Oracle® Database Appliance Oracle® Database Appliance Simulator Labs





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Simulator Labs for Oracle Database Appliance - Release 19.16



Preface

This document provides instructions for Oracle Database Appliance simulator labs. Additionally, this document provides you with practices for key new features.

Audience

Read Oracle Database Appliance Release Notes if you want to learn about features, options, and enhancements that are new in Oracle Database Appliance release 19.16.

Documentation Accessibility

For information about Oracle's commitment to accessibility, visit the Oracle Accessibility Program website at https://www.oracle.com/pls/topic/lookup?ctx=acc&id=docacc.

Access to Oracle Support

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Related Documents

For more information, see the following documents in the Oracle Database Appliance documentation set:

- Oracle Database Appliance Deployment and User's Guide
- Oracle Database Appliance Frequently Asked Questions
- Oracle Database Licensing Information User Manual
- Oracle Database Security Guide

Conventions

The following text conventions are used in this document:



Convention	Meaning	
boldface	Boldface type indicates graphical user interface elements associated with an action, or terms defined in text or the glossary.	
italic	Italic type indicates book titles, emphasis, or placeholder variables for which you supply particular values.	
monospace	Monospace type indicates commands within a paragraph, URLs, code in examples, text that appears on the screen, or text that you enter.	



Setting Up the Oracle Database Appliance Simulator

- About the Simulator
- Accessing the ODA Simulator
- Prerequisites for Setting up the Simulator
- Installing the Simulator
- Creating a Restore Point or Snapshot for the Oracle Database Simulator
- BUI Agent Certificate Issue
- Restarting ODA Simulator in a Container



About the Simulator

Overview

The Oracle Database Appliance X8-2 simulator application is a container-base simulator on Oracle Cloud Infrastructure (OCI) that simulates the operation of an Oracle Database Appliance X8-2 single-node or highavailability (2 nodes) system. You must have an OCI account to run the Oracle Database Appliance simulator. When you launch the Oracle Database Appliance simulator on the OCI Marketplace, a simulator VM is started in your tenancy. If you use the **Always Free OCI account**, due to the 1GB memory limitation, it is recommended that you set up the simulator with the single-node option.

Following are the steps to set up the simulator environment so that you can run the Oracle Database Appliance hands-on labs to learn how to deploy, patch, and manage an Oracle Database Appliance.



Accessing the ODA Simulator

For CLI access, connect by SSH to the simulator VM, connect by sudo to root, and connect to the container, for example, odasim-1. No password is required.

./connectContainer.sh -n odasim-1

For a high-availability system, you can access the second node or container, for example, oda-1-node1.

./connectContainer.sh -n oda-1-node1

For BUI access, use the VM IP address and port number, for example, 7095, 7097.

https://server_IP:xxxx/mgmt/index.html



Prerequisites for Setting up the Simulator

Requirements

- You must have an OCI account and credentials.
- You must also have the VM IP address to access the simulator VM and setup the environment for the Oracle Database Appliance hands-on labs.

Create a Key with PuTTYgen

If you use Putty to create a key, you must create a key with PuTTYgen:

- 1. Generate key of type RSA.
- 2. Save the private key.
- 3. Under **Public key for pasting into OpenSSH authorized_keys file:**, copy all contents in the box and paste into a text file and save as a .pub file. This is the key you use when you setup the Oracle Database Appliance simulator instance.

Important! You must configure network security rules first to access Oracle Database Appliance BUI.

Configure Network Security Rules

- 1. Open your OCI application VM and click on your VCN link above Virtual Cloud Network.
- Click Security Lists in the left panel and click on the Default Security List for your_vcn in the middle of the screen.
- 3. Click Add Ingress Rules and fill in following information:

```
SOURCE TYPE :CIDR
SOURCE CIDR : 0.0.0.0/0
IP PROTOCOL : TCP
```

- 4. Click Add Ingress Rule.
- 5. Similarly add egress rule for outgoing traffic, if not already added.



Installing the Simulator

Docker is installed in the Simulator VM by default.

Log into the simulator VM:

```
ssh -i key opc@IP address
```

(OCI public IP address)

Switch to root user:

\$sudo -s

Navigate to the simulator directory, where 19.xx.0.0.0 is the release number.

cd simulator_19.xx.0.0.0

Run the following command to make sure that the docker is running:

docker ps

You may see a default container running already, for example, oda-1. If that is the case, then you are set up to connect to the container to run the ODACLI commands already. Run the following command:

./connectContainer.sh -n odasim-1

No password is required for an OCI VM. Note that if you run the simulator on a Mac system, then use the Mac password to login.

To access the Oracle Database Appliance simulator through GUI or Browser User Interface (BUI):

Ensure that you have access to the port number assigned to the container.

Go to the simulator log directory.



//log

Run the cat command for the most recent log file.

```
cat
ODA Simulator system info:
Executed on: 2021_06_14_06_33_PM
Executed by:
num= 1
dept= oda
hostpubip=
USERS:
Container : oda-1
ODA Console: https://ip_of_simulator_machine :7095/mgmt/index.html
ODA cli access: Connect to the host and run following command:
sh connectContainer.sh -n oda-1
```

Note the port number, for example, 7095.

Following are optional steps for manually managing the containers.

Note that if you are running the simulator standalone in a Linux or Mac system, then you must run the following steps.

Run the following command to make sure the docker is running and to view which containers are running:

#docker ps

If you see any unwanted container running, run the cleanup script to start fresh:

#./cleanup_odasimulator_sw.sh

Run the simulator setup script:

./setup_odasimulator_sw.sh noportainer

For always free OCI account with 1GB memory, it is recommended that you set up the simulator with one user and the single node option.



If a default container is not running, you can manually create a single node container for a user.

./createOdaSimulatorContainer.sh -d oda -t single -o noportainer

A single container called **oda-1** is created.

To view the options, use the following command:

```
# ./createOdaSimulatorContainer.sh -help
```

For standard OCI account with minimum 2GB memory, it is recommended that you set up the simulator with the high-availability option:

./createOdaSimulatorContainer.sh -d oda -t ha -o noportainer

For each Oracle Database Appliance X8-2-HA simulator user, two containers, **oda-1-node0** and **oda-1-node1**, are created.

Ignore any warning messages about Agent or Zookeeper. Ensure that you can connect to the container.

Note the assigned port numbers in the following output. The port numbers are necessary for logging into the simulator Browser User Interface (BUI).

```
ODA Simulator system info:
Executed on: 2021_04_11_03_23_PM
Executed by:
num= 1
dept= oda
hostpubip= ip_of_simulator_machine
USERS:
Container : oda-1-node0
ODA Console: https://ip_of_simulator_machine:7095/mgmt/index.html
ODA cli access: Connect to the host and run following command:
sh connectContainer.sh -n oda-1-node0
Container : oda-1-node1
ODA Console: https://ip_of_simulator_machine:7097/mgmt/index.html
ODA cli access: Connect to the host and run following command:
sh connectContainer.sh -n oda-1-node0
```



After you have completed the labs, you must clean up the environment by deleting the user containers. The following command deletes instances **oda-1-node0** and o**da-1-node1**:

./deleteOdaSimulatorContainer.sh -t ha -i 1 -n 1 -d oda

Clean up your log files from the lab by deleting your logs in the / simulator 19.11.0.0.0/log directory.

To completely reset the lab, run the following command:

./cleanup_odasimulator_sw.sh

This deletes all the containers.



Creating a Restore Point or Snapshot for the Oracle Database Simulator

You can create a restore point or snapshot at the end of a lab and go back to it, so you do not have to restart the lab from the beginning. For example, once you complete Lab 3, you create a restore point at the beginning of Lab 4. During Lab 4, if there is any error, then you can go back to the restore point at the beginning of Lab 4 instead of starting from Lab 1 again.

To create a snapshot, run the following command from the simulator directory:

```
# ./snapshot.sh
Usage: snapshot.sh [-c | -r | -1] [] | -h
Options:
    create [ha|single] Create a new snapshot of the simulator
    restore [ha|single] Restore the simulator to a previous snapshot
    list [ha|single] List all snapshots created with their IDs
    help, -h Display this help and exit
    is mandatory. You only need the name of the environment
    without 'node0' or 'node1' in case the simulator environment is HA
    is either 'ha' or 'single'. Default is 'single'
```

Use this script to create and restore snapshots of the Oracle Database Appliance simulator. This is useful when trying different scenarios or for creating backups.

```
# ./snapshot.sh create oda-1
/scratch/user/simulator_19.12_ade/simulator_19.12.0.0.0/snapshots.dat doesn't ex
ist. Creating a new one...
Snapshot with ID: 1 has been created successfully. Timestamp: Wed Sep 22 14:01:2
4 PDT 2021
# ./snapshot.sh list oda-1
ID CONTAINER NAME DEPLOYMENT TYPE TIMESTAMP
1 oda-1 single Wed Sep 22 14:01:24 PDT 2021
# ./snapshot.sh restore 1 oda-1
Snapshot with ID: 1 has been restored successfully!
```



BUI Agent Certificate Issue

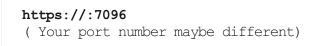
You may encounter a BUI Agent Certificate Issue. See the following example:

https://server IP:7097/mgmt/index.html		
Your assigned port	number maybe different	

You may see a BUI agent security certificate error message:

Applications Places	Firefox	Mon 11	:33	40	ø
	Oracle Database Appliance Appliance - Mozilla Firefox		-	•	×
🚸 Oracle Linux	× 👔 Portainer 🛛 🗙 🌍 Oracle Database Appl	liano 🗙	+		
↔ ∀ ☆	④ ♣ https://localhost:7095/mgmt/index.html ···· ♥	☆	lil/		≡
	There was an error in connecting to the agent. Cause: The agent may not be running or the agent security certificates are not recognized. Check your network connection and refresh your browser. Check that the agent is running and you have accepted the security certificates. OK Comply with your system security requirem After configuring the password, login using new password. Password *	ents.			
paul@localhost:/simulato	or_19.6/log Oracle Database Appliance Applianc				1/4

To fix it, you must add a certificate exception to the BUI agent port, with is your assigned port number -1. In this case, the port number is 7097-1 or 7096.



Go through the certificate exception process and add the exception. Then go back to your assigned port.



https://:7097/mgmt/index.html

Go through the certificate exception process again and add the exception. Then you can access the BUI to create the appliance.



Restarting ODA Simulator in a Container

If the ODACLI commands fails, then check if the Oracle Database simulator is running in the container.

Run the following command to check the status of the simulator:

/opt/oracle/dcs/bin/statusOdaStack.sh

If the simulator is not running, then start the simulator as follows:

/opt/oracle/dcs/bin/startOdaStack.sh



About Oracle Database Appliance Simulator Lab Exercises

- Connecting to the Oracle Database Appliance OCI Lab Environment
- Connecting to the Simulator Using BUI
- Connecting to the Simulator Using ODACLI



Connecting to the Oracle Database Appliance OCI Lab Environment

Overview

The exercises in this guide use a container-based Oracle Database Appliance simulator to perform these labs. Performing deployment and patching on an actual ODA would require you to have your own system, and would take a rather long time. The simulator provides a similar experience, but is faster, and you get your own simulator to complete the labs. The simulator simulates an Oracle Database Appliance X8-2 single node or a high-availability (2-node) database appliance.

If you are using the simulator in the OCI Marketplace with an <bold>Always Free OCI Account</bold>, the memory is limited to 1GB. In this case, set up the simulator with the single-node option due to memory limitation. For more information, refer to the Readme.

Keep in mind this is a simulation. Not all features are supported by the simulator, and no database is actually created and running. Unlike on an actual appliance, the simulator may not display an error if you enter invalid data, and some of the detailed output and screen shots displayed in the command output may not be apply to an actual appliance.

Some command line operations require specifying long UUIDs or file names. Use copy/paste to enter long entries. If you accidentally exit the simulator, simply reconnect to it. It will remember your state.

After the Oracle Database Appliance simulator is set up in the OCI VM, you must log into the Oracle Database Appliance simulator VM with your credentials or key. You can perform the labs in this book with both Command Line Interface (CLI) and a web Browser User Interface (BUI) similar to how you work on an actual Oracle Database Appliance.

Requirements

You need a web browser on your local system to perform the BUI tasks in the labs. Make sure you have the public Oracle Database Appliance simulator VM IP address and the simulator container port number (for example, 7095). Make sure to log in as odaadmin with **Enable Multi-User Access** checked.

You need a console on your local system to connect to the ODA simulator container and switch to odaadmin (su odaadmin) user to run the CLI commands in the labs. Make sure you have the container name (e.g odasim-1). By default, a container called odasim-1 is created.

Firefox and Chrome are the recommended web browsers for this lab.

If you run into BUI agent credential issue, refer to the Troubleshooting section in the Readme document for details.



Connecting to the Simulator Using BUI

Connect to the simulator as follows:

1. Use the OCI VM public IP address and port number to log into ODA BUI and enable Multi-User Access

https://<IP Address>:xxxx/mgmt/index.html (e.g. 7095)

2. You must first complete odacli configure-firstnet and run the odacli update-repository commands in the Lab 1 (using CLI)

Note that if you run into BUI agent credential issue, refer to the Troubleshooting section in the Readme document for details.

Oracle Database Appliance
Configure the user password to comply with your system security requirements. After configuring the password, login using the new password. If multi-user access is enabled, the same credentials are used for the BUI and for system login to run CLI commands. Password * Confirm Password *
Enable Multi-User Access (N/A for DB System) Note: You cannot disable or enable Multi-User Access after you have provisioned the appliance Configure Multi-User Access Settings Submit

Set a new password based on the required rules. For simplicity, you can use a password similar to WELcome12## or come up with your own unique password.

You can then login as odaadmin with the new password.



Oracle Database Appliance
User Name * odaadmin
ODA Password 🚳
•••••
Login Forgot password?

The Appliance page is displayed after you log into Oracle Database Appliance.

ORACLE	Database Appliance	Current User: odaadm	in 🗎 Resources 🔻 Account 🔻	9 Search OD4 Documentation for
		Appliance Database Object Store	Monitoring Security Multi-U	Iser Access Activity Diagnostics
Appliance				Help
Overview				
Compute Instances				
DB Systems				
Network				
CPU Pool				
Oracle ASR				
Patch Manager		Oracle Database Appliance is not configured.		
		Click Create Appliance to get started.		
		Create Appliance		
		Learn More		



Connecting to the Simulator Using ODACLI

Run the following script to connect to the container. This script is usually located in the simulator directory (for example, simulator_19.xx.0.0.0)

To access the default single node simulator (for example, odasim-1), run the following command. You need to switch to the odaadmin user with earlier password you set with the Browser UI to run the CLI commands.

```
# ./connectContainer.sh -n odasim-1
[root@odasim-1 /]# su odaadmin
[odaadmin@odasim-1 /]$
```

Or if you have created a 2-node Oracle Database Appliance (high-availability) simulator, you can access each node independently. To access the first node (nodeO), run the following command.

./connectContainer.sh -n oda-1-node0
[root@oda-1-node0 /]#

To access the second node (node1), run the following command:

```
# ./connectContainer.sh -n oda-1-node1
[root@oda-1-node1 /]#
```

Make sure you have both – a command line window and a web browser open for the lab exercises as some require ODACLI command line input require entries in the web browser (BUI).

Note:



Simulator Labs Overview

The lab exercises use a mix of command line and web-based administration tools. On the BUI, if you encounter any certificate warnings, simply accept them. Note in the output examples below, the text you type is in bold, and the text output in the simulator is not.

Note that some examples in the lab may show steps for a 2-node high-availability simulator, and if you are running a single-node simulator, then you can ignore the information for the second node.

- Lab 1 Deploy Appliance
- Lab 2 Manage Databases
- Lab 3 Patch and Update
- Lab 4 Virtualization: Create Application and Database KVMs
- Lab 5 Multi-User Access
- Lab 6 Monitoring and Resources



Lab 1 - Deploy Appliance

- Step 1 Enable Multi-User Access
- Step 2 Add the Appliance to the Network
- Step 3 Update the Repository with the Oracle Database Appliance Software
- Step 4 Deploy the Appliance
- Step 5 Validate the Deployment
- Step 6 Networking

Step 1 - Enable Multi-User Access

You can deploy the appliance using either the BUI or the command line. The command line is useful for scripted and silent installations. This lab uses the BUI.

