

Oracle® Database Appliance

Oracle® Database Appliance Simulator Labs



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ORACLE®

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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>.

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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.
<i>italic</i>	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](#)
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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 high-availability (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 1 GB 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**.
2. 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 ODA CLI 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-node1
```

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 **oda-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 | -l] [] | -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.

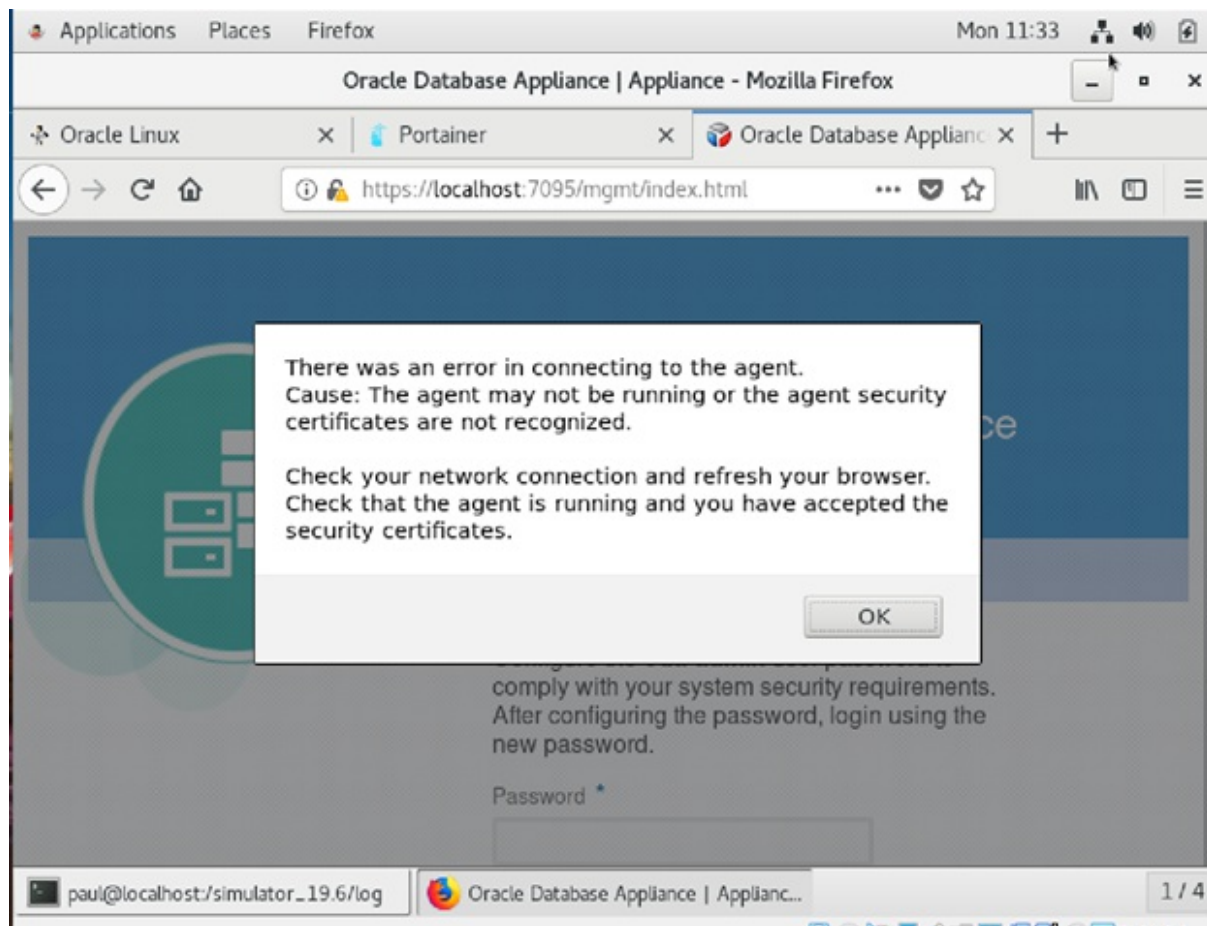
```
# ./snapshot.sh create oda-1
/scratch/user/simulator_19.12_ade/simulator_19.12.0.0.0/snapshots.dat doesn't exist. Creating a new one...
Snapshot with ID: 1 has been created successfully. Timestamp: Wed Sep 22 14:01:24 PDT 2021
# ./snapshot.sh list oda-1
ID      CONTAINER NAME      DEPLOYMENT TYPE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



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.

```
https://:7096
( Your port number maybe different)
```

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 **Always Free OCI Account**, 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

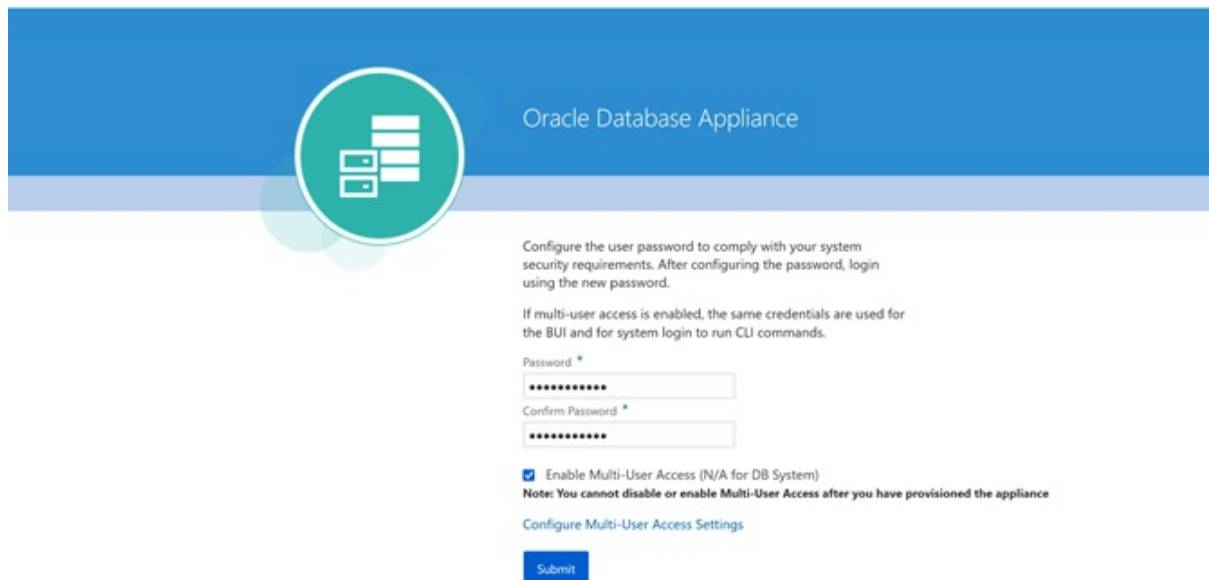
Connect to the simulator as follows:

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)

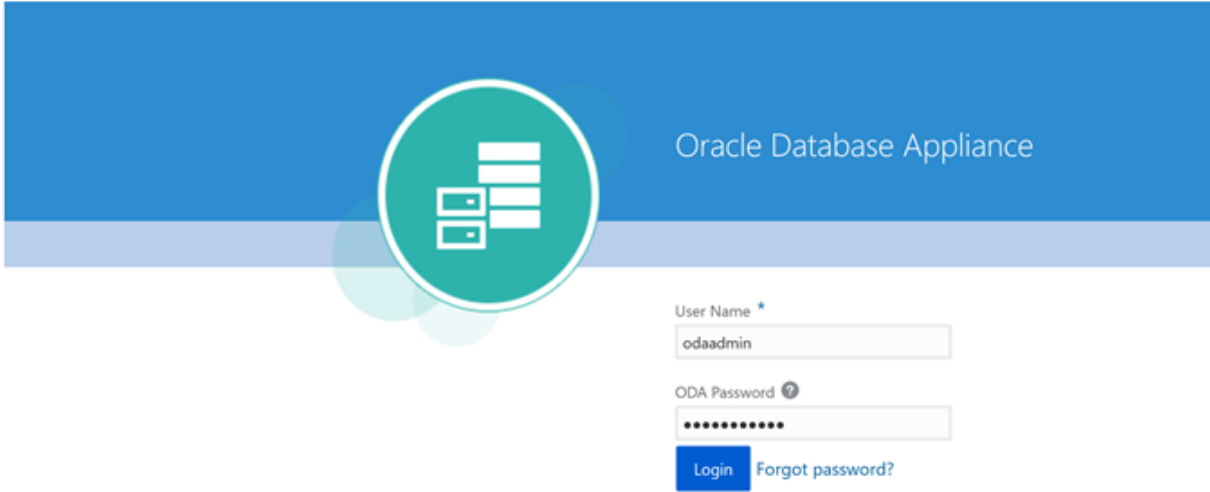
Note: You cannot disable or enable Multi-User Access after you have provisioned the appliance

[Configure Multi-User Access Settings](#)

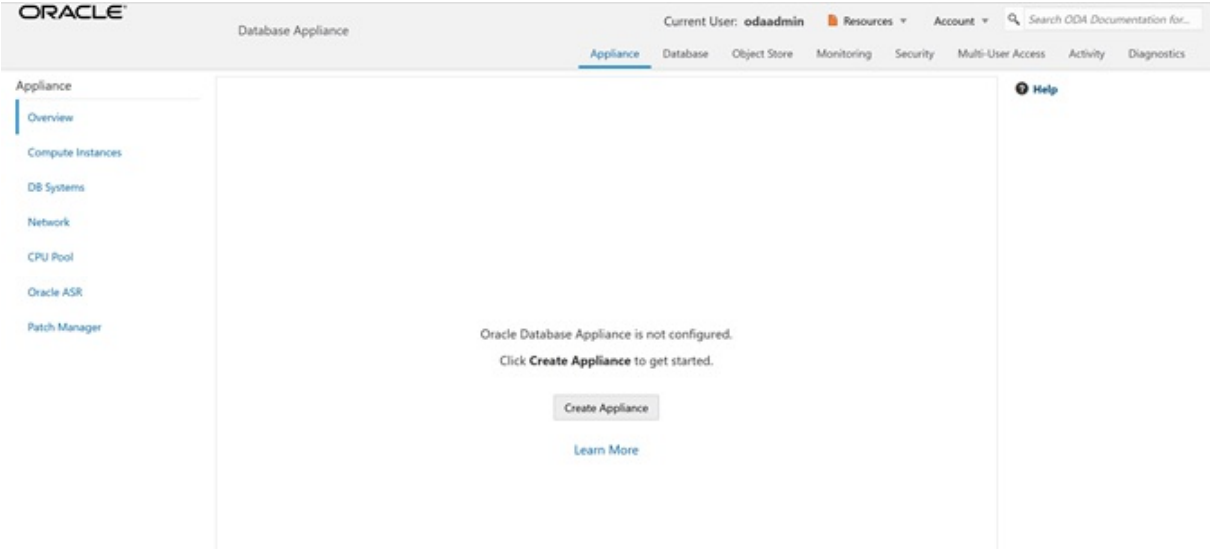
Submit

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.



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



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 (node0), 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

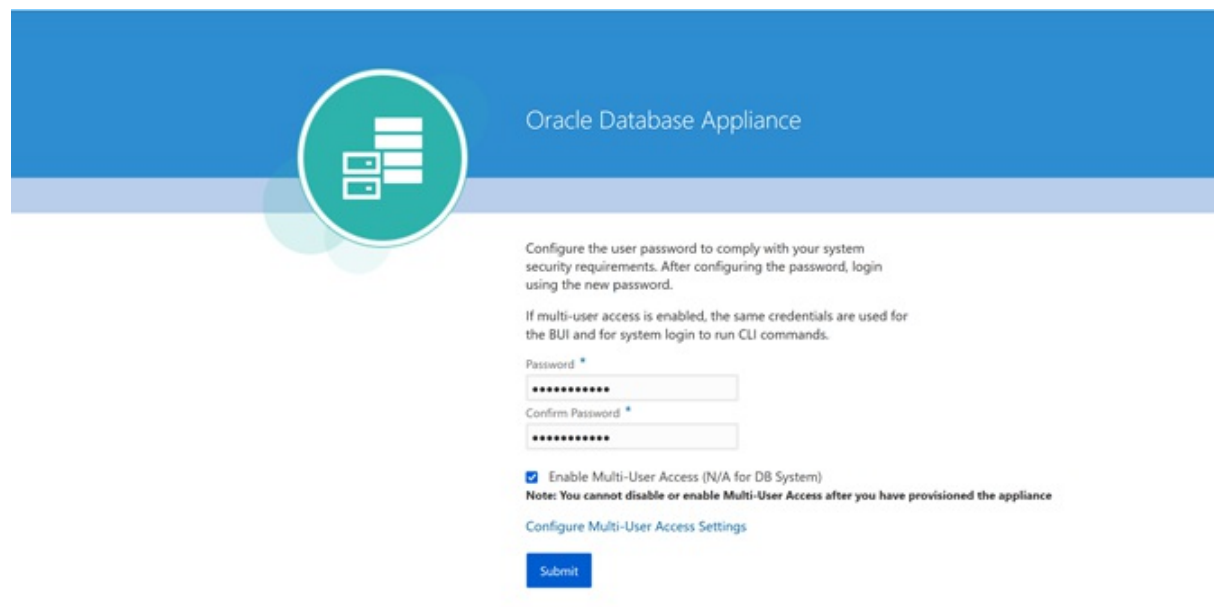
Step 1 - Enable Multi-User Access

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 `odaadmin` and the previously-created password (for example, `WELcome12##`)

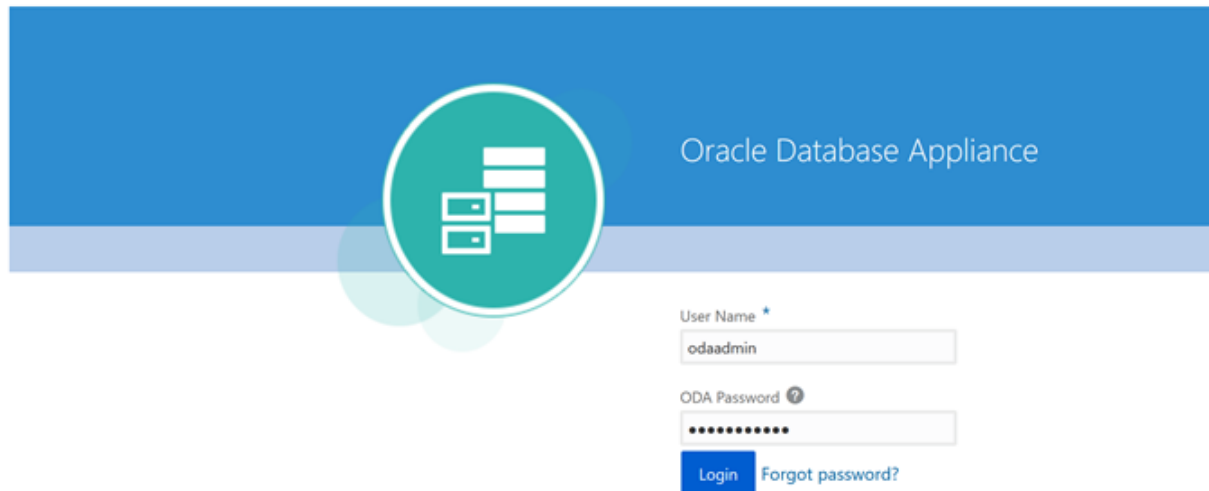
```
https://OCI public <IP Address>:xxxx/mgmt/index.html)
```

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



The screenshot shows the Oracle Database Appliance BUI configuration page. On the left, there is a circular icon with a server rack. The main heading is "Oracle Database Appliance". Below the heading, there is a section for configuring the user password. The text reads: "Configure the user password to comply with your system security requirements. After configuring the password, login using the new password." Below this, it says: "If multi-user access is enabled, the same credentials are used for the BUI and for system login to run CLI commands." There are two password input fields: "Password" and "Confirm Password", both with masked characters. Below the password fields, there is a checkbox labeled "Enable Multi-User Access (N/A for DB System)" which is checked. A note below the checkbox states: "Note: You cannot disable or enable Multi-User Access after you have provisioned the appliance". At the bottom, there is a link "Configure Multi-User Access Settings" and a blue "Submit" button.

Log into BUI:



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 `odacli 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 em1:        [ OK ]
Shutting down interface plp1:       [ OK ]
Shutting down interface plp2:       [ OK ]
Shutting down loopback interface:   [ OK ]
Bringing up loopback interface:     [ OK ]
Bringing up interface :             [ OK ]
Bringing up interface em1:          [ OK ]
Bringing up interface plp1: Determining if ip address 192.168.16.24 is already i
n use for device plp1... [ OK ]
Bringing up interface plp2: Determining if ip address 192.168.17.24 is already i
n use for device plp2... [ 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 `odaccli configure-firstnet` on the second node (node-1). Log into node-1 and run the command `odaccli 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 `odaccli update-repository` command.

Filename	Description
<code>odaccli-dcs-19.15.0.0.0-date-GI-19.15.0.0.0.zip</code>	Oracle Grid Infrastructure 19.15 Clone Files

odacli-dcs-19.15.0.0.0-date-DB-19.15.0.0.zip	Oracle Database 19.15 Clone Files
odacli-dcs-19.16.0.0.0-date-ODAVM-19.16.0.0.zip	DB 19.16 DB System Template (used in lab 4)
oda-sm-19.16.0.0.0-date-server.zip	ODA 19.16 Patch Bundle (used in lab 3)
odacli-dcs-19.16.0.0.0-date-GI-19.16.0.0.zip	Oracle Grid Infrastructure 19.16 Clone Files (used in lab 3)
odacli-dcs-19.16.0.0.0-date-DB-19.16.0.0.zip	DB 19.16 Clone Files (used in lab 3)
odacli-dcs-12.1.0.2.0-date-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-19.15.0.0.0-
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",
  "updatedAt" : "July 26, 2022 00:05:38 AM UTC"
```

