Oracle® Enterprise Manager Ops Center

Discover an Oracle ZFS Storage Appliance and Configure Storage Libraries

12c Release 3

This guide provides an end-to-end example of how to configure and discover an Oracle ZFS Storage Appliance with Oracle Enterprise Manager Ops Center and to create a dynamic storage library.

Introduction

A virtualization host such as a global zone or a control domain relies on a storage library to store all the metadata for the virtualization hosts' virtual hosts, as well as the data that is the output of their operations. A storage library can use block storage or file system storage. Block storage is backed by Fibre Channel disks or iSCSI disks in the form of Logical Units or LUNs. The Oracle ZFS Storage Appliance family of products is unified storage, that is, it is capable of both file system storage and block storage. See Related Articles and Resources for links to information and articles about other types of storage libraries.

In this document, a standalone ZFS storage appliance which uses both block storage backed by iSCSI LUNs and NFS storage (optional) is discovered. In the storage appliance's UI, configure the iSCSI targets and optionally configure a dedicated user (a dedicated user needs to be defined only if the root user of the appliance cannot be used). In the Oracle Enterprise Manager Ops Center's UI, specify the discovery profile to discover the iSCSI objects, which results in a dynamic storage library. When you complete these procedures, the dynamic storage library is ready to be associated with a server pool. You can then use Oracle Enterprise Manager Ops Center to create, resize, delete, and clone LUNs.

What You Will Need

Requirements for completing the discovery and configuration procedures in Oracle Enterprise Manager Ops Center.

You will need the following to set up and use a dynamic block storage library:

- On the Proxy Controller, Port 215 must be open for the SSH protocol.

- The IP address of the storage appliance

- The role of Storage Admin

- The role of Security Admin to create a new account or the `root` user account. This account is used to discover the storage appliance and to manage it after discovery.

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- An unmanaged Oracle ZFS Storage Appliance connected to a managed network and with the latest patch level installed.

Tasks for Setting Up a Storage Library on an Oracle ZFS Storage Appliance

Lists the procedures that must be completed to use the storage provided by Oracle ZFS storage appliances in Oracle Enterprise Manager Ops Center.

The tasks for setting up a dynamic storage library on an Oracle ZFS Storage Appliance are done on both the storage appliance itself and in Oracle Enterprise Manager Ops Center.

From the Oracle ZFS Storage Appliance's User Interface

1. Configure iSCSI Targets

2. Verify an Account for Oracle Enterprise Manager Ops Center

From Oracle Enterprise Manager Ops Center

1. Create a Discovery Profile

2. Discover the Oracle ZFS Storage Appliance

Discovering a Clustered ZFS Storage Appliance

Description on how to discover a clustered ZFS Storage Appliance

When the ZFS Storage appliance is in a cluster configuration, the same procedure described for a standalone appliance (that will be detailed in the next chapter) will be executed for each active head.

Note:

The Oracle ZFS storage appliances are available in a cluster configuration, in which two storage controllers, or heads, use storage and network resources to provide services. In an active-active cluster, both heads are active. In an active-passive cluster, one head is active. In both cases, if a head fails, the other head takes control of all known resources and provides the services associated with those resources. Starting in Release 12.3.1.0, Oracle Enterprise Manager Ops Center supports an active-active configuration. Previous releases support an active-passive configuration.

- In an active-passive configuration

  - Define an iSCSI target group for the active head.

  - Execute the same discovery as for a standalone appliance against the active head (specifying the iSCSI target).

  - Execute a new discovery for the passive head. For the passive head discovery the iSCSI and NFS targets will be unchecked since the head is passive and does not provide iSCSI and NFS services at the discovery time.

–   The two heads that were discovered will automatically detect that they are part of the same active-passive cluster.

*   In an active-active configuration

    –   Define one iSCSI target group for each of the active heads (performed on the appliance)

    –   Execute the same discovery as for a standalone appliance against each of the active heads (specifying the corresponding iSCSI target for each head). So this is like discovering two standalone ZFS storage appliances.