After you configure the firstnet and update the repository, log into Oracle Database Appliance BUI using odaad min and the previously-created password (for example, WELcome12##)

```
https://OCI public <IP Address>:xxxx/mgmt/index.html)
```

Multi-User access can only be enabled during initial provisioning of Oracle Database Appliance. Select the **Enable Multi-User Access** checkbox.

Oracle Database Appliance
Configure the user password to comply with your system security requirements. After configuring the password, login using the new password. If multi-user access is enabled, the same credentials are used for the BUI and for system login to run CLI commands. Password * Confirm Password * Confirm Password * Enable Multi-User Access (N/A for DB System) Note: You cannot disable or enable Multi-User Access after you have provisioned the appliance Configure Multi-User Access Settings

Log into BUI:



Oracle Database Appliance
User Name *
odaadmin
ODA Password 🚱
•••••
Login Forgot password?

Step 2 - Add the Appliance to the Network

On an actual appliance, after you first install Oracle Database Appliance into your data center rack, you must configure it to use the IP address your network administrator has assigned it. The easiest way to do this is to first configure ILOM using a network or serial connection. Oracle Database Appliance includes a command oda cli configure-firstnet to make it very easy to get Oracle Database Appliance on the network. Once your appliance is on the network, you can complete the rest of the deployment steps from any networked computer.

Run the network configuration command odacli configure-firstnet at the Linux prompt. Respond to the prompts as in the example below. Since this is a simulation, to configure the network, you can use any IP address (for example, 192.168.0.100) to complete this step.

```
[oracle@xx ~]$ odacli configure-firstnet
bonding interface is:
Using bonding public interface (yes/no) [yes]:
Select the Interface to configure the network on () [btbond1]:
Configure DHCP on btbond1 (yes/no) [no]:
INFO: You have chosen Static configuration
Use VLAN on btbond1 (yes/no) [no]:
Enter the IP address to configure : 192.168.0.100
Enter the Netmask address to configure : 255.255.255.0
Enter the Gateway address to configure[192.168.0.1] :
INFO: Restarting the network
```



```
Shutting down interface :
                                  [ OK ]
Shutting down interface eml:
                                     [ OK ]
                                     [ OK ]
Shutting down interface plp1:
Shutting down interface p1p2:
                                     [ OK ]
Shutting down loopback interface:
                                            [ OK ]
Bringing up loopback interface: [ OK ]
Bringing up interface :
                          [ OK ]
Bringing up interface eml: [ OK ]
Bringing up interface plp1: Determining if ip address 192.168.16.24 is already i
n use for device plpl... [ OK ]
Bringing up interface p1p2: Determining if ip address 192.168.17.24 is already i
n use for device p1p2... [ OK ]
Bringing up interface btbond1: Determining if ip address 192.168.0.100 is alread
y in use for device btbond1...
                                [ OK ]
INFO: Restarting the DCS agent
```

If this is an Oracle Database Appliance X8-2-HA system, you must run the command odac li configure-firstnet on the second node (node-1). Log into node-1 and run the command odacli configure-firstnet again. You can use 192.168.0.101 for the IP address for node-1.

Step 3 - Update the Repository with the Oracle Database Appliance Software

When you receive your Oracle Database Appliance, you must download the Oracle software prior to deployment from My Oracle Support. Refer to the *Oracle Database Appliance Release Notes* for the latest Oracle Database Appliance release, for details about the patches to download. Specifically, you must download the Oracle Grid Infrastructure Clone files, Oracle Database Clone files, and the Server Patch Bundle. For our lab exercises, the simulated versions of these files in the simulator already exist.

For the labs, you will first deploy the Oracle Database Appliance with the Oracle Database Appliance release 19.15 patches, and then in the third lab you will patch the Oracle Database Appliance and databases to the latest 19.16 release.

The clone files are listed below. The other file in the directory contains patches, and will be used in the patching lab.

Note about file paths: you must specify the full path of the files you specify in the odacli update-r epository command.

Filename	Description
odacli-dcs-19.15.0.0.0-date-GI-19.15.0.0.zip	Oracle Grid Infrastructure 19.15 Clone Files



odacli-dcs-19.15.0.0.0- <i>date</i> -DB-19.15.0.0.zip	Oracle Database 19.15 Clone Files
odacli-dcs-19.16.0.0.0- <i>date</i> -ODAVM-19.16.0.0.zip	DB 19.16 DB System Template (used in lab 4)
oda-sm-19.16.0.0.0- <i>date</i> -server.zip	ODA 19.16 Patch Bundle (used in lab 3)
odacli-dcs-19.16.0.0.0- <i>date</i> -GI-19.16.0.0.zip	Oracle Grid Infrastructure 19.16 Clone Files (used in lab 3)
odacli-dcs-19.16.0.0.0- <i>date</i> -DB-19.16.0.0.zip	DB 19.16 Clone Files (used in lab 3)
odacli-dcs-12.1.0.2.0- <i>date</i> -DB-19.15.0.0.zip	DB 12.1 Clone Files (used in lab 3)

You must update the Oracle Database Appliance repository, so that Oracle Database Appliance knows about the files. Run the odacli update-repository command for each clone file.

Hint: to reduce amount of manual typing and typing errors, use copy and paste functions to copy the file name or tab function to auto complete a file name. Also, use the up arrow to repeat the previous command, and then edit the file name.

Note: On an actual Oracle Database Appliance, you must update the DCS agent first, before updating the repositories. It is release dependent, so check the patching steps in the *Oracle Database Appliance Deployment and User's Guide* for your hardware model.

On an actual Oracle Database Appliance, local boot drive storage space is limited. It is recommended that you copy only the Oracle Grid Infrastructure clone file first, update the repository, deploy the Oracle Database Appliance, and then copy the database clone files to Oracle ACFS storage to deploy databases. Check the latest Oracle Database Appliance documentation for the steps.

Go to the command line window and entering the following odacli commands.

```
$ odacli update-repository -f /opt/oracle/dcs/patchfiles/odacli-dcs-19.15.0.0.-
date-GI-19.15.0.0.zip
{
    "jobId" : "4d428b05-a33f-4fe0-82ec-56849503aa28",
    "status" : "Running",
    "message" : "/opt/oracle/dcs/patchfiles/odacli-dcs-19.15.0.0.0-date-GI-19.15.0
    .0.zip",
    "reports" : [ ],
    "createTimestamp" : "July 26, 2022 00:05:38 AM UTC",
    "resourceList" : [ ],
    "description" : "Repository Update",
    "updatedTime" : "July 26, 2022 00:05:38 AM UTC"
```

```
}
$ odacli update-repository -f /opt/oracle/dcs/patchfiles/odacli-dcs-19.15.0.0.o-
date-DB-19.15.0.0.zip
{
    "jobId" : "bblcaa66-7d19-4de1-a074-f475f4a2505a",
    "status" : "Running",
    "message" : "/opt/oracle/dcs/patchfiles/odacli-dcs-19.15.0.0.0-date-DB-19.15.0
.0.zip",
    "reports" : [ ],
    "createTimestamp" : "July 26, 2022 00:08:58 AM UTC",
    "resourceList" : [ ],
    "description" : "Repository Update",
    "updatedTime" : "July 26, 2022 00:08:58 AM UTC"
}
```

When you run commands using the ODACLI command line tool, most operations are asynchronous, meaning that they return a job ID immediately while the job runs in the background. This means that to get information on long running background jobs, you can query the status of the job.

At this point, the clone files are all loaded into the repository, so we are ready to deploy the appliance and create a database.

You can also use the Browser-based User Interface (BUI) to update the Oracle Database Appliance repository, by pasting the complete file path of the patch file or even clone file in the patch bundle location box of the patch manager in the web BUI. However, it is not necessary as you have used command line to update the repository (clone files) already.

ORACLE	Database Appliance Current User: odaadmin Besources v Account v Q. Search ODA Documentation for., Appliance Database Object Store Monitoring Security Multi-User Access Activity Diagnostics
Appliance Overview	Update Repository Update Server/Storage Cleanup Repository
Compute Instances DB Systems Network	Update Patch Repository Download the Oracle Database Appliance patch bundles from My Oracle Support and save the concatenated zip file in a directory on the appliance. For multi-node systems, save the concatenated file in a directory on each node. Then, enter a comma-separated list of absolute file paths (without spaces) for the patch bundles on the appliance.
CPU Pool Oracle ASR Patch Manager	Note: After updating the Patch Repository or components, refresh the page to display the latest information. Patch Bundle Location: Update Repository

Step 4 - Deploy the Appliance

You can deploy the appliance using either the BUI or the command line. The command line is useful for scripted and silent installations. This lab uses the BUI.



After you configure the firstnet and update the repository, log into Oracle Database Appliance BUI using odaad min and previously created password (for example, WELcome12##)

https://OCI public IP Address>:xxxx/mgm	nt/index.html
	Oracle Database Appliance
	User Name * odaadmin ODA Password @ Login Forgot password?

This takes you to the **Appliance** tab in the BUI. It should show that the appliance is not yet deployed:

ORACLE	Database Appliance	Current	t User: odaadmir	Resources *	Account + Q Search C	DA Documentation for
		Appliance Database	e Object Store	Monitoring Securit	ty Multi-User Access	Activity Diagnostics
Appliance					• Help	
Overview						
Compute Instances						
DB Systems						
Network						
CPU Pool						
Oracle ASR						
Patch Manager		Oracle Database Appliance is not config	ured.			
		Click Create Appliance to get started	d.			
		Create Appliance				
		Learn More				
		Learn More				

Click **Create Appliance** to start the deployment wizard. Fill in the first page of the form as shown below. Most fields are self-explanatory. A possible exception is the Data Storage Percentage. This will affect how much space is allocated for backups. By default, 80% is allocated for data and 20% is allocated for archive logs. You can also



specify a different percentage. Select Disk Group Redundancy as Flex. You can specify individual database storage redundancy later, either Mirror (double mirroring) or High (triple mirroring). Create a password. Be aware there is a password complexity test that will reject simple passwords such as test and other common variants. However, WELcome12## will work if you want to use that password for these lab exercises.

You can also load a configuration file, for example, oda.json that was saved previously to avoid manual entries. To create a configuration file, you manually fill in all the information then click **Save Configuration** at the end.

	Dilance Current User: oda-admin 陷 Resources * Account * 🔍 Search ODA Documentation
	Appliance Database Object Store Monitoring Security Activity Diagnostics
Overview	Create Appliance
Compute Instances	System Information Network Information User and Group Selection Database Informal >
DB Systems	Parameter No. 61 and and
Network	Load Configuration Browse No file selected.
CPU Pool	Diagnostics Information
Oracle ASR	Redact sensitive information such as IP and MAC addresses, host names, user names, database and tablespace names, and ports in diagnostic collections.
Patch Manager	Enable Trace File Redaction 🔿 Yes 💿 No
Parameter Repository	
	Configure and enable Oracle Auto Service Request (Oracle ASR) now or later.
	Enable ASR: Ves No
	< Cancel Save Configuration Reload Submit >

Click on each tab. In the Network Information page, you can configure the network for the public Client Access network here. Since this is a single node simulator, the information is pre-populated from configure-firstnet process. You can also configure the ILOM network if you choose. Enter values for the IP Address, Subnet Mask, Gateway, and specify the interface to be used for the public network.

In the User and Group Selection screen, enter the 19xx ID as shown below.

Customize Users & Groups 🔹 Yes 🔵	No	Allow OS Role Separation . Yes No
GI User *	GI UserID *	
grid	1900	
DB User *	D8 UserID *	
oracle	1901	
install Group *	Install GroupID *	
oinstall	1901	
DBA Oper Group *	DBA Oper GroupID *	
dbaoper	1902	
DBA Group *	DBA GroupID *	
dba	1903	
ASM Admin Group *	ASM Admin GroupID *	
asmadmin	1904	
ASM Oper Group *	ASM Oper GroupID *	
asmoper	1905	
ASM DBA Group *	ASM DBA GroupID *	
asmdba	1906	

Next is the Database screen.



atabase Information						
Create Initial Database 🔹 Yes 🔿 No						
Reload DB Version						
06 Name *	Database Edition		SYS and PDB Admin User Passw	ord *		
db1	Enterprise Edition					
08 Unique Name	Database Class		Confirm Password *			
db1u	OLTP					
8 Version	Shape		Character Set			
19.13.0.0.211019 +	odb1(1 Core, 8GB Memory)		AL32UTF8			
DE 🔿 Yes 🔹 No	Storage		National Character Set			
	ASM		AL16UTF16			
	Database Redundancy		Language			
	Mirror		AMERICAN			
	Configure EM Express 🔿 Yes	 No 	Territory			
			AMERICA			
			Enable TDE 🔿 Yes 🔹 No			
			TDE Wallet Password			
			Confirm TDE Wallet Password			
agnostics Information						
Redact sensitive information such as IP and MAC addresse	s, host names, user names, database and ta	blespace names, and ports in d	liagnostic collections.			
inable Trace File Redaction 🔿 Yes 🔹 No						
Configure and enable Oracle Auto Service Request (Oracle	ASR) now or later.					
nable ASR: 🔿 Yes 🔹 No						
					1	
					Save Configuration	Save Configuration < Cancel

Specify the database name and other database related information as shown below. Select DB Version as **19.13**.

To configure Oracle ASR, specify credentials here. This is also where you can save the configuration file, for example, oda.json for later use.

Click **Submit** to continue and click **Yes** in the confirmation box. This will bring up a link to the job status. Similar to ODACLI, operations are asynchronous, and return immediately with a job ID. That job ID can then be used to monitor progress. This allows the administrator to perform other tasks, if desired while the operations completes. Click the job ID to see the status.

ORACLE Delater Applance		Current User: adaadmin	Resources + Assound + St, Search-Olde Documentation for.
		Applance Existence Object Store Int.	mining Security Multi-class Actually Diagnostics
Applance			0
Daminu			
Compute Instances			
DB Typiters			
Tertacrit			
Onthe			
Crack Alk			
fact Merope	Circuite Cataloane Applicator is loading configured. Preview gis 16 Addinity page to see job distails.		
	Job Status ×		
	The job to provision the appliance is submitted.		
	Click the link to display job details.		
	807107-2845-408-842-26496-SHR		

In the simulation, the deployment job status will complete within 1-2 minutes. You can see the various steps running, and their status changing to Success as they complete. Click the **Refresh** button to more quickly



refresh the screen. In an actual appliance, the deployment takes about 60-90 minutes to complete.

ORACLE Database Applance		Current Uber, adiadmin 🔒 Ressum + Acount + 🤗 Inech (20) Decomentation for,
		Applance Database Object Store Monitoring Security Multi-User Access Activity Diagnositics
e e		Called Dispession Reheats Back
vavisioning service creation		
8: N017117-2545-4c88-682-30#96c5385c		
nated: Fil Feb 25 2022 4 56 27 PM		
fereage: tatwa: Success		
tope of 10 (1-5 of 40 tores) = 1 = 1 = 2 = 3 = 4 = 5 = 10 = 3 = 9		
Setting up Network		
Start Time: Ini Feb 25 2022 14:56:30 GMT-0800 (Pacific Standard Time)	End Time: Ini Arb 25 2022 16:56:30 GMT-0800 (Pacific Standard Tene)	Statue: Success
OS usergroup 'aondba'creation		
Start Time: Pri Feb 25 2022 16:56:30 GMT-0800 (Pacific Standard Time)	End Time: Its Feb 25 2022 16:56:30 GMT-0800 (facific Standard Time)	Station: Success
OS-usergroup 'asmoper'metion		
Start Time: Hi Feb 25 2022 16 56:30 GMT-0800 (Paofis Standard Time)	End Time: Hi Feb 25 3002 16:56 30 GMT-0800 (Pacific Standard Time)	Status: Success
Cri usergroup 'aumadmin'creation		
Start Time: Ini Feb 25 2022 16:56:30 GMT-0800 (Pacific Standard Time)	End Time: Ini Arb 25 2022 16:56:30 GMT-0800 (Pacific Standard Time)	Stative: Success
05 unergroup (dbaloniation		
Rart Time: Ini Neb 25 2022 16 56:30 GMIT-0600 (Pacific Standard Time)	End Time: Ini Asto 25 2022 16 56 30 GAT 0820 (Barille Standard Time)	Elabor Locates

Step 5 - Validate the Deployment

Next, click on the **Database** tab at the top right of the BUI. The deployed database is displayed. The web pages refresh every few seconds, so if the database does not show up at first, wait till the page refreshes. Click on the database name for more details about the database. Click on the **Database Home** link in the left-hand column, when viewing the **Database** tab to see information about the database home. Note this may take up to a minute to display.

