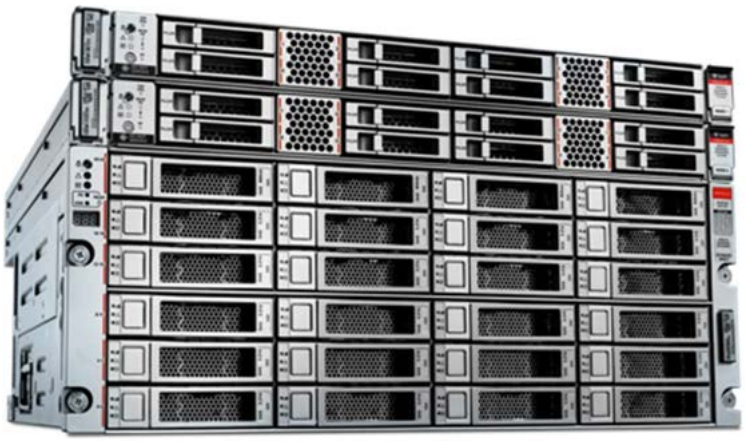
Oracle Corporation

Oracle Database Appliance

X8-2-HA 19.9 Hands-on Lab Manual (OCI)



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ODA X8-2-HA 19.9 OCI Simulator Labs in OCI

We will use a container-based Oracle Database Appliance (ODA) simulator to complete 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 will provide a very similar experience, but is faster, and you get your own simulator to complete the labs. The simulator simulates an ODA X8-2-HA, a 2-node database appliance.

Keep in mind this is a simulation. Not all features are supported by the simulator, and no database is actually created and running. The simulator may be more forgiving than a real ODA if you enter invalid data, and some of the detailed output and screen shots it provides may not be completely accurate.

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

Connecting to the OCI ODA Lab Environment

After the ODA Simulator is setup in the OCI VM, you'll need to log into the ODA Simulator VM with your credentials to access the ODA Simulator Command Line Interface (CLI) and a web browser to access the Browser User Interface (BUI) like a real ODA.

You need to use a console on your local system to ssh into the ODA simulator and be root (su -s) to run the commands. You also need to have the container names (e.g. odapm-1-node0, odapm-1-node1) to access the CLI. You'll need a web browser on your local system with provided ODA simulator VM IP address and a port number (e.g. 7097) to access the BUI.

Firefox and Chrome are recommended web browsers for this lab. If you run into a BUI agent certificate issue. See the Troubleshooting section for details.

Because ODA X8-2-HA is a 2-node system, you will be given **two** set of credentials, one for node-0 and one for node-1. Use node-0 for most of the lab exercises.

To connect to the ODA Simulator Command Line Interface (CLI)

Run the following script to connect to the container. This script is usually located in the simulator directory (e.g. simulator_19.9.0.0.0)

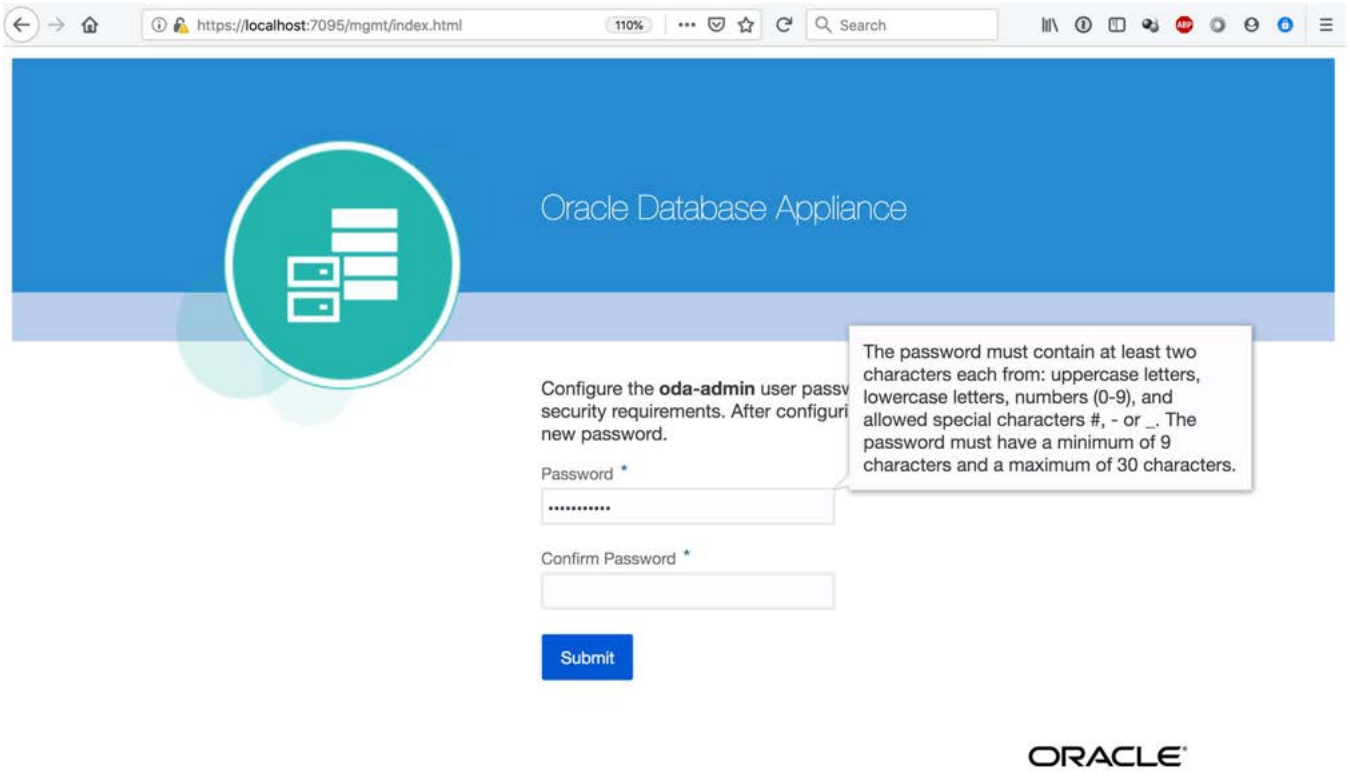
```
# ./connectContainer.sh -n oda-1-node0

[root@oda-1-node0 /]#
```

To connect to the ODA Simulator Browser User Interface (BUI)

1. You must first complete odacli configure-first net and run the odacli update-repository commands in the Lab 1 (using CLI) before you can start deploying ODA in BUI

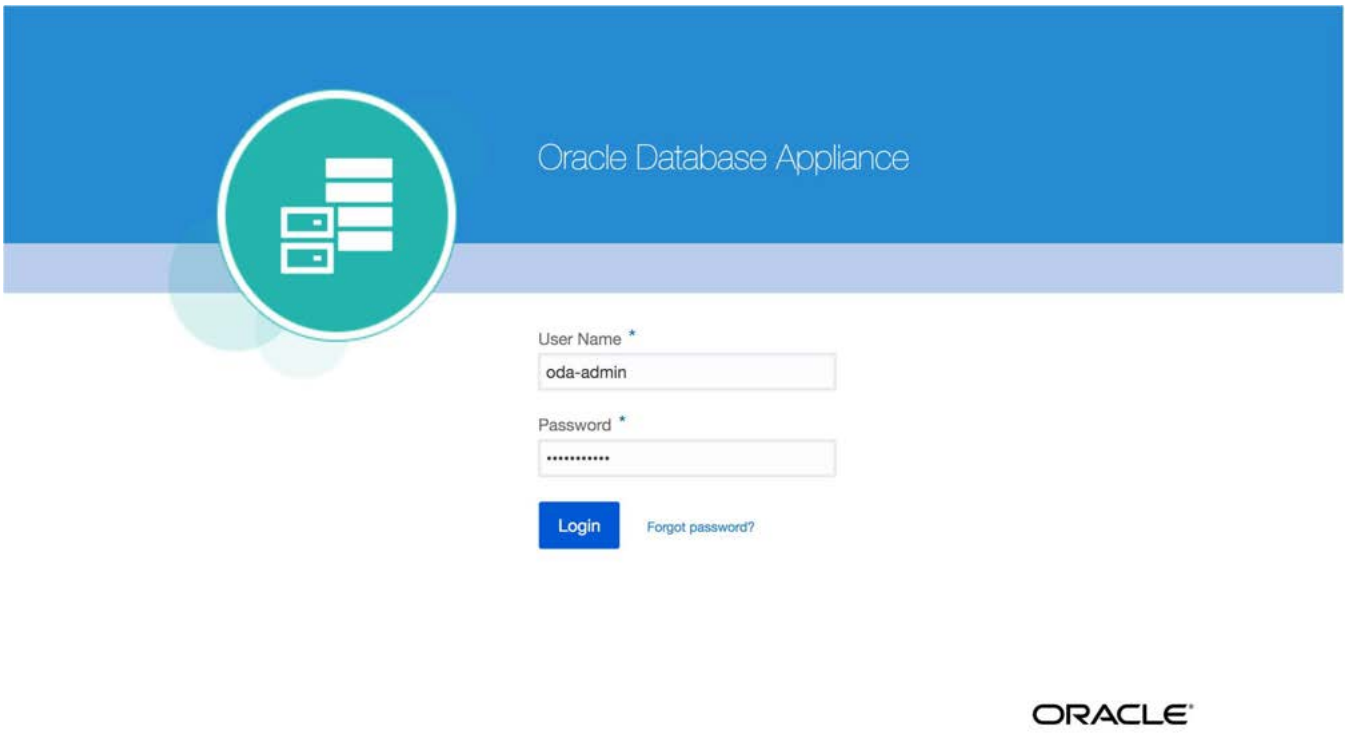
2. Use the VM IP address and port number provided to log into ODA BUI
    a. Go to https://<IP Address>:xxxx/mgmt/index.html (e.g. 7097)

