

Oracle® Enterprise Manager Ops Center

Discover an Oracle ZFS Storage Appliance and Configure Storage Libraries

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

Introduction

A virtualization host such as a global zone or a control domain relies on a storage library. The storage library stores all the metadata for the virtualization hosts' virtual hosts, as well as the data that is the output of their operations. In most cases, virtualization hosts are in a server pool, so each virtualization host uses the storage library associated with the server pool.

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. In this document, the Oracle ZFS Storage Appliance is used for block storage.

Oracle Enterprise Manager Ops Center manages block storage as either a static library or a dynamic library. Dynamic block storage libraries support users and applications with storage demands that change quickly. Static block storage libraries support users and applications that have predictable requirements for storage capacity. The type of library that Oracle Enterprise Manager Ops Center creates depends on the type of storage server and the way the storage server is discovered.

- When Oracle Enterprise Manager Ops Center is directed to discover an Oracle ZFS Storage Appliance using iSCSI or NFS protocols, the result is a dynamic storage library. Oracle Enterprise Manager Ops Center can create, resize, delete, and clone LUNs. By default, the discovery profile for an Oracle ZFS Storage Appliance enables the options to discover iSCSI and NFS objects.
- When Oracle Enterprise Manager Ops Center discovers a storage device that does not use iSCSI or NFS protocols or when the options for iSCSI or NFS protocols have been disabled in the Oracle ZFS Storage appliance discovery profile, the result is a static storage library. Oracle Enterprise Manager Ops Center creates the library from information it retrieves from the operating system of the storage server. In this case, Oracle Enterprise Manager Ops Center can use the LUNs but cannot change a LUN, delete a LUN, or create a new LUN. These actions must be done through the storage device's user interface.

In this document, Oracle Enterprise Manager Ops Center discovers an Oracle ZFS Storage Appliance, which results in a dynamic storage library. When you complete these procedures, the storage library is ready to be associated with a server pool.

See [Related Articles and Resources](#) for links to related information and articles about other types of storage libraries.

What You Will Need

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.
- An unmanaged Oracle ZFS Storage Appliance connected to a managed network and with the latest patch level installed
- The IP address of the storage appliance
- The role of Storage Admin
- The role of Security Admin if you need to create new credentials
- The root user account to log into the storage appliance

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

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 LUNs](#)
2. [Create 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](#)

Configure the Oracle ZFS Storage Appliance

These procedures specify the type of LUN, the access to the LUN, and the path to the LUN, using the Fibre Channel and iSCSI protocols. The Fibre Channel protocol requires specialized underlying transport media. The iSCSI protocol works over standard Ethernet or InfiniBand (IPoIB). These procedures are performed on the Oracle ZFS Storage Appliance and use its UI.

See the *Sun ZFS Storage Appliance Administration Guide* or the Oracle ZFS Storage Appliance's on-line help for current and specific configuration procedures. The following procedures are examples of the varied ways to configure the Oracle ZFS Storage Appliance.

Configure LUNs

These instructions configure the Oracle ZFS Storage Appliance to expose LUNs using Fibre Channel and iSCSI protocols. If you prefer, you can configure the appliance to expose the LUNs over only the iSCSI protocol. To use Fibre Channel, the appliance

must have a Fibre Channel HBA card. To verify that the appliance has this card, select Maintenance and then Hardware. In the primary chassis, select Details and then Slots.

Configure Fibre Channel Ports

You must identify the ports through which the LUNs can be reached. These are called target ports. By default, all the ports are initiator ports. Change at least one port from an initiator port to a target port. Then create a target group and include the target ports in the target group.

Another way to protect access to LUNs is to specify which initiators can write to the LUN. Although the new storage library will be using the LUNs, the library has not yet been created and the Oracle ZFS Storage Appliance has not yet been discovered by Oracle Enterprise Manager Ops Center so these entities cannot be included in the Initiators list.