    –   The two heads that were discovered will automatically detect that they are part of the same active-active cluster

Configure the Oracle ZFS Storage Appliance

Description of Oracle ZFS Storage Appliance user interface.

These procedures specify access to LUNs using the iSCSI protocol to create iSCSI targets and target groups. The procedures are performed on the Oracle ZFS Storage Appliance through its user interface. See the Oracle ZFS Storage Appliance's on-line help for current and specific configuration procedures.

Note:

The user interface of the Oracle Sun 7-series storage appliance is different from the user interface of the Oracle ZS3-series or ZS4–series storage appliance but the attributes and values have not changed. This document shows the UI of the Oracle ZS3-4 storage appliance.

Configure iSCSI Targets

Procedure for setting up storage according to iSCSI protocol in the Oracle ZFS Storage Appliance.

These instructions expose iSCSI LUNs as iSCSI targets of the storage appliance.

1. Log into the Oracle ZFS Storage Appliance.

2. Select the **Configuration** tab to display the default subtab, **Service**s.

3. In the **Data Services** section, verify that the iSCSI service is online.

4. Click **iSCSI** to display the service's details. Verify that the iSNS and Radius services are disabled. Click **Back to Services**.

5. In the **System Settings** section, verify that the **Phone Home** service is online. If it is not, this service might require registration or restart or both.

6. Click **SAN** and then the **iSCSI** subtab.

7. Click the **Add** icon, shown in the figure, to create a target with the following attributes:

- Target IQN: Auto-assign

- Alias: a name for the target. Throughout this document, the alias is `OC-iSCSI-Target`.

- Initiator authentication mode: None

- You can use CHAP credentials. If you add this option, include these credentials when you create the discovery profile.

- Network interfaces: Select a network interface from the list of available interfaces.

Note:

To configure a new network interface, select **Configuration** and then **Network**. Click the **Add** icon in the Interfaces section to specify a new network interface.

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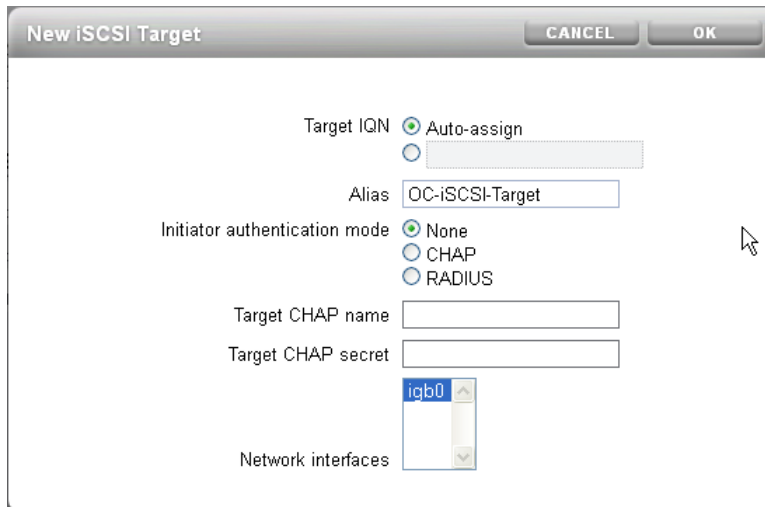
8. To create the new target group, highlight the new target, in this case `OC-iSCSI-Target`, to show the **Move** icon, drag it to the Target Group table, and drop it in the area at the (+) icon.
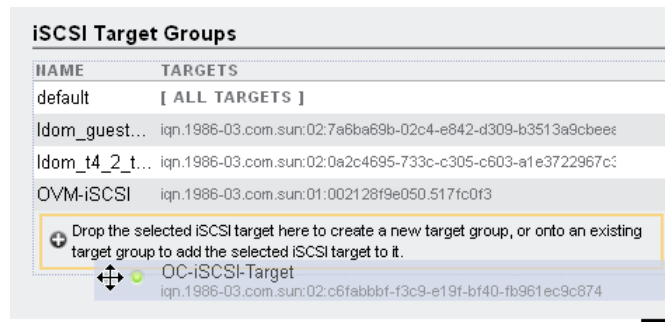
9. Click the **Edit** icon, shown in the figure, and rename the new group. This example renames the group to `OC-iSCSI`.
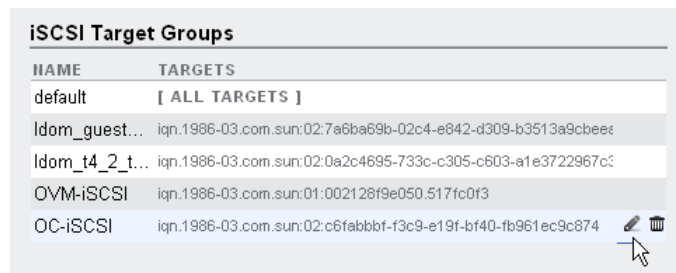
You must provide the names of the target group and target in the discovery procedure.