You can also verify that the appliance is properly deployed by clicking the **Appliance** tab to see more details. The view is similar to the screen displayed as follows, taking into account that this is a simulation:

RACLE	Database Appliance				Current User: edaadmin	Resources +	Account + 9, Search ODA Documenter
				Appl	ance Database Object Store	Monitoring Secur	ity Multi-User Access Activity Diag
plance	Basic Informatio	an Advanced Information					0
ompute Instances	System Informa	ation					
8 Systems		Platform:					
interork		Data Disk Count: CPU Core Count:					
PU Post		DCS Agent					
Nacle ASR			19.13.0.0.0				
		Created:	Fri Feb 25 2022 4:56:27 PM				
ch Manager		Host Name:					
		Domain Name:					
		Time Zone:					
		DNS Servers:	3.5.53				
		NTP Servers:					
	Disk Group Info	ormation					
						Refresh	
	Name	Redundancy	Physical Total Space	Physical Free Space	Logical Free Space		
	reame						
	> DATA	PLEX.	11.0 TB	10.0 TB	3.33 TB - 5.0 TB		

Step 6 - Networking

You can check the network by clicking on the **Network** tab on the left hand pane in the BUI.



ORACLE	Dutabase Appliance			Account + 9, Search CDI Decumentation for.
Applance Overview Compute Instances OR System Particular CPU Fool Oracle ASR Patch Manager	Show Robustles Show Interface march Q Page of 1 (2nd 5 hound) c < 1 > > > Public-network Scatter 52 2022 45627 PM. States: CONFIGURED Network: Type: Hobit Subnot Muke: 255.255.55 Scatter: CONFIGURED Network: Type: Hobit Subnot Muke: 255.255.55 Scatter: Configured Scatter: Configured Scatter: End Scatter: Road Scatter: configured Scatter: Road Scatter: Road Scatter: Road Scatt Scatter: Road Scatt Scatter: Road Scatter	Hode0 IP Address: 192.168.0.100 V/P Address: 192.168.0.100 V/P Address: 192.168.0.100	Cruth Network Sort by Created New to Od • Referent Actions *	0 Hay

You can also create a new VLAN by clicking the **Create Network** button and specify the network information below.

DRACLE'	Database Appliance								Multi-User Acco	
oplance					-				0 may	
Overview	Create Network									
Compute Instances										
DB Systems	Enable Vian 💌 Yes 🔿 Ne		Default Network	Yes . No						
Network -	Name *		Subnet Mask *		M.*					
	backup		255215215215252		100	-	A			
CPU Pool	# Address.*		Gateway							
Oracle ASR	192.168.0.200		192.168.0.201							
	Network Type		Interface *							
Patch Manager	Backup		btbond1							
							11	ancel Create		

Click on the **Create** button, then submit the job. Following is an example that shows the backup VLAN has been created.

ORACLE	Dutabase Appliance						Account = 9, 5		
legilance Consuler Consuler DB Systems Nations CPU Heat Oracle ADR Patch Manager	Dane Notanula Dane Interfaces aserth Q. Page of1 (1/2 of 2/dmmt) x < 1 > x backup Created: fin feb 25 2022 5:06:48 PM. backup Dataset: Confidence x < 1 > x backup Created: Explore Backup x < 1 > x backup Created: Explore Backup x < 1 > x backup Created: Explore Backup x < 1 > x backup Created: Explore Backup x < 1 > x backup Explore Backup x < 1 > x ba	Node0 17 Address: 192,368,0,200	Applance	 Chant Store	Create Nets	ork	Multi User Acces	s Activity	Diagnostics
	Public-network Created: Fir Feb 25 2022 4:56:27 PM States: CONFIGURED Network Type: Public Subart Mark: 255:255:255:0 Gateways 192; 56:80:0 Interface Type: Bond ScAN Rame: robt?-scan SCAN IIP Address: 192; 16:80:100	Node0 IP Address: 192,168.0.100 VIP Nomer node0-vip VIP Address: 192,168.0.100			Actions *				

This concludes Lab 1.



Lab 2 - Manage Databases

In this lab, we will create and delete databases in the appliance. We can do this using the command line (CLI) or BUI.

You must complete Lab 1 before starting Lab 2.

- Step 1 Create a new database using the Web GUI
- Step 2 Delete a Database
- Step 3 View the Databases and Database Homes Using the CLI
- Step 4 Create a New Database with the CLI
- Step 5 Delete and Recreate a Database
- Step 6 Create a CPU Pool for a Database
- Step 7 Delete a Database Home
- Step 8 Create Database Backups on Local Disk, External NFS Storage, or on Oracle Cloud

Step 1 - Create a new database using the Web GUI

On the Oracle Database Appliance BUI, click the **Database** tab in the web page.

You will see the database db1 created during deployment. In the upper right-hand corner, there is a **Create Database** button. Click it. It brings up the **Create Database** wizard.

ORACLE	Dutabase Appliance		Current User: odiademin 🗿 Resources = 4. Scource = 9, Snorth OD4 Documentation for: Appliance Database Object Score Manhoring Security Multi-Ober Access Activity Diagnostics		
Database Database Database Home Storage Database Home Backup Policy	numb Q Page of 5: (1 of 3 here) X 1 X		Sort by Created New to Old • Reheah	Create Database	© Help
	001 10:635064-4475-4876-9471-608721255950 Copy States: CONFIGURED Created: Fin Feb 25 2022 4:5627 FM	CDB: false DB Version: 19.13.0.0.211019 System Name: cda	Shape: odb1 Storage: ASM	Actions *	

Choose Create Database, and click Next.

ORACLE	Dutatase Applance Content User: odasdenin 🐌 Resource x Account = 🔍 Seath OCA Documentation En: Applance Database Object Store Monitoring Security Multi-User-Access Account Diagnostica
Dutabase Dutabase Dutabase Home Strage Dutabase Home Backup Policy	Create Database Image: The option below to create a database, or done a database. Database can be clored from one appliance to another appliance, or to the same appliance. Image: The option below to create a database, or done a database. Database can be clored from one appliance to another appliance, or to the same appliance. Image: The option below to create a database. Image: Create a Database Create a Database Image: The option below Image: Create a Database Image: Create a Database Image: Create a Database

Specify the DB Name, for example, db2, and if you are creating a CDB, a PDB Name. Also remember to scroll down and enter a password that would, in an actual appliance be used for SYS, SYSTEM, and PDB Admin. When finished, click on the **Create** button. Click **Yes** to confirm. Beware of the password complexity checker —"WELcome12##" will pass the test.



ORACLE	Database Appliance			Appliance Detabuse			Account # 9 Search ODI Deci ty Multi-User Access Activity	
latabase	Create Database						O Hulp	
Database								
Database Home Storage	C8 Name *	Database Edition		SYS and PDB Admin User Passe	ed*			
Database Nome	412	Enterprise Edition						
Database Porte	DB Unique Name	Database Class		Confirm Password *				
Backup Policy		0(79						
	Use Existing DB Home	Shape		Character Set				
	Nes . No	odb1(3 Core, 8G8 Memory)		AU32V778	1.1			
	DB Venion	Storage		National Character Set				
	19.13.0.0.211019	ASM		AL16UTF16				
	CDB Ves No	Database Redundancy		Language				
		Mirror		AMERICAN				
		Networks *		Sambory				
		Public network ×		AMERICA				
		CPU Pool Name		Enable TDE 🔷 Yes 🔹 No				
		Select CPU Pool		TDE Wallet Password				
		Configure DM Express 🔿 Yes •	No	Confirm TDE Wallet Password				
					C Back Canoel	Create >		

This will bring up a link to the job status. Similar to ODACLI, operations on the BUI are asynchronous, and return immediately with a job ID. That job ID can then be used to monitor progress. This allows the administrator to perform other tasks if desired while long running operations complete. Click the job ID to see the status.

In the simulation, the job will complete within 30 seconds. You can see the various steps running, and their status changing to Success as they complete. Click the **Refresh** button to refresh the screen more quickly. On an actual appliance, these steps take about 20 minutes to complete.

ORACLE	Database Appliance	Current User: odaadmin 🔒 Resources 👻 Appliance Database Object Store Monitoring Secur	Account + 9, Search ODA Documentation for., ity Multi-User Access Activity Diagnostics
search	Q.		Collect Diagnostics Refresh Back
Database service creatio	on with db name: db2		
0:09365000-c345-4531-b8	r7-942460f81974		
reated: Fri Feb 25 2022 5:1			
Aessage:			
Status: Success			
Page of 6 (1-5 of 26 its	ems) K < 1 2 3 4 5 6 > X		
Validating dbHome availat Start Time: Fri Feb 25 202	ble space 22 17:18:50 GMT-0800 (Pacific Standard Time)	End Time: Fri Feb 25 2022 17:18:50 GMT-0800 (Pacific Standard Time)	Status: Success
Setting up ssh equivalance Start Time: Fri Feb 25 202	e 12 17:18:50 GMT-0800 (Pacific Standard Time)	End Time: Fri Feb 25 2022 17:18:50 GMT-0800 (Pacific Standard Time)	Status: Success
Setting up ssh equivalance Start Time: Fri Feb 25 202	e 22 17:18:50 GMT-0800 (Pacific Standard Time)	End Time: Fri Feb 25 2022 17:18:51 GMT-0800 (Pacific Standard Time)	Status: Success
Creating ACFS database h Start Time: Fri Feb 25 202	ome 12 17:18:51 GMT-0800 (Pacific Standard Time)	End Time: Fri Feb 25 2022 17:18:52 GMT-0800 (Pacific Standard Time)	Status: Success
Validating dbHome availab	ble space 12 17:18:52 GMT-0800 (Pacific Standard Time)	End Time: Fri Feb 25 2022 17:18:52 GMT-0800 (Pacific Standard Time)	Status: Success

Once the operation completes, click on the **Appliance** tab and then the **Database** tab at the top right of the web page. This should show the newly-created database. The web pages refreshes every few seconds, so if the database does not show up at first, wait till the page refreshes.



ORACLE	Database Appliance	Appliance	Current User: odaadmin Database Object Store		 Q Search ODA Documentation for i-User Access Activity Diagnostics
Database Database Database Home Storage	search Q. Page of 1 (1-2 of 2 items) K < 1	Sort by:	Created: New to Old +	Refresh Create Database	0 Help
Database Home Backup Policy	db2 IID: d1e615c3-5855-4b19-9ad0-40b620ac5f13 Copy Status: CONFIGURED Created: Fri Feb 25 2022 5:18:48 PM	CDB: false DB Version: 19.13.0.0.211019 System Name: oda	Shape: odb1 Storage: ASM	Actions *	
	db1 ID: 63fc04ef-4e75-4f1b-9a71-6087212b5b50 Copy Status: CONFIGURED Created: Fri Feb 25 2022 4:56:27 PM	CDB: false DB Version: 19.13.0.0.211019 System Name: oda	Shape: odb1 Storage: ASM	Actions *	

See detailed database information by clicking on the database name, for example, db2. You can also view the newly-created home by clicking on the **Database Home** link in the left-hand column of the **Database** tab.

Step 2 - Delete a Database

You can also delete a database from the **Database** tab. Click the **Appliance** tab and then **Database** tab to view the list of databases. Click the **Action** dropdown to the right of the db1 database, and then select **Delete**. Click **Yes** to confirm, and then close the status box. The Database list should reflect the deletion. Click **Refresh**, if necessary.

ORACLE	Database Appliance	Applance		Resources * Account *	Q Search ODA Documentation for -User Access Activity Diagnostics
Database Database Database Home Storage	search Q. Page of 1 (1-2 of 2 herm) × < 1 > ×	Sort by:	Created: New to Old + Re	efresh Create Database	O Help
Database Home Backup Policy	db2 ID: d1e615c3-5855-4b19-9ad0-40b620ac5f13 Copy Status: CONFIGURED Created: Fri Feb 25 2022 5:18:48 PM	CDB: false DB Version: 19.13.0.0.211019 System Name: oda	Shape: odb1 Storage: ASM	Actions *	
	db1 ID: 63tc04ef-4e75-4f1b-9a71-6087212b5b50 Copy Status: CONFIGURED Created: Fri Feb 25 2022 4:56:27 PM	CDB: false DB Version: 19.13.0.0.211019 System Name: oda	Shape: odb1 Storage: ASM	Actions 💌 View Modify	
				Move Upgrade Delete	

After the database delete operation, only db2 is left.

Activity Diagnostics



Step 3 - View the Databases and Database Homes Using the CLI

You can also manage databases from the command line. Go to the command line window.

Use the odacli list-databases command to view your databases. Then use odacli describe-databas e to see the details for a specific database. Be sure to use the database ID shown in the odacli list-databa ses command, not the ID shown in the example.

atabase details	
ID: d1e615c3-5855-	4b19-9ad0-40b620ac5f13
Description:	db2
DB Name:	db2
DB Version:	19.15.0.0.220118
DB Type:	SI
DB Role:	PRIMARY
DB Target Node Name:	_
DB Edition:	EE
DBID:	
Instance Only Database:	
	false
PDB Name:	
PDB Admin User Name:	
SEHA Enabled:	
Class:	-
Shape:	
Storage:	
DB Redundancy:	
CharacterSet:	
National CharacterSet:	
Language:	
Territory:	a1314be1-2c6f-411f-b2c7-61444449f02b
Console Enabled:	
TDE Wallet Management:	Tatse
TDE Mariet Management: TDE Enabled:	falso
Level 0 Backup Day:	
AutoBackup Enabled:	-
-	
	-
Associated Networks:	
DB Domain Name:	July 26, 2022 1:18:48 AM UTC example.com

Step 4 - Create a New Database with the CLI

There are many options you can specify when using the CLI to create a new database. Type odacli create-d atabase -h to see the options. Note that only the database name is required. Create a new database and database home named db3 as follows. You will be prompted for a password for SYS, SYSTEM, and PDB admin. To meet password complexity requirements, use WELcome12## for this lab.