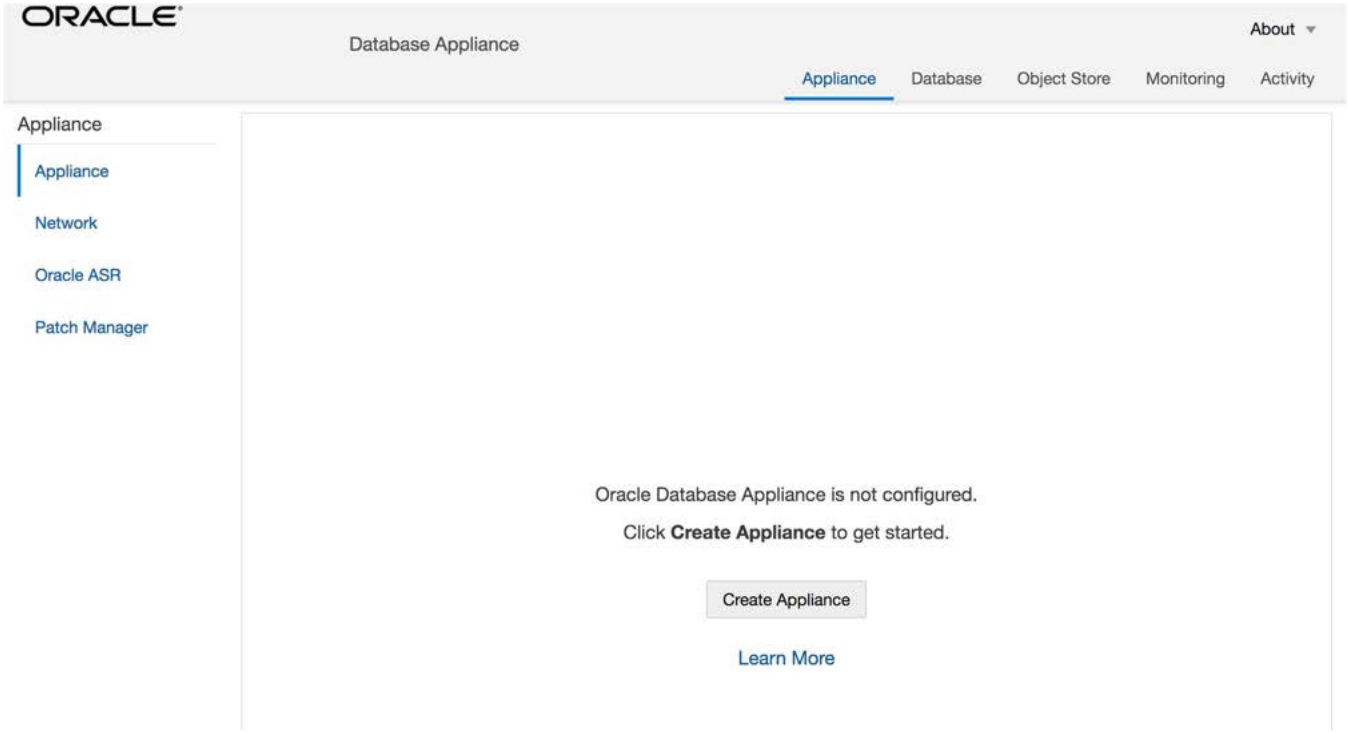
Note if you run into BUI agent credential issue, please see Troubleshooting section



The first thing is to set a new password based on the required rules. For simplicity, you can use something like "WELcome12##" or come up with your own unique password.

You can then login as oda-admin with the new password




ORACLE
Database Appliance
About
Appliance
Database
Object Store
Monitoring
Activity
Appliance
Appliance
Network
Oracle ASR
Patch Manager
Oracle Database Appliance is not configured.
Click Create Appliance to get started.
Create Appliance
Learn More

Simulator Labs Overview

This workshop consists of the following four labs:

Lab 1: Deploy Appliance
Lab 2: Managing Databases
Lab 3: Patch and Update
Lab 4: Monitoring and Administration

Labs will use a mix of command line and web-based administration tools. On the 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.

Lab 1: Deploy Appliance

Go to the Node-0 console command line window to start the lab.

Step 1: Put the ODA on the Network

After you first install the ODA 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 via a network or serial connection. The ODA includes a command called "odacli configure-firstnet" to make it very easy to get the ODA on the network. Once you've put the ODA on the network, you can complete all 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 we are only simulating configuring the network, you can use any IP address (e.g. 192.168.0.100) to complete this step.

```
# 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 p1p1:           [  OK  ]
Shutting down interface p1p2:           [  OK  ]
Shutting down loopback interface:               [  OK  ]
Bringing up loopback interface:    [  OK  ]
Bringing up interface :     [  OK  ]
Bringing up interface em1:    [  OK  ]
Bringing up interface p1p1: Determining if ip address 192.168.16.24 is already in use
fordevice p1p1...    [ OK  ]
Bringing up interface p1p2: Determining if ip address 192.168.17.24 is already in use
fordevice p1p2...    [ OK  ]
Bringing up interface btbond1: Determining if ip address 192.168.0.100 is already in
use for device btbond1...     [  OK  ]
```

Note because this is an ODA X8-2-HA system, you'll also need to run configure firstnet on node-1. Log into node-1 and run the odacli configure-firstnet again. Use 192.168.0.101 for the IP address for node-1.

```
# 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 : 192.168.0.101
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 p1p1:           [  OK  ]
Shutting down interface p1p2:           [  OK  ]
Shutting down loopback interface:               [  OK  ]
Bringing up loopback interface:    [  OK  ]
Bringing up interface :     [  OK  ]
Bringing up interface em1:    [  OK  ]
Bringing up interface p1p1: Determining if ip address 192.168.16.24 is already
in use fordevice p1p1...    [ OK  ]
Bringing up interface p1p2: Determining if ip address 192.168.17.24 is already
in use fordevice p1p2...    [ OK  ]
Bringing up interface btbond1: Determining if ip address 192.168.0.101 is
already in use for device btbond1...     [  OK  ]
```

Step 2: Update the Repository with the ODA Software

The ODA does not ship with the database software pre-loaded, due to regulatory concerns. You must download the Oracle software prior to deployment from My Oracle Support. Go to the ODA documentation web site, the ODA Patch section of the Release Note will provide links to the ODA software. Specifically, we need to download the Grid Infrastructure Clone files, the RDBMS Clone files, and the Server Patch Bundle. We've already downloaded simulated versions of these files in the simulator.

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

Note about file paths: you must specify the full path of the files you pass to the "odacli update-repository" command.

Filename	Description
odacli-dcs-19.8.0.0.0-200714-GI-19.8.0.0.zip	Grid Infrastructure 19.8 Clone Files
odacli-dcs-19.8.0.0.0-200714-DB-19.8.0.0.zip	DB 19.8 Clone Files
oda-sm-19.9.0.0.0-201020-server.zip	ODA 19.9 Patch Bundle (used in lab 3)
odacli-dcs-19.9.0.0.0-201020-DB-19.9.0.0.zip	DB 19.9 Clone Files (used in lab 3)
odacli-dcs-19.9.0.0.0-201020-DB-18.12.0.0.zip	DB 18.12 Clone Files (used in lab 3)

You must update the ODA repository so it knows about the files. This is done with the 'odacli update-repository' command for each clone file (copy/paste is your friend).