Verify an Account for Oracle Enterprise Manager Ops Center

Procedure for setting up an account on the Oracle ZFS Storage Appliance.

When you create the discovery profile, you provide Storage Administration credentials. This username and password are used to log into the storage appliance during discovery and, after discovery, to monitor the storage appliance. It is recommended to use the storage appliance's `root` account. If this is not possible, you can use a different account.

If you choose to use an account that is not the root account, verify the account's access and privilege as described in this section. If you choose to use the root account, you can skip this procedure.

Verify that the user account used for discovery and management has the following characteristics:

1. Log into the Oracle ZFS Storage Appliance.

2. Click **Configuration** and then **Users**.

3. Locate the user you intend to use and verify that the user's role has the following privileges.

4. Hover the cursor on the role, to display a set of icons. Click the **Edit Entry** icon to display the account details.

5. In the **Scope** drop-down list, select **Workflow**.

6. Verify that the **modify** and **read** options are selected.

	Scope	Workflow	
	Owner	*	
	Name	*	

☐ 2 Total	
☑ modify	Delete workflow
☑ read	Execute workflow

7. In the **Scope** drop-down list, select **System**.

8. Verify that the **powerOff** option is selected. This allows an Oracle Enterprise Manager Ops Center user with the appropriate role to power off the storage appliance remotely.

	Scope	System	
	Appliance name	*	

☐ 5 Total	
☐ factoryReset	Restore the appliance to factory defaults
☑ powerOff	Power down the appliance
☐ reboot	Reboot the appliance
☐ setName	Modify the appliance name
☐ shell	Access the underlying Solaris shell

9. In the Scope drop-down list, select **Alerts**.

10. Verify that the **Configure alert filters and thresholds** option is selected. This allows an Oracle Enterprise Manager Ops Center user with the appropriate role to set up the monitoring feature.