```

}

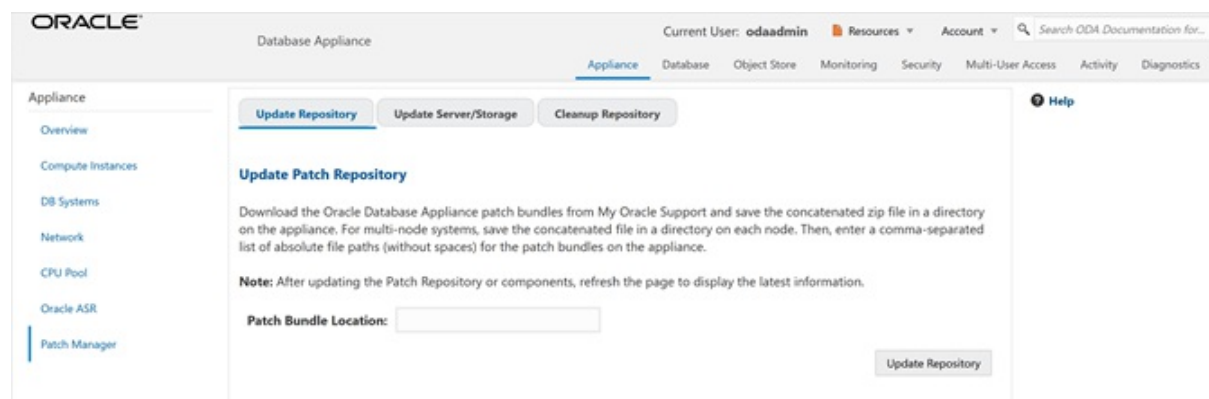
$ odacli update-repository -f /opt/oracle/dcs/patchfiles/odacli-dcs-19.15.0.0.0-
date-DB-19.15.0.0.zip
{
  "jobId" : "bb1caa66-7d19-4de1-a074-f475f4a2505a",
  "status" : "Running",
  "message" : "/opt/oracle/dcs/patchfiles/odacli-dcs-19.15.0.0.0-date-DB-19.15.0
.0.zip",
  "reports" : [ ],
  "createTimestamp" : "July 26, 2022 00:08:58 AM UTC",
  "resourceList" : [ ],
  "description" : "Repository Update",
  "updatedAtTime" : "July 26, 2022 00:08:58 AM UTC"
}

```

When you run commands using the ODA CLI 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.

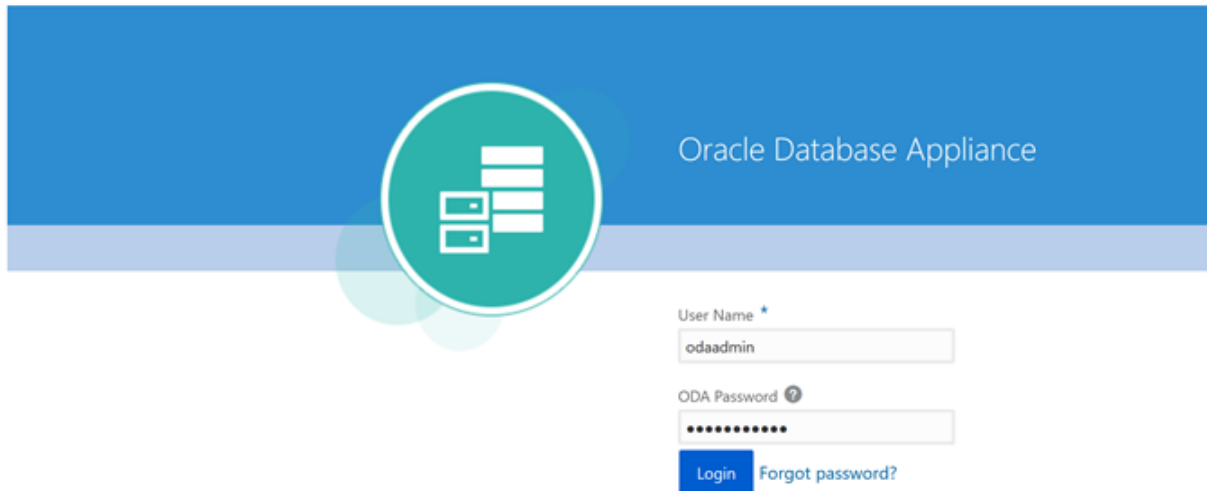


Step 4 - Deploy the Appliance

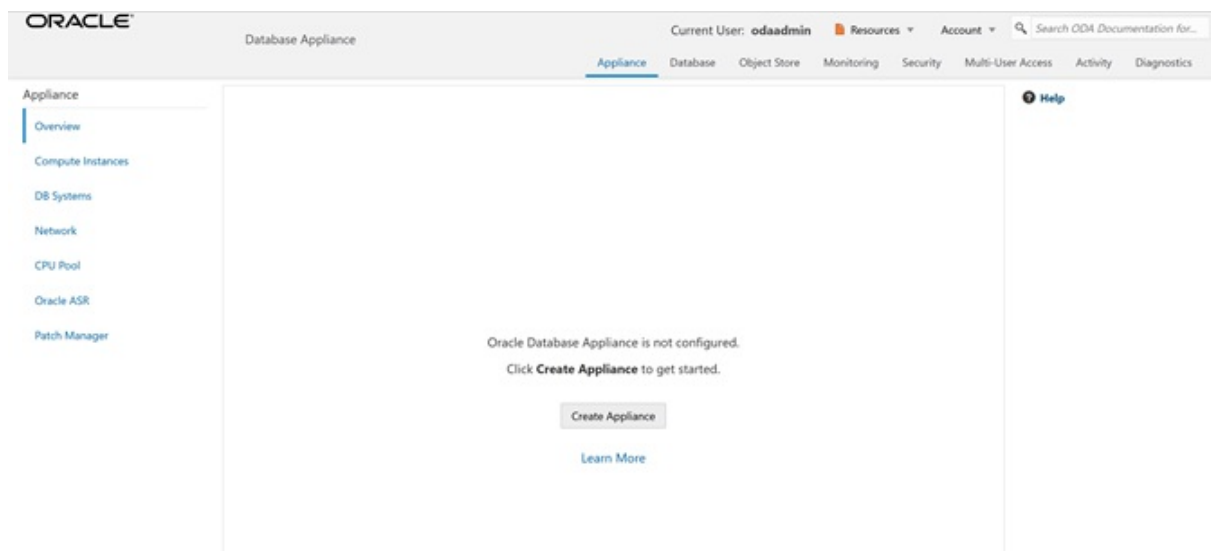
You can deploy the appliance using either the BUI or the command line. The command line is useful for scripted and silent installations. This lab uses the BUI.

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

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



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



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.

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.

Field Name	Value
GI User	grid
DB User	oracle
Install Group	oinstall
DBA Oper Group	dbaoper
DBA Group	dba
ASM Admin Group	asmadmin
ASM Oper Group	asmoper
ASM DBA Group	asmdba
GI UserID	1900
DB UserID	1901
Install GroupID	1901
DBA Oper GroupID	1902
DBA GroupID	1903
ASM Admin GroupID	1904
ASM Oper GroupID	1905
ASM DBA GroupID	1906

Next is the Database screen.

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

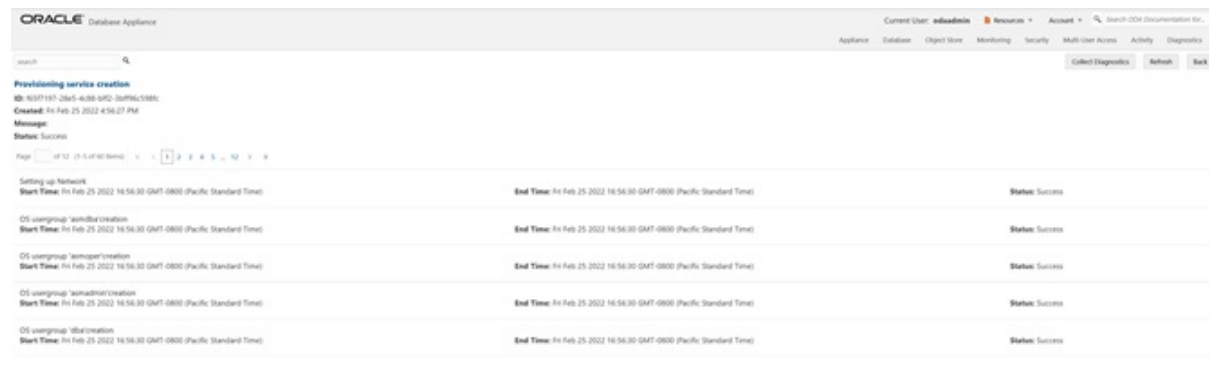
To configure Oracle ASR, specify credentials here. This is also where you can save the configuration file, for example, `oda.json` for later use.

Click **Submit** to continue and click **Yes** in the confirmation box. This will bring up a link to the job status. Similar to ODA CLI, 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.



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

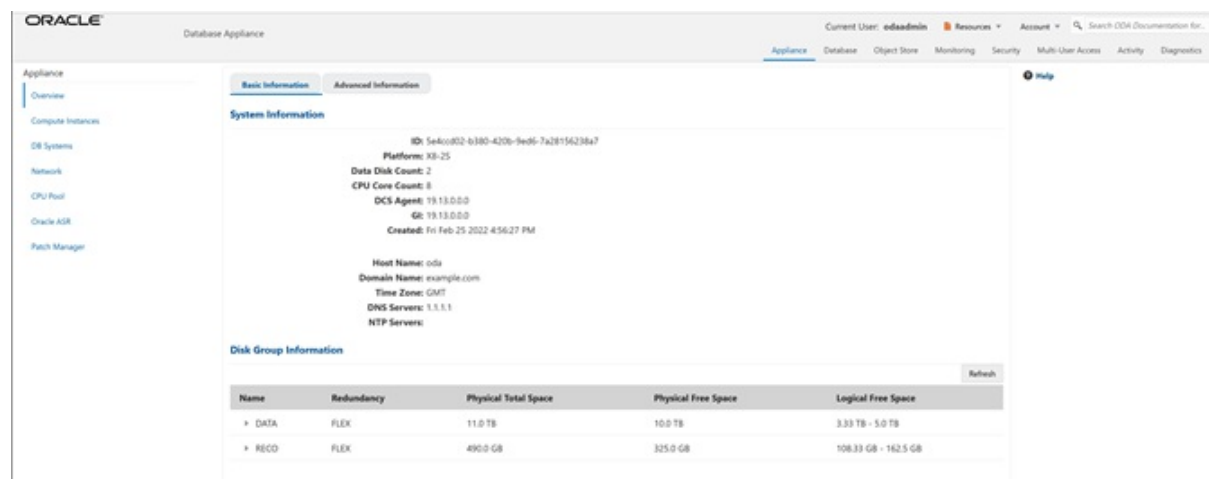
refresh the screen. In an actual appliance, the deployment takes about 60-90 minutes to complete.



Step 5 - Validate the Deployment

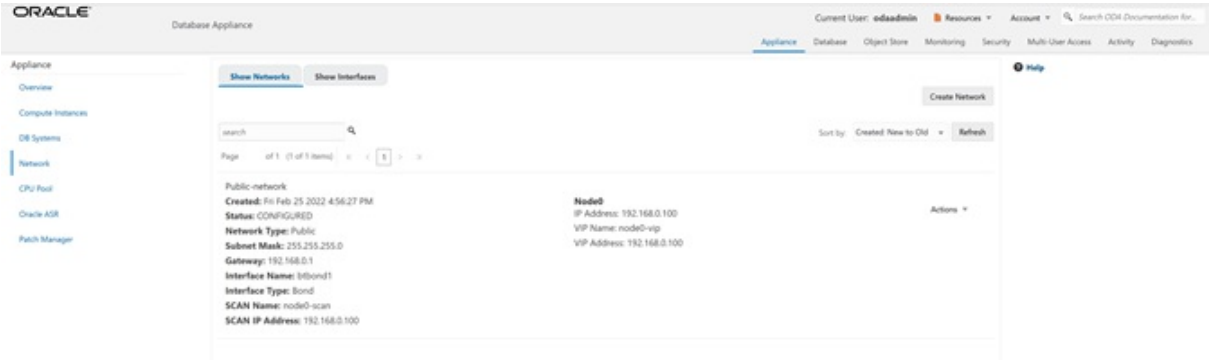
Next, click on the **Database** tab at the top right of the BUI. The deployed database is displayed. The web pages refresh every few seconds, so if the database does not show up at first, wait till the page refreshes. Click on the database name for more details about the database. Click on the **Database 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:

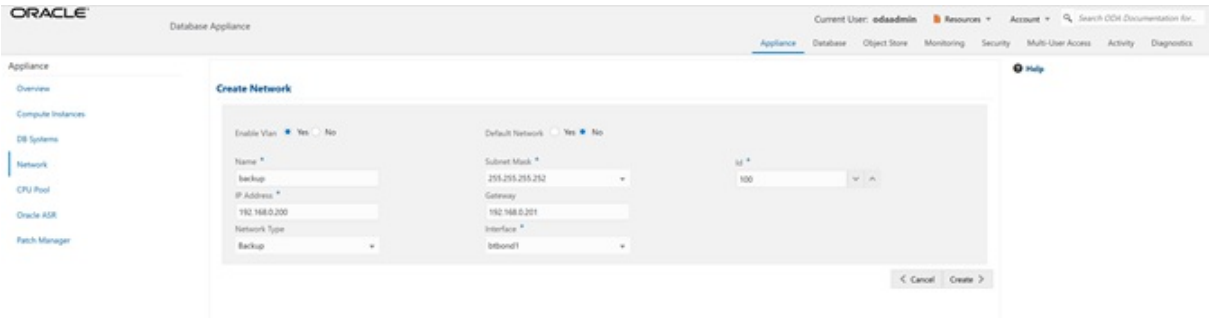


Step 6 - Networking

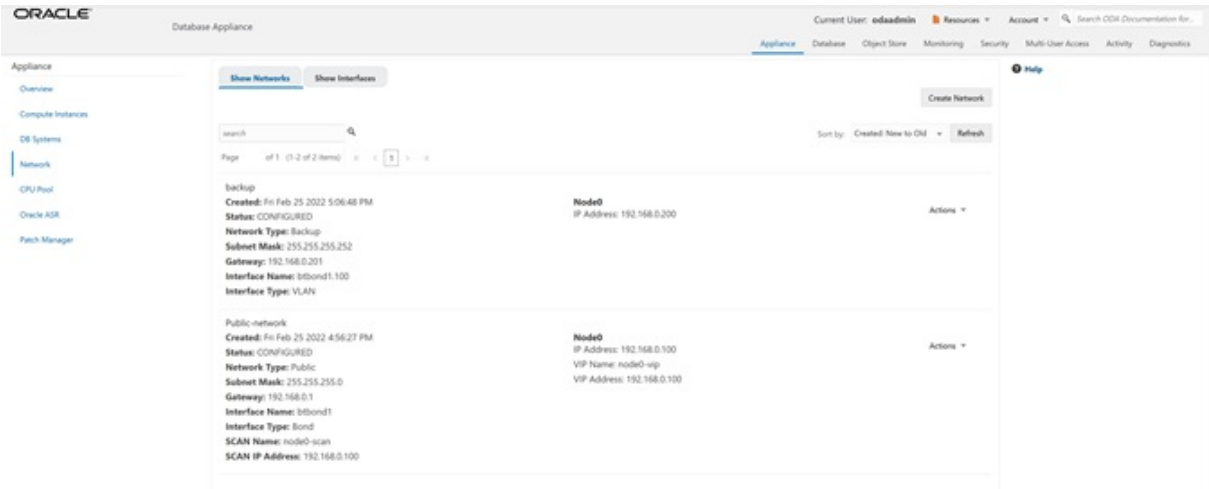
You can check the network by clicking on the **Network** tab on the left hand pane in the BUI.



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



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



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

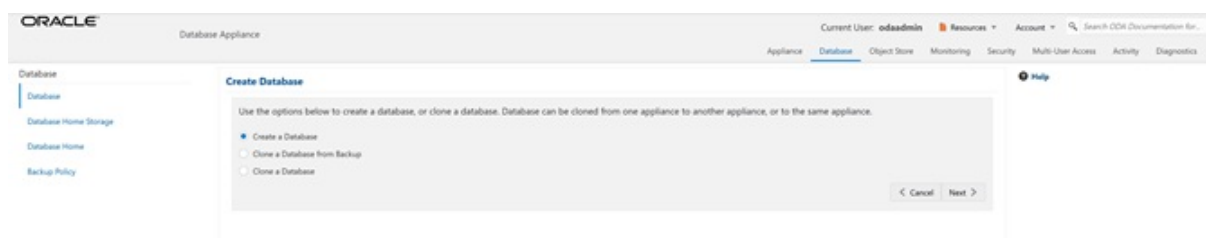
Step 1 - Create a new database using the Web GUI

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

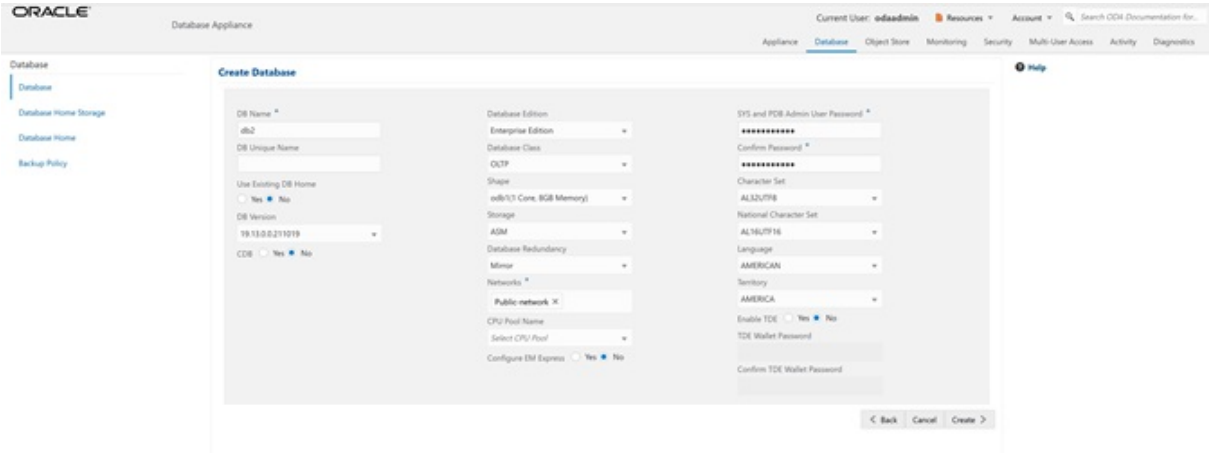
You will see the database `db1` created during deployment. In the upper right-hand corner, there is a **Create Database** button. Click it. It brings up the **Create Database** wizard.



Choose **Create Database**, and click **Next**.

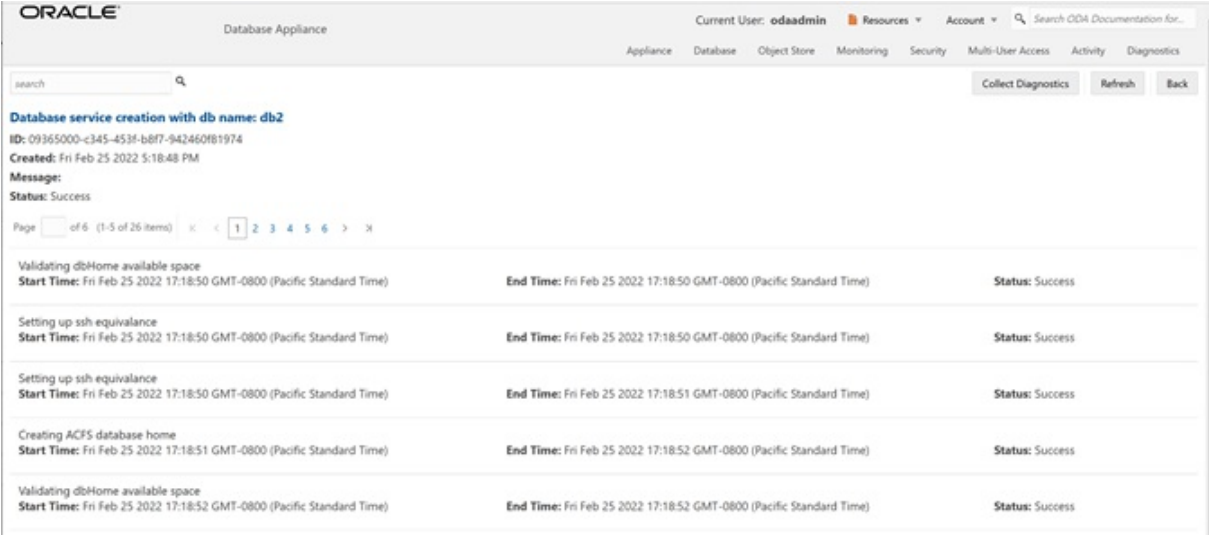


Specify the DB Name, for example, `db2`, and if you are creating a CDB, a PDB Name. Also remember to scroll down and enter a password that would, in an actual appliance be used for SYS, SYSTEM, and PDB Admin. When finished, click on the **Create** button. Click **Yes** to confirm. Beware of the password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

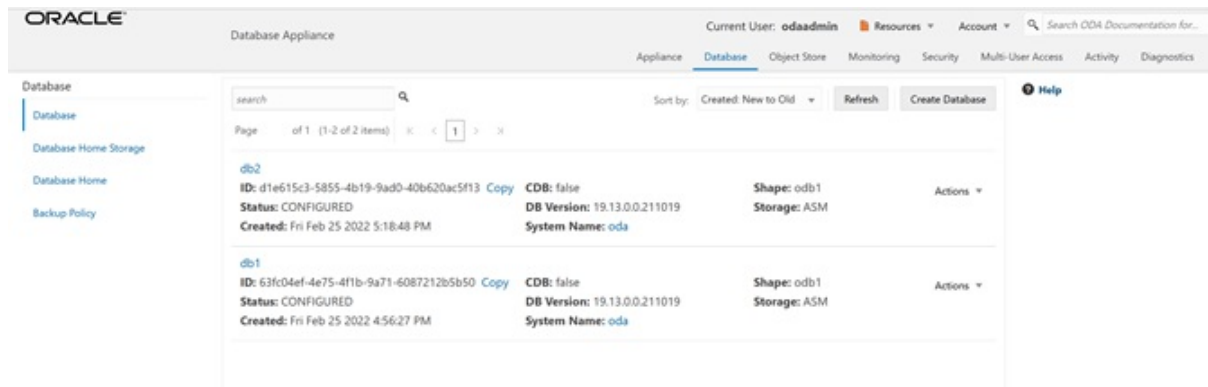


This will bring up a link to the job status. Similar to ODA CLI, operations on the BUI are asynchronous, and return immediately with a job ID. That job ID can then be used to monitor progress. This allows the administrator to perform other tasks if desired while long running operations complete. Click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



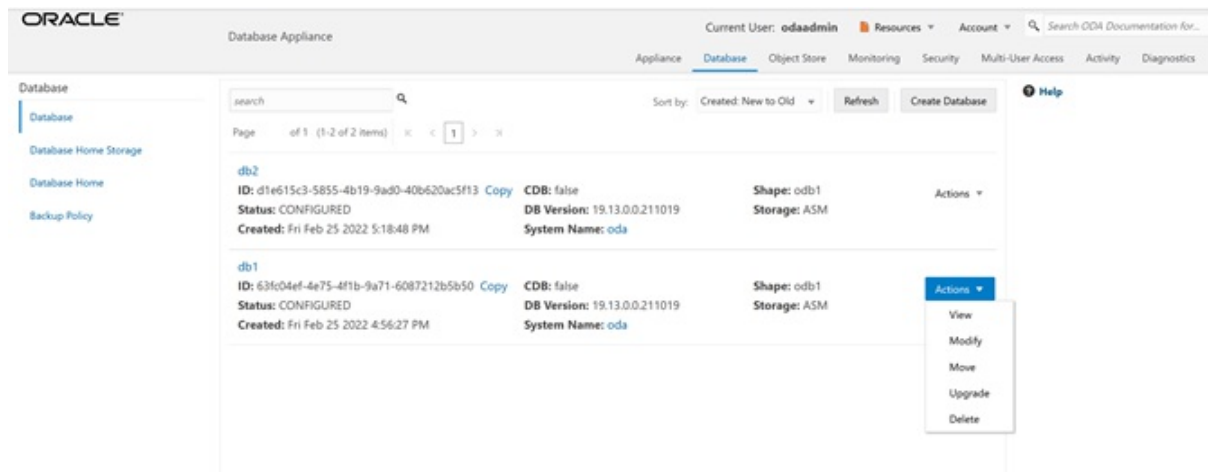
Once the operation completes, click on the **Appliance** tab and then the **Database** tab at the top right of the web page. This should show the newly-created database. The web pages refreshes every few seconds, so if the database does not show up at first, wait till the page refreshes.



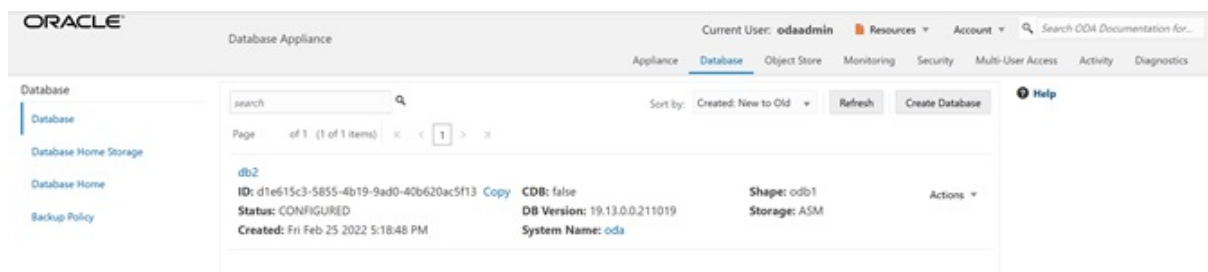
See detailed database information by clicking on the database name, for example, db2. You can also view the newly-created home by clicking on the **Database Home** link in the left-hand column of the **Database** tab.

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.



After the database delete operation, only db2 is left.



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-databases` to see the details for a specific database. Be sure to use the database ID shown in the `odacli list-databases` command, not the ID shown in the example.