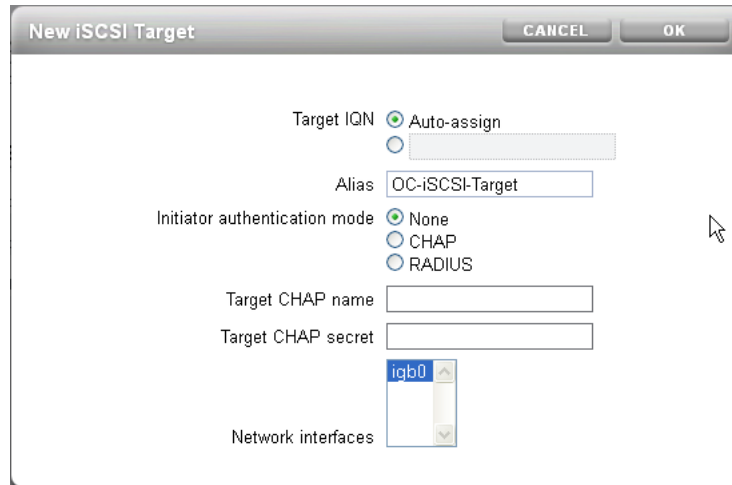
1. Log into the Oracle ZFS Storage Appliance.
2. Select **Configuration** and then select **SAN**.
3. Click the **Fibre Channel Ports** tab, if it is not selected.
4. Select at least one port and change its role from Initiator to Target.
5. Reboot the storage appliance.
6. (Optional) Each port is identified by its WWN. To create an alternate name, select Configuration, then SAN, and then click the "i" icon to see Port Details. In the Alias field, enter a name for the port, for example a combination of host name and port number.
7. To create a new target group, select the port, drag it to the Target Group table, and drop it at the (+) icon. Click the Edit icon to name the new group. Drag more target ports to the group. Make a note of all the target groups you create because you will provide the names in the discovery procedure.

Configure iSCSI Targets

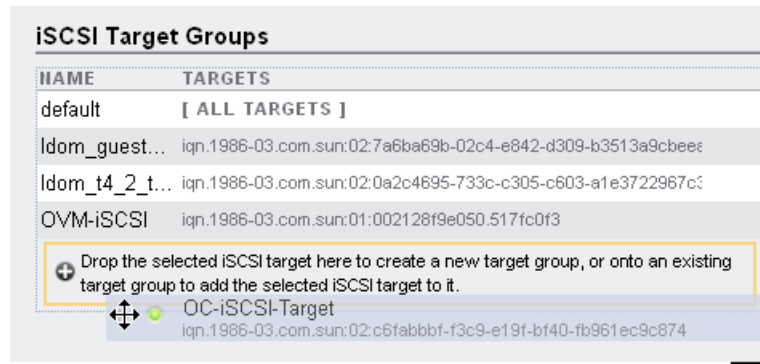
1. Log into the Oracle ZFS Storage Appliance.
2. Select **Configuration** and then **Services** to verify that the iSCSI service is Online. Click the iSCSI service details to verify that the iSNS and Radius services are disabled.
3. Select **Configuration** and then select **SAN**.
4. Click the **Targets** tab and then **iSCSI Targets**.

5. Click the **Add** icon to create a target with the following attributes:

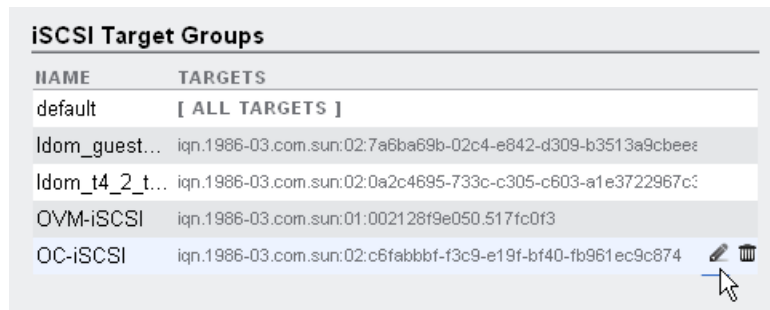
- Target IQN: Auto-assign
- Alias: OC-iSCSI-Target
- Initiator authentication mode: None
- Network interfaces: Select an IP address to use for the iSCSI transactions. To configure a network interface, you can select **Configuration** and then **Network**. The Interfaces section shows available interfaces.



6. To create a new target group, select the new target, drag it to the Target Group table, and drop it at the (+) icon.



7. Click the **Edit** icon to rename the new group to OC-iSCSI



You will provide the name of the target group and target in the discovery procedure.