	Scope	Alerts	
☐ 1 Total			
☑ configure	Configure alert filters and thresholds		

11. In the Scope drop-down list, select **Services**.

12. In the Services drop-down list, select **SNMP**.
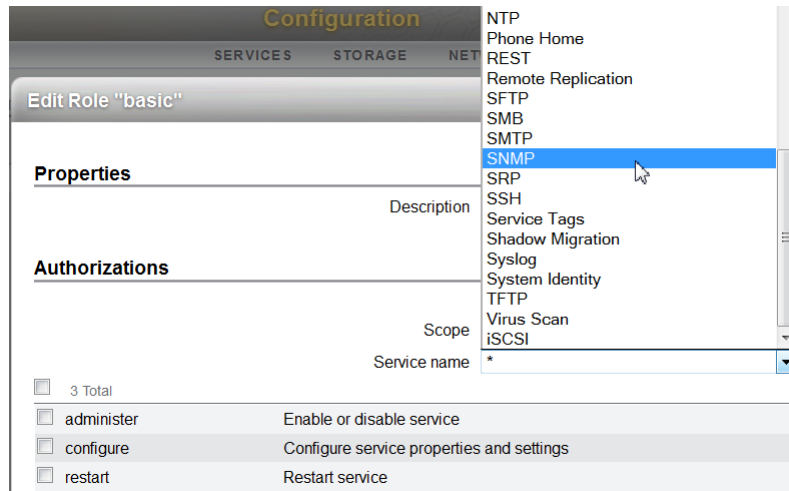
13. Verify that the **administer**, **configure**, and **restart** options are selected.
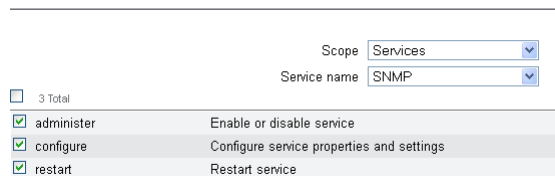
14. In the Services drop-down list, select **REST**.

15. Verify that the **administer**, **configure**, and **restart** options are selected.

16. If you made any changes, click **Apply**.

17. Log out of the appliance.

Manage the Oracle ZFS Storage Appliance

Lists the procedures used to discover an Oracle ZFS storage appliance.

Now that the Oracle ZFS Storage Appliance has been configured, use Oracle Enterprise Manager Ops Center to discover and manage it. You will provide the head's management address and port and information the iSCSI storage that is available from this head: the iSCSI target group.

- Create a Discovery Profile

- Discover the Oracle ZFS Storage Appliance

Create a Discovery Profile

Procedure for creating a profile that discovers an Oracle ZFS Storage Appliance.

Use this procedure to create a discovery profile. You can also create a discovery profile by selecting the **Add Assets** action.

1. Expand **Plan Management** in the Navigation pane.

2. In the Profiles and Policies section, click **Discovery.**

3. Click **Create Profile** in the Actions pane.

4. Enter a name for the discovery profile.

5. For Asset Type, expand the Storage section and select **Sun ZFS Storage Appliance**. Click **Next**.

6. (Optional) The Tags step of the wizard provides a way to add information for semantic tags. All assets discovered by this profile have the same tags. Click **Next**.

7. In the Targets step, select the **iSCSI** option. In the iSCSI storage IP field, enter the IP address of the storage appliance. You can accept the default ports.

8. To use the REST driver, select the **RESTful/SSH Ops Center driver** option to enable the Target Name and Target Group fields. Enter the names that you configured on the Oracle ZFS Storage Appliance in Configure iSCSI Targets:

   a. Enter the name of the target, in this case `OC-ISCSI-Target`, in the Target Name field.

   b. Enter the name of the target group, in this case `OC-iSCSI`, in the Target Group field.

9. (Optional) To include the storage appliance's exported NFS shares in the discovery, select **NFS** and provide the IP address and port.

Note:

Note that the driver is set separately for iSCSI and NFS. If you select to work with the RESTful driver, which is the recommended option, make sure to select this option in the NFS part as well

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10. Oracle Enterprise Manager Ops Center gets access to the storage appliance using the Storage Administration credentials. In addition, you have the option to use CHAP credentials. In this example, we are creating a new discovery profile so create new credentials for the user account you reviewed in Verify an Account for Oracle Enterprise Manager Ops Center. The following example configures credentials for both Storage Administration and CHAP.

11. a. For Storage Administration credentials, click **New**.

b. For Name and Description, enter text to describe the purpose of these credentials.

c. For Admin User, enter the storage appliance's root username, or the user account that was verified in "Verify an Account for Oracle Enterprise Manager Ops Center".

d. For Admin Password, enter the password of the account you verified or the root password.

e. For Confirm Admin Password, enter the password again.

f. Click **Create** to complete the new credentials. These credentials will be available when you use this profile in a deployment plan.