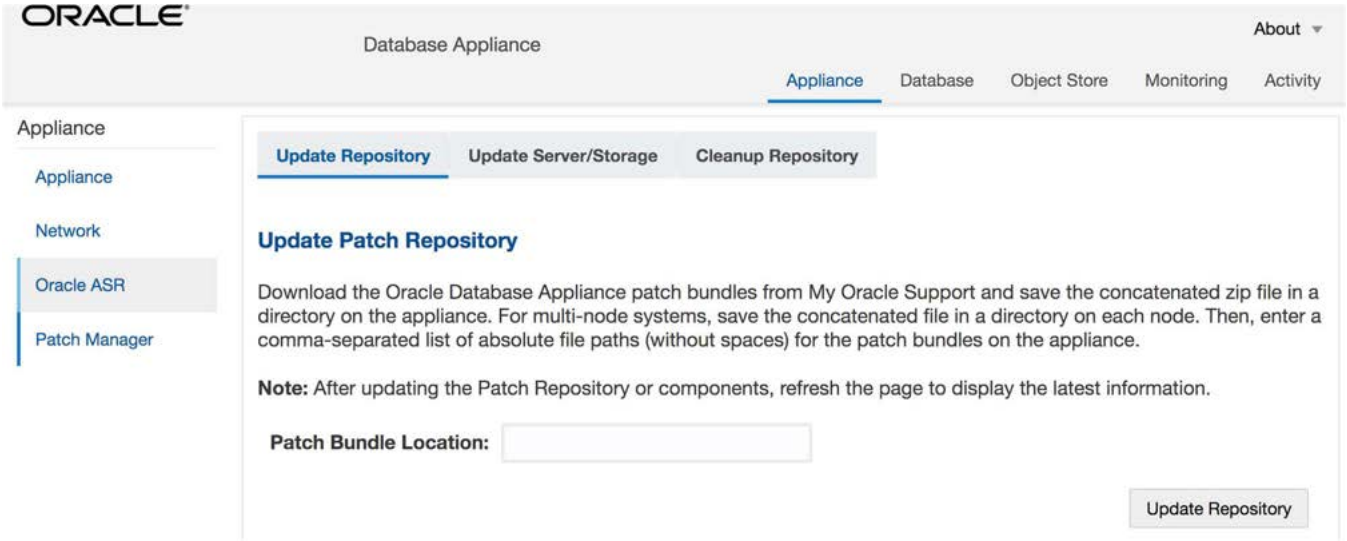
Hint: to reduce amount of manual typing and typing errors, use copy and paste functions to copy the file name or tab function to auto complete a file name. Also use the up arrow to repeat the previous command, then edit the file name.

```
# odacli update-repository -f /opt/oracle/dcs/patchfiles/odacli-dcs-
19.8.0.0.0-200714-GI-19.8.0.0.zip
{
  "jobId" : "2c6c8847-847f-49cf-8fed-1d5f2c6d44fb",
  "status" : "Running",
  "message" : "/opt/oracle/dcs/patchfiles/odacli-dcs-19.8.0.0.0-
200714-GI-19.8.0.0.zip",
  "reports" : [ ],
  "createTimestamp" : "November 10, 2020 03:30:42 AM UTC",
  "resourceList" : [ ],
  "description" : "Repository Update",
  "updatedTime" : "November 10, 2020 03:30:43 AM UTC"
}


# odacli update-repository -f /opt/oracle/dcs/patchfiles/odacli-dcs-
19.8.0.0.0-200714-DB-19.8.0.0.zip
{
  "jobId" : "afae2bcf-56fa-46c4-85a5-55dc5c3da474",
  "status" : "Running",
  "message" : "/opt/oracle/dcs/patchfiles/odacli-dcs-19.8.0.0.0-
200714-DB-19.8.0.0.zip",
  "reports" : [ ],
  "createTimestamp" : "November 10, 2020 03:31:51 AM UTC",
  "resourceList" : [ ],
  "description" : "Repository Update",
```

When you run commands using the odacli command line tool, most operations are asynchronous, meaning they return a job id immediately while the job runs in the background. This means that in order 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.

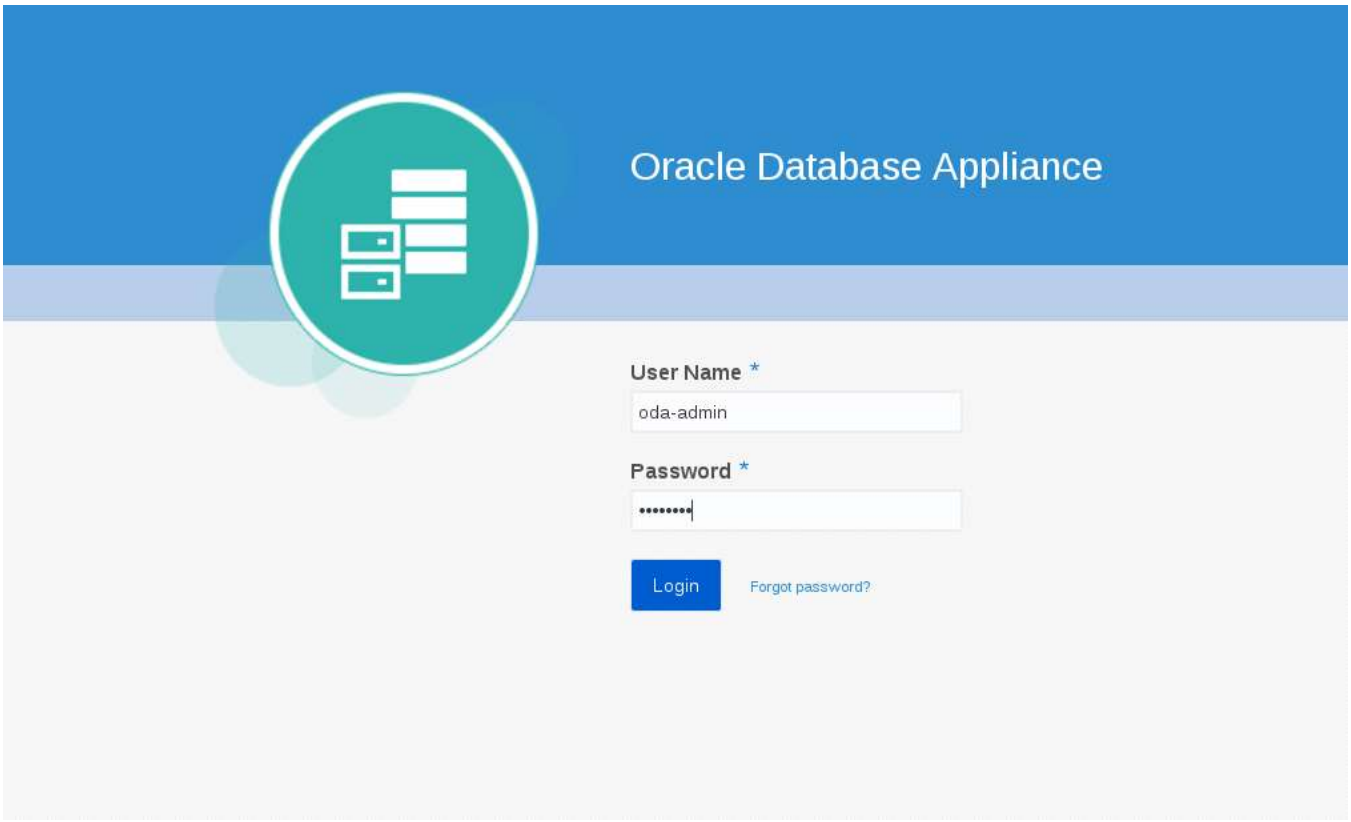
You can also use the Browser-based User Interface (BUI) to update the ODA repository, by pasting the complete file path of the patch file or even clone file in the patch bundle location box of the patch manager in the web console. However, it's not necessary as you have used command line to update the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



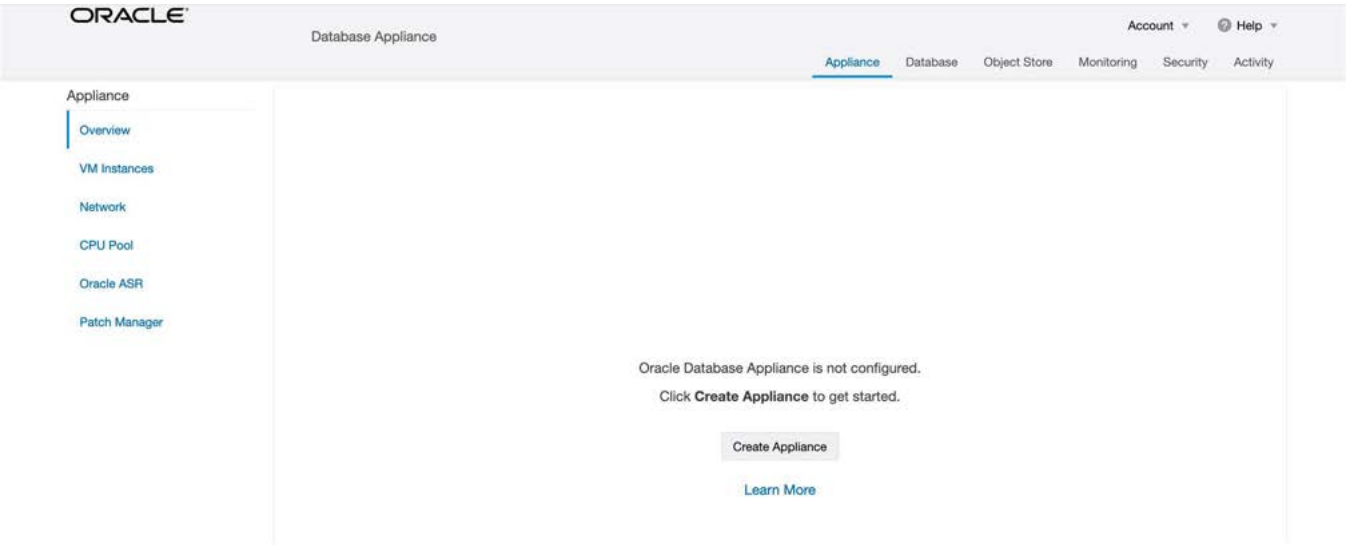
Step 3: Deploy the Appliance

A customer can deploy the appliance using either the BUI or the command line. The command line is useful for scripted and silent installations. Most customers (and this lab) will use the BUI.