```
$ odacli describe-database -i d1e615c3-5855-4b19-9ad0-40b620ac5f13
```

```
Database 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: node_0
  DB Edition: EE
    DBID:
Instance Only Database: false
    CDB: false
    PDB Name:
PDB Admin User Name:
  SEHA Enabled: false
    Class: OLTP
    Shape: odb1
    Storage: ASM
  DB Redundancy: MIRROR
  CharacterSet: AL32UTF8
National CharacterSet: AL16UTF16
  Language: AMERICAN
  Territory: AMERICA
    Home ID: a1314be1-2c6f-411f-b2c7-61444449f02b
  Console Enabled: false
TDE Wallet Management:
  TDE Enabled: false
  Level 0 Backup Day: Sunday
  AutoBackup Enabled: true
    Created: July 26, 2022 1:18:48 AM UTC
  DB Domain Name: example.com
Associated Networks:
```

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-database -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.

```
$ odacli create-database -n db3 -v 19.15.0.0
```

```
Job details
```

```
-----
ID: 2051bf5b-4815-4cd2-8d85-e51367ba3269
Description: Database service creation with db name: db3
Status: Created
Created: July 26, 2022 1:45:49 AM UTC
Message:

Task Name                               Start Time                               End
Time                                     Status
-----

```

```
$ odacli describe-job -i 2051bf5b-4815-4cd2-8d85-e51367ba3269
```

```
Job details
```

```
-----
ID: 2051bf5b-4815-4cd2-8d85-e51367ba3269
Description: Database service creation with db name: db3
Status: Success
Created: July 26, 2022 1:45:49 AM UTC
Message:

Task Name                               Start Time                               End
Time                                     Status
-----
Validating dbHome available space       July 26, 2022 1:45:50 AM UTC             July 26
, 2022 1:45:50 AM UTC Success
Setting up ssh equivalence               July 26, 2022 1:45:50 AM UTC             July 26
, 2022 1:45:50 AM UTC Success
Setting up ssh equivalence               July 26, 2022 1:45:50 AM UTC             July 26
, 2022 1:45:50 AM UTC Success
Creating ACFS database home              July 26, 2022 1:45:51 AM UTC             July 26
, 2022 1:45:51 AM UTC Success
Validating dbHome available space       July 26, 2022 1:45:51 AM UTC             July 26
, 2022 1:45:51 AM UTC Success
Configuring user access to ACFS DBHome  July 26, 2022 1:45:51 AM UTC             July 26
base storage July 26, 2022 1:45:51 AM UTC Success
Creating DbHome Directory                July 26, 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
```

ID	DB Name	DB Type	DB Version
CDB	Class	Shape	Storage Status DbHomeID
d1e615c3-5855-4b19-9ad0-40b620ac5f13	db2	SI	19.15.0.0.220419
false	OLTP	odb1	ASM CONFIGURED a1314be1-2c6f-411f-b2c7-61444449f02b
324a42ea-bba2-477d-8bca-5a26af159f1c	db3	SI	19.15.0.0.220419
false	OLTP	odb1	ASM CONFIGURED ecfa440e-2482-40c1-8ccd-67316cd48ba2

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
```

ID	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
```

ID	DB Name	DB Type	DB Version		
CDB	Class	Shape	Storage	Status	DbHomeID
324a42ea-bba2-477d-8bca-5a26af159f1c	db3	SI	19.15.0.0.220419	CONFIGURED	ecfa440e-2482-40c1-8ccd-673
false	OLTP	odb1	ASM		
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

```

```

Created: July 26, 2022 1:51:50 AM UTC
Message:

Task Name                               Start Time                               End
Time                                     Status
-----
# odacli list-databases

ID          Class  Shape  Storage  DB Name  DB Type  DB Version
CDB         Class  Shape  Storage  Status  DbHomeID

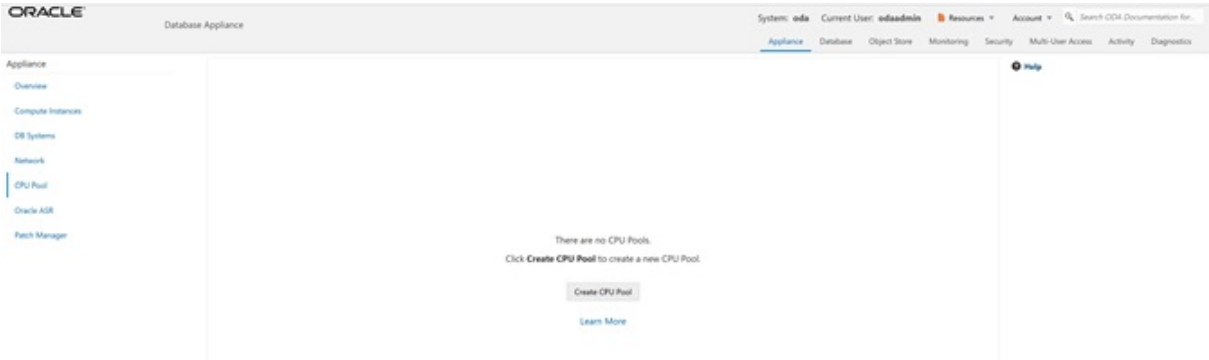
ID          Class  Shape  Storage  DB Name  DB Type  DB Version
CDB         Class  Shape  Storage  Status  DbHomeID
-----
-----
324a42ea-bba2-477d-8bca-5a26af159f1c  db3      SI      19.15.0.0.220419
false      OLTP    odb1    ASM      CONFIGURED  ecfa440e-2482-40c1-8ccd-673
16cd48ba2
deac01db-aaa8-4f4e-a511-aea042be3a18  db4      SI      19.14.0.0.220419
false      OLTP    odb1    ASM      CONFIGURED  c3c63738-703e-4c1d-98de-95b
551b67468

```

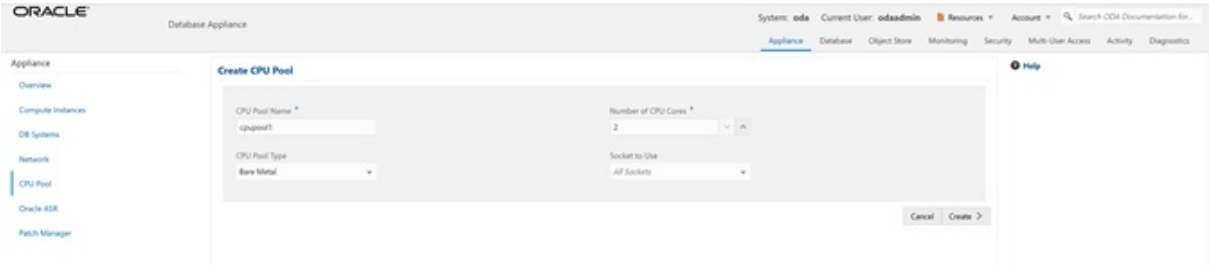
Step 6 - Create a CPU Pool for a Database

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

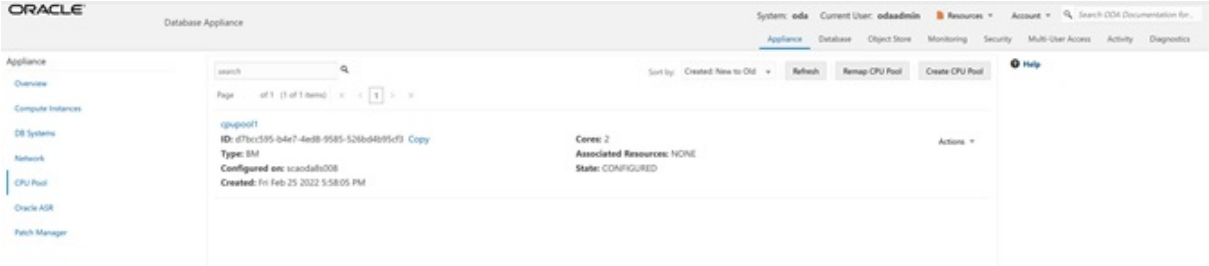
Click **CPU Pool** on the left, then click **Create a CPU Pool**.



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

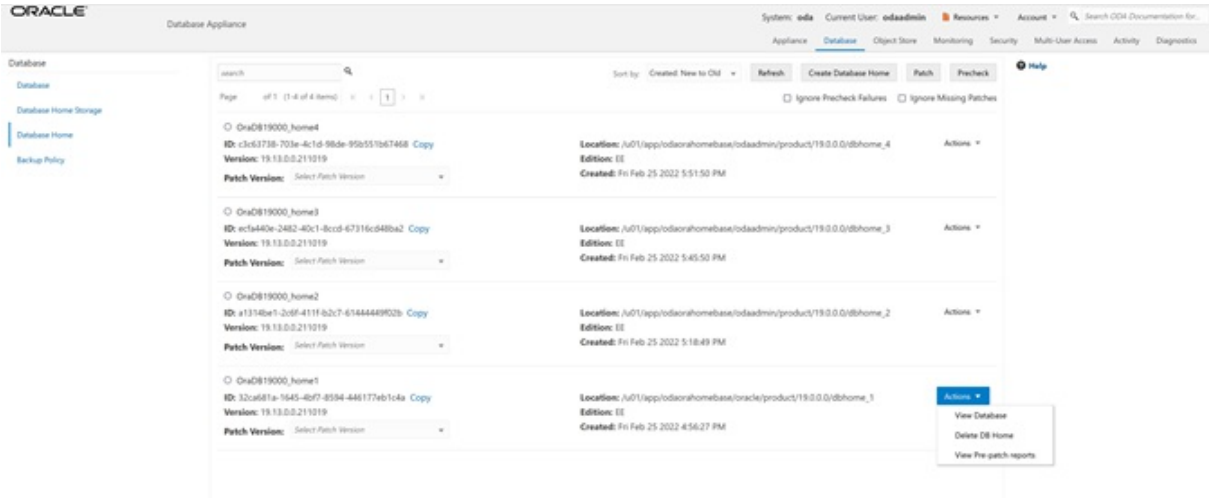


You can see that CPU Pool **cpupool1** has been created:

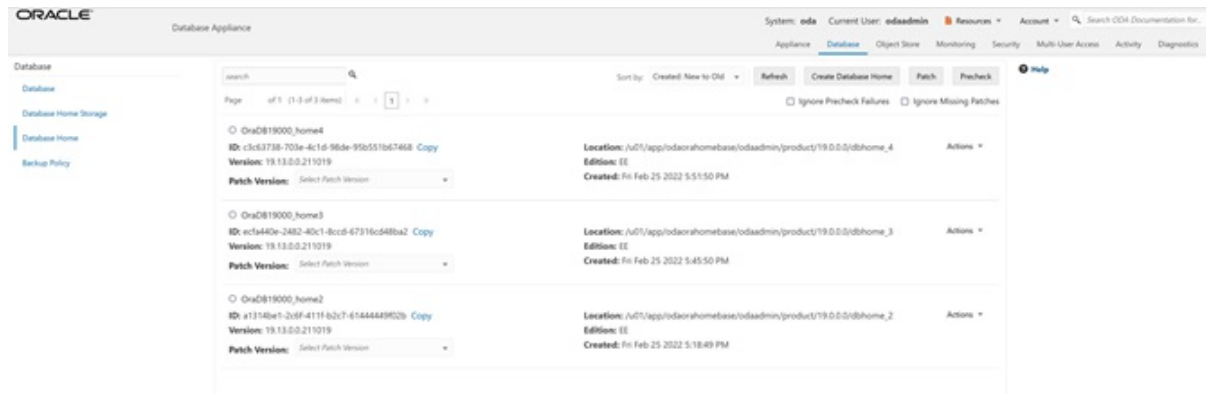


Step 7 - Delete a Database Home

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).



You can see that home1 database home has been deleted.



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

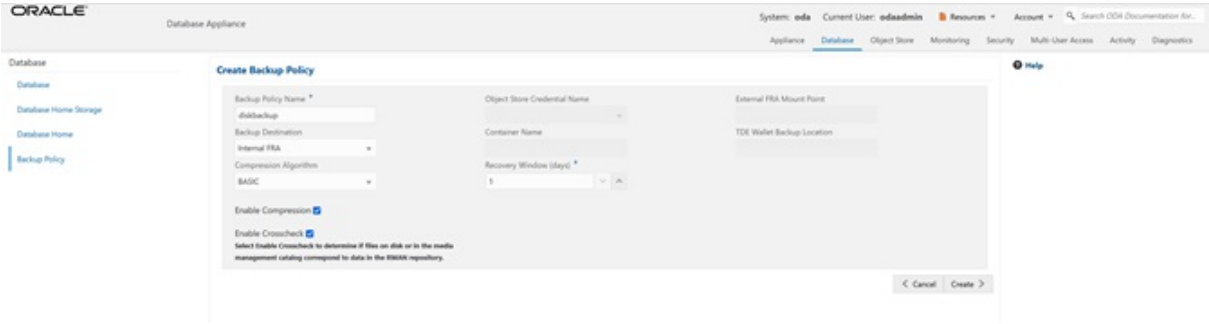
To back up to an external NFS storage, you must create an NFS mount point first.

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

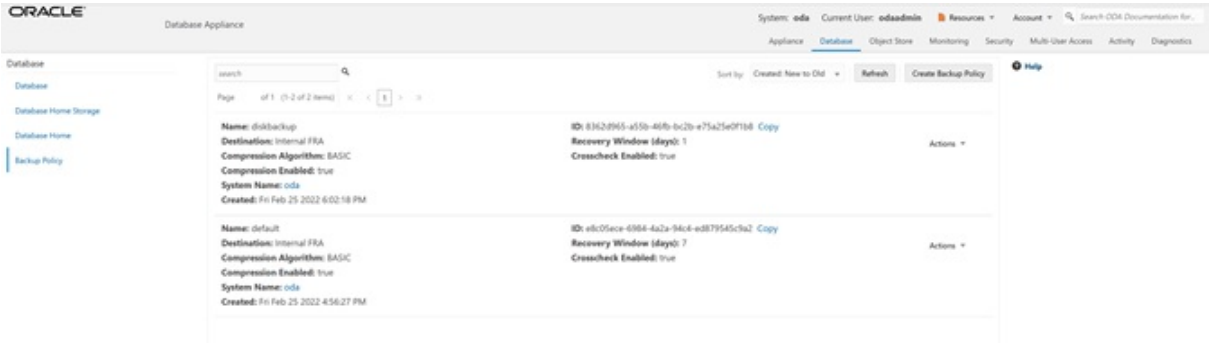
There is a default backup policy associated with the database. To create a new backup policy, click on the **Backup Policy** tab and then click **Create Backup Policy**.



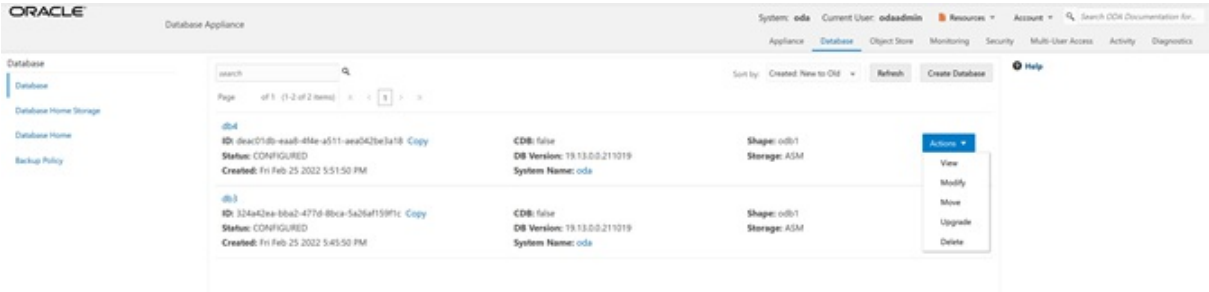
Then, name the Backup Policy (for example, `DiskBackup`), Backup Destination (Internal FRA/Local Disk or External FRA/External NFS Storage or Object Store/Oracle Cloud), and Recovery Window in days, then click **Create**. To back a database to an external NFS storage, you need to specify a mount point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



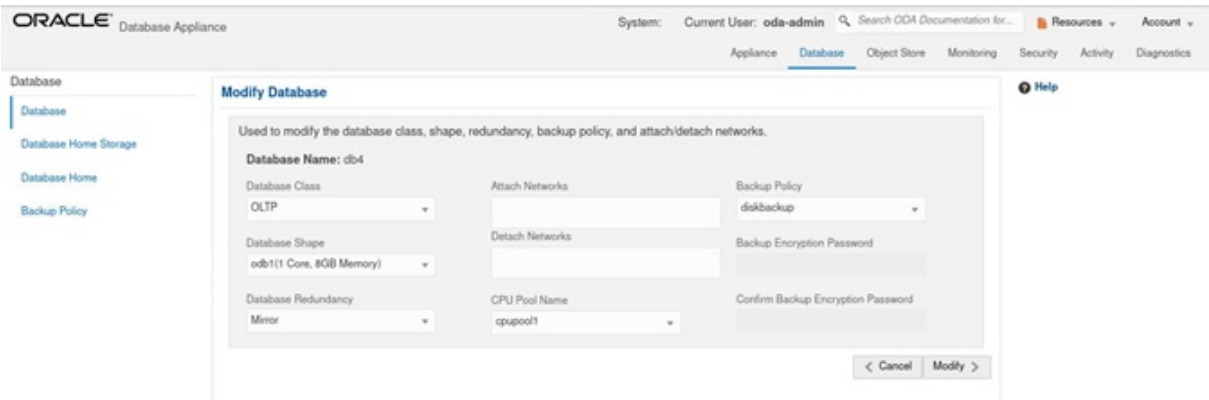
You can see the **DiskBackup** policy has been created.



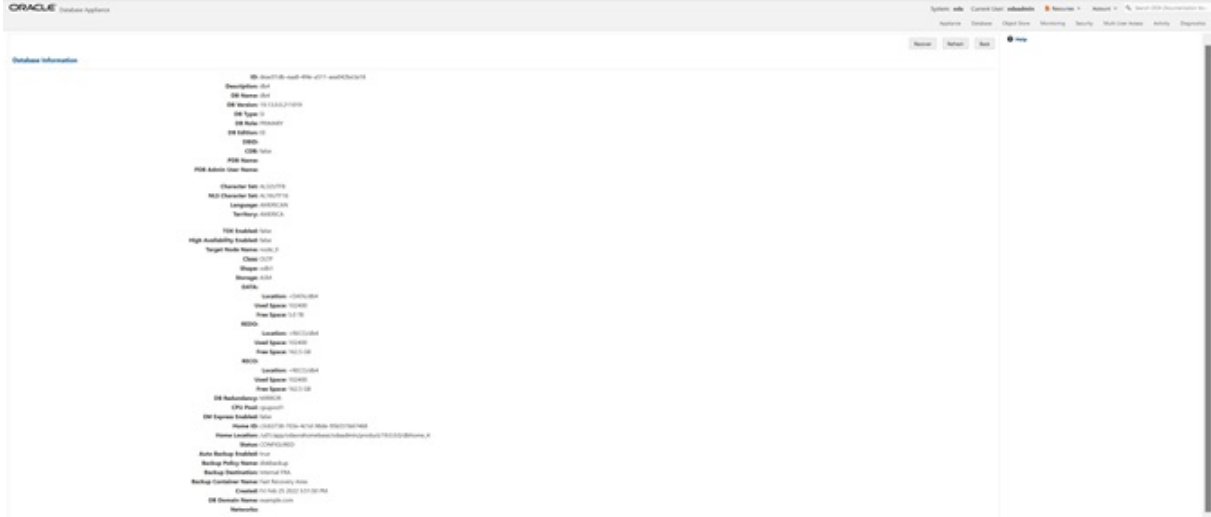
Next you select the database, for example, db4, that you want to backup. The db4 database has the default backup policy, so modify the database first by clicking **Modify** under **Actions**. Assign a CPU pool to db4 at the same time.