<pre>\$ odacli cr</pre>	eate-database	-n db3 -v 19.1	15.0.0			
Job details	5					
	Description: Status:	2051bf5b-4815 Database serv Created July 26, 2022	vice creati	on with db		
Task Name Time	nebbuge.	Status	Start Ti	me		End
		2051bf5b-4815-		e51367ba32	69	
Job details						
	ID: Description: Status:	2051bf5b-4815 Database serv Success July 26, 2022	5-4cd2-8d85 vice creati	-e51367ba3 on with db	269	
Task Name	Messaye.		Start Ti	me		End
Time		Status				
Validating		ole space		2022 1:45	:50 AM UTC	July 26
Setting up	ssh equivalance 50 AM UTC	ce	July 26,	2022 1:45	:50 AM UTC	July 26
Setting up	ssh equivalance 5:50 AM UTC	ce	July 26,	2022 1:45	:50 AM UTC	July 26
Creating AC	FS database ho 5:51 AM UTC	ome	July 26,	2022 1:45	:51 AM UTC	July 26
Validating		ole space	July 26,	2022 1:45	:51 AM UTC	July 26
Configuring	user access t	UTC Success		ge July 26	, 2022 1:45:	51 AM UTC
	Home Directory			2022 1:45	:51 AM	

In an actual appliance, this command would run a job in the background for approximately 40 minutes. As with the GUI, you can monitor the progress if you choose, but the Linux prompt returns immediately. Because this is a simulation, you should see your new database and home almost immediately. Verify creation of the new



database using the following odacli command:

```
$ odacli list-databases
TD
                               DB Name
                                       DB Type DB Version
CDB
        Class
               Shape Storage Status DbHomeID
    _____ ___
                               db2 SI 19.15.0.0.220419
d1e615c3-5855-4b19-9ad0-40b620ac5f13
false OLTP odb1 ASM CONFIGURED a1314be1-2c6f-411f-b2c7-6144444
9f02b
324a42ea-bba2-477d-8bca-5a26af159f1c db3 SI 19.15.0.0.220419
      OLTP odb1 ASM CONFIGURED ecfa440e-2482-40c1-8ccd-67316
false
cd48ba2
```

Step 5 - Delete and Recreate a Database

You can also use CLI to delete a database. Run odacli delete-database to remove database db2. Be sure to use the ID of your db2 database, which is likely different from the one in this workbook. Note that you can also use the database name instead of the ID.

```
$ odacli delete-database -i d1e615c3-5855-4b19-9ad0-40b620ac5f13
{
  "jobId" : "ccde4700-3c1e-423a-8079-477f49f8cd5f",
 "status" : "Running",
 "message" : null,
  "reports" : [ {
   "taskId" : "TaskZJsonRpcExt 10048",
   "taskName" : "Validate db d1e615c3-5855-4b19-9ad0-40b620ac5f13 for deletion"
   "taskResult" : "OK",
   "startTime" : "July 26, 2022 01:49:40 AM UTC",
   "endTime" : "July 26, 2022 01:49:40 AM UTC",
   "status" : "Success",
   "taskDescription" : null,
   "parentTaskId" : "TaskSequential 10046",
   "jobId" : "ccde4700-3c1e-423a-8079-477f49f8cd5f",
   "tags" : [],
   "reportLevel" : "Info",
$ odacli list-databases
TD
                                      DB Name DB Type DB Version
CDB
          Class Shape Storage
                                     Status
                                                  DbHomeID
                           _____ ____
```

```
_____

      324a42ea-bba2-477d-8bca-5a26af159f1c
      db3
      SI
      19.15.0.0.220419

      false
      OLTP
      odb1
      ASM
      CONFIGURED
      ecfa440e-2482-40c1-8ccd-673

16cd48ba2
$ odacli delete-database -i d1e615c3-5855-4b19-9ad0-40b620ac5f13
{
  "jobId" : "ccde4700-3c1e-423a-8079-477f49f8cd5f",
  "status" : "Running",
  "message" : null,
  "reports" : [ {
    "taskId" : "TaskZJsonRpcExt 10048",
    "taskName" : "Validate db d1e615c3-5855-4b19-9ad0-40b620ac5f13 for deletion"
    "taskResult" : "OK",
    "startTime" : "July 26, 2022 01:49:40 AM UTC",
    "endTime" : "July 26, 2022 01:49:40 AM UTC",
    "status" : "Success",
    "taskDescription" : null,
    "parentTaskId" : "TaskSequential 10046",
    "jobId" : "ccde4700-3c1e-423a-8079-477f49f8cd5f",
    "tags" : [],
    "reportLevel" : "Info",
$ odacli list-databases
                                               DB Name DB Type DB Version
ID
       Class Shape Storage Status
CDB
                                                              DbHomeID
                                     _____ ___ ____
                                                                                   _____
_____

      324a42ea-bba2-477d-8bca-5a26af159f1c
      db3
      SI
      19.15.0.0.220419

      false
      OLTP
      odb1
      ASM
      CONFIGURED
      ecfa440e-2482-40c1-8ccd-673

16cd48ba2
```

Using the CLI, create a new database db4.

```
$ odacli create-database -n db4 -v 19.15.0.0
Enter SYS, SYSTEM and PDB Admin user password:
Retype SYS, SYSTEM and PDB Admin user password:
Job details
ID: aa259376-4ac0-474a-8730-8c8e1c8ac504
Description: Database service creation with db name: db4
Status: Created
```



		eated: J ssage:	uly 26, 2022	2 1:51:50 AM	UTC
Task Name Time			Status	Start Time	End
# odacli l	ist-data	bases			
ID CDB	Class	Shape	Storage	DB Name Status	DB Type DB Version DbHomeID
ID CDB	Class	Shape	Storage	DB Name Status	DB Type DB Version DbHomeID
 324a42ea-b false 16cd48ba2			6af159f1c ASM	db3 CONFIGURED	SI 19.15.0.0.220419 ecfa440e-2482-40c1-8ccd-673
deac01db-e			042be3a18 ASM	db4 CONFIGURED	SI 19.14.0.0.220419 c3c63738-703e-4c1d-98de-95b

Step 6 - Create a CPU Pool for a Database

You can create a CPU pool for a bare-metal database to improve CPU resource management and quality of service for a database.

Click **CPU Pool** on the left, then click **Create a CPU Pool**.

ORACLE	Database Appliance		System: edia Current User: ediaadmin 🐌 Resources * Account * 🔍 Search COA Documentation fo Applance: Database Object Store Microbaring Security Multi-UserAcceus Activity Diagnesis
Appliance			0 m/s
Overview			
Compute Instances			
DB Systems			
Network			
CPU Post			
Onacle ASR			
Patch Manager		There are no CPU Pools.	
		Click Create CPU Pool to create a new CPU Pool.	
		Create CPU Pool	
		Learn More	

Specify the CPU Pool Name **cpupool1**, select CPU Pool Type **Bare Metal**, and Number of CPU Cores **2**, then click **Create**.



DRACLE	Database Appliance	System: eda Current User: edaadmin 🐌 Resources * Accourt * 🤤 Invest-CDI Decommission for
pplance	Create CPU Pool	Applance Distributer Object Store Monitoring Security Multi-Uner Access Activity Disposition
Overview		
Compute Instances	OPU Pool Name *	Number of CPU Cores.*
DB Systems	(pupor)	2
Pertwork	CPU Pool Type	Societ to Use
CPU Pool	Bare Metal +	All Society +
Oracle #5R		Carol Cruste >
Patch Manager		Cancer United 2

You can see that CPU Pool cpupool1 has been created:

ORACLE	Database Appliance	System: eds. Current Unic: edsaddnin 🐌 Resurves + Accourt + 🔍 Secrit OLD Documentation Em. Applienz: Database Object Store Monitoring Security Multi-Unit-Acces Activity Disposition
Appliance Denvice Compute Instances DB Systems Nationsk CPU Paol Oracle ASR Petch Manager	much Q. Page of 1 (1 of 1 have) x 1 x Grappot1 Bit: fit:1 have) x 4 x Re: fit:0:055 heir/- hasti #938-520bd895cfl Copy Type: IM Configured and xxxxxxxxxx X X Configured and xxxxxxxxx X X X Configured and xxxxxxxx X X X	Sort by Control None to Old + Refresh Remop CPU Real Count CPU Real Control CPU Real Control Provided Resources: NONE Stude: COARIGURED

Step 7 - Delete a Database Home

You can delete a database home using the BUI or the command line. We will use BUI to delete a database home. Go to the **Database** tab, then click on the Database Home to see all the database homes. Click on **Actions**, then click on **Delete DB Home** (for home1).

ORACLE	Dutabase Appliance	System: edia Current User: ediaadimin 3 Resources = Account = 9 , Smith DOI Documentation Applance Distribute Object Stars Monitoring Security Multi-User Access Activity Diagno
Database Database Database Home Storage Database Home	eventh 9, Pope of 5 (1-4) of 4 lowed) 6 (1-5) = 10 O 0xx0010000,home4 0	Sort by Created New to Old • Refeath Create Database None Autor Pacheck Palares Ignore Missing Patches
Backup Policy	ID: c1c63738-703a-4c1d-988e578657468 Copy Venilon: 13.13.05.0211919 Partch Venilon: Select Zetth Venilon 4	Location: /v0'(app)/odecrahomeban/iodadmini/product/19.0.0.0/dbhome_4 Actions. * Edition: II Created: Fir Feb 25 2022 5:51:50 PM
	Orad 8119000, home3 Rit ecta480-a902 - 490	Lecation: ///UisppIotison/homebane/odaadmin/product/1930.0/dbhome_3 Actions = Edition: EE Greated: Fn Feb 25 2022 5:45:50 PM
	O Had819000,home2 Bit x1318be1-2x84-411162c1-6164444902b Copy Version: 18.18.0.0211019 Petch Version: set	Lecation: /v01/spp:/ofisorahomebase.lodaadmin/product/18:0.0/dbhome_2 Actions. * Edition: El Created: Ini Pob 25 2022 5:18:49 PM
	C Cha0819000,home1 Re: 2024611a-1665-467-3594-468177eb1c4a Copy Version: 13.13.02.2199 Patch Version: Select Anth Version: v	Lecation: //01/app/totionshomebasis/oracle/product/18.0.0/dbhome_1 // Vew Datase Edition: UI Greated: Fri Feb 25 2022 456:27 FM Deter D Hone Vew Prepath reports

You can see that home1 database home has been deleted.



ORACLE	Cutabase Appliance	System: oda Cantent User: ediaadmin 🔒 Resures × Account × 🔍 Snanh COA Documentation Appliance <u>Database</u> Object Stars Manitoring Security Multi-User Access Activity Diagnee
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Database Home Backup Policy	Bit: Colstate: Field: Field:	Lecation: /v0/lapp/odacrahomebase/odaadmin/product/19.0.0.0/dbhome_4 Addew = Edition: III Created: Fri Feb 25 2022 5:55:50 PM
	© Grad#19600,home3 Bit ectu4480-3482-49C1-8ccd-473156548ba2 Copy Werkley 113.13.02.131919 Public Version: Select Anni Version: •	Leverlion: /v0/lapp/indexrshomebase/odaadmin/product/19.0.00(rbhome_3 Advance = Edition: IE Crusted: Ini Feb 25 2022:54550 PM
	Orad/0119000_horme2 Bb a1158b-6-308/a1116-b27-4584448962b: Copy Vension: 13:136-0.211019 Petch Vension: *	Lecation: AdVapp/tolaorshomebase/tolaadmin/product/19.0.0.0/dbhome_2 Antons = Editions: 18 Created: Fri Feb 25 2022 5:1849 PM

Step 8 - Create Database Backups on Local Disk, External NFS Storage, or on Oracle Cloud

Backing up and restoring Oracle databases on Oracle Database Appliance is very simple. There are two simple steps involved to create a database backup locally or on Oracle Cloud. These can be done using the web GUI:

- 1. Create a backup policy
- 2. Attach a backup policy to a database

To back up to an external NFS storage, you must create an NFS mount point first.

To back up to the Oracle Cloud, you must obtain and create Object Store credentials first.

There is a default backup policy associated with the database. To create a new backup policy, click on the **Backup Policy** tab and then click **Create Backup Policy**.

ORACLE	Database Appliance	Spitzen: oda: Current User: odiaadmini Bi Resurces + Account + R, Sound COX Decomentation for Applance: Database: Object Sour: Ministering: Security: Multi-User-Access: Activity: Diagnostica
Database Database Database Home Storage	neerst Q, Page of 1 (1 of 1 hons) = i = 1 = i Name: default	Son by Created New to Old + Refresh Creater Biology Palay
Durahase Home Backup Policy	Destination: Internal FRA Compression Applicable: (ASOC Compression Exabled: true System Name: cola Created: Fri Feb 25 2022 4.56/27 PM	Recovery Window (depu): ? Actors * Creascheck Enabled: Twe

Then, name the Backup Policy (for example, DiskBackup), Backup Destination (Internal FRA/Local Disk or External FRA/External NFS Storage or Object Store/Oracle Cloud), and Recovery Window in days, then click **Create**. To back a database to an external NFS storage, you need to specify a mount point such as **/u03/app/oracle/oradata/nfs_backup**.



ORACLE	Database Appliance			System: oda Current User: odaade	nin 🔒 Resources + Account + 🔍 Search CDH Documentation for. 14 Monitoring Security Multi-Cher Access Activity Diagnostics
Database	Create Backup Policy				O Help
Database	Backup Policy Name *	Object Store Credential 1	Name	External FRA Mount Point	
Database Home Storage	dolbachup				
Database Home	Backup Destination	Container Name		TDE Wallet Backup Location	
	Internal FRA				
Backup Policy	Compression Algorithm	Recovery Window (days)			
	BASIC	 A. (1997) 100 	~ A.		
	Enable Compression				
	Enable Crosscheck S Select Badde Creacheck to determine if the management catalog correspond to data 5				
				<	Cancel Create >

You can see the **DiskBackup** policy has been created.

ORACLE	Database Appliance	System: edia Current User: ediaedin Applance: Database Object Scor	nin 🖡 Resources 🕆 Account 🕈 e Monitoring Security Multi-U	
Database Database	$\begin{array}{ c c c c c c c c c c c c c c c c c c c$	Sort by Created New to Old + Refeet	Creater Backup Pulicy	
Database Home Database Home Backup Policy	Name: disblockup Destination: Internal FFA Compension Application: EASC Compension Enabled: True System Name: of Created: Fn Feb 25 2022 6:02:18 PM	ID1 83624965-4530-4666-6420-475425607138 Copy Receivery Window (days): 1 Creascheck Enabled: true	Actions *	
	Mamar: default Destinational Internal FRA Compression Adjunctions (AASC Compression Enabled): true System Name: cola Created: Fin Feb 25 2022 456 (27 PM	ID: Infc05ece-6584-6a29-56c4-ed079565c5a2_Copy Receivery Window (dopt) 7 Creascheck Enabled (run	Actions *	

Next you select the database, for example, db4, that you want to backup. The db4 database has the default backup policy, so modify the database first by clicking **Modify** under **Actions**. Assign a CPU pool to db4 at the same time.

ORACLE	Dutabase Appliance			in BResources + Account + 9, Sneich CON Decommon Monitoring Security Multi-User Access Activity D
Database Database Database Home Storage	march Q. Page of1 (1-2 of 2 mms) x (1) >		Sort by Created New to Old v Refeet	Create Database
Database Home Backup Policy	db4 B0. deac01db-eaa8-dMe-a511-aea642be3a18 Copy Setter: COMINGUED Created: Fri Feb 25 2022 55150 FM	CDB: faise DB: Version: 13.13.00.211015 System Name: oda	Shaper odb1 Storage: ASM	Actions + View Modely
	(6) ID: 334a42Heir bba2-477d-8bca-5a264159Htc. Copy Statue: CONFIGURED Created: ht Feb 25 2022 54550 FM	CDB: failse DB: Version: 15.13.0.0.211019 System Name: oda	Shape: odb1 Storage: ASM	Miyee Upgrade Delete

Select **DiskBackup** as the Backup Policy and **cpupool1** as the CPU pool for db4, and then click **Modify**.

ORACLE Database Ap	pliance			System:	Current User: oda	admin 9,	Search ODA D	oumentation for	Res	ources +	Account ,
					Appliance	Database	Object Store	Monitoring	Security	Activity	Diagnostics
Database	Modify Database								O Help		
Database											
Database Home Storage	Used to modify the database	class, shape	e, redundancy, backup policy, a	and attach/d	letach networks.						
	Database Name: db4										
Database Home	Database Class		Attach Networks		Backup Po	licy					
Backup Policy	OLTP	*			diskback.	p	*				
	Database Shape		Detach Networks		Backup En	cryption Pass	word				
	odb1(1 Core, 8GB Memory)										
	Database Redundancy		CPU Pool Name		Confirm Ba	ickup Encrypt	ion Password				
	Mirror		cpupool1	*							
							< Cancel	Modify >			



Once the job is completed, you can verify that the backup policy is listed under **Database Information** of the database, for example, **db4**. You can also see that a CPU pool is assigned to **db4**. Once this configuration is completed, Oracle Database Appliance will start backing up the database to the disk regularly and produce backup reports.

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You can see the backup reports under the **Backups** heading below.

Backups			
Delete Backups	Manual Backup	Update Database Backup Schedule	Update Archive Log Backup Schedule
Database Backup	Reports Archive	Log Backup Reports	
Page (0 of 0	items) K X	1 > N	
No items to disp	play.		

You can also click **Manual Backup**, then click **Start** to back up a database manually.