After you configured the firstnet and update the repository, go to the unique URL provided by the instructor to log into ODA BUI (https://<IP Address>:xxxx/mgmt/index.html) using oda-admin and previously created password (e.g. WELcome12##)



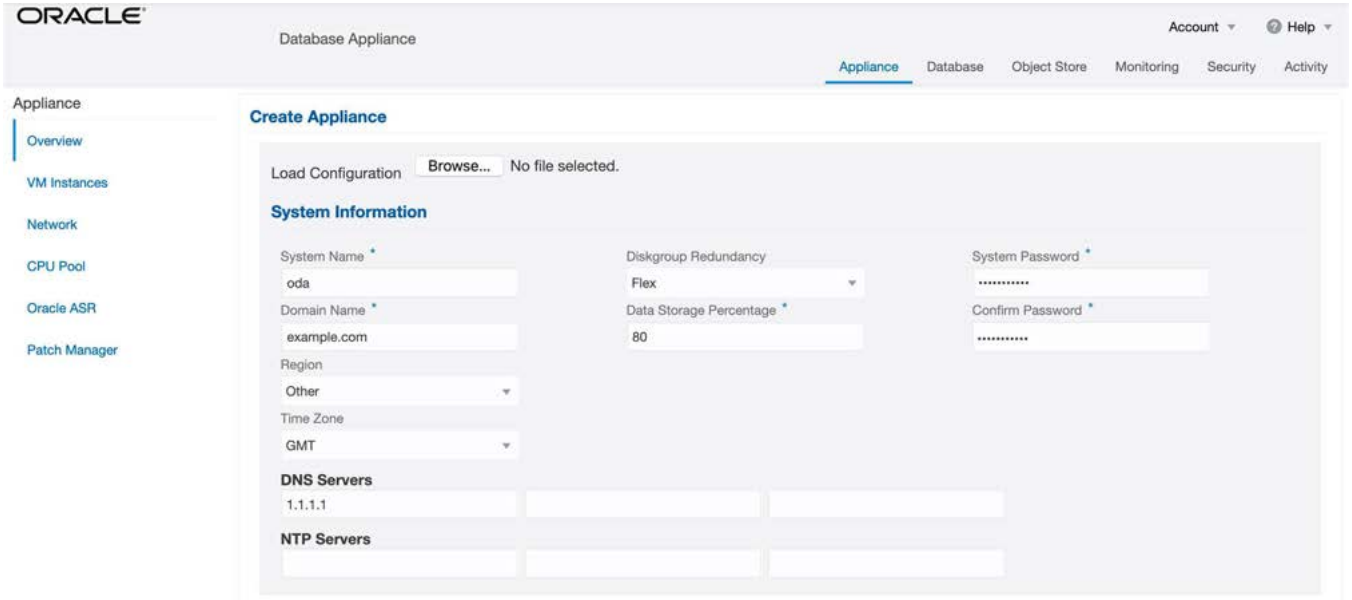
This will take you to the appliance tab of the ODA Appliance Manager. It should show that the appliance has not been deployed as shown below:



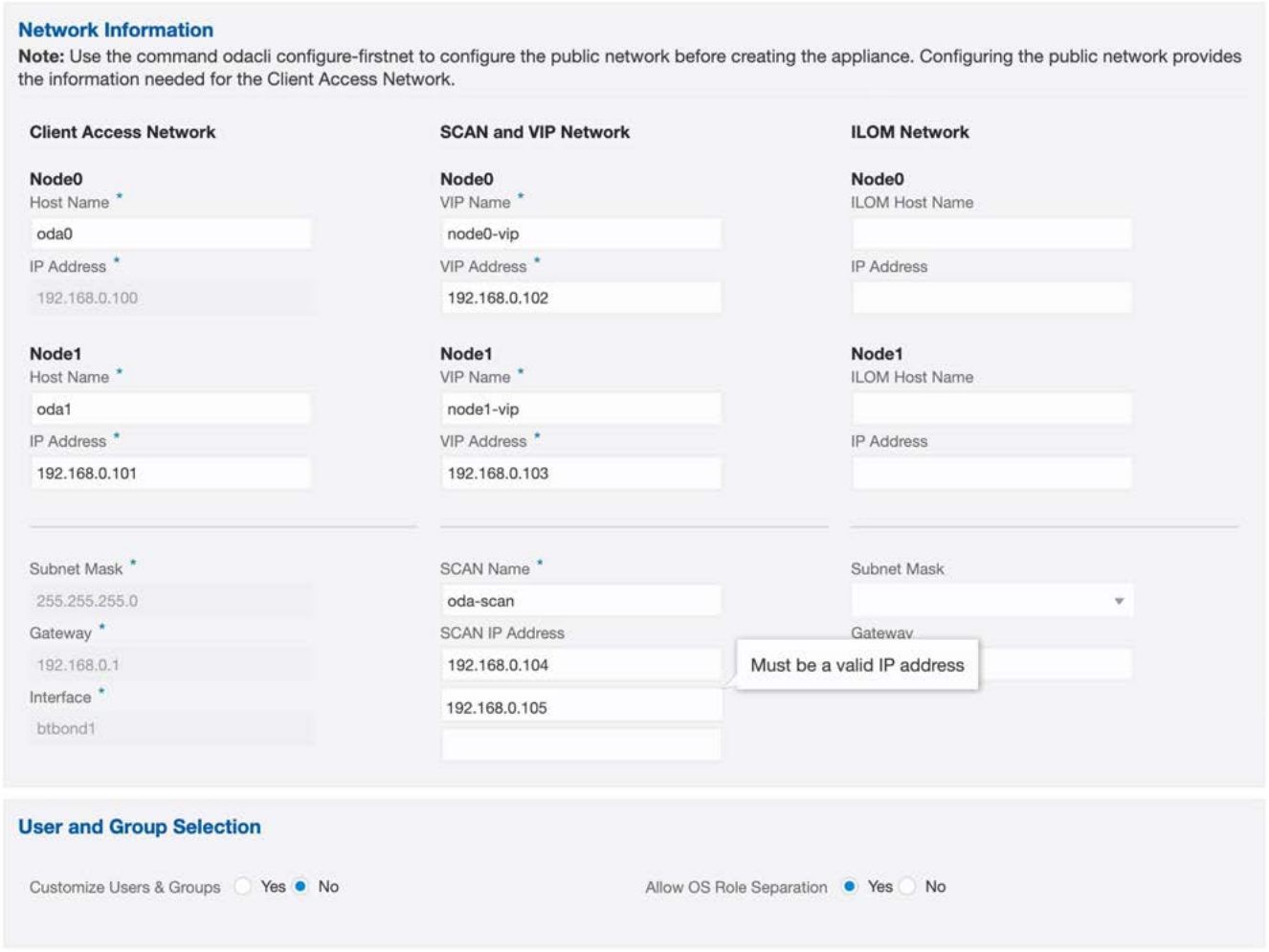
Click "Create Appliance" to start the deployment wizard. Fill in the first page of the form as shown below. Most fields should be self-explanatory. A possible exception is the Data Storage

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 Diskgroup Redundancy "Flex", then you will be able 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 like "test" and other common variants. However, "WELcome12##" will work if you'd like to use that password.

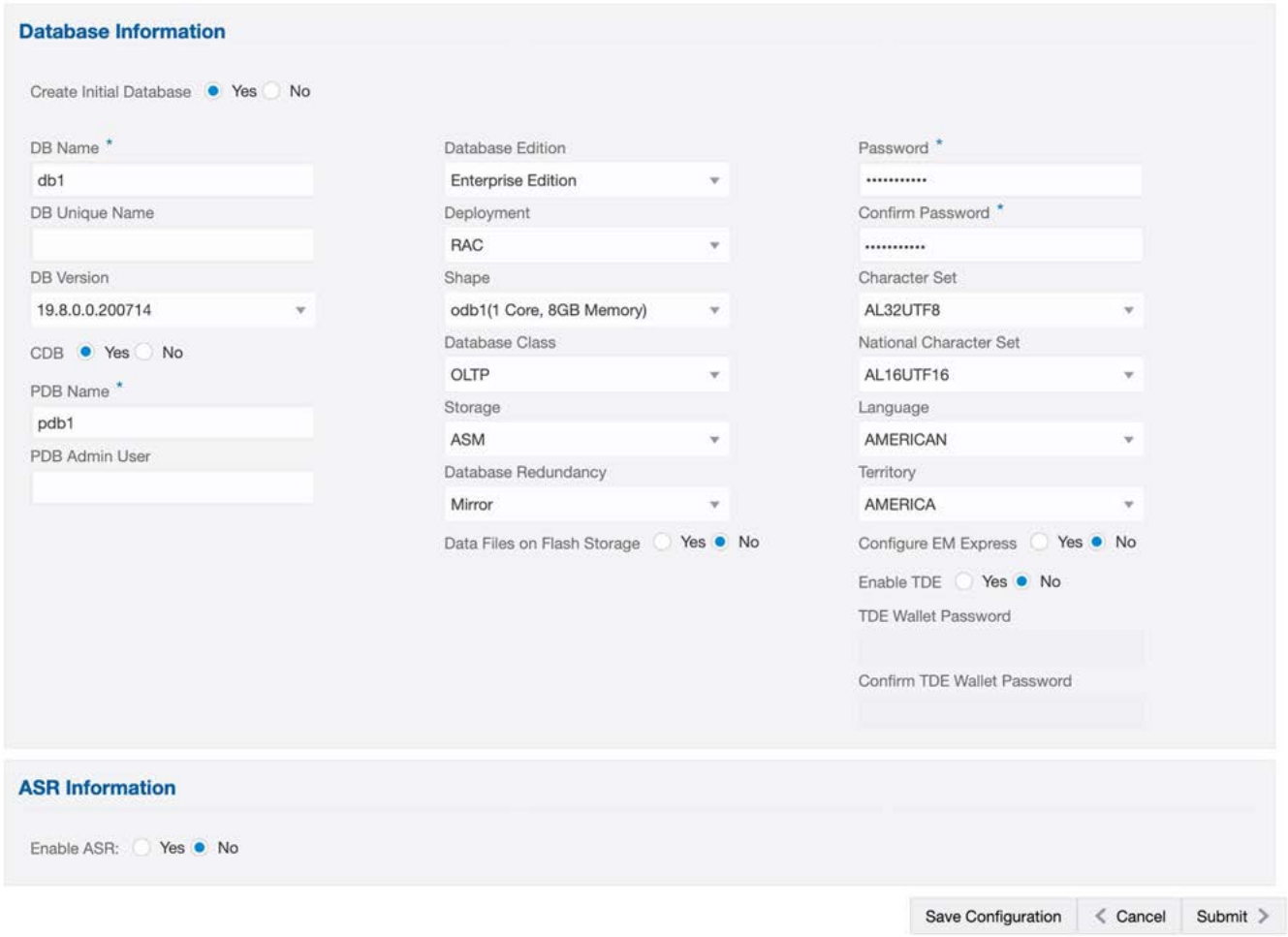
You can also load a configuration file (e.g. oda.json) that was saved previously to avoid manual entries. To create a configuration file, you manually fill in all the information then click "Save Configuration" at the end.