12. (Optional) To create challenge-handshake authentication protocol (CHAP) credentials, choose **CHAP** as the protocol and then click **New**.

This is only required if CHAP authentication was configured on the storage appliance.

> **a.** For Name and Description, enter text to describe the purpose of these credentials.
>
> **b.** For CHAP User, enter the CHAP username that you configured on the storage appliance.
>
> **c.** For CHAP Secret, enter the CHAP password.
>
> **d.** For Confirm CHAP Secret, enter the password again.
>
> **e.** Click **Create** to complete the new credentials. These credentials will be available when you use this profile in a deployment plan.

13. Review the summary and click **Finish** to create the discovery profile.

Discover the Oracle ZFS Storage Appliance

Procedure for discovering an Oracle ZFS storage appliance using a discovery profile in Oracle Enterprise Manager Ops Center.

The discovery profile locates the Oracle ZFS Storage Appliance on the network, retrieves its configuration information, and makes it a managed asset.

1. Expand **All Assets** in the navigation pane.

2. Click **Add Assets** in the Actions pane.

3. Select the option, **Add and Manage Various Types of Assets via Discovery Probes**.

4. Select the new discovery profile.

5. To direct the discovery probe, enter the IP address of the storage appliance.

6. For Network, select **Automatic** to direct the discovery probe to identify the Proxy Controller closest to the storage appliance.

7. The credentials you specified in the discovery profile will be used to discover the storage appliance. The option to change or create credentials is displayed so that when you use the plan in the future for different appliances, you can change the credentials.

8. Click **Add Now** to submit the discovery job.

When the discovery job is completed, Enterprise Manager Ops Center displays the Oracle ZFS Storage Appliance in the Storage section of the Assets tree. The LUNs allocated to the iSCSI target in the storage appliance are now available for a new storage library. Because you discovered the storage appliance's iSCSI targets, a dynamic block storage library is created automatically.
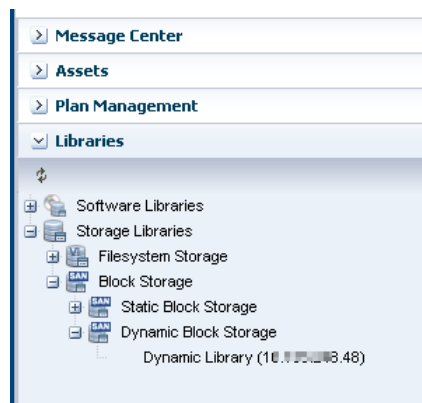
What's Next

Description of the status of storage in Oracle Enterprise Manager Ops Center when the procedures are completed.

The new storage library is not associated with any server pool or virtualization host. Select a server pool or virtualization host and then use the **Associate Libraries** action.

Related Articles and Resources

See the following for more information:

- `Manage Assets` and `Configure Storage` in *Oracle Enterprise Manager Configuration Reference* for information about discovery procedures for different types of servers.

- `Hardware` in *Oracle Enterprise Manager Operation Reference Guide* for information about managing and monitoring hardware assets.

See the `Deploy Storage Workflow` in the Deploy How To library at http:// docs.oracle.com/cd/E59957_01/nav/deploy.htm for storage examples.

To view the storage appliance's *Administration Guide,* log in to the Unified Storage System software interface and click Help in the top right corner of any screen. You can also access this guide at the host name or IP address of the storage system:

- `https://`*`hostname`*`:215/wiki`

- `https://`*`ipaddress`*`:215/wiki`

See the Oracle ZFS Storage Appliance Software product information page at http://www.oracle.com/technetwork/documentation/oracle-unified-ss-193371.html?ssSourceSiteId=ocomen for links to more information.