Dutabase Appliance			c adaadmin 🔒 Resources * Account * 9, Search CDI Deciment Direct Store Monitoring Security Multi-User Access Activity Dir
Manual Backup			0 Help
Dutabase Name: db4	Backup Policy Name: dothackup	Backup Destination: Internal FRA	
Backup Type	Component		
Level 2 incremental Backup +	Database v		
(Backs up all blocks in the database)			
Backup Tap	Keep Days *		
			< Canval Start >
			< Cancel Start 2

You can see the details of the Backup Report by clicking on the Backup Report ID.



ORACLE Database Applance	System edu Current Unit eduatedes 🔒 Resources + Account + 🔍 Search Oth Desarrent
	Appliance Database Object Store Manifolding Security Multi-chair Access Activity Dis
	Save Backup Report Refeat
(kup Report	
IR: 3x011x79-11x2-4753-xx20-16482188c144	
Name: Backup Report (b)4	
OB Researce ID: deaching - each-dhie ad 11-aead-42belia18	
Tag auto	
DR ID: CK	
DB Name did	
DB Unique Name: dbd	
Backup Type: Regular-L0	
Keep Days	
Backup Location: FRA	
Of Backup Handle:	
10 Backup Handle	
PITR Time Stamp: 7:57eb 25 2022 6:09:07 PM	
Storuge: AGM	
PITR SCN: 2773405	
Reset Logo Time Stamp: Nr Feb 25 2022 6/09/07 PM	
Reset Logs SCN: 1534332	
Oracle Home Version: 19.13.0.0.211019	
SQL Patches:	
Barkup Log Location:	
TOI Walket Location:	
08 Cently Location:	
Status: CONFIGURED	
Beckup Report Log Detail:	
Gravited: Pri Poli 25 2022 6:09:07 PM	
Wpdated: Ini Telo 25 2022 6 09:07 PM	
08 Data Size: 1751M	
06 REDO Size: 3000M	
RIMAN Backup Pieren:	
Compression Algorithm: 545C	
GPU Peet cpupcell	
Number of Cores: 2	
Database Class: CV7P	
Database Type: St	
Database Shape: odb/1	
Database Edition: UI	
Dutations Renigs: AGM	
Database Redundancy MillOR	

In addition to backing up to local disk, you can back up to Oracle Cloud. To back up databases in Oracle Database Appliance to Oracle Cloud, you must obtain Object Store credentials first. Once you have your credentials, click the **Object Store** tab, then click **Create Object Store Credential**.



Enter the required Object Store Credentials including the name. You can now create a backup policy, attach a database to the policy, and specify the Object Store as the backup destination. Oracle Database Appliance will start backing up the database to the Oracle Cloud regularly.

ORACLE Database Applance			System edia Current/Dier ediadmin Bressers + Accest + 9, Sont 004 (Incommittee In Applanes Database Object/Spee Monitoring Security Multi-Spee Acces Activity Dispersion
Njørd Skore Ogent Skore Onderstals	Create Object Store Credential		Q 1100
	Object Shore-Oredential Name *	Liber Name *	
	Endpoint URL *	Paramined *	
	Imant Name *	Confirm Passaced *	
			C General Ormatic 3

This concludes Lab 2.



Lab 3 - Patch and Update

If you just completed Lab 2, the simulator should have two databases, db3 and db4.

For Lab 3, you will use the CLI to update the repository and BUI to update the Oracle Database Appliance infrastructure including the server. You will also use the web BUI to patch a database home from release 19.15 to 19.16, and upgrade a database from release 12.2 to 19.16.

Starting with Oracle Database Appliance release 19.11, patching of Oracle Database Appliance is out-of-place. The new Oracle Grid Infrastructure home will be placed on the local system/boot drive, and all new database homes will be placed on Oracle ACFS file system on the data drives. In an Oracle Database Appliance highavailability system, the database homes will be placed on the shared storage.

Note: on an actual Oracle Database Appliance, you may have to update the server repository and the DCS agent before updating the database and Oracle Grid Infrastructure clone files in the repositories. This is release dependent, so check the patching steps in the Oracle Database Appliance documentation first.

- Step 1 Update the ODA Repository with Latest Patches
- Step 2 Update the DCS Agent (If not done already)
- Step 3 Update the Server
- Step 4 Patch a Database: Update a Database to point to a New Database Home
- Step 5 Upgrade a Database

Step 1 - Update the ODA Repository with Latest Patches

Refer to the Oracle Database Appliance Release Notes for the latest Oracle Database appliance patches.

You must download the server patch file for Oracle Database appliance release 19.15. The server patch updates the firmware and operating system. You must patch the server before you patch the databases. When patching databases, you can choose to patch a subset, if required. However, it is recommended to patch all databases to keep them current.

For this lab, we have downloaded simulated 19.16.0.0.0 patches for the server, Oracle Grid Infrastructure, and database clone files to your simulator.

You must update the repositories with the latest server patch, Oracle Grid Infrastructure, and database clone files, as well as additional applicable database clone files. For example, if you plan to patch Oracle Database from release 19.15 to 19.16, you must update the repository with the 19.16 Oracle Grid Infrastructure and database clone files first.

Before you start patching the server, you can check the current installed components from the web console. Go to the **Appliance** tab, click on **Patch Manager** on the left, and then click the **Update Server/Storage** tab. Note all the installed 19.15.0.0.0 components. Since you have not updated the repository to 19.16.0.0.0, all components are displayed as up to date.

Next, update the server repository. The server patch file is oda-sm-19.16.0.0.0-date-server.zip.



```
$ odacli update-repository -f /opt/oracle/dcs/patchfiles/oda-sm-19.16.0.0.0-date
-server.zip
{
    "jobId" : "b3794603-4fbb-42a4-89ee-791d420e68a6",
    "status" : "Running",
    "message" : "/opt/oracle/dcs/patchfiles/oda-sm-19.16.0.0.0-date-server.zip",
    "reports" : [],
    "createTimestamp" : "July 26, 2022 06:29:42 AM UTC",
    "resourceList" : [],
    "description" : "Repository Update",
    "updatedTime" : "July 26, 2022 06:29:42 AM UTC"
}
```

For an actual Oracle Database Appliance, you may need to update the DCS agent first, before updating repository with the 19.16 Oracle Grid Infrastructure and database clone files, if you want to create a 19.16 database or patch a database to 19.16. See the *Oracle Database Appliance Deployment and User's Guide* for your hardware model.

Run the following commands to update the Oracle Database Appliance repository with these patches. **You must use the full path for the file names.**

```
$ odacli update-repository -f /opt/oracle/dcs/patchfiles/odacli-dcs-19.16.0.0-
date-GI-19.16.0.0.zip
{
  "jobId" : "529141f1-c5fb-42a6-ad1e-0b5540781a71",
  "status" : "Waiting",
  "message" : "/opt/oracle/dcs/patchfiles/odacli-dcs-19.16.0.0.0-date-GI-19.16.0
.0.zip",
 "reports" : [],
  "createTimestamp" : "July 26, 2022 06:32:43 AM UTC",
  "resourceList" : [ ],
  "description" : "Repository Update",
  "updatedTime" : "July 26, 2022 06:32:43 AM UTC"
}
$ odacli update-repository -f /opt/oracle/dcs/patchfiles/odacli-dcs-19.16.0.0-
date-GI-19.16.0.0.zip
{
  "jobId" : "6478c708-bef8-4d5a-83a6-b411fe9b3e7d",
  "status" : "Running",
  "message" : "/opt/oracle/dcs/patchfiles/odacli-dcs-19.16.0.0.0-date-DB-19.16.0
.0.zip",
  "reports" : [],
  "createTimestamp" : "July 26, 2022 06:33:13 AM UTC",
  "resourceList" : [],
```

```
"description" : "Repository Update",
  "updatedTime" : "July 26, 2022 06:33:13 AM UTC"
}
$ odacli update-repository -f /opt/oracle/dcs/patchfiles/odacli-dcs-19.16.0.0-
date-DB-12.2.0.1.zip
{
  "jobId" : "76e5156b-160f-41fc-b9aa-580992902d9f",
  "status" : "Running",
  "message" : "/opt/oracle/dcs/patchfiles/odacli-dcs-19.16.0.0.0-date-DB-12.2.0.
1.zip",
 "reports" : [],
  "createTimestamp" : "April 26, 2022 07:06:26 AM UTC",
  "resourceList" : [],
  "description" : "Repository Update",
  "updatedTime" : "April 26, 2022 07:06:27 AM UTC"
}
```

After you update the repository, you can use the web console to see the 19.16.0.0.0 available component versions.

* Account * 9, Search COX Decumentation 6	Current User: adaadmin 💧 Nesources	System: edu			CH	RACLE Database Applian
Security Multi-User Access Activity Diagnost	Database Object Store Monitoring	Applance				
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	Caseeri va				No items to display.	

Step 2 - Update the DCS Agent (If not done already)

The next step is to update the DCS agent on both nodes for a high-availability system with the web console, before actually updating the server. The DCS agent is the Oracle Database Appliance software that provides the intelligence and automation. In the patching screens, select **Update Server**, then click **Apply Patch**, then click **Submit**, and then click **OK** in the Updating DCS Agent window.



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From the BUI, go to the **Appliance** tab, click **Patch Manager**, and click **Refresh** to verify that the DCS Agent is up-to-date.

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It is recommended that you run the prechecks for the operating system, Oracle ILOM, and Oracle Grid Infrastructure before patching by clicking **Precheck**. Note that the simulator output maybe different.



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Step 3 - Update the Server

The next step is to update the server. This includes firmware, operating system, and Oracle Grid Infrastructure updates.

To update the server, select **Update Server**, then click **Apply Patch**.

After the job is completed, you can refresh the browser to see that Node0 has all 19.16.0.0.0 components installed, and everything is up-to-date.

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Patching an actual Oracle Database Appliance will take some time, whereas the simulator speeds up the whole process. The Linux prompt returns immediately, and the patch runs in the background. You can monitor the



progress of the patch job by checking the Activity tab.

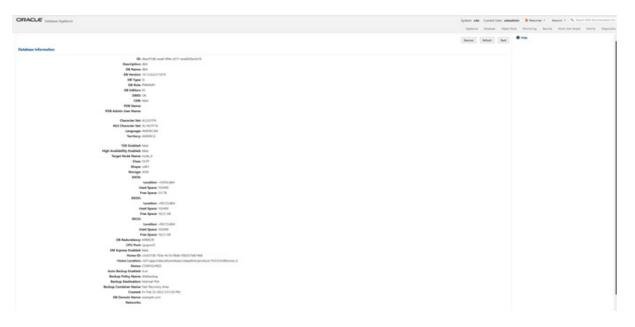
Step 4 - Patch a Database: Update a Database to point to a New Database Home

Because we may not want to patch all databases at once, we must first identify which database home corresponds to which database.

To use the BUI to identify the database homes, go to the **Database** tab.



Click on the database name, for example, db4 to identify the database home ID for patching.



Note the Database home ID, or the Database home location. You will need this to patch the database by pointing it to a home.

You can use either the command odacli update-dbhome or the BUI to update the database homes, and thus the databases, running on the appliance. Each home is updated independently, giving you control over when you patch your databases.

Now, we will use the CLI to patch database db4.

The odacli list-databases command displays details about each database, its ID and its database home



ID. Those database homes will be the ones we will patch by supplying the database home ID to the patching command. You can also see more information, such as the name of the database home, using the odacli list-dbhomes command.

```
$ odacli list-databases
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$ odacli list-dbhomes
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```

Use the clipboard to copy the DB home ID for db4. Then use the DB home ID with the odacli update-dbhom e command to update the home for db4. Verify that the job has completed successfully using the command o dacli describe-job.

```
$ odacli update-dbhome -i c3c63738-703e-4c1d-98de-95b551b67468 -v 19.16.0.0.0
{
    "jobId" : "af879f3e-9c50-4dfd-86db-5d380a42f8d2",
    "status" : "Created",
    "message" : null,
    "reports" : [],
    "createTimestamp" : "July 26, 2022 06:59:59 AM UTC",
    "resourceList" : [],
    "description" : "DB Home Patching: Home Id is c3c63738-703e-4c1d-98de-95b551b6
7468",
    "updatedTime" : "July 26, 2022 06:59:59 AM UTC"
```

}							
\$ odacli describe-job -i af879f3e-9c50-4dfd-86db-5d380a42f8d2							
Job details							
ID: Description: 5b551b67468		-4dfd-86db-5d380a42f8d2 ing: Home Id is c3c63738-703e-4c1	_d-98de-9				
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Verify that database home db4 is updated to the release 19.16. You can use either the BUI or CLI for verification.

# odacli list-dbhomes		
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You can also use the GUI web console to update the database homes by clicking **Patch** on the left panel, and then select **Apply** in the Patch drop-down. We have already updated the db4 database by pointing to a new home using the command line already.



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Step 5 - Upgrade a Database

To upgrade a database from release 12.2 to 19.16, we must first create an Oracle Database release 12.2 database.

Create an Oracle 12.2 database db5. Select Create a Database, then click Next.

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Fill in the information and click **Create**.

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You can see Oracle Database release 12.2 database db5 is created.

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Now we will upgrade database db5 from release 12.2 to 19.16 by clicking Actions and then select Upgrade.



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Then, select a new database home, for example, OraDB19000_home4. Database upgrade is also an out-of-place operation, which means the existing home of the database is not modified.

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You can see db5 is upgraded from Oracle Database release 12.2 to 19.16.

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This concludes Lab 3.



Lab 4 - Virtualization: Create Application and Database KVMs

Virtualization provides many benefits to customers such as cost savings through consolidation and better resource utilization, Virtual Machine (VM) isolation that provides better security, and KVM license hard partitioning support. Kernel-based VM (KVM) is an industry standard virtualization technology that is also used in Oracle Cloud and other public clouds.

You will use Oracle Database Appliance BUI to create an application KVM, called Compute Instance, and a database KVM, called Database System.

- Step 1 Create an Application KVM (Compute Instance)
- Step 2 Create a Database KVM (Database System)

Step 1 - Create an Application KVM (Compute Instance)

Before you create an application KVM on Oracle Database Appliance, you must create the following:

- CPU Pool
- VM Storage
- Virtual Disk
- Virtual Network

You must create a guest operating system (Linux or Windows) ISO image to create the application KVM instance. After that, you must configure the guest operating system, networking (set IP address) so that you can access the VM to install applications. You can also modify and delete an application KVM.

First, create a CPU Pool for the application KVM. In the BUI, click **CPU Pool**, and then click **Create CPU Pool**. Enter the following information, then click **Create**.

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Next, create the VM Storage. Select the VM Storage tab, and then click Create VM Storage.

Enter the following information for vmstorage1, and then click **Create**. VM Storage can be used by different application KVMs.

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Next, create a virtual disk vdisk to be used by the application KVM. Select the **Virtual Disks** tab and click **Create Virtual Disk**.

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Select Create Virtual Disk, then click Next.

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Enter the following information for vdisk1, and then click Create.

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Create a virtual network for the KVM. Select the **Virtual Networks** tab, and then click **Create Virtual Network**.

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Specify the Virtual Network information, then click **Create**.

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You can see the virtual network <code>vmnet1</code> is created.

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Create an application KVM (Compute Instance). Select the **VM Instances** tab, and then click **Create VM Instance**.



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Select Create VM Instance, then click Next.

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Specify the information for AppKVM1, then click **Create**. Note the **Source Installation** path to the Linux ISO image. Note that the VM disk size is 10GB. VM disk is the local system boot disk where the Linux image is installed.

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You can see AppKVM1 instance is created.

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You can see the detailed information for AppKVM1 by clicking on AppKVM1.



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If you want to modify the VM instance, then click the **VM Instance** tab. For AppKVM1, click the **Actions** dropdown and then click **Modify**.

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This is where you can modify AppKVM1.

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To delete an application KVM, from the **VM Instances** tab, click the **Actions** dropdown, and then click **Delete**.



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Step 2 - Create a Database KVM (Database System)

To create a database KVM (Database System) in Oracle Database Appliance, you must first download the DB system image (database VM template) into the appliance, then update the repository so that the database VM template is saved in Oracle Database Appliance.