Scroll down to continue. This brings up the Network screen. You can configure the network for the public "Client Access" network here. 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 the public network.

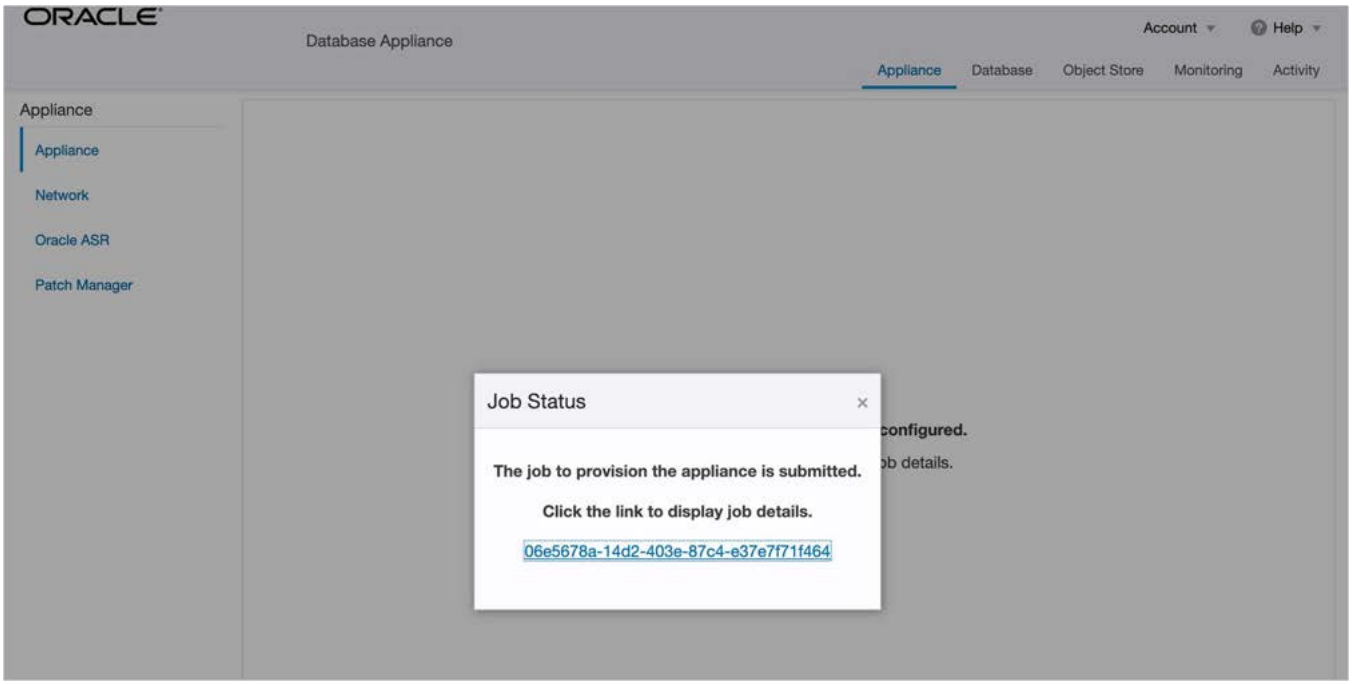


Scroll down to continue. This brings up the Database screen. Specify the database name and other database related information as shown below. Select DB Version 19.8.0.0.200714.

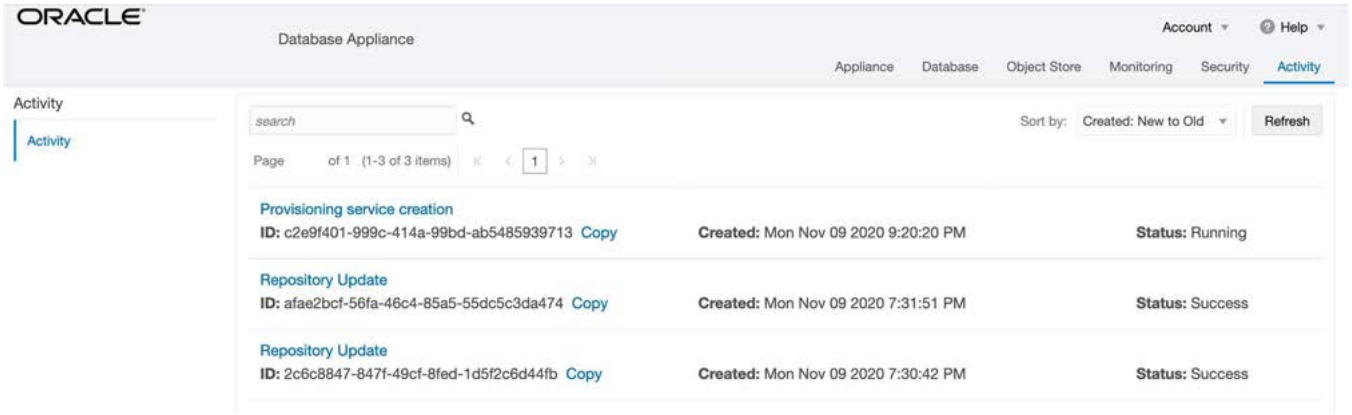


To configure ASR, specify credentials here. This is also where you can save the configuration file (e.g. oda.json) for later use.

Click "Submit" to continue and click "yes" in the confirmation box. This will bring up a link to the job status. Like with odacli, operations are asynchronous, and return immediately with a job ID. That job ID can then be used to monitor progress. This allows the administrator to perform other tasks if desired while long running operations complete. Click the job ID to see the status.



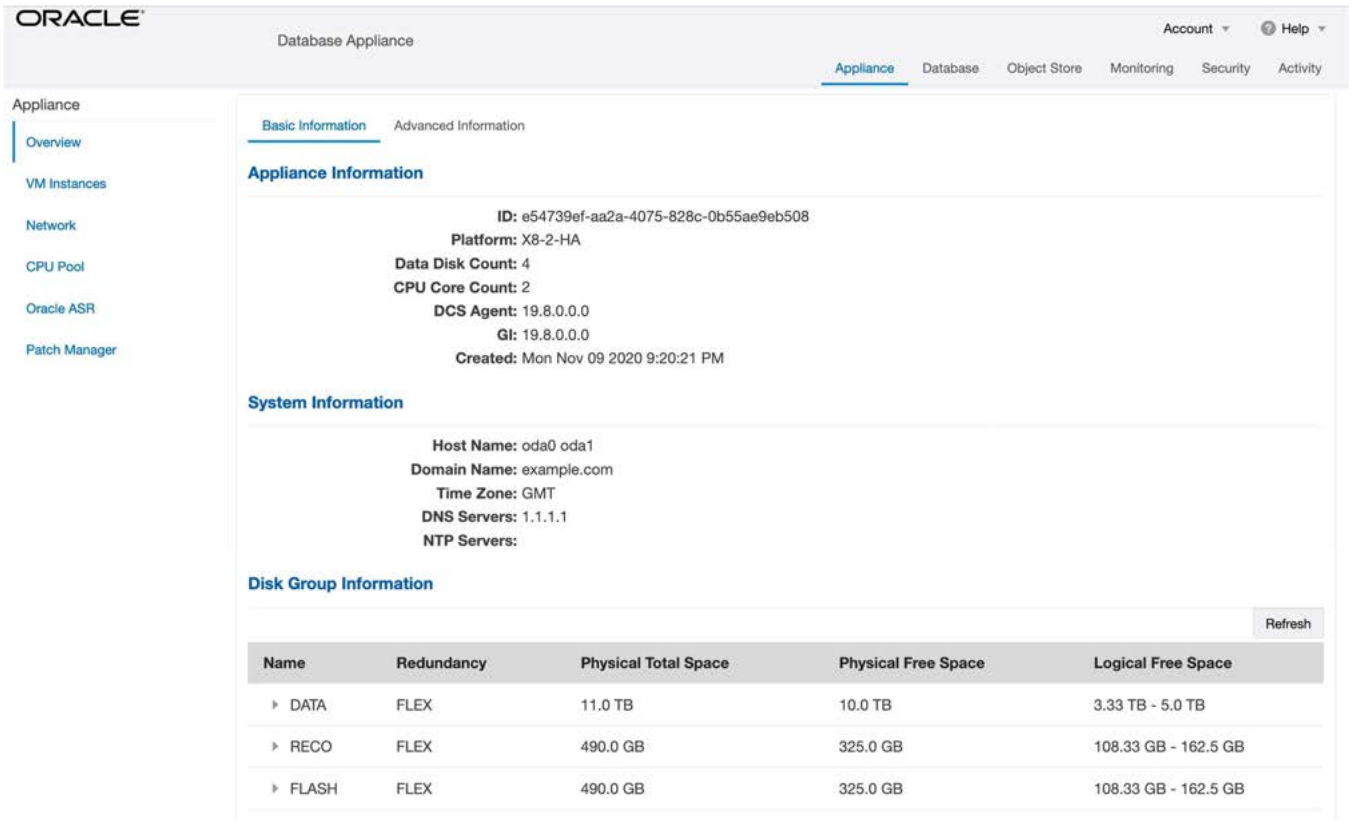
In the simulation, the deployment job status will complete within 1-2 minutes. You can see the various steps running, and their status changing to 'Success' as they complete. Click the Refresh button to more quickly refresh the screen. In a real ODA, deployment takes about 60-90 minutes to complete.