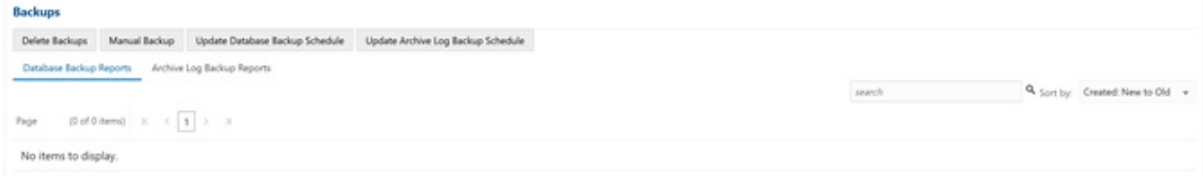
Select **DiskBackup** as the Backup Policy and **cpupool1** as the CPU pool for db4, and then click **Modify**.



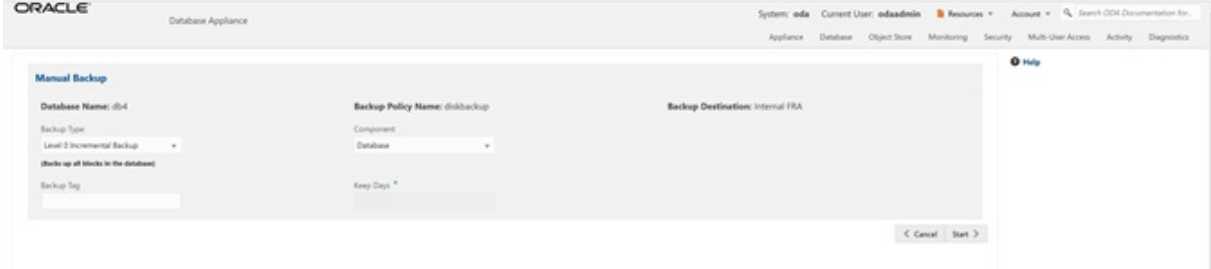
Once the job is completed, you can verify that the backup policy is listed under **Database Information** of the database, for example, **db4**. You can also see that a CPU pool is assigned to **db4**. Once this configuration is completed, Oracle Database Appliance will start backing up the database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



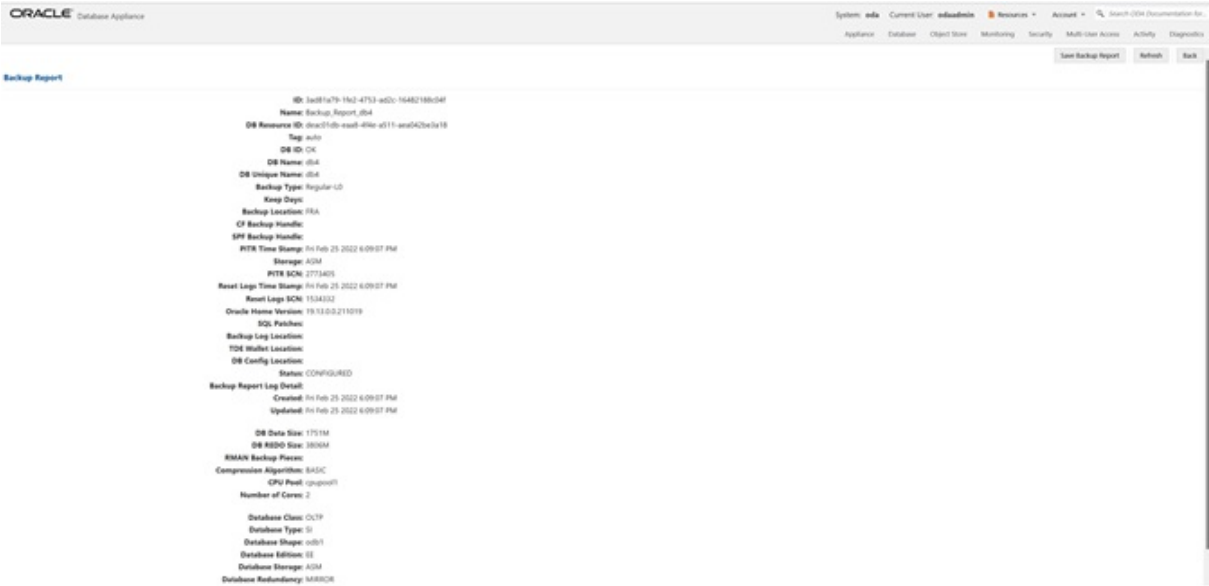
You can see the backup reports under the **Backups** heading below.



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



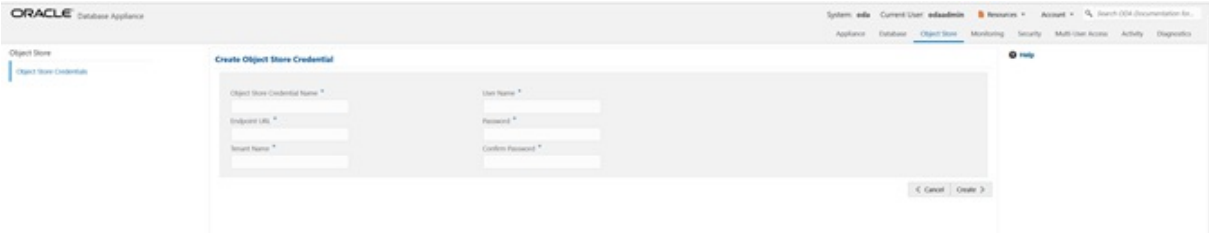
You can see the details of the Backup Report by clicking on the Backup Report ID.



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.



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 high-availability 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",
  "updatedAtTime" : "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-19.16.0.0.0-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",
  "updatedAtTime" : "July 26, 2022 06:32:43 AM UTC"
}

$ odacli update-repository -f /opt/oracle/dcs/patchfiles/odacli-dcs-19.16.0.0.0-date-DB-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",
"updatedAt" : "July 26, 2022 06:33:13 AM UTC"
}

$ odacli update-repository -f /opt/oracle/dcs/patchfiles/odacli-dcs-19.16.0.0.0-
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",
  "updatedAt" : "April 26, 2022 07:06:27 AM UTC"
}

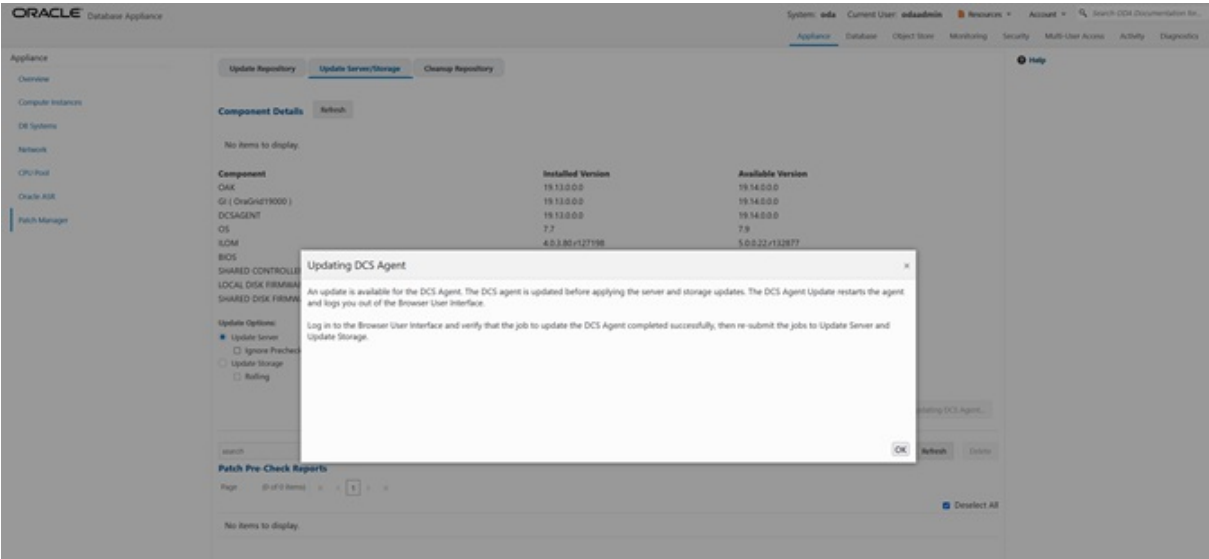
```

After you update the repository, you can use the web console to see the 19.16.0.0 available component versions.

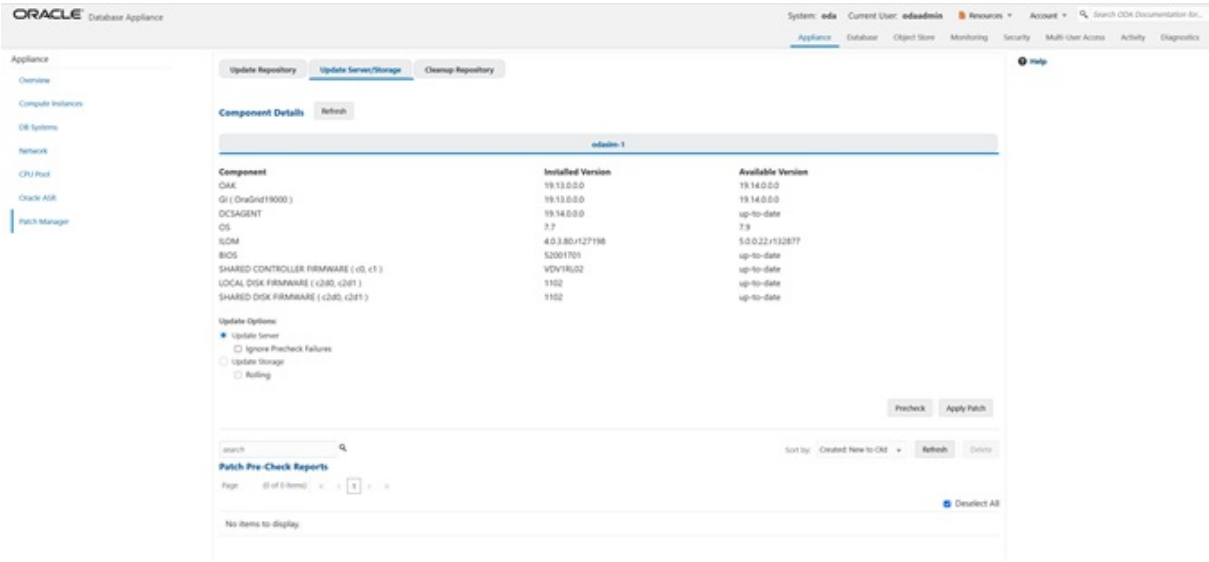
Component	Installed Version	Available Version
DAK	19.13.0.0.0	19.14.0.0.0
GI (Oracle/19000)	19.13.0.0.0	19.14.0.0.0
DCSAGENT	19.13.0.0.0	19.14.0.0.0
OS	7.7	7.9
SOM	4.0.3.80/127198	5.0.0.22/132877
BIOS	52001701	up-to-date
SHARED CONTROLLER FIRMWARE (c0, c1)	VDV1RL02	up-to-date
LOCAL DISK FIRMWARE (c2R0, c2R1)	1102	up-to-date
SHARED DISK FIRMWARE (c2R0, c2R1)	1102	up-to-date

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

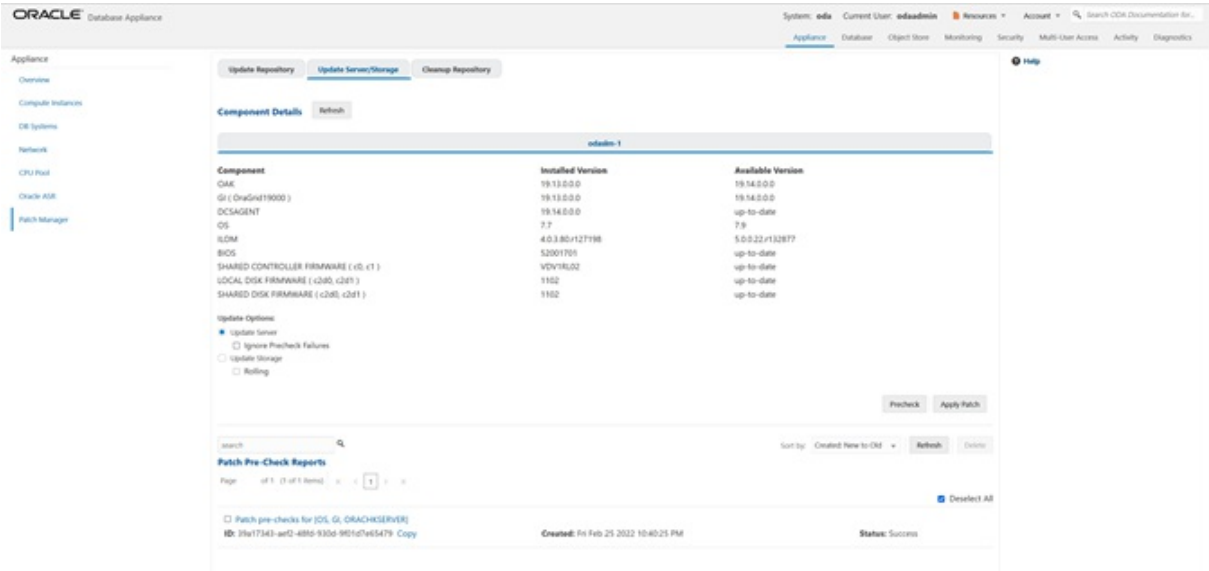
The next step is to update the DCS agent on both nodes for a high-availability system with the web console, before actually updating the server. The DCS agent is the Oracle Database Appliance software that provides the intelligence and automation. In the patching screens, select **Update Server**, then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



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



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.

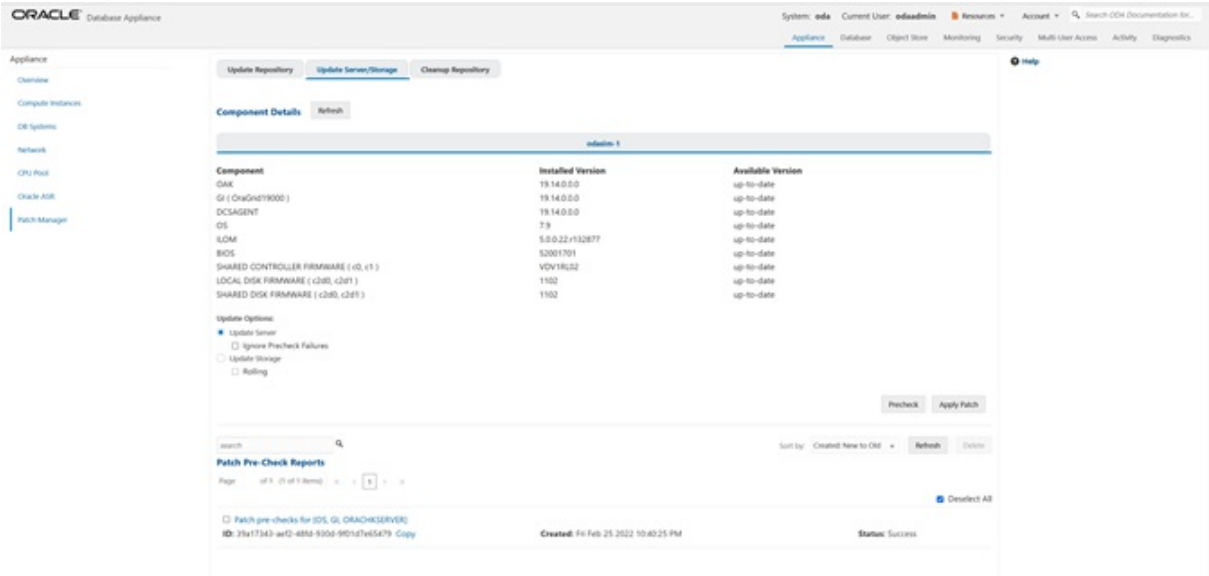


Step 3 - Update the Server

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.



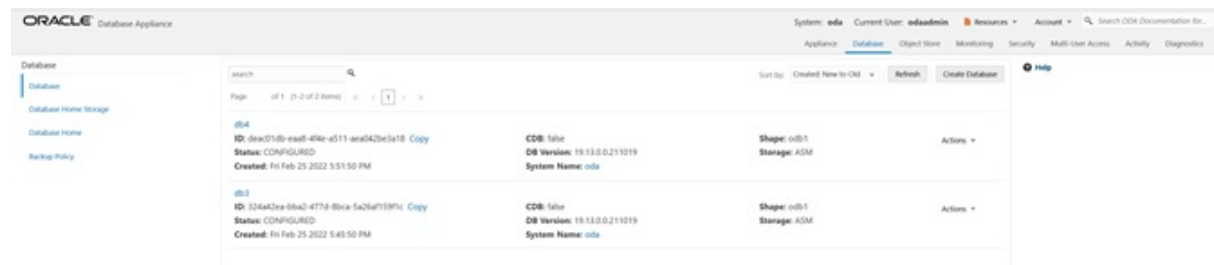
Patching an actual Oracle Database Appliance will take some time, whereas the simulator speeds up the whole process. The Linux prompt returns immediately, and the patch runs in the background. You can monitor the

progress of the patch job by checking the **Activity** tab.

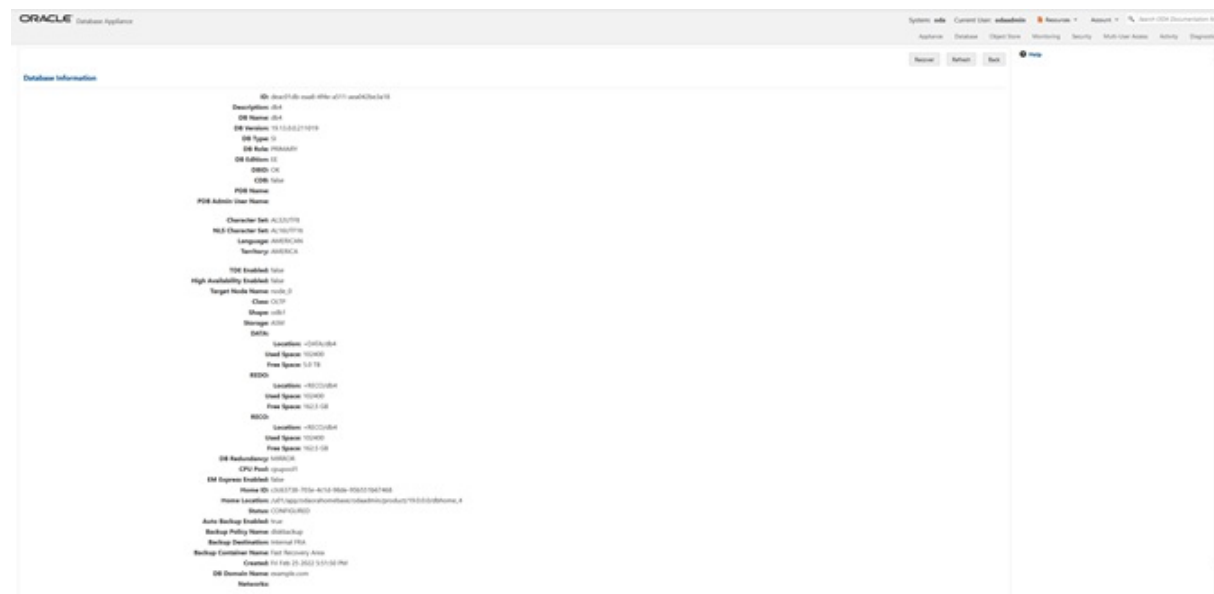
Step 4 - Patch a Database: Update a Database to point to a New Database Home

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-database` 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
```

ID	DB Name	DB Type	DB Version
CDB	Status	DbHomeID	
Class	Shape	Storage	
324a42ea-bba2-477d-8bca-5a26af159f1c	db3	SI	19.15.0.0.220419
false	CONFIGURED	ecfa440e-2482-40c1-8ccd-67316cd48ba2	
OLTP	odb1	ASM	
deac01db-aaa8-4f4e-a511-aea042be3a18	db4	SI	19.15.0.0.220419
false	CONFIGURED	c3c63738-703e-4c1d-98de-95b551b67468	
OLTP	odb1	ASM	

```
$ odacli list-dbhomes
```

ID	Name	DB Version
Home Location	Status	
a1314bel-2c6f-411f-b2c7-61444449f02b	OraDB19000_home2	19.15.0.0.220419
/u01/app/odaorahomebase/odaadmin/product/19.0.0.0/dbhome_2	CONFIGURED	
ecfa440e-2482-40c1-8ccd-67316cd48ba2	OraDB19000_home3	19.15.0.0.220419
/u01/app/odaorahomebase/odaadmin/product/19.0.0.0/dbhome_3	CONFIGURED	
c3c63738-703e-4c1d-98de-95b551b67468	OraDB19000_home4	19.15.0.0.220419
/u01/app/odaorahomebase/odaadmin/product/19.0.0.0/dbhome_4	CONFIGURED	

Use the clipboard to copy the DB home ID for db4. Then use the DB home ID with the `odacli update-dbhome` command to update the home for db4. Verify that the job has completed successfully using the command `odacli 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-95b551b67468",
  "updatedTime" : "July 26, 2022 06:59:59 AM UTC"
```