```
$ odacli update-repository -f /opt/oracle/dcs/patchfiles/odacli-dcs-19.16.0.0.0
-date-ODAVM-19.16.0.0.zip
{
    "jobId" : "2d45004d-923b-45d9-b27c-cfbda391edb6",
    "status" : "Running",
    "message" : "/opt/oracle/dcs/patchfiles/odacli-dcs-19.16.0.0.0-date-ODAVM-19.1
6.0.0.zip",
    "reports" : [],
    "createTimestamp" : "July 26, 2022 07:45:04 AM UTC",
    "resourceList" : [],
    "description" : "Repository Update",
    "updatedTime" : "July 26, 2022 07:45:05 AM UTC"
}
```

In the BUI, select **DB Systems** on the left, and click **Create DB System**. Then, click **Create**.

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Enter the System Information, Network Information, CPU Pool and Database Information, then click **Create**.



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Note the database shape selected will determine the number of CPU cores assigned to the database. A database CPU pool is automatically created, or a database CPU Pool can be selected. A default network is also be automatically assigned to the database, or a network can be selected. Make sure **CDB** is selected.

Database Information		
D8 Name *	Database Edition	SHS and PDB Admin User Password *
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POB Name *	Minor w	AL16U7F16 *
pdb1	Configure EM Express 🔿 Yes 🛎 No	Language
PDB Admin User		AMORCAN +
		Territory
		AM(RCA +
		Enable TDE 🔿 Yes 💌 No
		TDE Wallet Password
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		and companies of the control of the

You can see that a database KVM <code>dbsystem1</code> is created.

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You can find the details for <code>dbsystem1</code> by clicking on it.



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You can modify the DB System by clicking **Actions** and then selecting **Modify**.

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You can change the database shape from odb2 (2 cores) to odb4 (4 cores).

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Click the **DB Systems** tab on the left to verify that <code>dbsystem1</code> has 4 cores now.

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This concludes Lab 4.



Lab 5 - Multi-User Access

Oracle Database Appliance Multi-User Access can enhance the security of your appliance and provide an efficient mechanism for role separation. With multi-user access, you can provide separate access to database administrators to manage databases and create multiple users with different roles that restrict them from accessing resources created by other users and restrict the set of operations they can perform.

In this lab, you will create two new users, user1 and user2, assign a resource, for example, database to user1, then create a database using user2. You will verify that both users have access to different resources.

- Step 1 Create New Users
- Step 2 Grant a Resource to a User
- Step 3 Create a Resource by a User

Step 1 - Create New Users

Navigate to the **Multi-User Access** tab in the BUI. Create a new user, user1, and provide a temporary password. The password for user1 must be changed on the first login.

ORACLE	Database Appliance	System: oda Current	User: odaadmin	Resource	is * Aco	ount + 9, Searc	h ODA Docu	mentation for
		Appliance Database	Object Store	Monitoring	Security	Multi-User Access	Activity	Diagnostics
Aulti-User Access	Create User					O Help		
Users								
Roles	Use the options below to create a new user. If multi-user access is er to run CU commands.	habled, the same credentials	s are used for the	BUI and for sys	item login			
Entitlements	User ID *	Roles *						
Resources	user1	ODA-D8 ×						
	Generate mTIS certificate	ODA Password *						
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		Confirm ODA password *						
				< Cance	el Create	>		
Enstiements Resources		ODA-D8 × ODA Pasoword * Confirm ODA pasoword *		< Cance	el Create	>		

Go to the Users tab on the left to verify that the new user, user1, is created.



ORACLE	Database Appliance		 Q Search ODA Documentation for 6-User Access Activity Diagnostics
Multi-User Access Users Roles	search Q. Page of 1 (1-5 of 5 items) X < 1 >	Sort by: User ID + Refresh Create User	Help
Entitlements Resources	grid ID: ee8625df-8bff-49fe-9962-f600ff/97966e Account Status: Active	Roles: ODA-GRID User Type: System	
	oakdroot ID: b196ba2f-1f30-49c6-81d6-624752febf15 Account Status: Active	Roles: CDA-OAKDROOT User Type: System	
	odaadmin ID: 63c082db-de04-45dd-baed-66b569f0e808 Account Statua: Active	Roles: ODA-ADMINISTRATOR User Type: System	
	oracle ID: e95a29bd-9d16-4c35-90ff-60258b/63664 Account Status: Active	Roles: CDA-DB User Type: System	
	user1 ID: 41074189-6a90-4b0b-8a8d-d57d81342906 Account Status: Inactive	Roles: ODA-D8 Actions * User Type: Custom	

Create a second user, user2 using the same process.

ORACLE	Database Appliance	System: oda Current User: odaadmin 🔋 Resources 👻 Account 👻 🔍 Search ODA Documentation fo	r
		Appliance Database Object Store Monitoring Security Multi-User Access Activity Diagnostic	8
Multi-User Access	Create User	O Help	
Users			
Roles	Use the options below to create a new user. If mult to run CU commands.	-user access is enabled, the same credentials are used for the BUI and for system login	
Entitlements	User ID *	Roles *	
Resources	user2	ODA-DB ×	
	Generate mTLS certificate	ODA Pasoword *	
		••••••	
		Confirm ODA password *	
		< Cancel Create >	

Go to the $\ensuremath{\textbf{Users}}$ tab on the left to verify that $\ensuremath{\texttt{user2}}$ is created.

DRACLE	Database Appliance	System: oda Current User: odaadmin 🚺 Resources * Account * 9, Search ODA Documentation Appliance Database Object Store Monitoring Security <u>Multi-User Access</u> Activity Diagnos
ulti-User Access	search Q	Sort by: User ID + Refresh Create User
Roles	Page of 1 (1-6 of 6 items) ⊨ < 1 > ∞	
Entitlements	grid	
	ID: ee8625df-8bff-49fe-9962-f600f69796fe Account Status: Active	Roles: ODA-GRID
Resources	Account Status: Active	User Type: System
	oakdroot	
	ID: b196ba2f-1f30-49c6-81d6-624752febf15 Account Status: Active	Roles: ODA-OAKDROOT User Type: System
	odaadmin	
	ID: 63c082db-de04-45dd-baed-66b569f0e808	Roles: ODA-ADMINISTRATOR
	Account Status: Active	User Type: System
	oracle	
	ID: e95a29bd-9d16-4c35-90ff-60258bf63664 Account Status: Active	Roles: ODA-DB
	Account Status: active	User Type: System
	user1	
	ID: 41074189-6a90-4b0b-8a8d-d57d81342906 Account Status: Inactive	Roles: ODA-DB Actions v User Type: Custom
	Account Status: macure	user type: Castom
	user2 ID: b7d3e24d-c7c1-4b09-8cec-31e0cc136c0c	Roles: ODA-DB
	ID: 57d3e24d-c7c1-4609-8cec-31e0cc136c0c Account Status: Inactive	Roles: ODA-DS Actions * User Type: Custom



Step 2 - Grant a Resource to a User

You will grant a resource, db5, to user1. Go the **Resources** tab on the left, click on **Show Advanced Search**, select **ODA_DB**, and click **Search**. On db5, click **Actions**, and then select **Grant Resource Access**.

ORACLE	Database Appliance		System: oda Appliance			Q Search ODA Documentation for User Access Activity Diagnostics
Multi-User Access	search Q	Show Advanced Search		Sort by: Name	• Refresh	O Help
Users	Search resources using the below filters.		resources are shown.	Just by. Hank		
Roles		Resource Type		Resource Name		
Entitlements	Show All Resources	OCA_D8	*			
Resources	Search Reset Search Filters					
	Page of 1 (1-3 of 3 items) \times	< 1 > ×				
	db3 ID: 324a42ea-bba2-477d-8bca-5a20	laf159f1c Copy	Type: ODA_DB		Actions *	
	Primary Owner: odaadmin Active: true Location: ecfa440e-2482-40c1-8ccc	-67316cd48ba2	Shared Access: Created: Fri Feb 25 20	22 5:45:50 PM		
	db4 ID: deac01db-eaa8-4f4e-a511-aea0 Primary Owner: odaadmin	42be3a18 Copy	Type: ODA_D8 Shared Access:		Actions *	
	Active: true Location: c3c63738-703e-4c1d-98d	e-95b551b67468	Created: Fri Feb 25 20	22 5:51:50 PM		
	db5					
	ID: 19245968-7775-4e9c-9448-3ad4	Wo41c5e1 Copy	Type: ODA_D8		Actions =	
	Primary Owner: odaadmin Active: true		Shared Access: Created: Fri Feb 25 20	22.11.14.20.044	Grant Resou	rce Access
	Location: /u01/app/odaorahomeba	se/odaadmin/product/19.		EE TEPEEVEN	Revoke Reso	ource Access

In the User Name drop-down, select user1, then click Grant.

ORACLE	Database Appliance	System: oda Current User: odaadmin Resources * Account * Q Search ODA Documentation for
Multi-User Access	Grant Resource Access	• Help
Roles	Grant user shared access to DCS resource db5 . Select the User Name *	e user name to whom access is to be granted.
Entitlements Resources	usert +	
		< Cancel Grant >

To verify that user1 has access to db5, click on the **Resources** tab on the left again. Note that user1 now has shared access to db5. Note that this database was originally created by the odaadmin user.



ORACLE	Database Appliance			iurrent User: odaadmin 🔋 Re atabase Object Store Monito	ring Security Multi-	Q Search ODA Documentation for User Access Activity Diagnostic
Multi-User Access	search Q 🖸	Show Advanced Search		Sort by: Name	* Refresh	Help
Users	Search resources using the below filters.	If no filters are specified, all res	ources are shown.			
Roles		Resource Type		Resource Name		
Entitlements	Show All Resources	ODA_DB	-			
Resources	Search Reset Search Filters					
	Page of 1 (1-3 of 3 items) K	< 1 > ×				
	db3					
	ID: 324a42ea-bba2-477d-8bca-5a26		Type: ODA_D8		Actions +	
	Primary Owner: odaadmin Active: true		Shared Access: Created: Fri Feb 25 2022	6.46-60.064		
	Location: ecfa440e-2482-40c1-8ccd		Created In Feb 25 2022	242.30 FM		
	db4					
	ID: deac01db-eaa8-4f4e-a511-aea04		Type: ODA_DB		Actions *	
	Primary Owner: odaadmin Active: true		Shared Access: Created: Fri Feb 25 2022	6-61-60 084		
	Location: c3c63738-703e-4c1d-98d		Created, mired as aver	2.31.30 FM		
	db5					
	ID: 19245968-7775-4e9c-9448-3ad4		Type: ODA_DB		Actions v	
	Primary Owner: odaadmin Active: true		Shared Access: user1 Created: Fri Feb 25 2022	11:14:00 PM		
	Location: /u01/app/odaorahomeba			11.19.00 1.00		

Log in as user1 to verify access to db5.

Oracle Database Appliance
User Name * user1 OCA Password

Specify the temporary password created by the odaadmin user, and you are prompted to provide a new password. You can use a password similar to WELcome12## or create your own.



Oracle Database Appliance
Your ODA account is inactive as temporary password has not been changed on first login. Configure the user1 user password to comply with your system security requirements. After configuring the password, login using the new password. ODA Password *
Confirm ODA Password *
Submit

When you log in with the new password, note that the **Current User** is displayed as user1. Note that there are fewer tabs on the top for user1.

ORACLE	Database Appliar	nce		System: oda	Current User: user1	Resources *	Account *	9. Search O	CA Documer	ntatio
						Appliance	Database	Object Store	Security	A
liance	Basic Informat	tion Advanced Info	umation					O Help		
retview										
twork	System Inform	nation								
J Pool	ID: 5e4ccd02-b380-420b-9ed6-7a28156238a7									
		Platform: X8-25								
Patch Manager		Data Disk Count: 2								
		CPU Core Count: 8								
		DCS Agent: 1								
			9.14.0.0.0							
		Created: r	ri Feb 25 2022 4:56:27 PM							
		Host Name: 0	da							
	Domain Name: example.com									
	Time Zone: GMT									
	DNS Servers: 1.1.1.1									
		NTP Servers:								
	- 13									
	Disk Group Inf	formation								
							Refresh			
					20000 V					
	Name	Redundancy	Physical Total Space	Physical Free	Space Lo	ogical Free Space	2			
	Name > DATA	Redundancy	Physical Total Space 11.0 TB	Physical Free		agical Free Space				

Click on the **Database** tab, and note that user1 has access to db5.

ORACLE	Database Appliance System: oda Current User: user1 🐌 Resources * Account * 🔍 Search ODA Documentation Arc.
Database	Applance Database Object Store Security Activity
Database Database Home Backup Policy	search Q, Sont by: Created New to Old + Refresh Create Database Show All Databases
	db5 Shape: odb1 Actions * ID: 19245968-7775-4e9c-9448-3ad64c41c5e1 COB: false Shape: odb1 Actions * Status: CONFIGURED DB Version: 19.14.0.0.220118 Storage: ASM
	Created: Fri Feb 25 2022 11:14:18 PM System Name: oda



Step 3 - Create a Resource by a User

Log in as user2, create a database, and have exclusive access to the database. First, log in as user2 with the temporary password created by odaadmin.

Oracle Database Appliance
User Name * user2
ODA Password
Login Forgot password?

A new password for user2 is required. You can use a password similar to WELcome12##, or create your own.

Oracle Database Appliance
Your ODA account is inactive as temporary password has not been changed on first login. Configure the user2 user password to comply with your system security requirements. After configuring the password, login using the new password. ODA Pawword *
Confirm ODA Password *
Submit

Log in as user2 with the new password.



	Database Appli	ance		System: oda Current	User: user2	Resources *	Account *	9. Search O	OA Documer	ntation A
						Appliance	Database	Object Store	Security	Acti
oliance	Basic Informa	Advanced Info	ormation					O Help		
etwork	System Infor	mation								
U Pool			e4ccd02-b380-420b-9ed6-7a2815	5238a7						
		Platform: X								
Patch Manager	Data Disk Count: 2									
		CPU Core Count: 8								
		DCS Agent: 19.14.0.0								
		GI: 19.14.0.0 Created: Fri Feb 25 2022 456:27 PM								
		Created: H1 HeD 25 2022 43622 HM								
		Hart Name of a								
	Host Name: oda									
		Domain Name: example.com Time Zone: GMT								
		DNS Servers: 1.1.1.1								
		NTP Servers:								
	Disk Group In	nformation								
							Refresh			
	Name	Redundancy	Physical Total Space	Physical Free Space	Log	ical Free Space				
			11.0 TB	10.0 TB	2.22	TB - 5.0 TB				
	► DATA	FLEX	11.0 18	10.0 18	3.33	18-5018				

Click on the **Database** tab. There are no database available to user2. Click **Create Database**.

ORACLE	Database Appliance		System: oda	Current User: user2	Resources *	Account *	9. Search O	OA Documen	tation for	
					Appliance	Database	Object Store	Security	Activity	
Database							O Help			
Database										
Database Home										
Backup Policy										
		There is no o	fatabase							
		Click Create Database to		ise.						
		Create Database 5	how All Databases							
		Learn N	tore							

Create a new database, user2db1.



ORACLE	Database Appliance		System: oda	Current User: user2	Resources *	Account *	Search O	DA Documen	station for
					Appliance	Database	Object Store	Security	Activity
Database	Create Database						O Help		
Database									
Database Home	D8 Name *	Database Edition		SYS and PDB Admin Us	er Password *				
	user2db1	Enterprise Edition	× .						
Backup Policy	D8 Unique Name	Database Class		Confirm Password					
	user2db1u	OUTP							