Step 4: Validate the Deployment

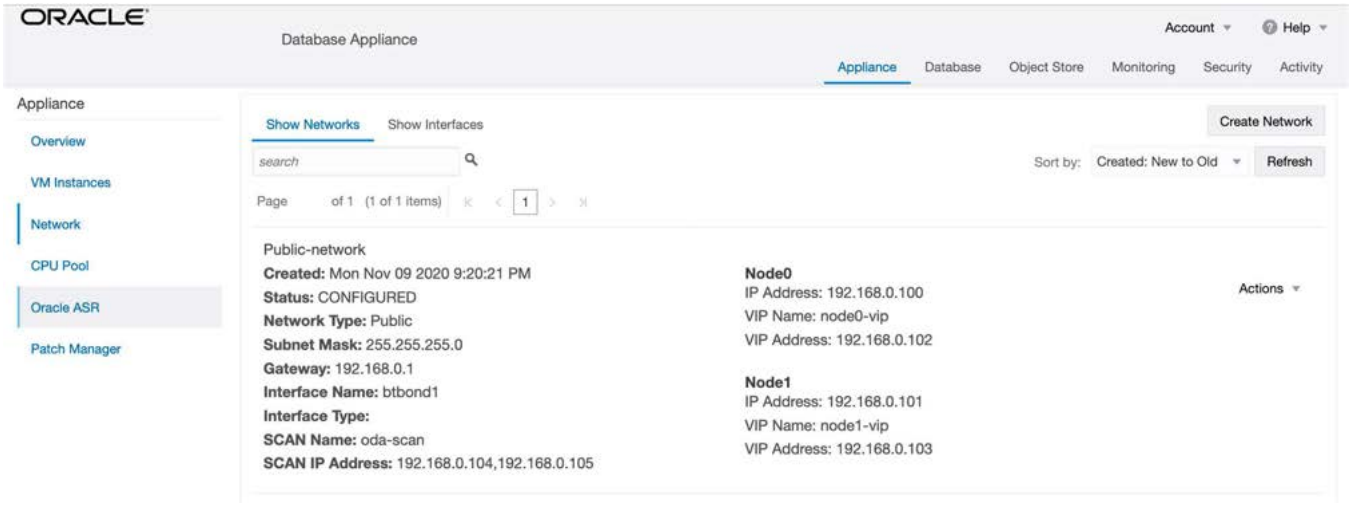
Next click on the "Database" tab at the top right of the web page. This should show the deployed database. The web pages refresh every few seconds, so if the database does not show up at first, be patient. Click on the database name for more detail about the database. Click on the "Database Home" link in the left-hand column (when viewing the "Database" tab) to see information about the database home.

You can also verify the appliance has been properly deployed by clicking the "Appliance" tab to see more details. It should look similar to the view below (remember this is a simulation):

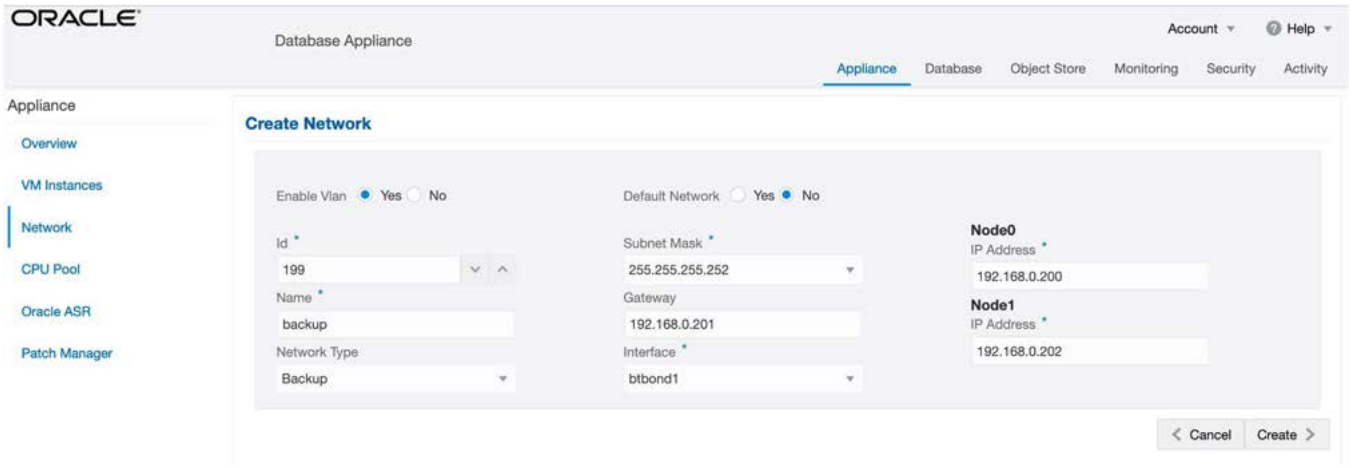


Step 5: Networking

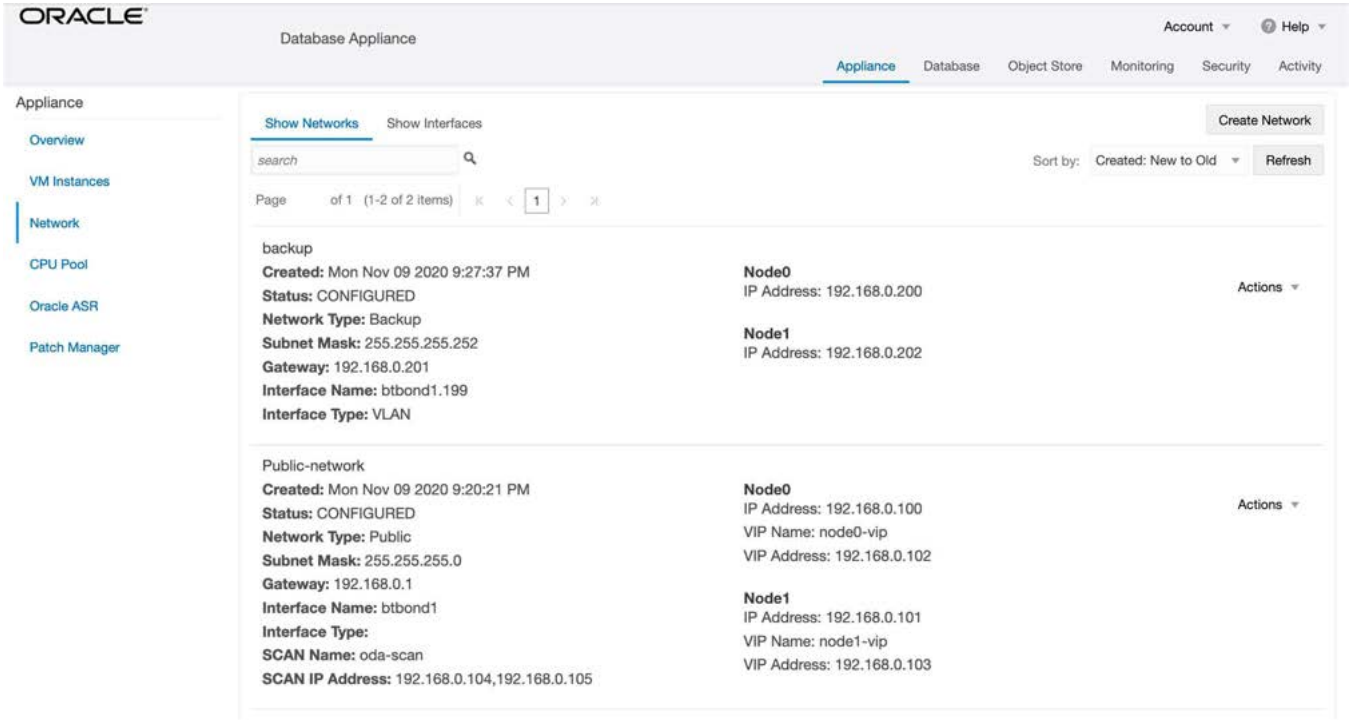
You can check the network by click on the "Network" tab on the left.



You can also create a new VLAN by clicking the "Create Network" button and filled in the network information below. Then hit "Create"



You can click on Create button, then submit the job. Below shows the backup VLAN has been created.