Create an Account for Oracle Enterprise Manager Ops Center

Oracle Enterprise Manager Ops Center must be able to log into the Oracle ZFS Storage Appliance. Create a user account on the appliance with the following characteristics, as shown in the figure:

1. Log into the Oracle ZFS Storage Appliance.
2. Click **Configuration** and then **Users**.
3. Click the **Add** icon to create a user account.
4. Enter the name of the account: `ocuser`
5. Clear the **Require Annotation** option.
6. Clear the **Kiosk user** option.
7. In the Role tab, select the **basic Administration** role.

The completed window is shown in the following figure:

Add User [CANCEL] [ADD]

Properties

Type Directory
 Local Only

Username

Full Name

Password

Confirm

Require session annotation

Kiosk user

Kiosk screen

Roles | **Exceptions**

1 Total

NAME ^	DESCRIPTION
<input checked="" type="checkbox"/> basic	Basic administration

8. Click the **Exceptions** tab.
9. In the **Scope** drop-down list, select **Workflow**.
10. Select the **modify** and **read** options.
11. In the **Scope** drop-down list, select **System**.
12. Click the **powerOff** option so that an Oracle Enterprise Manager Ops Center user with the appropriate role can power off the storage appliance remotely.

Roles : Exceptions

Scope

Appliance name

5 Total

<input type="checkbox"/>	factoryReset	Restore the appliance to factory defaults
<input checked="" type="checkbox"/>	powerOff	Power down the appliance
<input type="checkbox"/>	reboot	Reboot the appliance
<input type="checkbox"/>	setName	Modify the appliance name
<input type="checkbox"/>	shell	Access the underlying Solaris shell

- In the Scope drop-down list, select **Alerts**.
- Click the **Configure alert filters and thresholds** option so that an Oracle Enterprise Manager Ops Center user with the appropriate role can set up the monitoring feature.

Roles : Exceptions

Scope

1 Total

<input checked="" type="checkbox"/>	configure	Configure alert filters and thresholds
-------------------------------------	-----------	--

- In the Scope drop-down list, select **Services**.
- In the Services drop-down list, select **SNMP**.
- Click the **administer**, **configure**, and **restart** options.

Roles : Exceptions

Scope

Service name

3 Total

<input checked="" type="checkbox"/>	administer	Enable or disable service
<input checked="" type="checkbox"/>	configure	Configure service properties and settings
<input checked="" type="checkbox"/>	restart	Restart service

- In the Services drop-down list, select **Phone Home**.
- Click the **administer** option so that an Oracle Enterprise Manager Ops Center user with the appropriate role can use the Enable Appliance Phone Home or Disable Appliance Phone Home actions.

Scope

Service name

3 Total

<input checked="" type="checkbox"/>	administer	Enable or disable service
<input type="checkbox"/>	configure	Configure service properties and settings
<input type="checkbox"/>	restart	Restart service

20. In the title bar of the Add User window, click **Add** to create the user account.
21. Log out of the appliance.

Manage the 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.

Create a Discovery Profile

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.

Identify Profile * Indicates Required Field

* Name:

Description:

Asset Type:

- Operating Systems
- Server Hardware
- Oracle Engineered Systems
- Oracle VM
- Storage
 - Sun ZFS Storage Appliance
 - ISCSI Storage
 - SAN Storage
 - File Server Storage
 - Exadata Storage Server
- Networking
- Datacenter Infrastructure
- Cluster Products

4. Enter a name for the discovery profile.
5. For Asset Type, expand the Storage section and select **Oracle 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, both the NFS and iSCSI targets are enabled. In the Access Host field, enter the IP address of the storage appliance. You can accept the default ports.
8. In the Plugin Specific Information field, enter the names of the target group and target that you configured on the Oracle ZFS Storage Appliance in [Configure iSCSI Targets](#).

Targets * Indicates Required Field

Targets must be associated with existing managed networks in Ops Center in order to route the discovery to the appropriate Proxy Controller. Only networks associated with Proxies are shown. You may create a new managed network or modify existing network/proxy associations. If specified, the hostname of the storage asset must be resolvable on the network selected. If automatic is selected the system will attempt to route the job to the most appropriate Proxy Controller.

iSCSI

* **Access Host:** 192.168.10.10

* **Access Port:** 3260

Plugin Specific Information: OC-iSCSI, OC-iSCSI-Target

Comma separated names of OVM target group and target previously configured on the storage appliance. Example: OVM-iSCSI, OVM-iSCSI-Target

NFS

* **Access Host:** 192.168.10.10

* **Access Port:** 2049

9. Oracle Enterprise Manager Ops Center probes targets using the credentials you provide. A storage server uses one of several types of credentials, but Oracle Enterprise Manager Ops Center handles all types as “Storage Administration” credentials. However, for iSCSI LUNs, you must provide CHAPS credentials.