	Use Existing DB Home	Shape		Character Set					
	O Yes ® No	odb1(1 Core, 8G8 Memory)	*	AL32UTF8	*				
	DB Version	Storage		National Character Set					
	19.14.0.0.220118 +	ASM		AL16UTF16	*				
	CD8 O Yes . No	Database Redundancy		Language					
		Mirror	*	AMERICAN	*				
		Networks *		Territory					
		Public-network ×		AMERICA	*				
		CPU Pool Name		Enable TDE 📀 Yes 🖲	No				
		Select CPU Pool		TDE Wallet Password					
		Configure EM Express 🔿 Yes	• No	Confirm TDE Wallet Pas	sword				
				< 1	Back Cancel (Create >			

Click **Create** and verify that the database is created.

ORACLE	Database Appliance			System: o	da Cur	ment User: user2	Resources *	Account *	9. Search C	OA Documer	tation for
							Appliance	Database	Object Store	Security	Activity
Database Database Database Home Backup Policy	search Page of 1 (1 of 1 i	Q . tems) к с 1 > х	Sort by:	Created: New to Old +	Refres	sh Create Data	base Show All	Databases	O Help		
	user2db1 ID: 9686d067-89a8-43 Status: CREATING Created: Sat Feb 26 2	008-aa3f-ed7cc72e7533 Copy 022 3:27:17 PM	D8 Versi	se ion: 19.14.0.0.220118 Name: oda		Shape: odb1 Storage: ASM	3	lations +			

Log in as user1 to verify that user1 does not have access to user2db1.

Oracle Database Appliance
Utur Name * user1 COA Password © Login Forgot password?

You can verify that user1 only has access to db5.



Database Appliance	System: od	a Current User: user1 🔋 R		 Search ODA Documentation for Object Store Security Activity
search Q, Page of 1 (1 of 1 item) K < 1 > - ×	Sort by: Created: New to Old *	Refresh Create Database	Show All Databases	O Help
db5 ID: 19245968-7775-4e9c-9448-3ad44c41c5e1 Copy Status: CONFIGURED Created: Fri Feb 25 2022 11:14:18 PM	CDB: false DB Version: 19.14.0.0.220118 System Name: oda	Shape: odb1 Storage: ASM	Actions *	
	search Q. Page of1 (1 of 1 item) K < < 1 > X co5 ID: 19245968-7775-4e%-9448-3ad44c41c5e1 Copy Status: CONFIGURED CONFIGURED	Database Appliance search Q. Sort by: Created. New to Old • Page of 1 (1 of 1 items) K. (1) >	Database Appliance Sort by: Created: New to Old Refeash Create Database Rape of 1 (1 of 1 items) K 1 > X X <t< td=""><td>Database Appliance Appliance search 9. Page of 1 (1 of 1 item) # 1 > x</td></t<>	Database Appliance Appliance search 9. Page of 1 (1 of 1 item) # 1 > x

Log in as odaadmin to review resources and user access.

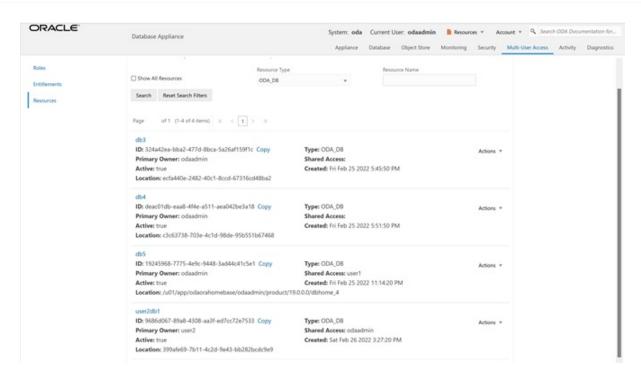
Oracle Database Appliance
User Name * odaadmin
CDA Password D
Login Forgot password?

When logged in as the odaadmin user, you can view all the databases.

ORACLE	Database Appliance	System: oda Appliance	Current User: odaadmin Database Object Store		 Q Search ODA Documentation for User Access Activity Diagnostic
Database Database	search Q, Page of 5 (1-4 of 4 items) K < 1 >	Sort by:	Created: New to Old +	Refresh Create Database	O Help
Database Home Storage Database Home Backup Policy	user2db1 ID: 9686d067-8948-4308-aa3f-ed7cc72e7533 Copy Status: CONFIGURED Created: Sat Feb 26 2022 3:27:17 PM	CDB: false DB Version: 19.14.0.0.220118 System Name: oda	Shape: odb1 Storage: ASM	Actions +	
	db5 ID: 19245968-7775-4e9c-9448-3ad44c41c5e1 Copy Status: CONFIGURED Created: Fri Feb 25 2022 11:14:18 PM	CDB: false DB Version: 19.14.0.0.220118 System Name: oda	Shape: odb1 Storage: ASM	Actions +	
	db4 ID: deac01db-eaa8-4f4e-a511-aea042be3a18 Copy Status: CONFIGURED Created: Fri Feb 25 2022 5:51:50 PM	CDB: faise DB Version: 19.14.0.0.220118 System Name: oda	Shape: odb1 Storage: ASM	Actions +	
	db3 ID: 324a42ea-bba2-477d-8bca-5a26af159f1c Copy Status: CONFIGURED Created: Fri Feb 25 2022 5:45:50 PM	CDB: faise DB Version: 19.13.0.0.211019 System Name: oda	Shape: odb1 Storage: ASM	Actions *	

Click on the **Multi-User Access** tab, then click on the **Resources** tab on the left. Use the **Advanced Search** feature and search for ODA_DB, You can see the Primary Owner of the database and Shared Access users for the databases. The user1 has access to db5, and user2 has access to user2db1.





This concludes Lab 5.



Lab 6 - Monitoring and Resources

Use either the command line or web BUI to monitor Oracle Database Appliance software, hardware, and feature usage. Oracle Database Appliance also provides security reports, diagnostic information, and context sensitive online help (documentation, FAQ, blogs). An Oracle Enterprise Manager plug-in is available if you want to use Oracle Enterprise Manager to monitor your IT infrastructure.

This lab will demonstrate how to monitor Oracle Database Appliance with BUI and ODACLI commands.

- Step 1 Advanced Information, Security Reports, Diagnostics, Online Help
- Step 2 Hardware Monitoring and Feature Tracking
- Step 3 Review Appliance Configuration
- Step 4 Review Storage Configuration
- Step 5 Review Network Status

Step 1 - Advanced Information, Security Reports, Diagnostics, Online Help

To view the Oracle Database Appliance software components, click on the **Advanced Information** tab on the Appliance Overview page.

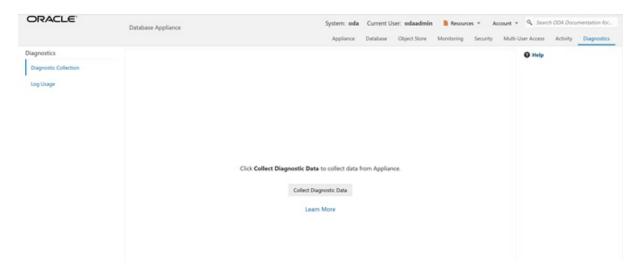
ORACLE	Database Appliance			Current User: odaade Database Object Sto		e v Q Search ODA Documentation for ulti-User Access Activity Diagnostic
Appliance Overview Compute Instances DB Systems	Basic Information Advanced I Node Name: scaoda7142.us.oracle.r Time) # Grid Infrastructure	nformation	e Oct 19 2021 11:29:20	GMT-0700 (Pacific Day	Refresh Download	O Help
Network CPU Pool	GI Version Home	Active Version Information	Active Version Information	Active Version Information	Software Version Information	
Oracle ASR Patch Manager	19.13.0.0.211019 /u01/app /19.13.0.0/grid	Oracle Clusterware active version on the cluster is [19.0.0.0]	The cluster upgrade state is [NORMAL]	The cluster active patch level is [573139142].	Oracle Clustenware version on node [scaoda7142] is [19.0.0.0.0]	
	 Database Homes Firmware Controller 					
	Firmware Disk					
	ILOM					
	BIOS					
	List of Operating System RP	Ms				

To view security-related information, click on the **Security** tab on the Appliance page.



ORACLE	Database Appliance		 Q_k Search ODA Documentation for S-User Access Activity Diagnostics
Multi-User Access Users Roles	search Q, Page of 1 (1-5 of 5 items) × < 1 > ×	Sort by: User ID + Refresh Create User	O Help
Entitlements Resources	grid ID: ee8625df-85/f-49fe-9962-1600f69796/e Account Status: Active	Roles: CDA-GRID User Type: System	
	oakdroot ID: b196ba2f-1f30-49c6-81d6-624752febf15 Account Status: Active	Roles: ODA-OAKDROOT User Type: System	
	odaadmin ID: 63c082db-de04-45dd-baed-66b569f0e808 Account Status: Active	Roles: ODA-ADMINISTRATOR User Type: System	
	oracle ID: e95a29bd-9d16-4c35-90ff-60258b663664 Account Status: Active	Roles: CDA-DB User Type: System	
	user1 ID: 41074189-6a90-4b0b-8a8d-d57d81342906 Account Status: Inactive	Roles: CDA-DB Actions * User Type: Custom	

To view diagnostic and log usage information, click on the **Diagnostics** tab on the Appliance page.



To view context sensitive in-line help information, click on **? Help**.



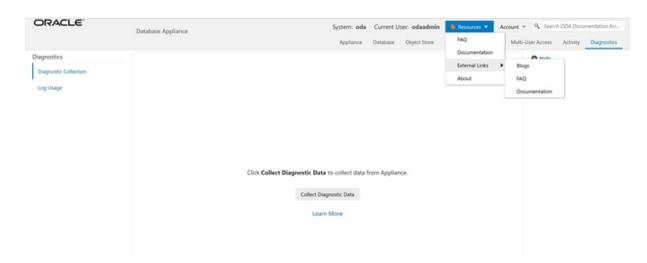
ORACLE	Database Applia	ince		System: odla Current User: or Appliance Database Obje	daadmin 🔒 Resource	s v Account v Q. Search ODA Documentation for Security Multi-User Access Activity Diagnostics
Appliance Overview Compute Instances DB Systems Network CPU Rool Oracle ASR Patch Manager	Bask Informa System Informa Disk Group In	ID: 5 Platform: 5 Data Disk Count 2 CPU Core Count 8 DCS Agent: 1 Gt: 1 Created: F Host Name: 0 Domain Name: 0 Domain Name: 0 DMS Servers: 1 NTP Servers:	e4ccd02-b380-420b-9ed6-7a2815 8-25 9.14.0.0.0 9.14.0.0.0 1 Feb 25 2022 4:56:27 PM da sample.com MT	6238#7		Appliance × FAQs
	Name	Redundancy	Physical Total Space	Physical Free Space	Logical Free S	
	► DATA	FLEX	11.0 TB	10.0 TB	3.33 TB - 5.0 TE	
	► RECO	FLEX	490.0 G8	325.0 GB	108.33 G8 - 16	with the CLI Follow the JSON file example to create a JSON file to deploy a multi-node appliance with the command odacti create-appliance.

You can also click inside the search box on the top right corner to search the Oracle Database Appliance documentation by topics.

ORACLE	Database Applia	ince		System: oda Current User: o Appliance Database Obj		Account *	tecliance
Appliance Overview Compute Instances	Basic Informa System Inform		rmation				Backup Config Backup Policy Database DB System
DB Systems Network CPU Rool Oracle ASR Patch Manager		Platform: 20 Data Disk Count: 2 CPU Core Count: 8 DCS Agent: 19 Git 19	8.14.0.0.0 8.14.0.0.0 i Feb 25 2022 4:56:27 PM da sample.com	6238#7			KVM
	Disk Group In Name DATA	Redundancy FLEX	Physical Total Space 11.0 TB	Physical Free Space 10.0 TB	Logical Free Space 333 TB - 5.0 TB		
	RECO	FLEX	490.0 GB	325.0 G8	108.33 GB - 162.5 G	8	

To view online help information such as Oracle Database Appliance documentation, FAQ, and blogs, click on the **Resources** tab on the Appliance page.





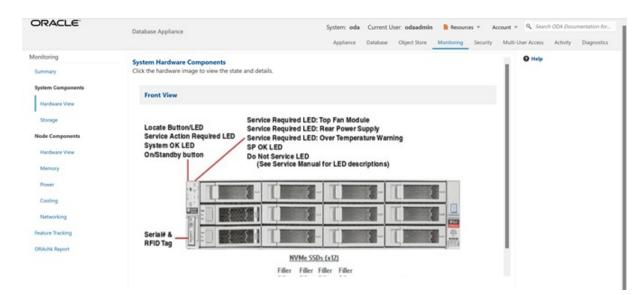
Step 2 - Hardware Monitoring and Feature Tracking

The BUI displays Oracle Database Appliance hardware status and tracks feature usage including High Water Marks.

DRACLE	Database Appliance		nt + 9 Search ODA Documentation for Nutl-User Access Activity Diagnostic
onitoring Summary System Components Hardware View	Last Collection time: Sat Feb 26 2022 2:20:56 PM Status Login to the ILOM console of odasim-1 for more details.	Apparente Canadase Copiet soler <u>excending</u> promy in	Help
Storage	Subsystem	Status	
Node Components	► Storage	ONLINE	
Hardware View	Memory	© OK	
Memory	Power	© OK	
Power	Cooling	© OK	
Cooling	Networking	© OK	
Networking			
Feature Tracking			
ORAchk Report			

Hardware Status





Storage

DRACLE	Database Appl	lance			System: oda	Current User: odaadmir	Resources	* Acc	count v 9 Searc	ch ODA Docu	mentation fo
					Appliance I	Database Object Store	Monitoring 5	Security	Multi-User Access	Activity	Diagnosti
onitoring	100000000								O Help		
Summary	Storage										
System Components											
Hardware View											
Storage				2 014	UNE (100%)						
Node Components											
Node Components Hardware View											
Hardware View				ONLINE C	FFUNE UNKNOWN						
Hardware View Memory	Name	State	Disk Type	CNUME COUNT	FFLME CHRONOWN Disk Size(GB)	Multipath List	Total Sectors	5			
Hardware View Memory Power	Name pd_00	State	Disk Type NVD			Multipath List /dev/nvme0n1	Total Sectors 12502446768				
Memory Power Cooling				ASM Disk List	Disk Size(GB)			5			

Hardware View



ORACLE	Database Appliance	System: oda Current User: odaadmin B Resources × Account × 9, Search ODA Documentation for Appliance Database Object Store Monitoring Security Multi-User Access Activity Diagnostic
Monitoring Summary	Node Hardware Components Click the hardware image to view the state and details.	O Help
System Components Hardware View	Top View	Rear View
Storage	Pile Banks (KFI) Pile Banks (KFI) Pile Banks (KFI) Pile Banks (KFI) Pile Banks (KFI)	REVER Types of Types with the REVERTS As and types with the REVERTS of the REVERT
Node Components Hardware View Memory		
Power		Provide and the second
Cooling Networking		Section 2. Section 1000
Feature Tracking		
ORAchk Report	Far. Stadion (14)	
	Das. Dotes (r/2) (under server)	
	Conversion of the	

Feature Tracking

The Feature Tracking output displayed in the simulator may not match the display on an actual Oracle Database Appliance. Following is a sample output:

ORACLE	Database Appliance			Appliance Datat	Current User: oda-ad	Imin Account v 🔘 Help v Monitoring Security Activity
Monitoring Summary	Feature Usage High Water Marks				-	Help
System Components Hardware View	Last Collection time: Wed Jun 23 202	1 1:00:01 PM				пер
Storage	Feature Name	Category	Currently Used	Detected Usage	Total Samples	Last Detected Usage Tin
Node Components	Object Store	Object Store	false	0	1	
Hardware View	Automatic Service Request (ASR)	Server	false	0	1	
Memory						
Power						
Cooling						
Networking						
Feature Tracking						
ORAchk Report						

High Water Marks

The High Water Marks output displayed in the simulator may not match the display on an actual Oracle Database Appliance.



DRACLE	Database Appliance	Appliance D	Current User: oda-admin Ar atabase Object Store Monitoring	Security Act
onitoring				_
Summary	Feature Usage High Water Marks			Help Downlos
lystem Components	30000			hep Downor
Hardware View	Last Collection time: Wed Jun 23 2021 1:00:01 PM			
Storage	Measured Feature Name	High Water Mark	Last Changed Time	Category
Node Components	Maximum usage of CPU	0.00 %	Wed Jun 23 2021 1:00:01 PM	DCS Agent
Hardware View	Maximum usage of Memory	331.29 MB	Wed Jun 23 2021 1:00:01 PM	DCS Agent
Memory	Maximum number of threads	91	Wed Jun 23 2021 1:00:01 PM	DCS Agent
Power	Maximum number of open file descriptors	48	Wed Jun 23 2021 1:00:01 PM	DCS Agent
Cooling	Maximum number of Object Store tenants	0	Wed Jun 23 2021 1:00:01 PM	Object Store
Networking	Maximum number of enabled CPU cores	2	Wed Jun 23 2021 1:00:01 PM	Server
Feature Tracking	Maximum number of disks	2	Wed Jun 23 2021 1:00:01 PM	Storage
ORAchk Report	Maximum number of ASM Disks Groups	0	Wed Jun 23 2021 1:00:01 PM	Storage
	Maximum size of ASM Disk Groups	0.00 bytes	Wed Jun 23 2021 1:00:01 PM	Storage
	Maximum usage of ASM Disk Groups	0.00 %	Wed Jun 23 2021 1:00:01 PM	Storage
	Maximum number of ASM Disks Groups with redundancy 'NORMAL'	0	Wed Jun 23 2021 1:00:01 PM	Storage
	Maximum number of ASM Disks Groups with redundancy 'HIGH'	0	Wed Jun 23 2021 1:00:01 PM	Storage
	Maximum number of ASM Disks Groups with redundancy 'EXTERN'	0	Wed Jun 23 2021 1:00:01 PM	Storage
	Maximum number of ASM Disks Groups with redundancy 'FLEX'	0	Wed Jun 23 2021 1:00:01 PM	Storage
	Maximum ASM Disk Groups compatibility		Wed Jun 23 2021 1:00:01 PM	Storage
	Minimum ASM Disk Groups compatibility		Wed Jun 23 2021 1:00:01 PM	Storage
	Maximum number of non-ACFS file systems	3	Wed Jun 23 2021 1:00:01 PM	Storage
	Maximum size of non-ACFS file systems	465.72 GB	Wed Jun 23 2021 1:00:01 PM	Storage

Step 3 - Review Appliance Configuration

Oracle Database Appliance Command Line Interface

The Oracle Database Appliance command line interfaces (odacli, odaadmcli) are tools that can also be used to install, configure, and interrogate the status of Oracle Database Appliance. ODACLI assists in the fast deployment, patching, and easy management of Oracle Database Appliance.

Review the following odaadmcli commands that provide information about Oracle Database Appliance configuration.

The sample output displayed in the simulator may not match exactly with the sample output on an actual appliance. For more details, refer to the Oracle Database Appliance documentation library for the latest release.

Command: odaadmcli show server

Description: Displays the server/node status, including Oracle ILOM IP address, firmware version, power consumption, and other details. This is helpful for an at-a-glance view of basic server and node information.