This concludes Lab 1.

Lab 2: Manage Databases

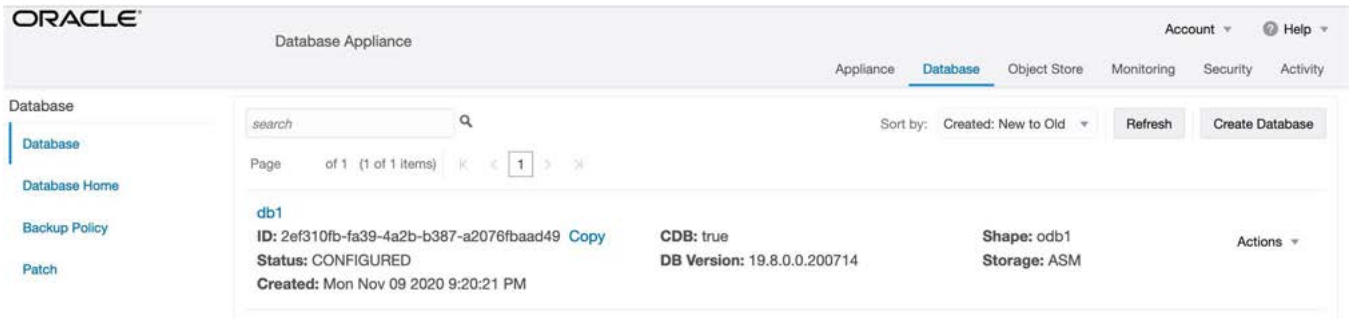
In this lab, we will create and delete additional databases in the appliance. We can do this via the BUI or the command line (CLI).

You must complete Lab 1 before starting Lab 2.

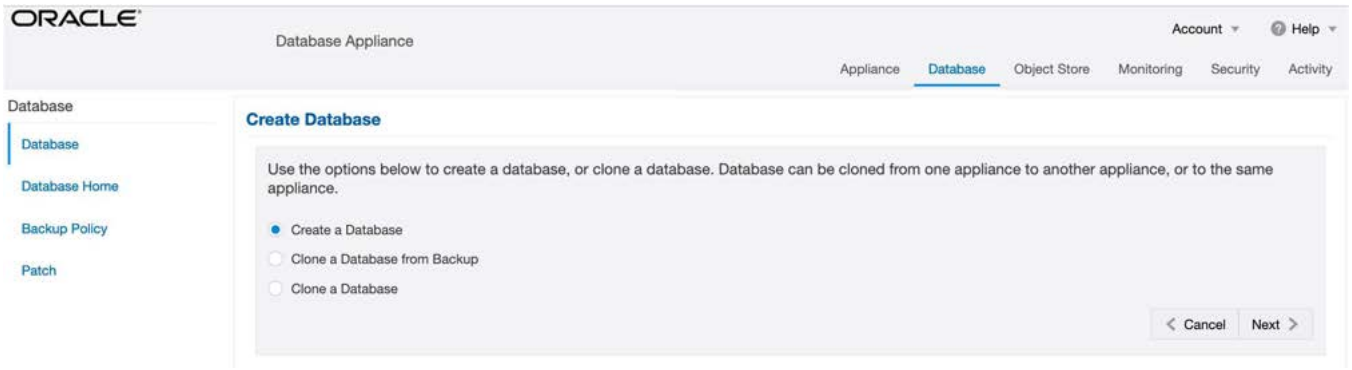
Step 1: Create a new database via the Web GUI

On the ODA BUI, click the database tab in the web page.

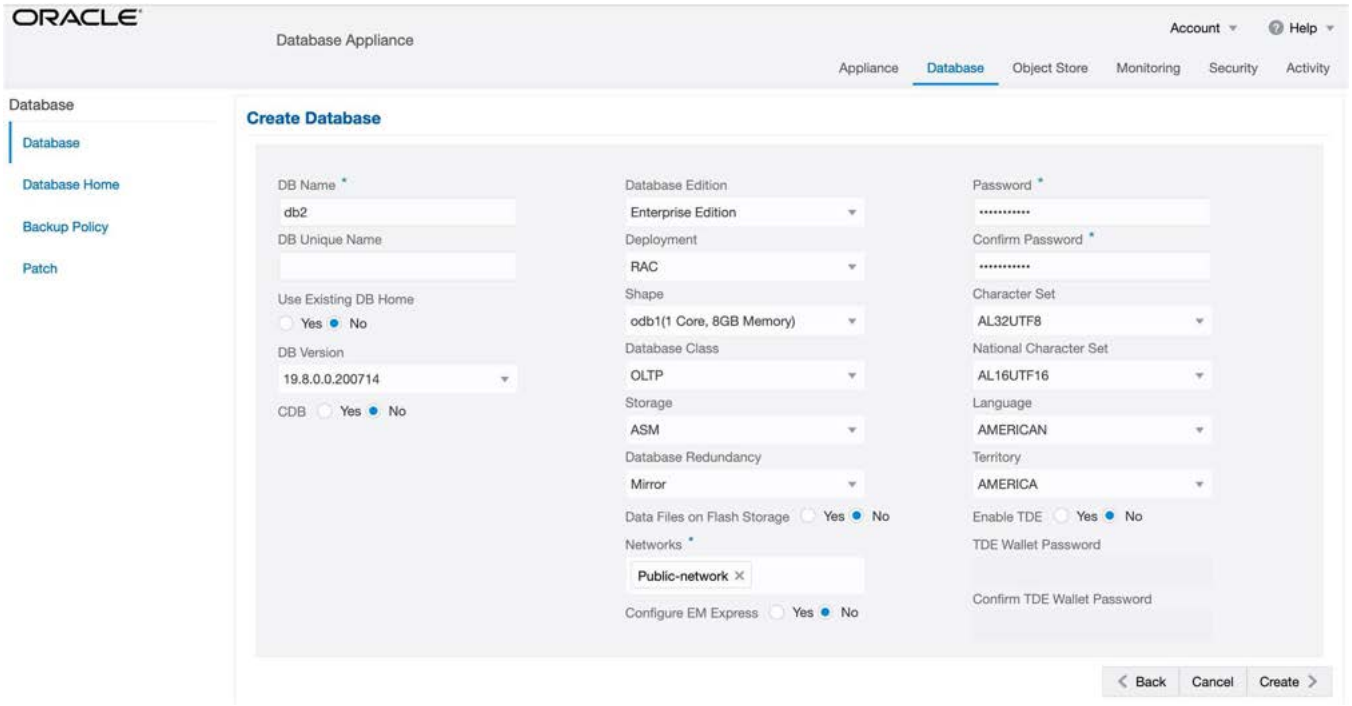
You should see the database db1 created during deployment. In the upper right-hand corner, there is a "Create Database" button. Click it. It will bring up the "Create Database" Wizard.



Choose "Create Database", and click "Next"

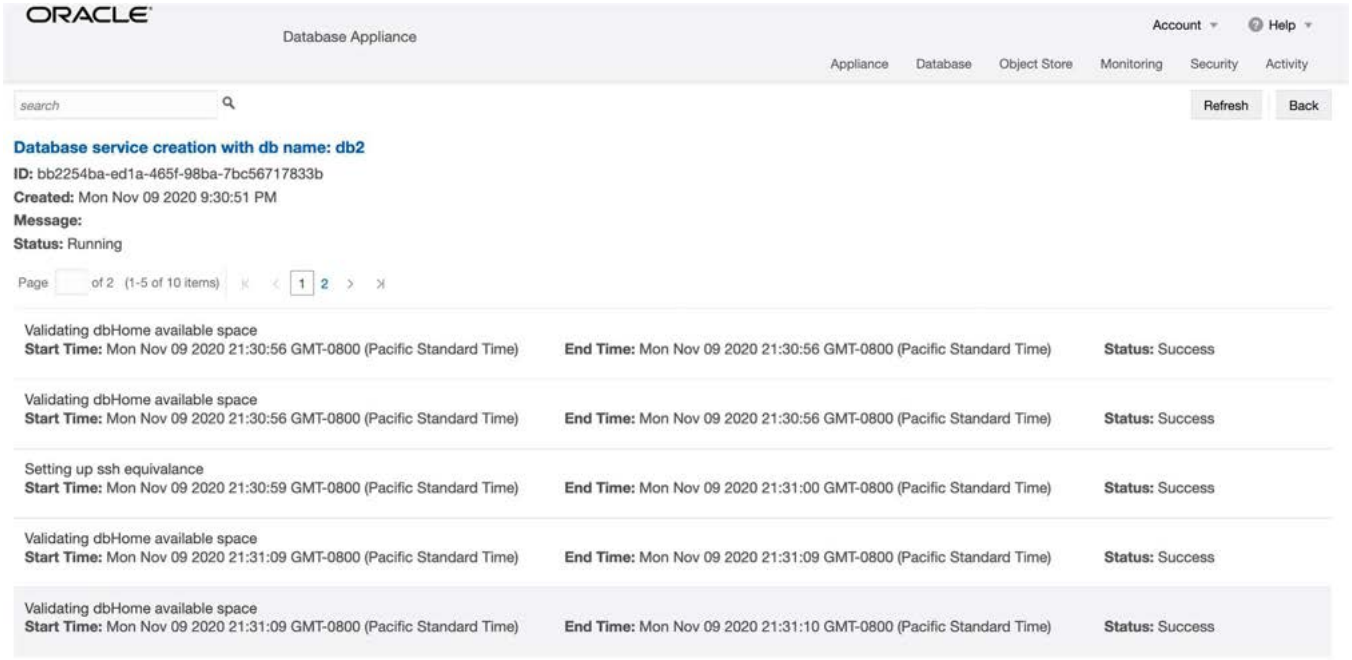


Specify the DB Name like db2, and if you are creating a CDB, a PDB Name. Also remember to scroll down and enter a password that would (in a real ODA) be used for SYS, SYSTEM, and PDB Admin. When finished, click on the "Create" Button. Click "yes" to confirm. Beware of the password complexity checker—"WELcome12##" will pass the test.