Discovery Credentials

Optionally specify the discovery and/or management credential sets for each protocol. These credentials are used to probe the assets.

Discovery

Storage Administration: [New] [Select] [Clear]

CHAP: [New] [Select] [Clear]

If credentials have been created for this appliance, click **Select** to choose one or, if you have the Security Admin role, click **New** to create a new set. Because this document configures iSCSI LUNs, specify credentials for both Storage Administration and CHAP.

10. For Storage Administration, click **New**.

- a. For Name and Description, identify the storage server.
 - b. For Admin User, enter the username of the account that administers the storage server.
 - c. For Admin Password, enter the password of the account that administers the storage server.
 - d. For Confirm Admin Password, enter the password again.
11. To create challenge-handshake authentication protocol (CHAP) credentials, choose **CHAP** as the protocol and then click **New**.

- a. For Name and Description, identify the storage server.
 - b. For CHAP User, enter the CHAP username.
 - c. For CHAP Secret, enter the CHAP password.
 - d. For Confirm CHAP Secret, enter the password again.
12. 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

Use the discovery profile to find the Oracle ZFS Storage Appliance on the network, retrieve its configuration information, and make 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.

The screenshot shows the 'Discovery Profile - MySS7K' configuration window. At the top, there is a table listing existing discovery profiles:

Profile Name	Asset Type	Last Run
MySS7K	Sun ZFS Storage Appliance	10/15/2012 10:01:56 am M
Sample Solaris Discover...	Solaris, Linux OS	10/04/2012 11:56:15 pm M
discovery test	Solaris, Linux OS	10/05/2012 4:37:11 pm M

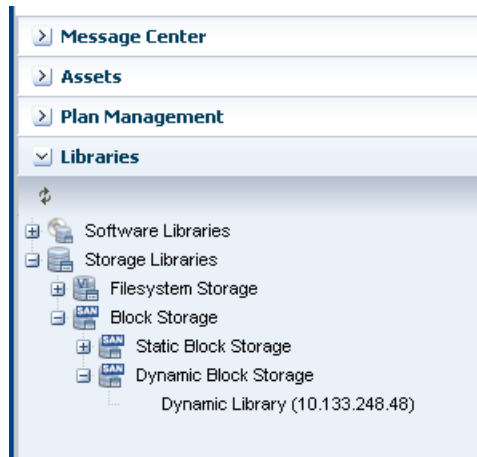
Below the table, there is a text block explaining the configuration requirements: 'Specify the hostname of the storage asset that will be added. Targets must be associated with existing managed networks in Ops Center in order to route the discovery to the appropriate Proxy Controller. Only networks associated with Proxies are shown. You may create a new managed network or modify existing network/proxy associations. If specified, the hostname of the storage asset must be resolvable on the network selected. If automatic is selected the system will attempt to route the job to the most appropriate Proxy Controller.'

The configuration fields include:

- Hostnames/IP Addresses:** A text input field.
- Network:** A dropdown menu currently set to 'Automatic'.
- Credentials:** A section with a dropdown arrow and a text box containing the following text: 'The following are credentials populated from the selected profile. You may change these values for the Add Assets job about to be run; the original profile will remain unchanged.'
- Discovery:** A section with two rows of credentials:
 - Storage Administration : zfs_creds_stadm (with New, Select, Clear buttons)
 - CHAP : zfs_creds_chap (with New, Select, Clear buttons)

5. To direct the discovery probe, enter the hostname of the storage appliance or its IP address.
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 are 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, Oracle Enterprise Manager Ops Center displays the Oracle ZFS Storage Appliance in the Storage section of the Assets tree. The LUNs defined 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

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

The following chapters in the *Oracle Enterprise Manager Ops Center Feature Reference Guide* contain more information:

- Hardware
- Storage

See the *Deploy Storage Workflow* in the Deploy How To library at http://docs.oracle.com/cd/E40871_01/nav/deployhowto.htm for storage examples.

To view the *Sun ZFS Storage System 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.

Documentation Accessibility

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