdown Guests list.

From the figure, you can see that the logical domain *guest2* which was enabled for automatic recovery was recovered and running in another control domain in the server pool. The logical domain *guest1* is also recovered and available as shutdown guest in the server pool.

What's Next?

Use the option **Start** to start the shutdown logical domain on another Oracle VM Server of the server pool.

You must do the following when you want to re-introduce the repaired Oracle VM Server back into Oracle Enterprise Manager Ops Center:

1. Start the failed server manually.

2. Login to the console of the failed server to verify that logical domains recovered on another control domain in the server pool were started but with their OS not booted to prevent any data corruption.

   Logical domains are started with their OS not booted until the Oracle Enterprise Manager Ops Center Agent Controller starts and verifies for each logical domain if the logical domain was recovered on another server. The Ops Center agent:

   - Removes the logical domains that were recovered on other servers without ever booting its OS since last startup.

   - Boots the OS of the logical domains that were not recovered on other servers.

3. Wait until the agent finished its startup on the control domain.

   You can wait until the Oracle Solaris command `/usr/bin/svcs -xv` doesn't show anymore the service
   `svc:/application/management/common-agent-container-1:scn-agent` is starting.

4. Discover the control domain in Oracle Enterprise Manager Ops Center selecting the option **Enable Oracle VM for Sparc management**. Refer to *Discovering Existing Oracle VM Server for SPARC Environments* for more information about the procedure.

5. Add the control domain to the server pool using the **Add Oracle VM Servers** action. Refer to *Exploring your Server Pools* for an example on adding an Oracle VM Server.

Related Articles and Resources

See the following guides for more information:

- *Oracle Enterprise Manager Ops Center Feature Reference Guide* for information about logical domains and server pools.

- *Oracle Enterprise Manager Ops Center Administration Guide* for information about user roles and permissions.

For more end-to-end examples, see the workflows and how to documentation in the Operate How To library at http://docs.oracle.com/cd/E40871_01/nav/operatehowto.htm.

For more information, see the Oracle Enterprise Manager Ops Center Documentation Library at http://docs.oracle.com/cd/E40871_01/index.htm.

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