```

}

$ odacli describe-job -i af879f3e-9c50-4dfd-86db-5d380a42f8d2

Job details
-----
                ID: af879f3e-9c50-4dfd-86db-5d380a42f8d2
Description: DB Home Patching: Home Id is c3c63738-703e-4c1d-98de-9
5b551b67468
                Status: Success
                Created: July 26, 2022 6:59:59 AM UTC
                Message:

Task Name                               Start Time                               End
Time                                     Status
-----
Adding USER SSH EQUIVALENCE             July 26, 2022 7:00:02 AM UTC             July 26
, 2022 7:00:02 AM UTC             Success
Adding USER SSH EQUIVALENCE             July 26, 2022 7:00:02 AM UTC             July 26
, 2022 7:00:02 AM UTC             Success

```

Verify that database home db4 is updated to the release 19.16. You can use either the BUI or CLI for verification.

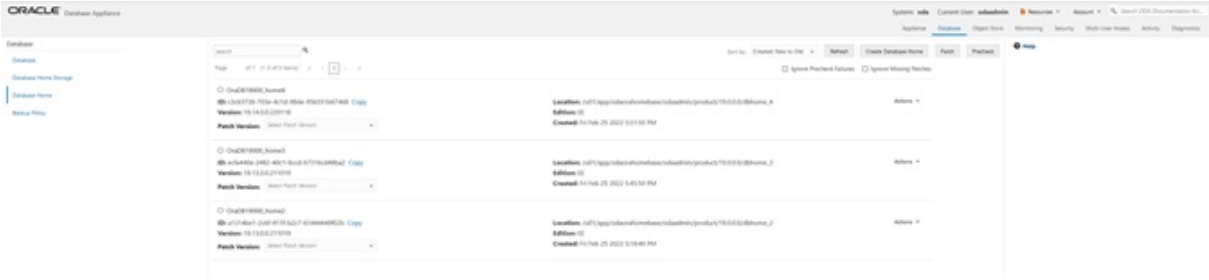
```

# odacli list-dbhomes

ID                               Name                               DB Version
Home Location                     Status
-----
a1314bel-2c6f-411f-b2c7-61444449f02b  OraDB19000_home2                 19.15.0.0.220419
/u01/app/odaorahomebase/odaadmin/product/19.0.0.0/dbhome_2 CONFIGURED
ecfa440e-2482-40c1-8ccd-67316cd48ba2  OraDB19000_home3                 19.15.0.0.220419
/u01/app/odaorahomebase/odaadmin/product/19.0.0.0/dbhome_3 CONFIGURED
c3c63738-703e-4c1d-98de-95b551b67468  OraDB19000_home4                 19.15.0.0.220419
/u01/app/odaorahomebase/odaadmin/product/19.0.0.0/dbhome_4 CONFIGURED

```

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.

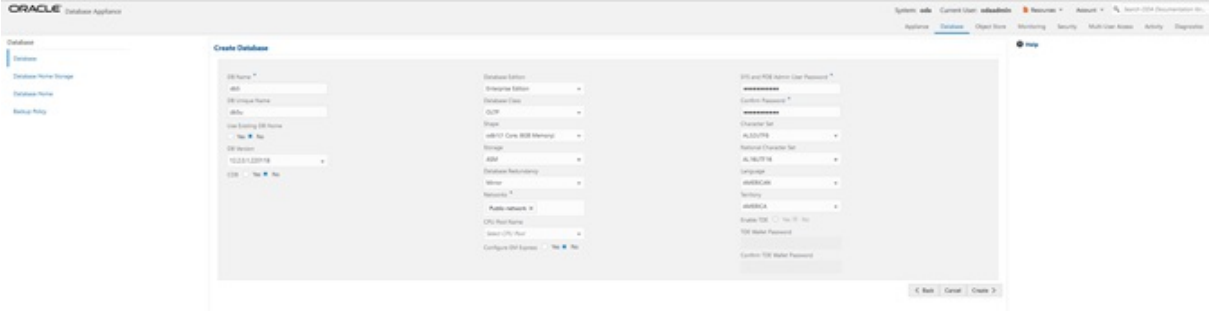


Step 5 - Upgrade a Database

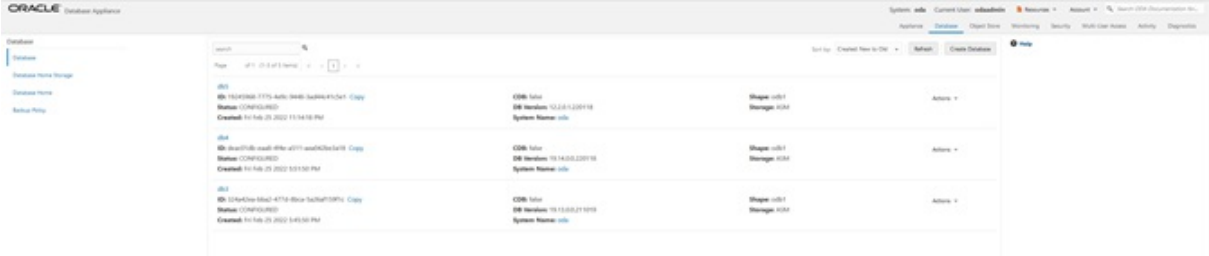
To upgrade a database from release 12.2 to 19.16, we must first create an Oracle Database release 12.2 database. Create an Oracle 12.2 database db5. Select **Create a Database**, then click **Next**.



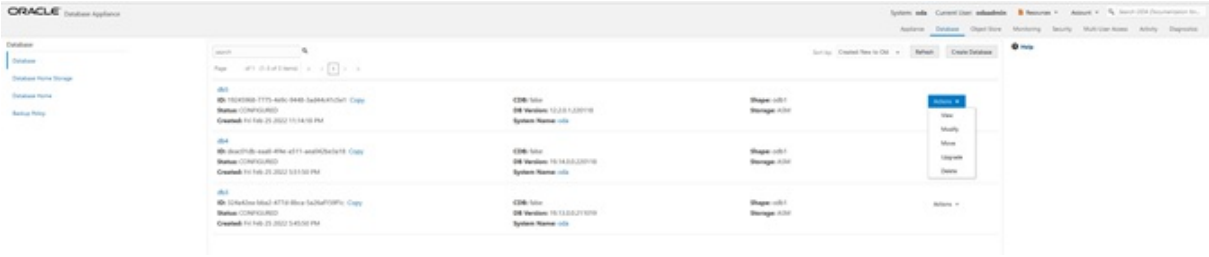
Fill in the information and click **Create**.



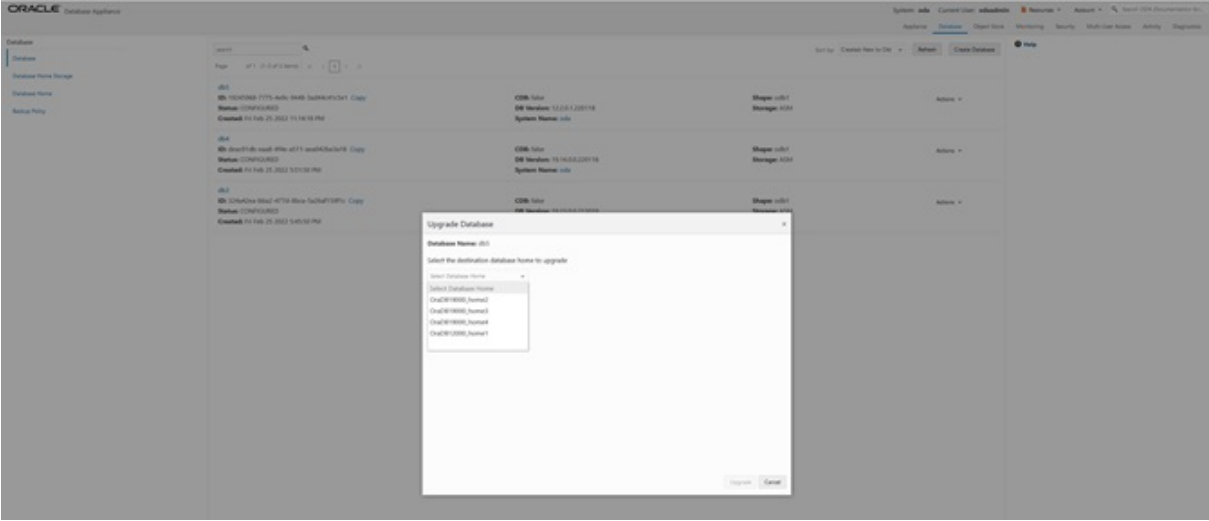
You can see Oracle Database release 12.2 database db5 is created.



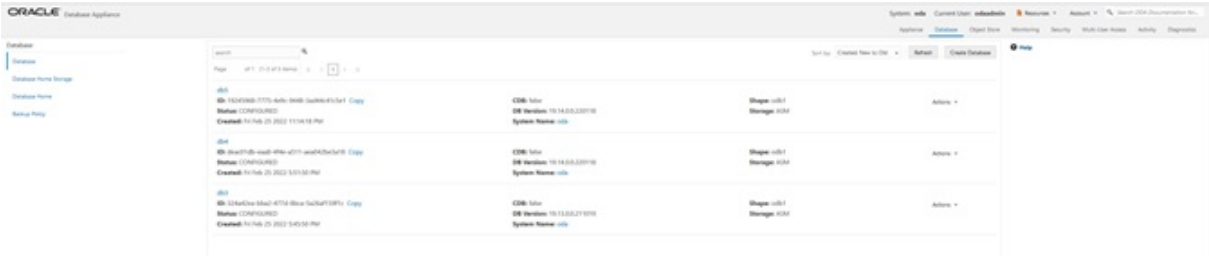
Now we will upgrade database db5 from release 12.2 to 19.16 by clicking **Actions** and then select **Upgrade**.



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.



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



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:

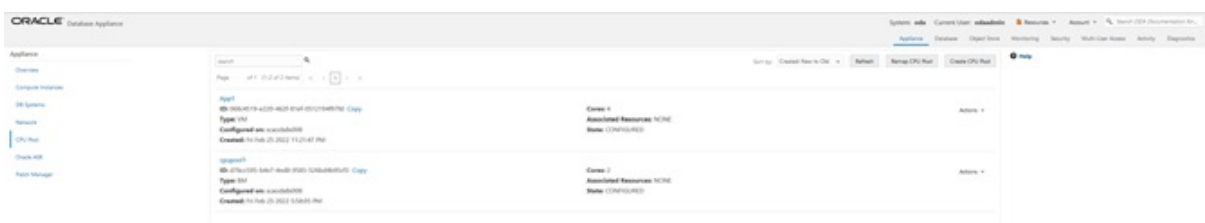
- CPU Pool
- VM Storage
- Virtual Disk
- Virtual Network

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**.



You can see the CPU pool `App1` is created. A CPU pool is optional and not required to create an application KVM.



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.



You can see `vmstorage1` is created.



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



Select **Create Virtual Disk**, then click **Next**.



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



You can see vdisk1 is created.



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



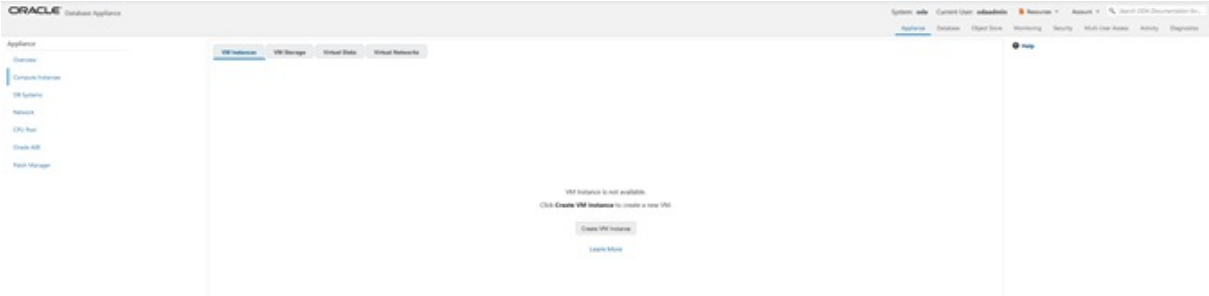
Specify the Virtual Network information, then click **Create**.



You can see the virtual network vmnet1 is created.



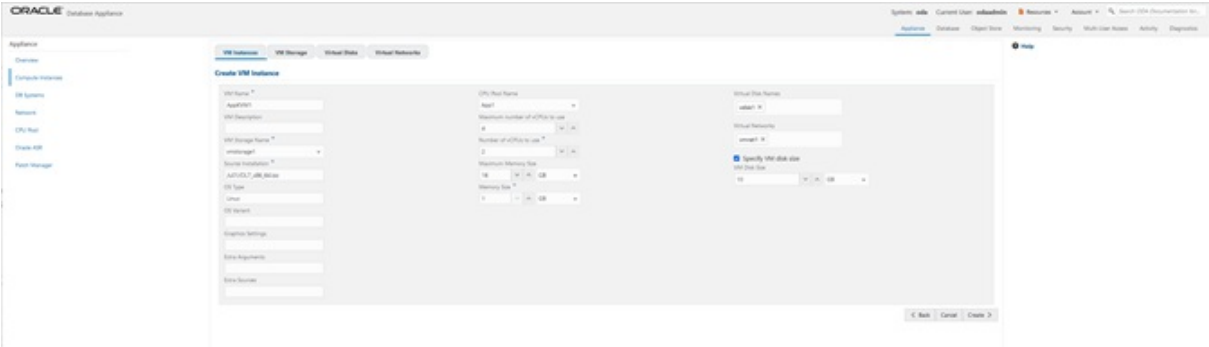
Create an application KVM (Compute Instance). Select the **VM Instances** tab, and then click **Create VM Instance**.



Select **Create VM Instance**, then click **Next**.



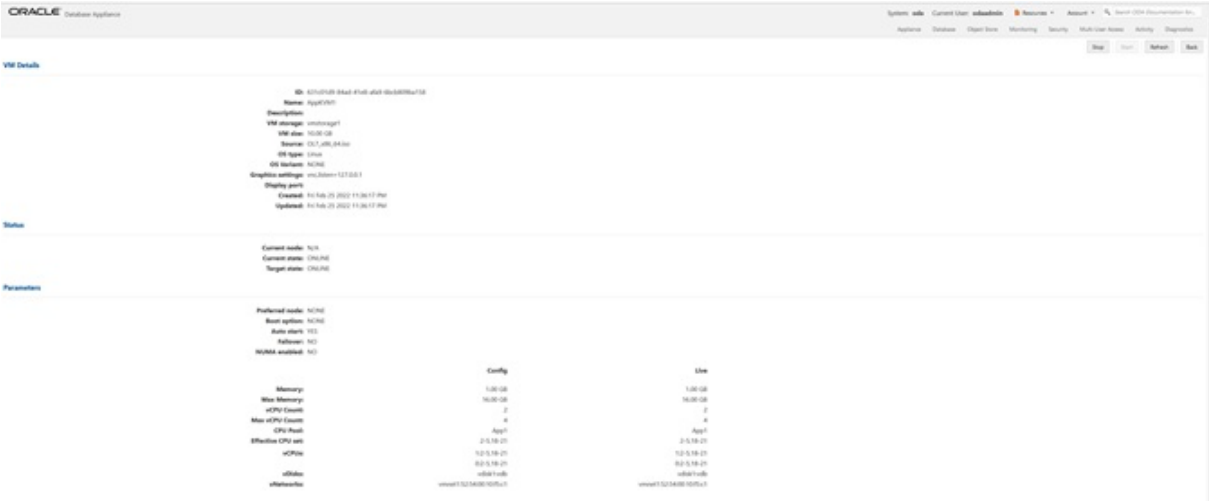
Specify the information for AppKVM1, then click **Create**. Note the **Source Installation** path to the Linux ISO image. Note that the VM disk size is 10GB. VM disk is the local system boot disk where the Linux image is installed.



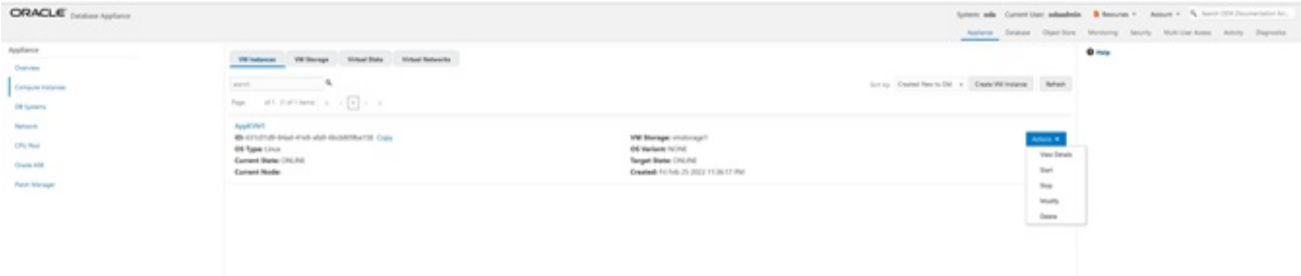
You can see AppKVM1 instance is created.



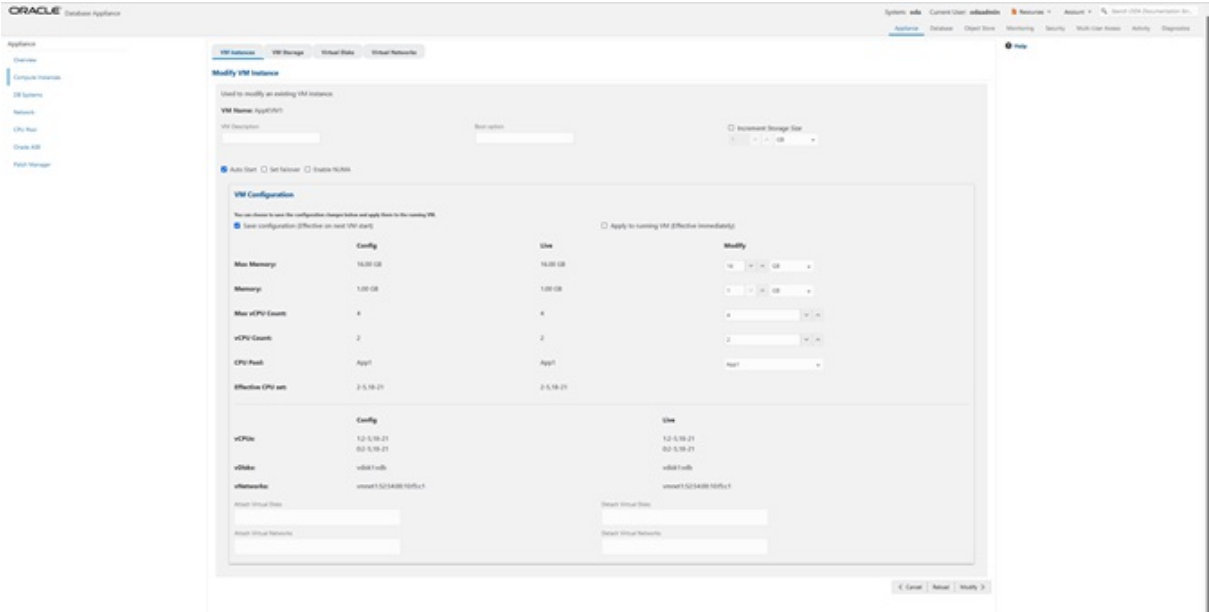
You can see the detailed information for AppKVM1 by clicking on AppKVM1.



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



This is where you can modify AppKVM1.



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

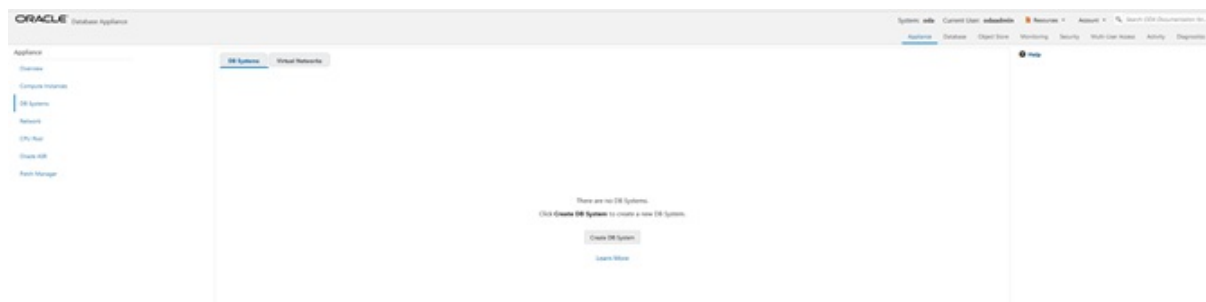


Step 2 - Create a Database KVM (Database System)

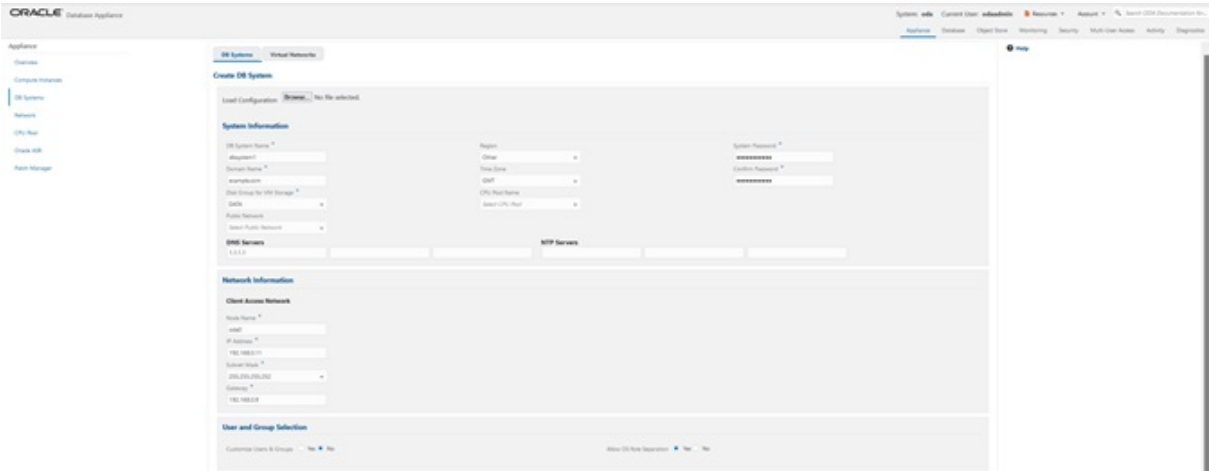
To create a database KVM (Database System) in Oracle Database Appliance, you must first download the DB system image (database VM template) into the appliance, then update the repository so that the database VM template is saved in Oracle Database Appliance.