```
$ sudo odaadmcli show server
           Open Problems
Model
                                        : On
                                      : 0
                                        : ODA X7-2-HA
          Type: Rack MountPart Number: ODA X7-2-HASerial Number: 1750XD0003Primary OS: Not AvailableILOM Address: 10.145.203.81ILOM MAC Address: 00:10:E0:DA:CD:66. Oracle Database Ar
           Type
                                        : Rack Mount
           Description
                                        : Oracle Database Appliance X7-2 High Availabi
lity 1750XD0003
                               : Off
           Locator Light
           Actual Power Consumption : 302 watts
           Ambient Temperature : 20.250 degree C
           Open Problems Report : System is healthy
```

Command: odacli describe-system

Description: Displays Oracle Database Appliance deployment status.

Domain	Name: example.com	
Time	Zone: GMT	
DB Ed	lition: EE	
DNS Se	ervers: 1.1.1.1	
NTP Se	rvers:	
DG Name	Redundancy	Percentage
	Redundancy	Percentage
DG Name	Redundancy	Percentage
DG Name Data	Redundancy Flex	Percentage 80

Command: odaadmcli show processor

Description: This command displays information about the CPUs running in the system.

```
\$ sudo odaadmcli show processor
     NAME HEALTH HEALTH DETAILS PART NO. LOCATION
                                                  MODEL
MAX CLK SPEED TOTAL CORES ENABLED CORES
     CPU 0 OK
                               SR3AX PO (CPU 0) Intel(R) Xeon(R) Gold 6140
                 _
                         NA
CP 2.300 GHz
                18
     CPU 1 OK
                 _
                               SR3AX P1 (CPU 1) Intel(R) Xeon(R) Gold 6140
CP 2.300 GHz
                 18
                          NA
```

Command: odaadmcli show memory



Description: This command displays information about the memory.

\$ sudo odaadmcli show memory

```
NAME HEALTH HEALTH DETAILS PART_NO. SERIAL_NO. LOCATION MANUFACTURER MEMORY_SIZE
CURR_CLK_SPEED_ECC_Errors
DIMM_0 OK - 3A4K40BB2-CTD 00CE02174337340008 P0/D0 Samsung 32 GB 2666 MHz 0
DIMM_11 OK - 3A4K40BB2-CTD 00CE0217433734000D P1/D0 Samsung 32 GB 2666 MHz 0
DIMM_12 OK - 3A4K40BB2-CTD 00CE02174237318364 P1/D2 Samsung 32 GB 2666 MHz 0
DIMM_16 OK - 3A4K40BB2-CTD 00CE0217423731A19A P1/D4 Samsung 32 GB 2666 MHz 0
DIMM_19 OK - 3A4K40BB2-CTD 00CE02174237318394 P1/D7 Samsung 32 GB 2666 MHz 0
DIMM_19 OK - 3A4K40BB2-CTD 00CE02174237318394 P1/D7 Samsung 32 GB 2666 MHz 0
DIMM_21 OK - 3A4K40BB2-CTD 00CE0217423731A195 P1/D9 Samsung 32 GB 2666 MHz 0
DIMM_21 OK - 3A4K40BB2-CTD 00CE0217423731A195 P1/D9 Samsung 32 GB 2666 MHz 0
DIMM_23 OK - 3A4K40BB2-CTD 00CE02174237318365 P1/D1 Samsung 32 GB 2666 MHz 0
DIMM_4 OK - 3A4K40BB2-CTD 00CE0217433734007B P0/D4 Samsung 32 GB 2666 MHz 0
DIMM_4 OK - 3A4K40BB2-CTD 00CE0217433734007B P0/D4 Samsung 32 GB 2666 MHz 0
DIMM_4 OK - 3A4K40BB2-CTD 00CE0217433734007B P0/D4 Samsung 32 GB 2666 MHz 0
DIMM_4 OK - 3A4K40BB2-CTD 00CE0217433734007B P0/D4 Samsung 32 GB 2666 MHz 0
```

Command: odaadmcli show power

Description: This command displays information about the power details for the appliance.

Command: odaadmcli show cooling

Description: This command displays information about the cooling of the appliance.

```
$ sudo odaadmcli show cooling
NAME HEALTH HEALTH_DETAILS LOCATION FAN % FAN SPEED
Fan_0 OK - FM0 35 % 6900 RPM
Fan_1 OK - FM0 34 % 5900 RPM
Fan 10 OK - FM2 32 % 6200 RPM
```



```
Fan_11 OK - FM2 31 % 5500 RPM
Fan_12 OK - FM3 32 % 6300 RPM
Fan_13 OK - FM3 31 % 5500 RPM
Fan_14 OK - FM3 32 % 6300 RPM
Fan_15 OK - FM3 31 % 5500 RPM
Fan_2 OK - FM0 36 % 6800 RPM
Fan_3 OK - FM0 34 % 5900 RPM
Fan_4 OK - FM1 35 % 6800 RPM
Fan_6 OK - FM1 32 % 6300 RPM
Fan_6 OK - FM1 32 % 6300 RPM
Fan_7 OK - FM1 29 % 5100 RPM
Fan_8 OK - FM2 32 % 6300 RPM
Fan_9 OK - FM2 31 % 5500 RPM
```

Step 4 - Review Storage Configuration

Review the following odaadmcli commands that provide information about Oracle Database Appliance configuration.

Command: odaadmcli show disk

Description: This command is helpful for getting a view into the device mapping and current state of the hard disks. The output lists the drives in the ODA X7-2-HA.

\$ sudo oda	admcli show disk			
	NAME	PATH	TYPE	
STATE	STATE_D	ETAILS		
	e0 pd 00	/dev/sdbv	HDD	
ONLINE	Good			
	e0 pd 01	/dev/sdbw	HDD	
ONLINE	Good			
	e0 pd 02	/dev/sdbx	HDD	
ONLINE	Good			
	e0 pd 03	/dev/sdby	HDD	
ONLINE	Good			
	e0 pd 04	/dev/sdbz	HDD	
ONLINE	Good	, ,		
	e0 pd 05	/dev/sdca	HDD	
ONLINE	Good	,,		
	e0 pd 06	/dev/sdcb	HDD	
ONLINE	Good		1100	
	e0 pd 07	/dev/sdcc	HDD	
ONLINE	Good	/ 40 / 3400	HDD	
		/dev/sdcd	HDD	
ONT THE	e0_pd_08	/uev/sucu	עעח	
ONLINE	Good			



	e0_pd_09	/dev/sdce	HDD	
ONLINE	Good e0_pd_10	/dev/sdcf	HDD	
ONLINE	Good e0 pd 11	/dev/sdcg	HDD	
ONLINE	Good e0 pd 12	/dev/sdch	HDD	
ONLINE	Good			
ONLINE	e0_pd_13 Good	/dev/sdci	HDD	
ONLINE	e0_pd_14 Good	/dev/sdcj	HDD	
ONLINE	e0_pd_15 Good	/dev/sdck	SSD	
ONLINE	e0_pd_16 Good	/dev/sdcl	SSD	
	e0_pd_17	/dev/sdcm	SSD	
ONLINE	Good e0_pd_18	/dev/sdcn	SSD	
ONLINE	Good e0_pd_19	/dev/sdco	SSD	
ONLINE	Good e0 pd 20	/dev/sdcp	SSD	
ONLINE	Good e0 pd 21	- /dev/sdcq	SSD	
ONLINE	Good	-	SSD	
ONLINE	e0_pd_22 Good	/dev/sdcr		
ONLINE	e0_pd_23 Good	/dev/sdcs	SSD	

Command: odaadmcli show diskgroup

Description: Lists Oracle ASM disk groups configured on Oracle Database Appliance.

DATA is where the database data files are stored.

FLASH is where the hot files or small databases can be placed to improve performance

RECO is where the backups, archive logs, and redo logs of the database are stored.

REDO is where the redo logs of the database are stored.

```
$ sudo odaadmcli show diskgroup
DiskGroups
DATA
```



FLASH RECO REDO

Command: odaadmcli show fs

Description: Lists the details of the Oracle Database Appliance X8-2 file systems, including total Space, Free Space, Disk Group, and other details.

The sample output displayed in the simulator may not match exactly with the sample output on an actual appliance. For more details, refer to the Oracle Database Appliance documentation library for the latest release.

Туре	Total Space	Free Space	Total DG Space	Free DG Space	Diskgroup
Mount Po	pint				
ext3	30109M	25254M	-	-	
/					
ext3	476M	405M	-	-	
/boot					
ext3	60347M	22117M	_	-	
/opt					
ext3	100665M	72839M	-	-	
/u01					
acfs	5120M	462.5M	112116480M	111977204M	DATT

Command: odaadmcli show raidsyncstatus

Description: Lists the status of the boot disk HW RAID.

\$ sudo oc	daadmcli show :	raidsyncstatus		
Raid Type ercentage	Raid Device	Partitions	RaidStatus Recovery	RecoveryP
S/W Raid N/A	md0	sdb2 sda2	UU No	
S/W Raid N/A	mdl	sdb3 sda3	UU No	

Command: odaadmcli show storage



Description: The following command displays the storage controllers and drives.

```
$ sudo odaadmcli show storage
==== BEGIN STORAGE DUMP ======
Host Description: Oracle Corporation: ORACLE SERVER X7-2
Total number of controllers: 2
             Тd
                       = 0
             Serial Num = 500605b00d3e88c0
             Vendor = LSI Logic
                      = ORCL-EXT-SAS3
             Model
             FwVers
                      = 13.00.00.00
             strId = mpt3sas:3b:00.0
                       = 1
             Id
             Serial Num = 500605b00d3e8450
             Vendor = LSI Logic
             Model = ORCL-EXT-SAS3
FwVers = 13.00.00.00
             strId = mpt3sas:5e:00.0
Total number of expanders: 2
             Id
                    = 0
             Serial Num = 50800200022f163f
             Vendor = ORACLE
             Model
                      = DE3-24C
             FwVers = 0306
strId = Secondary
             WWN
                       = 50800200022e41be
             Τd
                       = 1
             Serial Num = 50800200022f163f
             Vendor = ORACLE
                     = DE3-24C
             Model
             FwVers
                       = 0306
             strId
                      = Primary
                       = 50800200022e447e
             WWN
Total number of PDs: 24
             /dev/sdaa
                            HGST
                                             HDD 9796qb slot: 0 exp: 0
                                                                            Η
7210A520SUN010T
             /dev/sdab
                            HGST
                                             HDD 9796qb slot: 1
                                                                  exp: 0
                                                                            Η
7210A520SUN010T
             /dev/sdac
                            HGST
                                             HDD 9796qb slot: 2 exp: 0
                                                                            Η
7210A520SUN010T
             /dev/sdad
                            HGST
                                             HDD 9796qb slot: 3
                                                                  exp: 0
                                                                            Η
7210A520SUN010T
             /dev/sdae
                                             HDD 9796qb slot: 4
                            HGST
                                                                  exp:
                                                                        0
                                                                            Η
7210A520SUN010T
             /dev/sdaf
                            HGST
                                              HDD 9796qb slot: 5 exp: 0
                                                                            Η
```



HGST	HDD 9796gb slot: 6 exp: 0 H
UCCT	HDD 9796qb slot: 7 exp: 0 H
11001	1100 9790gb S10C. 7 exp. 0 11
HGST	HDD 9796gb slot: 8 exp: 0 H
HGST	HDD 9796gb slot: 9 exp: 0 H
IICOM	
HGST	HDD 9796gb slot: 10 exp: 0 H
HGST	HDD 9796qb slot: 11 exp: 0 H
11001	
HGST	HDD 9796gb slot: 12 exp: 0 H
HGST	HDD 9796gb slot: 13 exp: 0 H
HGST	HDD 9796gb slot: 14 exp: 0 H
ЦССТ	SSD 3200qb slot: 15 exp: 0 H
11651	55D 5200gb 510C. 15 ekp. 0 11
HGST	SSD 3200qb slot: 16 exp: 0 H
HGST	SSD 3200gb slot: 17 exp: 0 H
HGST	SSD 3200gb slot: 18 exp: 0 H
UCOD	SSD 3200qb slot: 19 exp: 0 H
пдэт	SSD 3200gb slot: 19 exp: 0 H
HGST	SSD 800qb slot: 20 exp: 0 H
HGST	SSD 800gb slot: 21 exp: 0 H
HGST	SSD 800gb slot: 22 exp: 0 H
IICOM	
HGST	SSD 800gb slot: 23 exp: 0 H
	HGST HGST HGST HGST HGST HGST HGST HGST

Step 5 - Review Network Status

Review the following ${\tt odaadmcli}$ command that provide information about Oracle Database Appliance configuration.

Command: odaadmcli show network

Description: Displays the MAC address, health status, and temperature of the network ports.



\$ sudo odaadm	cli show netwo	ork				
NAME	HEAI	TH HEALTH DETAILS	LOCATION	PART NO	MANUFACTURER	MAC A
DDRESS	LINK DETECTEI	DIE TEMP		—		—
Ether	net_NIC_0 OK	_	NETO	i210	INTEL	00:10
:E0:DA:CD:62	no (eml)	N/A				
Ether	net_NIC_1 OK	-	NET1	BCM5741	7Broadcom	00:10
:E0:DA:CD:63	yes (em2)	N/A				
Ether	net_NIC_2 OK	-	NET2	BCM5741	7Broadcom	00:10
:E0:DA:CD:64	yes (em3)	N/A				
Ether	net_NIC_3 -	-	NET3	X540	INTEL	00:0A
:F7:CF:36:38	yes (p1p2)	-				
Ether	net_NIC_4 -	-	NET4	X540	INTEL	00:0A
:F7:CF:36:30	yes (p1p1)	-				

This concludes Lab 6.