```
$ 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",
  "updatedAtTime" : "July 26, 2022 07:45:05 AM UTC"
}
```

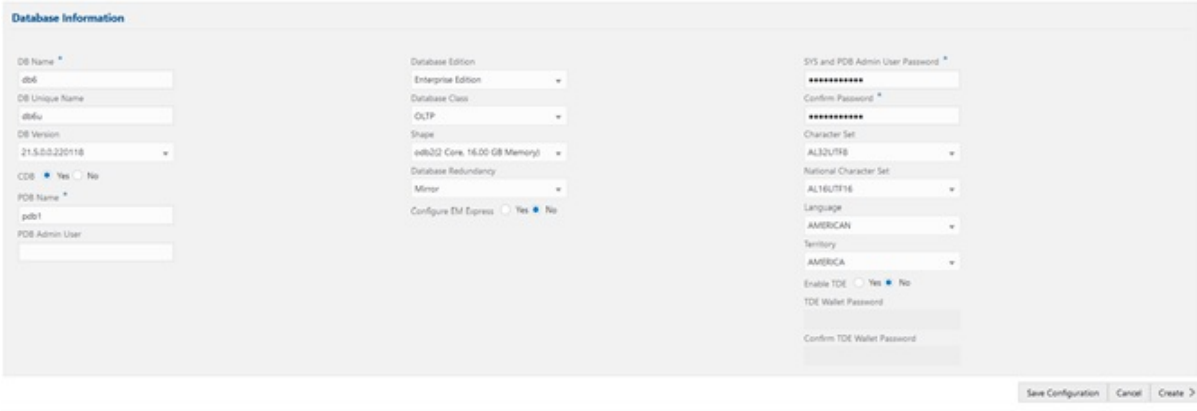
In the BUI, select **DB Systems** on the left, and click **Create DB System**. Then, click **Create**.



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



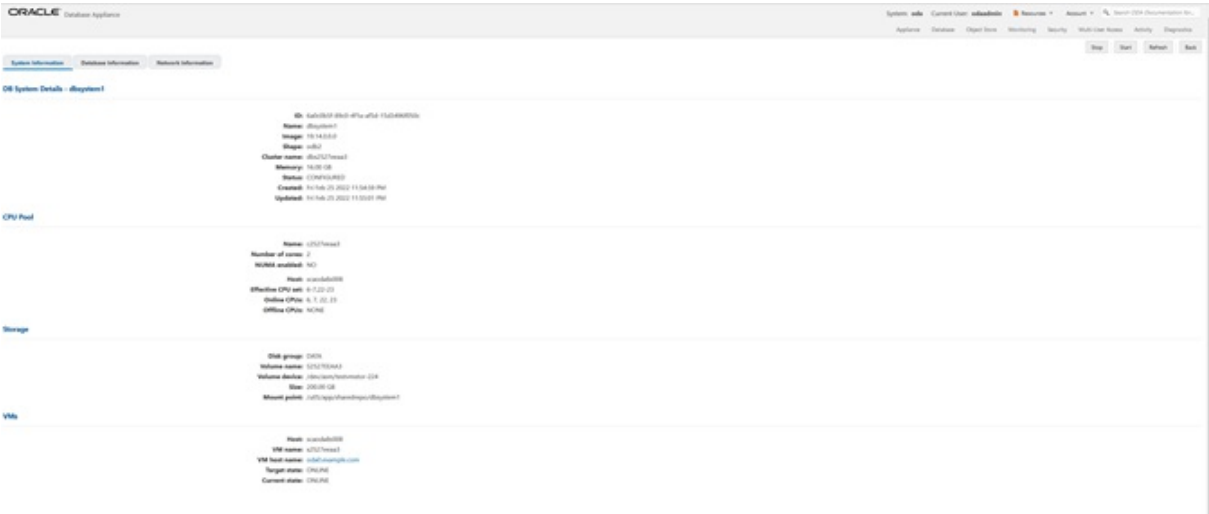
Note the database shape selected will determine the number of CPU cores assigned to the database. A database CPU pool is automatically created, or a database CPU Pool can be selected. A default network is also be automatically assigned to the database, or a network can be selected. Make sure **CDB**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



You can see that a database KVM `dbssystem1` is created.



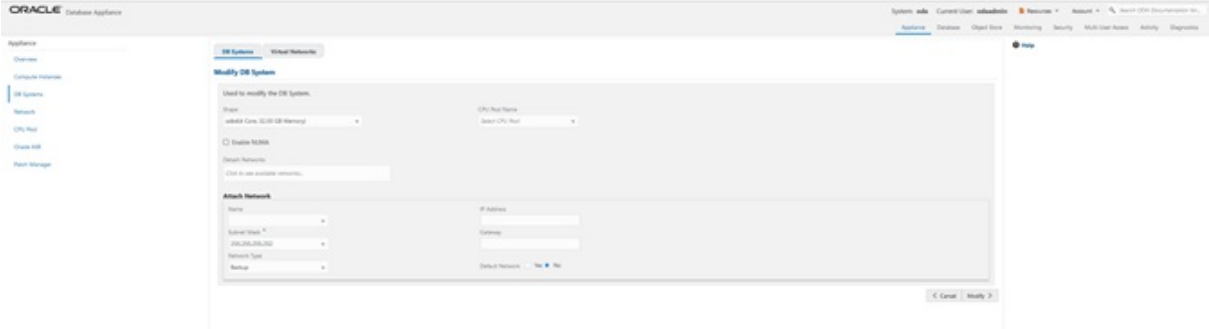
You can find the details for `dbssystem1` by clicking on it.



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



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



Click the **DB Systems** tab on the left to verify that dbSystem1 has 4 cores now.



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.

The screenshot shows the Oracle Database Appliance BUI interface. The top navigation bar includes 'System: oda', 'Current User: odaadmin', and 'Resources'. The 'Multi-User Access' tab is selected. On the left, a sidebar lists 'Users', 'Roles', 'Entitlements', and 'Resources'. The main content area is titled 'Create User' and contains the following fields and options:

- User ID ***: A text input field containing 'user1'.
- Roles ***: A dropdown menu showing 'ODA-DB X'.
- ODA Password ***: A password input field with masked characters.
- Confirm ODA password ***: A second password input field with masked characters.
- Generate mTLS certificate**

At the bottom right of the form, there are '< Cancel' and 'Create >' buttons.

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

The screenshot shows the Oracle Database Appliance Multi-User Access interface. The top navigation bar includes 'System: oda', 'Current User: odaadmin', and 'Resources'. The 'Multi-User Access' tab is selected. On the left, a sidebar lists 'Users', 'Roles', 'Entitlements', and 'Resources'. The main content area displays a table of users with the following details:

User ID	Roles	Account Status	User Type
grid ID: ee8625df-8bf-49fe-9962-1600f9796fe	ODA-GRID	Active	System
oakdroot ID: b196ba2f-1f30-49c6-81d6-624752feb15	ODA-OAKDROOT	Active	System
odaadmin ID: 63c082db-de04-45dd-baed-66b5690e808	ODA-ADMINISTRATOR	Active	System
oracle ID: e95a29bd-9d16-4c35-90ff-60258b63664	ODA-DB	Active	System
user1 ID: 41074189-6a90-4b0b-8abd-d57d81342906	ODA-DB	Inactive	Custom

Create a second user, user2 using the same process.

The screenshot shows the 'Create User' form in the Oracle Database Appliance Multi-User Access interface. The form includes the following fields:

- User ID: user2
- Roles: ODA-DB (selected)
- ODA Password: [masked]
- Confirm ODA password: [masked]
- Generate mTLS certificate:

Buttons for '< Cancel' and 'Create >' are visible at the bottom right of the form.

Go to the **Users** tab on the left to verify that user2 is created.

The screenshot shows the Oracle Database Appliance Multi-User Access interface with the updated list of users. The 'Users' tab is selected in the sidebar. The table now includes the newly created user:

User ID	Roles	Account Status	User Type
grid ID: ee8625df-8bf-49fe-9962-1600f9796fe	ODA-GRID	Active	System
oakdroot ID: b196ba2f-1f30-49c6-81d6-624752feb15	ODA-OAKDROOT	Active	System
odaadmin ID: 63c082db-de04-45dd-baed-66b5690e808	ODA-ADMINISTRATOR	Active	System
oracle ID: e95a29bd-9d16-4c35-90ff-60258b63664	ODA-DB	Active	System
user1 ID: 41074189-6a90-4b0b-8abd-d57d81342906	ODA-DB	Inactive	Custom
user2 ID: b7d3e24d-c7c1-4b09-8cec-31e0c136c0c	ODA-DB	Inactive	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**.

The screenshot shows the Oracle Database Appliance Multi-User Access interface. The left sidebar has the 'Resources' tab selected. The main area displays a search interface with 'Show Advanced Search' checked. The search filters are set to 'Resource Type: ODA_DB'. A table lists three resources: db3, db4, and db5. The db5 resource is selected, and the 'Actions' menu is open, showing the 'Grant Resource Access' option.

Resource Name	ID	Type	Primary Owner	Active	Location	Created	Actions
db3	324a42ea-bba2-477d-8bca-5a26af159f1c	ODA_DB	odaadmin	true	efca440e-2482-40c1-8ccd-67316cd48ba2	Fri Feb 25 2022 5:45:50 PM	Actions
db4	deac01db-aaa8-4f6e-a511-aaa042be3a18	ODA_DB	odaadmin	true	c3c63738-703e-4c1d-98de-95b551b67468	Fri Feb 25 2022 5:51:50 PM	Actions
db5	19245968-7775-4e9c-9448-3ad44c41c5e1	ODA_DB	odaadmin	true	/u01/app/odaorahomebase/odaadmin/product/19.0.0.0/dbhome_4	Fri Feb 25 2022 11:14:20 PM	Actions

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

The screenshot shows the 'Grant Resource Access' dialog box. The dialog box prompts the user to select a user name to whom access is to be granted. The user name 'user1' is selected in the drop-down menu. The 'Grant' button is highlighted.

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.

The screenshot shows the Oracle Database Appliance Multi-User Access interface. The top navigation bar includes 'System: oda', 'Current User: odaadmin', and 'Resources'. The main content area displays a search interface with filters for 'Resource Type' (set to ODA_DB) and 'Resource Name'. Below the search filters, there is a table of resources:

Resource Name	ID	Type	Primary Owner	Shared Access	Created
db3	324a42ea-bba2-477d-8bca-5a26af159f1c	ODA_DB	odaadmin		Fri Feb 25 2022 5:45:50 PM
db4	deac01db-aa8-4f4e-a511-aea042be3a18	ODA_DB	odaadmin		Fri Feb 25 2022 5:51:50 PM
db5	19245968-7775-4e9c-9448-3ad44c41c5e1	ODA_DB	odaadmin	user1	Fri Feb 25 2022 11:14:20 PM

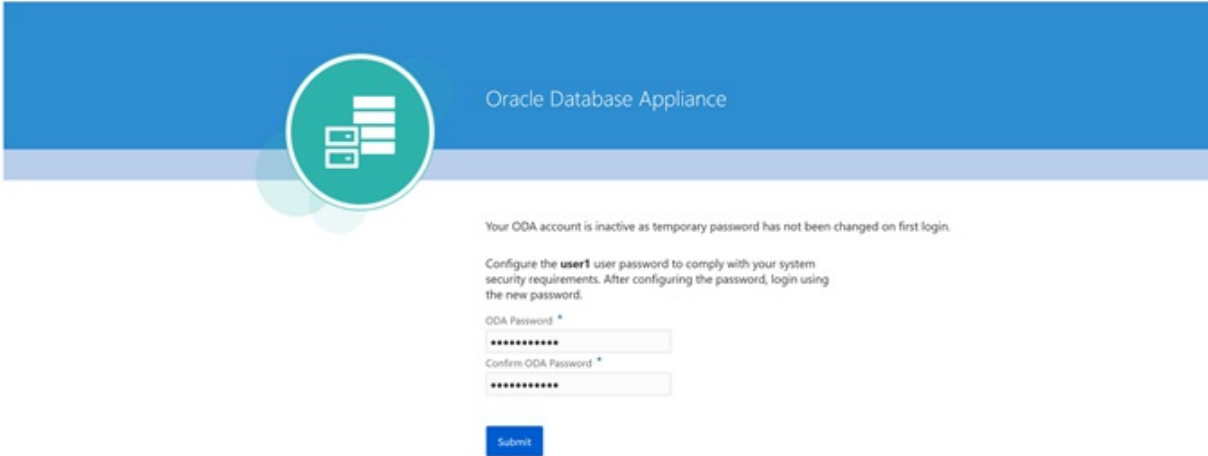
Log in as user1 to verify access to db5.

The screenshot shows the Oracle Database Appliance login page. It features a blue header with the Oracle Database Appliance logo and name. Below the header, there is a login form with the following fields:

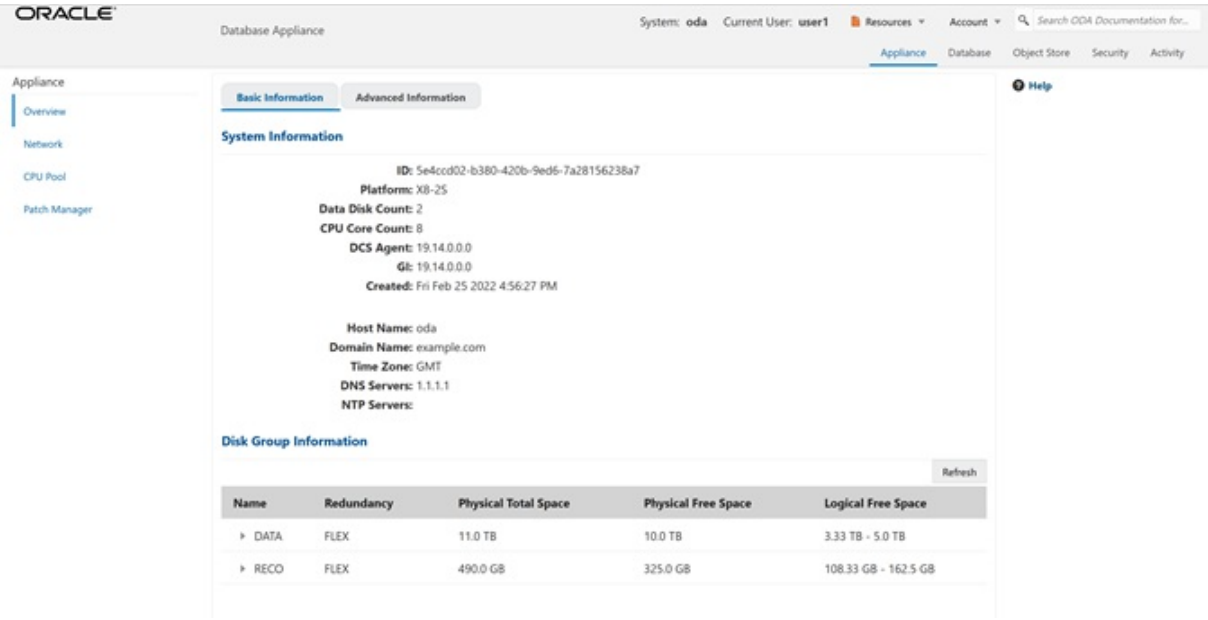
- User Name: user1
- ODA Password: [masked]

Buttons for 'Login' and 'Forgot password?' are visible at the bottom of the form.

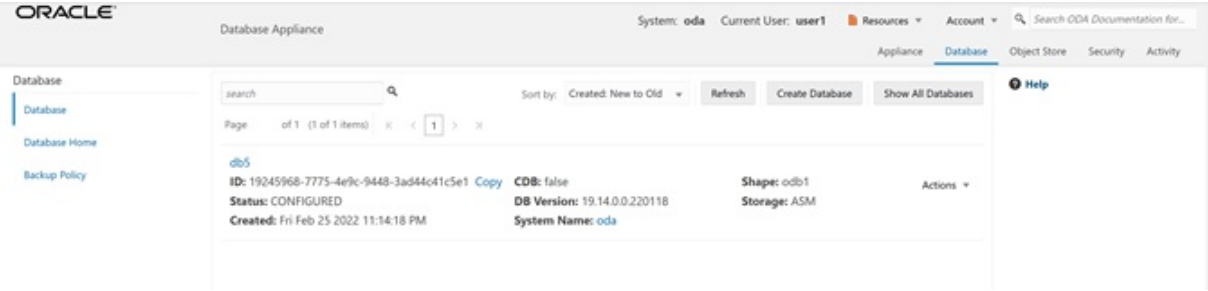
Specify the temporary password created by the odaadmin user, and you are prompted to provide a new password. You can use a password similar to WELcome12## or create your own.



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`.

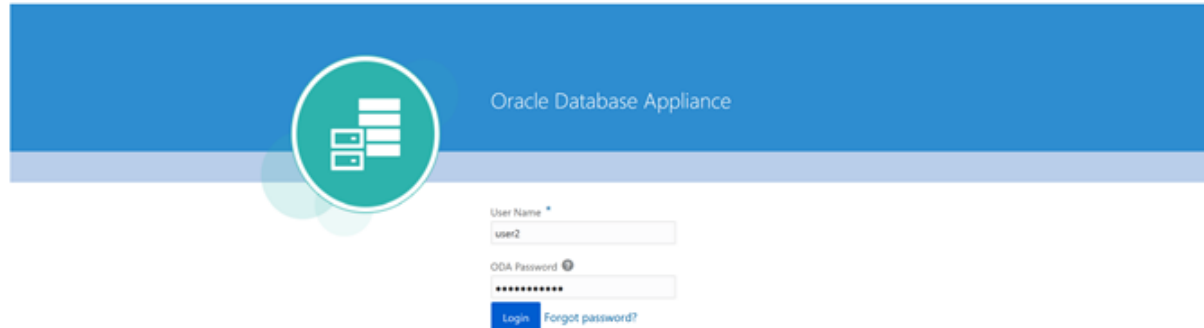


Click on the **Database** tab, and note that `user1` has access to `db5`.



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`.



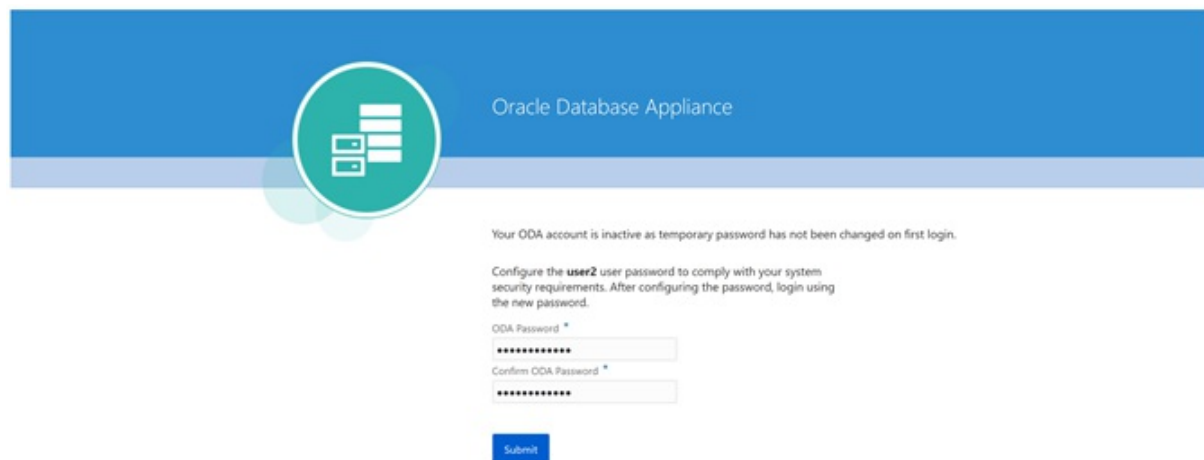
Oracle Database Appliance

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 Password *

Confirm ODA Password *

Submit

Log in as `user2` with the new password.

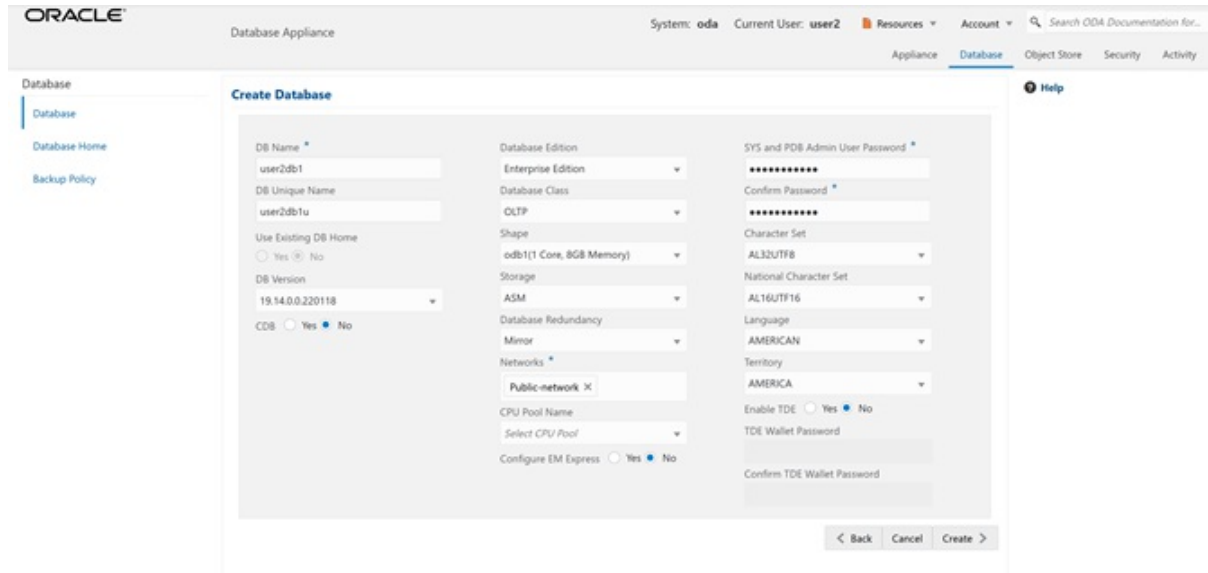
The screenshot shows the Oracle Database Appliance simulator interface. The top navigation bar includes the Oracle logo, 'Database Appliance', and system details: 'System: oda', 'Current User: user2', 'Resources', and 'Account'. A search bar is present on the right. The left sidebar lists navigation options: 'Appliance', 'Overview', 'Network', 'CPU Pool', and 'Patch Manager'. The main content area has two tabs: 'Basic Information' (selected) and 'Advanced Information'. Under 'System Information', the following details are listed: ID: 5e4ccd02-b380-420b-9ed5-7a28156238a7, Platform: X8-25, Data Disk Count: 2, CPU Core Count: 8, DCS Agent: 19.14.0.0.0, GI: 19.14.0.0.0, Created: Fri Feb 25 2022 4:56:27 PM, Host Name: oda, Domain Name: example.com, Time Zone: GMT, DNS Servers: 1.1.1.1, and NTP Servers. Below this is the 'Disk Group Information' section with a 'Refresh' button and a table:

Name	Redundancy	Physical Total Space	Physical Free Space	Logical Free Space
DATA	FLEX	11.0 TB	10.0 TB	3.33 TB - 5.0 TB
RECO	FLEX	490.0 GB	325.0 GB	108.33 GB - 162.5 GB

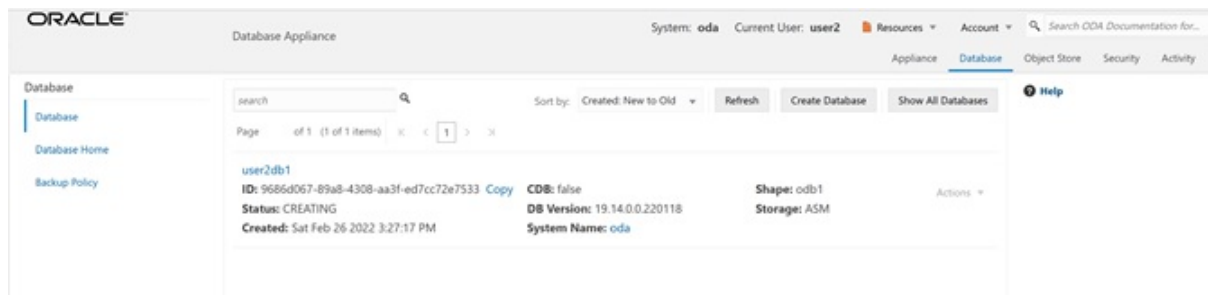
Click on the **Database** tab. There are no database available to user2. Click **Create Database**.

The screenshot shows the Oracle Database Appliance simulator interface with the 'Database' tab selected. The top navigation bar is the same as in the previous screenshot. The left sidebar now lists 'Database', 'Database Home', and 'Backup Policy'. The main content area displays a message: 'There is no database. Click **Create Database** to create a new database.' Below the message are two buttons: 'Create Database' and 'Show All Databases', and a 'Learn More' link.

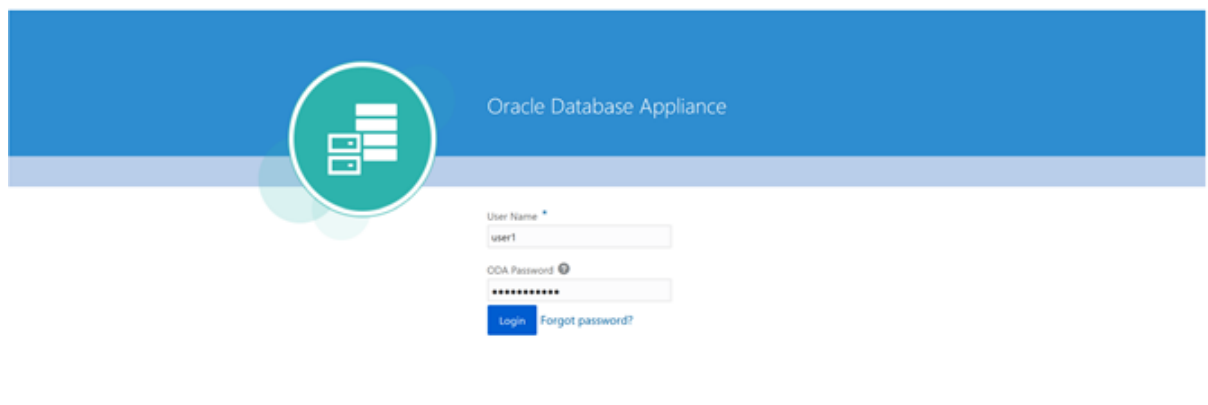
Create a new database, user2db1.



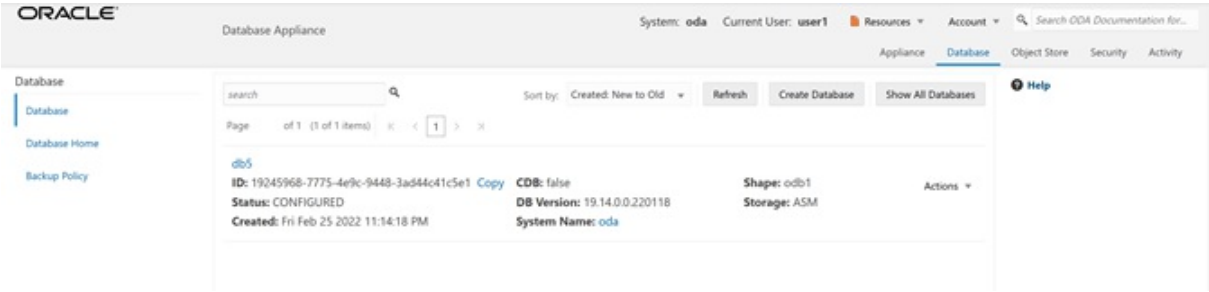
Click **Create** and verify that the database is created.



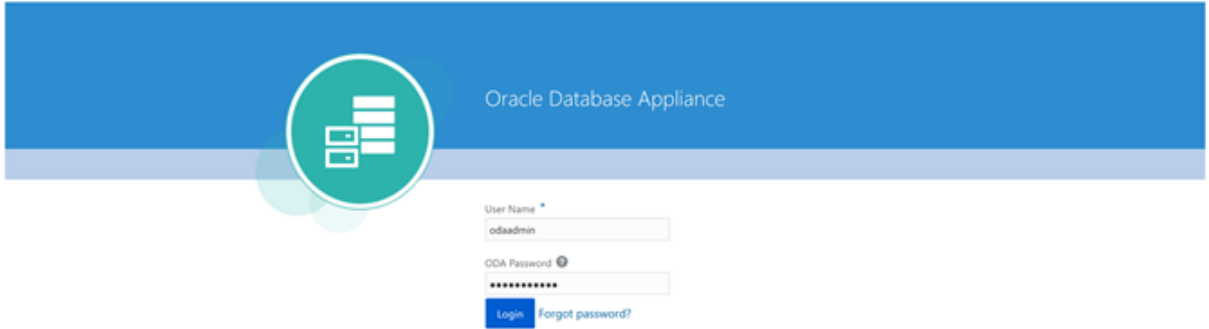
Log in as user1 to verify that user1 does not have access to user2db1.



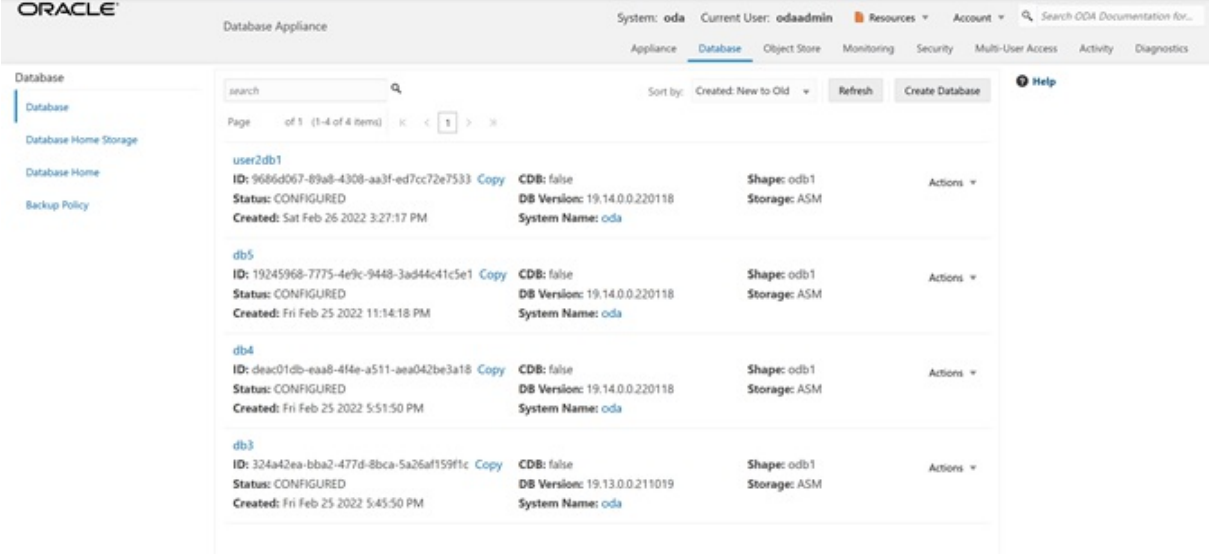
You can verify that user1 only has access to db5.



Log in as odaadmin to review resources and user access.



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



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.

The screenshot shows the Oracle Database Appliance Multi-User Access interface. The top navigation bar includes 'System: oda', 'Current User: odaadmin', and 'Resources'. The main content area displays a list of resources under the 'ODA_DB' type. The resources listed are db3, db4, db5, and user2:db1. Each resource entry includes its ID, Primary Owner, Active status, Location, Type, Shared Access, and Created date.

Resource Name	ID	Primary Owner	Active	Location	Type	Shared Access	Created
db3	324a42ea-bba2-477d-8bca-5a26af159f1c	odaadmin	true	ecfa440e-2482-40c1-8ccd-67316cd48ba2	ODA_DB	odaadmin	Fri Feb 25 2022 5:45:50 PM
db4	deac01db-aaa8-4fae-a511-aea042be3a18	odaadmin	true	c3c63738-703e-4c1d-98de-95b551b67668	ODA_DB	odaadmin	Fri Feb 25 2022 5:51:50 PM
db5	19245968-7775-4e9c-9448-3ad44c41c5e1	odaadmin	true	/u01/app/odaorahomebase/odaadmin/product/19.0.0.0/dbhome_4	ODA_DB	user1	Fri Feb 25 2022 11:14:20 PM
user2:db1	9686d067-89a8-4308-aa3f-ed7cc72e7533	user2	true	399afe69-7b11-4c2d-9e43-bb282bcd9e99	ODA_DB	odaadmin	Sat Feb 26 2022 3:27:20 PM

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 ODA CLI 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

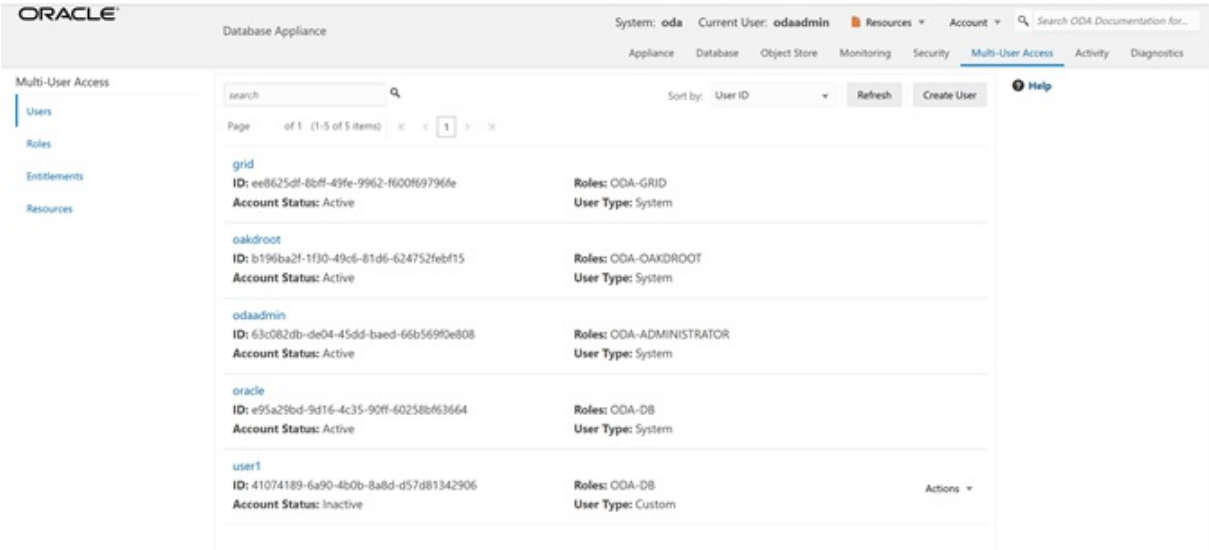
To view the Oracle Database Appliance software components, click on the **Advanced Information** tab on the Appliance Overview page.

The screenshot shows the Oracle Database Appliance BUI interface. The top navigation bar includes the Oracle logo, 'Database Appliance', and system information: 'System: oda', 'Current User: odaadmin', and 'Resources'. A search bar for ODA documentation is also present. The main content area is divided into tabs: 'Appliance', 'Database', 'Object Store', 'Monitoring', 'Security', 'Multi-User Access', 'Activity', and 'Diagnostics'. The 'Appliance' tab is active, and the 'Advanced Information' sub-tab is selected. The page displays the following information:

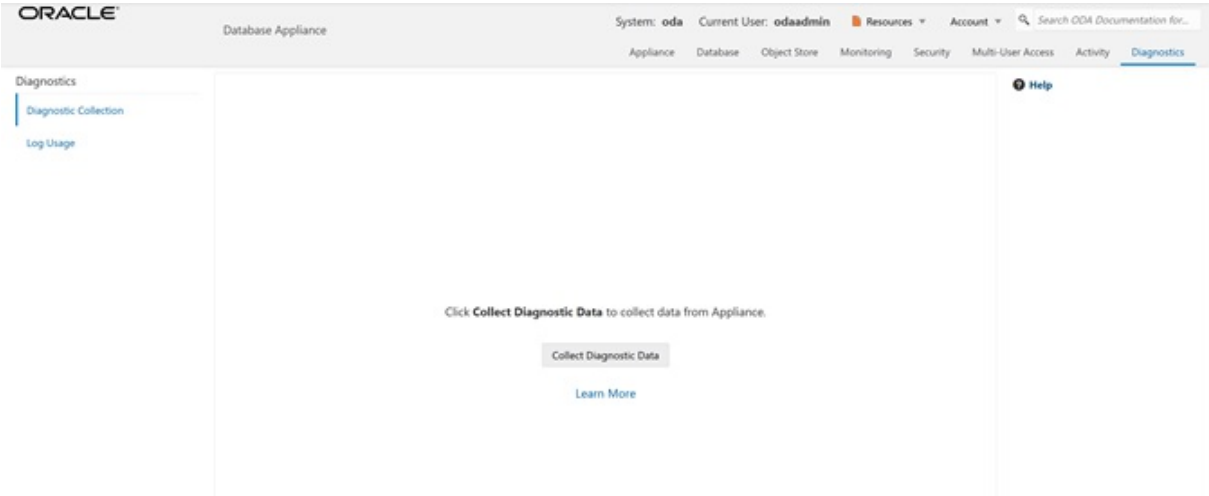
- Node Name:** scaoda7142.us.oracle.com
- Last Collection Time:** Tue Oct 19 2021 11:29:20 GMT-0700 (Pacific Daylight Time)
- Grid Infrastructure Table:**

GI Version	Home	Active Version Information	Active Version Information	Active Version Information	Software Version Information
19.13.0.0.211019	/u01/app /19.13.0.0/grid	Oracle Clusterware active version on the cluster is [19.0.0.0.0]	The cluster upgrade state is [NORMAL]	The cluster active patch level is [573139142]	Oracle Clusterware version on node [scaoda7142] is [19.0.0.0.0]
- Other sections:** Patches, Database Homes, Firmware Controller, Firmware Disk, ILOM, BIOS, List of Operating System RPMs.

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



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**.

The screenshot shows the Oracle Database Appliance simulator interface. The top navigation bar includes 'System: oda', 'Current User: odaadmin', and a search box for ODA documentation. The main content area is divided into 'Basic Information' and 'Advanced Information' tabs. Under 'System Information', the following details are listed: ID: 5e4ccd02-b380-420b-9ed6-7a28156238a7, Platform: X8-2S, Data Disk Count: 2, CPU Core Count: 8, DCS Agent: 19.14.0.0.0, GI: 19.14.0.0.0, and Created: Fri Feb 25 2022 4:56:27 PM. Below this, 'Disk Group Information' is shown in a table:

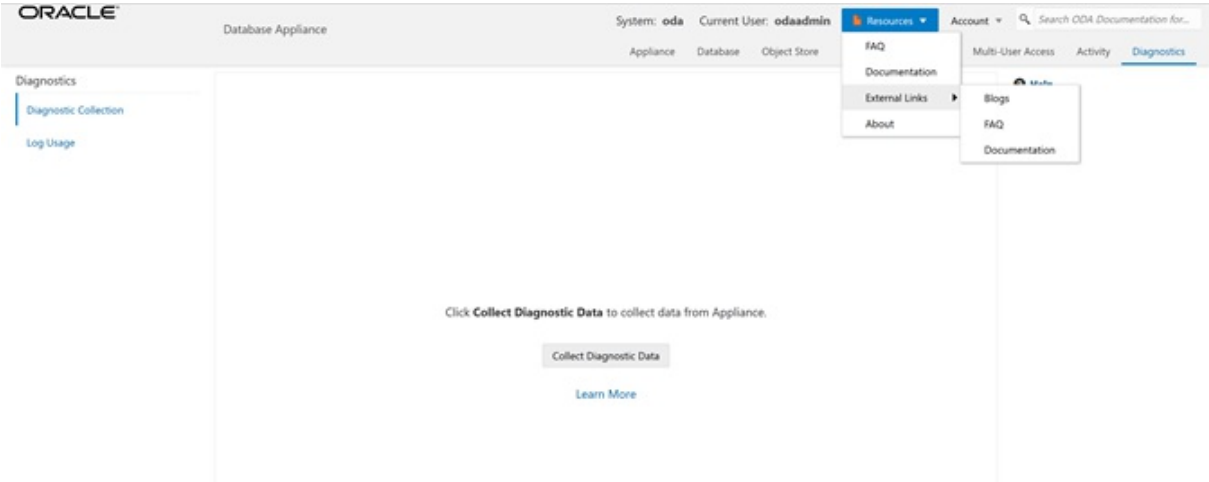
Name	Redundancy	Physical Total Space	Physical Free Space	Logical Free Space
DATA	FLEX	11.0 TB	10.0 TB	3.33 TB - 5.0 TB
RECO	FLEX	490.0 GB	325.0 GB	108.33 GB - 162.5 GB

On the right side, there is a sidebar with 'Appliance' and 'FAQs' sections, and a search box for ODA documentation.

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

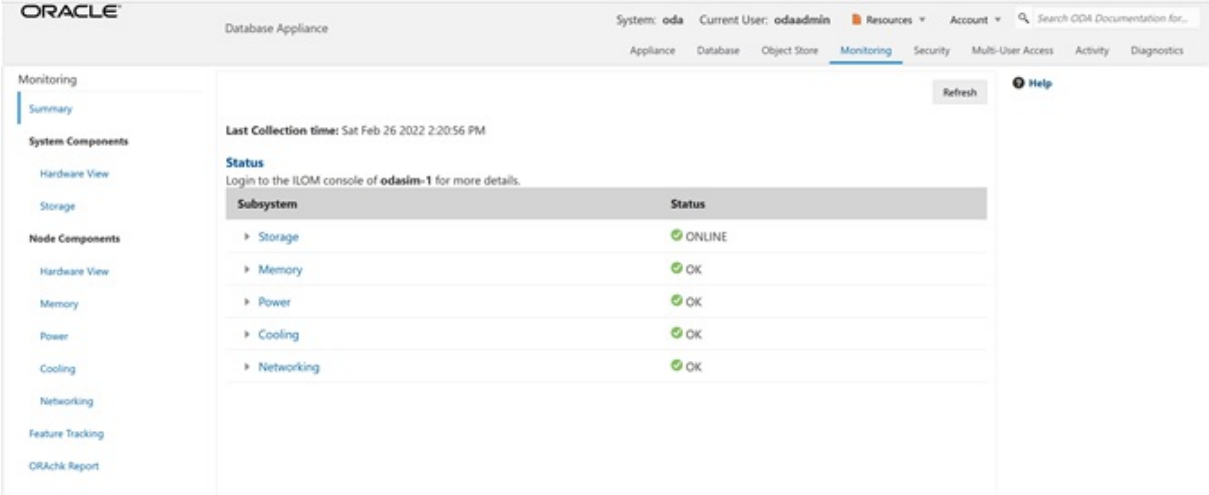
This screenshot is similar to the previous one, but the search box in the top right corner is open, displaying a dropdown menu with the following items: Appliance, Backup, Backup Config, Backup Policy, Database, DB System, and KVM. The main content area remains the same, showing system and disk group information.

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

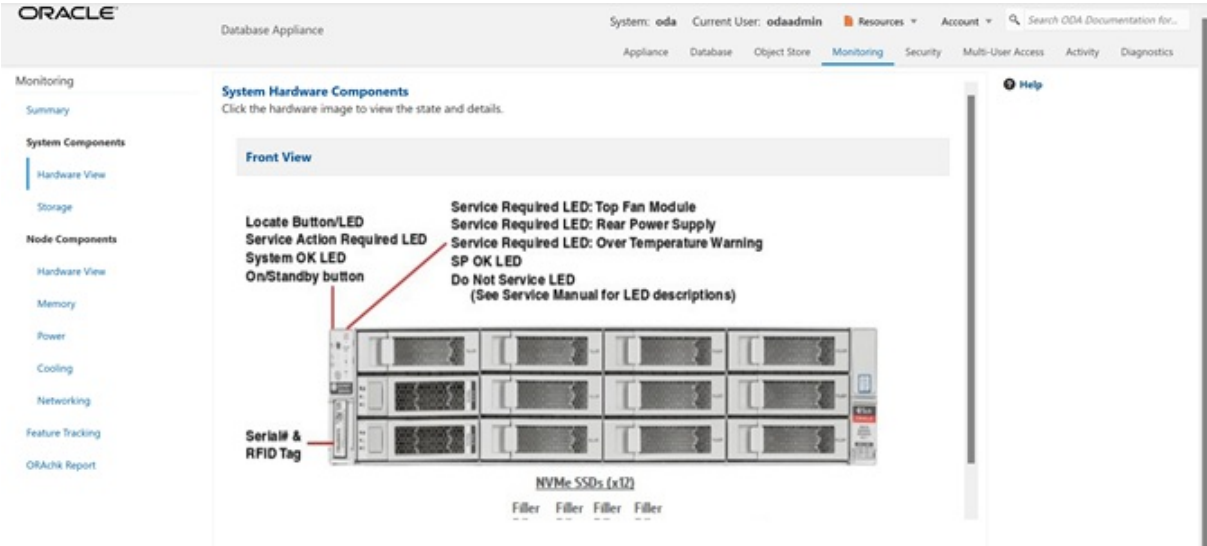


Step 2 - Hardware Monitoring and Feature Tracking

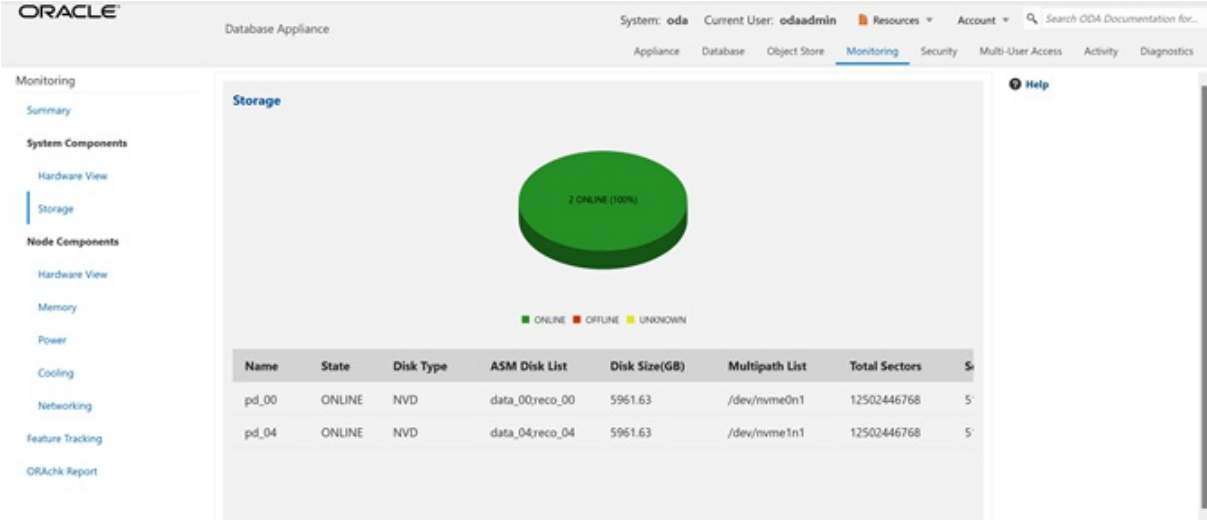
The BUI displays Oracle Database Appliance hardware status and tracks feature usage including High Water Marks.



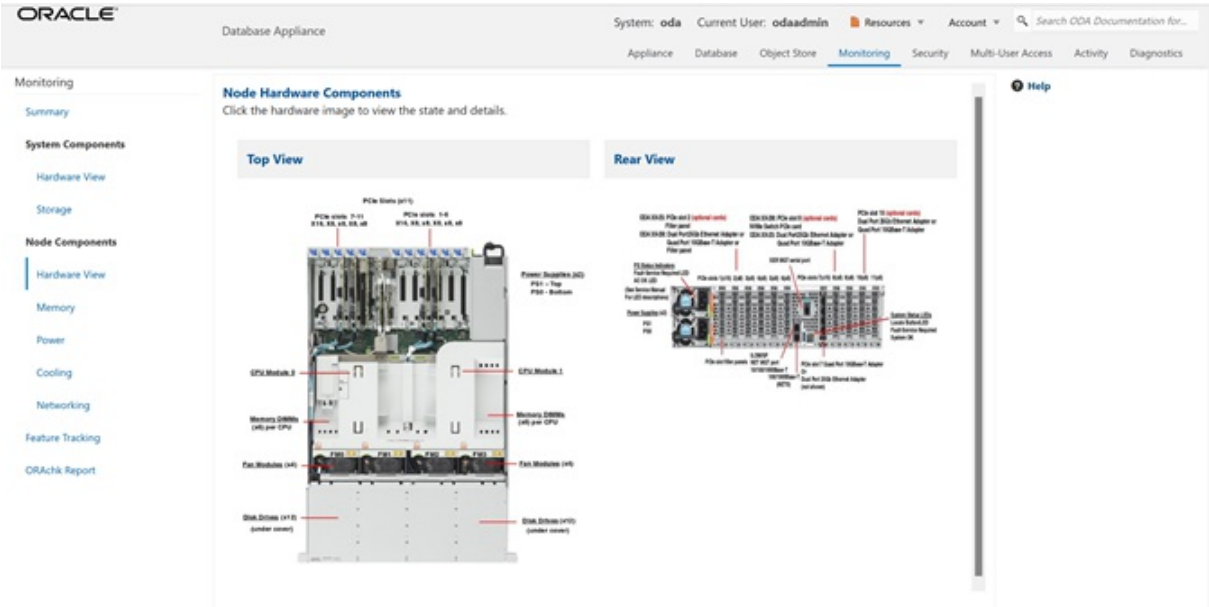
Hardware Status



Storage

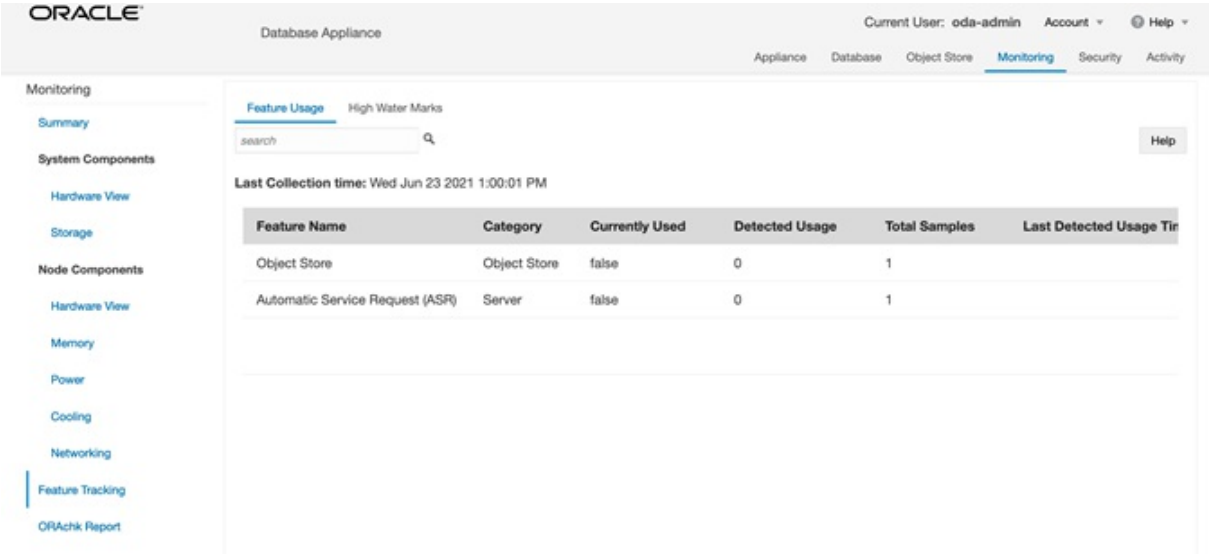


Hardware View



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:



High Water Marks

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

The screenshot displays the Oracle Database Appliance Monitoring page. The top navigation bar includes 'Appliance', 'Database', 'Object Store', 'Monitoring' (selected), 'Security', and 'Activity'. The current user is 'oda-admin'. The left sidebar shows navigation options like 'Monitoring', 'System Components', and 'Node Components'. The main content area is titled 'High Water Marks' and shows a table of measured features with their high water marks and last changed times.

Measured Feature Name	High Water Mark	Last Changed Time	Category
Maximum usage of CPU	0.00 %	Wed Jun 23 2021 1:00:01 PM	DCS Agent
Maximum usage of Memory	331.29 MB	Wed Jun 23 2021 1:00:01 PM	DCS Agent
Maximum number of threads	91	Wed Jun 23 2021 1:00:01 PM	DCS Agent
Maximum number of open file descriptors	48	Wed Jun 23 2021 1:00:01 PM	DCS Agent
Maximum number of Object Store tenants	0	Wed Jun 23 2021 1:00:01 PM	Object Store
Maximum number of enabled CPU cores	2	Wed Jun 23 2021 1:00:01 PM	Server
Maximum number of disks	2	Wed Jun 23 2021 1:00:01 PM	Storage
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
```

```

Power State           : On
Open Problems         : 0
Model                 : ODA X7-2-HA
Type                  : Rack Mount
Part Number           : ODA X7-2-HA
Serial Number         : 1750XD0003
Primary OS            : Not Available
ILOM Address          : 10.145.203.81
ILOM MAC Address      : 00:10:E0:DA:CD:66
Description           : Oracle Database Appliance X7-2 High Availabi
lity 1750XD0003
Locator Light         : Off
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.

```
$ sudo odacli describe-system
```

```
Appliance Information
```

```
-----
```

```
          ID: oda
```

```
        Platform:
```

```
    Data Disk Count: 9
```

```
    CPU Core Count: 36
```

```
          Created: July 19, 2022 8:25:14 PM GMT
```

```
System Information
```

```
-----
```

```
          Name: oda
```

```
Domain Name: example.com
```

```
Time Zone: GMT
```

```
DB Edition: EE
```

```
DNS Servers: 1.1.1.1
```

```
NTP Servers:
```

Disk Group Information

```
-----
```

DG Name	Redundancy	Percentage
Data	Flex	80
Reco	Flex	20
Redo	High	100
Flash	Flex	100

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 P0 (CPU 0) Intel(R) Xeon(R) Gold 6140
CP 2.300 GHz 18 NA
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 00CE021743373400D8 P0/D0 Samsung 32 GB 2666 MHz 0
DIMM_11 OK - 3A4K40BB2-CTD 00CE02174337340065 P0/D1 Samsung 32 GB 2666 MHz 0
DIMM_12 OK - 3A4K40BB2-CTD 00CE0217433734000D P1/D0 Samsung 32 GB 2666 MHz 0
DIMM_14 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_2 OK - 3A4K40BB2-CTD 00CE02174337340078 P0/D2 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_7 OK - 3A4K40BB2-CTD 00CE02174337340013 P0/D7 Samsung 32 GB 2666 MHz 0
DIMM_9 OK - 3A4K40BB2-CTD 00CE02174337340101 P0/D9 Samsung 32 GB 2666 MHz 0
```

Command: odaadmcli show power

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

```
$ sudo odaadmcli show power
```

```
NAME HEALTH HEALTH_DETAILS PART_NO. SERIAL_NO. LOCATION INPUT_POWER OU
TPUT_POWER INLET_TEMP EXHAUST_TEMP
```

```
Power_Supply_0 OK - 7333459 465824T+1647D30456 PS0 Present 135 watts 20 degrees
C 42.500 degree C
Power_Supply_1 OK - 7333459 465824T+1647D30762 PS1 Present 146 watts 20 degrees
C 51.500 degree C
```

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_5 OK - FM1 34 % 5900 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 odaadmcli show disk

STATE          NAME          STATE_DETAILS  PATH          TYPE
-----
ONLINE         e0_pd_00     Good           /dev/sdbv    HDD
ONLINE         e0_pd_01     Good           /dev/sdbw    HDD
ONLINE         e0_pd_02     Good           /dev/sdbx    HDD
ONLINE         e0_pd_03     Good           /dev/sdby    HDD
ONLINE         e0_pd_04     Good           /dev/sdbz    HDD
ONLINE         e0_pd_05     Good           /dev/sdca    HDD
ONLINE         e0_pd_06     Good           /dev/sdcb    HDD
ONLINE         e0_pd_07     Good           /dev/sdcc    HDD
ONLINE         e0_pd_08     Good           /dev/sdcd    HDD

```

ONLINE	e0_pd_09	Good	/dev/sdce	HDD
ONLINE	e0_pd_10	Good	/dev/sdcf	HDD
ONLINE	e0_pd_11	Good	/dev/sdcg	HDD
ONLINE	e0_pd_12	Good	/dev/sdch	HDD
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
ONLINE	e0_pd_17	Good	/dev/sdcm	SSD
ONLINE	e0_pd_18	Good	/dev/sdcn	SSD
ONLINE	e0_pd_19	Good	/dev/sdco	SSD
ONLINE	e0_pd_20	Good	/dev/sdcp	SSD
ONLINE	e0_pd_21	Good	/dev/sdcq	SSD
ONLINE	e0_pd_22	Good	/dev/sdcr	SSD
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.

```
$ sudo odaadmcli show fs
```

Type	Total Space	Free Space	Total DG Space	Free DG Space	Diskgroup
Mount Point					
ext3	30109M	25254M	-	-	
/					
ext3	476M	405M	-	-	
/boot					
ext3	60347M	22117M	-	-	
/opt					
ext3	100665M	72839M	-	-	
/u01					
acfs	5120M	4625M	112116480M	111977204M	DATA
/opt/oracle/dcs/commonstore					

Command: odaadmcli show raidsyncstatus

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

```
$ sudo odaadmcli show raidsyncstatus
```

Raid Type	Raid Device	Partitions	RaidStatus	Recovery	RecoveryP
percentage					
S/W Raid	md0	sdb2 sda2	UU	No	
N/A					
S/W Raid	md1	sdb3 sda3	UU	No	
N/A					

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
    Id          = 0
    Serial Num  = 500605b00d3e88c0
    Vendor      = LSI Logic
    Model       = ORCL-EXT-SAS3
    FwVers      = 13.00.00.00
    strId       = mpt3sas:3b:00.0
    Id          = 1
    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
    Id          = 1
    Serial Num  = 50800200022f163f
    Vendor      = ORACLE
    Model       = DE3-24C
    FwVers      = 0306
    strId       = Primary
    WWN         = 50800200022e447e

Total number of PDs: 24
    /dev/sdaa      HGST          HDD 9796gb slot: 0  exp: 0  H
7210A520SUN010T
    /dev/sdab      HGST          HDD 9796gb slot: 1  exp: 0  H
7210A520SUN010T
    /dev/sdac      HGST          HDD 9796gb slot: 2  exp: 0  H
7210A520SUN010T
    /dev/sdad      HGST          HDD 9796gb slot: 3  exp: 0  H
7210A520SUN010T
    /dev/sdae      HGST          HDD 9796gb slot: 4  exp: 0  H
7210A520SUN010T
    /dev/sdaf      HGST          HDD 9796gb slot: 5  exp: 0  H

```

```

7210A520SUN010T
    /dev/sdag      HGST          HDD 9796gb slot: 6  exp: 0  H
7210A520SUN010T
    /dev/sdah      HGST          HDD 9796gb slot: 7  exp: 0  H
7210A520SUN010T
    /dev/sdai      HGST          HDD 9796gb slot: 8  exp: 0  H
7210A520SUN010T
    /dev/sdaj      HGST          HDD 9796gb slot: 9  exp: 0  H
7210A520SUN010T
    /dev/sdak      HGST          HDD 9796gb slot: 10 exp: 0  H
7210A520SUN010T
    /dev/sdal      HGST          HDD 9796gb slot: 11 exp: 0  H
7210A520SUN010T
    /dev/sdam      HGST          HDD 9796gb slot: 12 exp: 0  H
7210A520SUN010T
    /dev/sdan      HGST          HDD 9796gb slot: 13 exp: 0  H
7210A520SUN010T
    /dev/sdao      HGST          HDD 9796gb slot: 14 exp: 0  H
7210A520SUN010T
    /dev/sdap      HGST          SSD 3200gb slot: 15 exp: 0  H
BCAC2DH2SUN3.2T
    /dev/sdaq      HGST          SSD 3200gb slot: 16 exp: 0  H
BCAC2DH2SUN3.2T
    /dev/sdar      HGST          SSD 3200gb slot: 17 exp: 0  H
BCAC2DH2SUN3.2T
    /dev/sdas      HGST          SSD 3200gb slot: 18 exp: 0  H
BCAC2DH2SUN3.2T
    /dev/sdat      HGST          SSD 3200gb slot: 19 exp: 0  H
BCAC2DH2SUN3.2T
    /dev/sdau      HGST          SSD 800gb slot: 20  exp: 0  H
BCAC2DH4SUN800G
    /dev/sdav      HGST          SSD 800gb slot: 21  exp: 0  H
BCAC2DH4SUN800G
    /dev/sdaw      HGST          SSD 800gb slot: 22  exp: 0  H
BCAC2DH4SUN800G
    /dev/sdax      HGST          SSD 800gb slot: 23  exp: 0  H
BCAC2DH4SUN800G
===== END STORAGE DUMP =====

```

Step 5 - Review Network Status

Review the following `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 odaadmcli show network
```

ADDRESS	NAME	HEALTH	HEALTH_DETAILS	LOCATION	PART_NO	MANUFACTURER	MAC_A
	Ethernet_NIC_0	OK	-	NET0	i210	INTEL	00:10
:E0:DA:CD:62	no (em1)		N/A				
	Ethernet_NIC_1	OK	-	NET1	BCM57417	Broadcom	00:10
:E0:DA:CD:63	yes (em2)		N/A				
	Ethernet_NIC_2	OK	-	NET2	BCM57417	Broadcom	00:10
:E0:DA:CD:64	yes (em3)		N/A				
	Ethernet_NIC_3	-	-	NET3	X540	INTEL	00:0A
:F7:CF:36:38	yes (plp2)		-				
	Ethernet_NIC_4	-	-	NET4	X540	INTEL	00:0A
:F7:CF:36:30	yes (plp1)		-				

This concludes Lab 6.