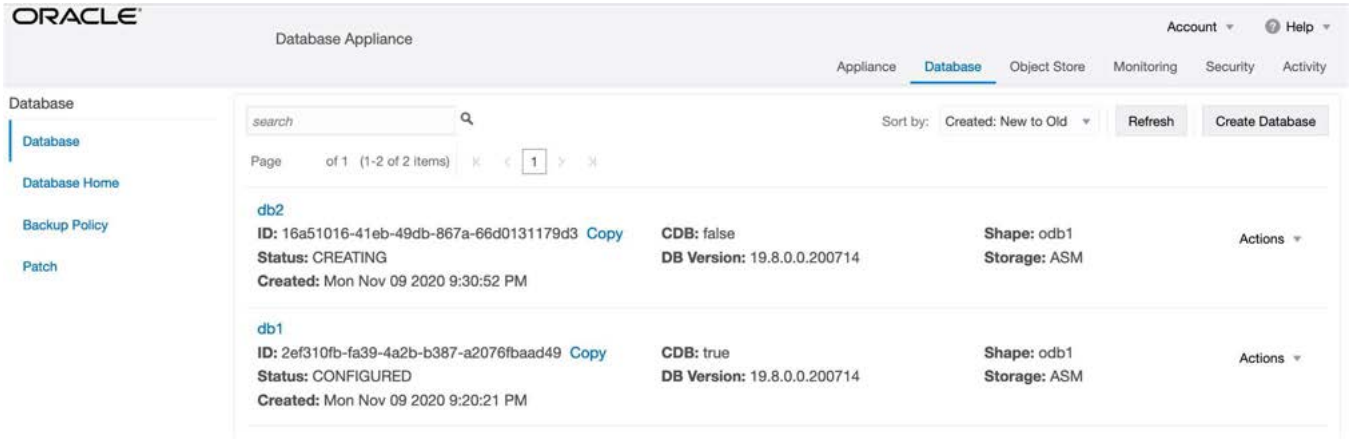


This will bring up a link to the job status. Like with odacli, operations are asynchronous, and return immediately with a job ID. That job ID can then be used to monitor progress. This allows the administrator to perform other tasks if desired while long running operations complete. Click the job ID 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. In a real ODA, these steps take about 20 minutes to complete.



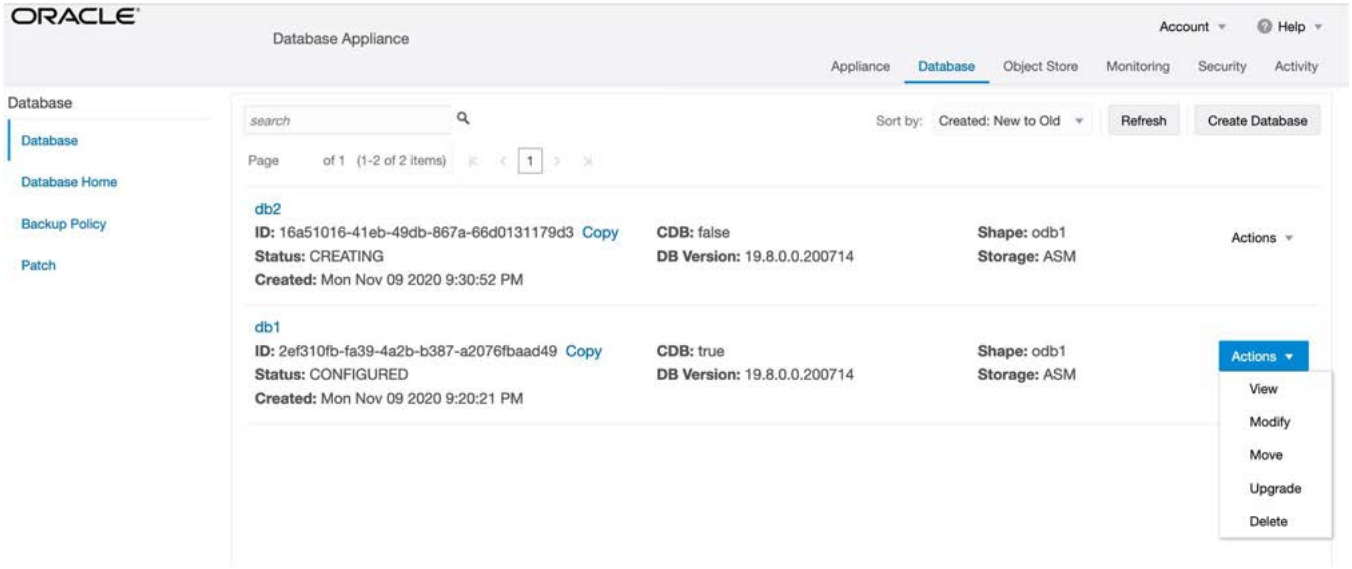
Once the operation completes, click on the "Appliance" tab and then "Database" tab at the top right of the web page. This should show the newly created database. The web pages refresh every few seconds, so if the database does not show up at first, be patient.



See detailed database information by clicking on the database name. You can also view the newly create 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" if not at the view that lists databases. Click the "Action" dropdown to the right of the db1 database, then select "Delete." Click "yes" to confirm, and then close the status box. The database list should reflect the deletion. Press "Refresh" if necessary.



After the database delete operation, only db2 is left.

Step 3: View the Databases and Homes via the CLI

You can also manage databases from the command line. Select the tab to go to the command line (CLI) tool.

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

```
# odacli list-databases

ID                                       DB Name    DB Type  DB Version           CDB        Class    Shape    Storage    Status        DbHomeID
---------------------------------------- ---------- -------- -------------------- ---------- -------- -------- ---------- ------------ --------------------
16a51016-41eb-49db-867a-66d0131179d3     db2        Rac      19.8.0.0.200714      false      Oltp     Odb1     Asm        Configured   c5556b62-cdc1-
42c5-ad03-5a90dea5594f


# odacli describe-database -i 16a51016-41eb-49db-867a-66d0131179d3

Database details
----------------------------------------------------------------
                     ID: 16a51016-41eb-49db-867a-66d0131179d3
            Description: db2
                DB Name: db2
             DB Version: 19.8.0.0.200714
                DB Type: Rac
                DB Role: PRIMARY
    DB Target Node Name:
             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: c5556b62-cdc1-42c5-ad03-5a90dea5594f
        Console Enabled: false
            TDE Enabled: false
     Level 0 Backup Day: Sunday
     AutoBackup Enabled: true
                Created: November 10, 2020 5:30:52 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 only the database name is really required. Create a new 18.8 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, we suggest using WELcome12## for this lab.

```
# odacli create-database -h
Usage: create-database [options]
  Options:
    --associated-networks, -nn
      Associated network names(in format networkName1,networkName2,...)
    --backupconfigid, -bi
      Backup Config ID
    --backupconfigname, -bn
      BackupConfig Name

… output deleted for brevity …


# odacli create-database -n db3 -v 19.8.0.0
Password for SYS,SYSTEM and PDB Admin:

Job details
----------------------------------------------------------------
                     ID:  880bca82-a79a-4bec-82fb-ec8777ec960d
            Description:  Database service creation with db name: db3
                 Status:  Created
                Created:  November 10, 2020 5:37:02 AM UTC
                Message:

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

# odacli describe-job -i 880bca82-a79a-4bec-82fb-ec8777ec960d

Job details
----------------------------------------------------------------
                     ID:  880bca82-a79a-4bec-82fb-ec8777ec960d
            Description:  Database service creation with db name: db3
                 Status:  Success
                Created:  November 10, 2020 5:37:02 AM UTC
                Message:

Task Name                                Start Time                          End Time
Status
---------------------------------------- ----------------------------------- ----------------
------------------- ----------
Validating dbHome available space        November 10, 2020 5:37:06 AM UTC    November 10,
2020 5:37:06 AM UTC    Success
Validating dbHome available space        November 10, 2020 5:37:07 AM UTC    November 10
```

In a real ODA, this command would run a job in the background for approximately 30 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 odacli command:

```
# odacli list-databases

ID                                       DB Name    DB Type  DB Version           CDB        Class    Shape    Storage    Status        DbHomeID
---------------------------------------- ---------- -------- -------------------- ---------- -------- -------- ---------- ------------ --------------------
16a51016-41eb-49db-867a-66d0131179d3     db2        Rac      19.8.0.0.200714      false      Oltp     Odb1     Asm        Configured   c5556b62-cdc1-
42c5-ad03-5a90dea5594f
40b87040-7a7c-4439-9fd8-9df176e307c2     db3        Rac      19.8.0.0.200714      false      Oltp     Odb1     Asm        Configured   c0628ee5-4bcb-
490c-9996-067f23e6bf17
```

Step 5: Delete and Recreate a Database

You can also delete a database via the CLI. 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 in lieu of the ID.

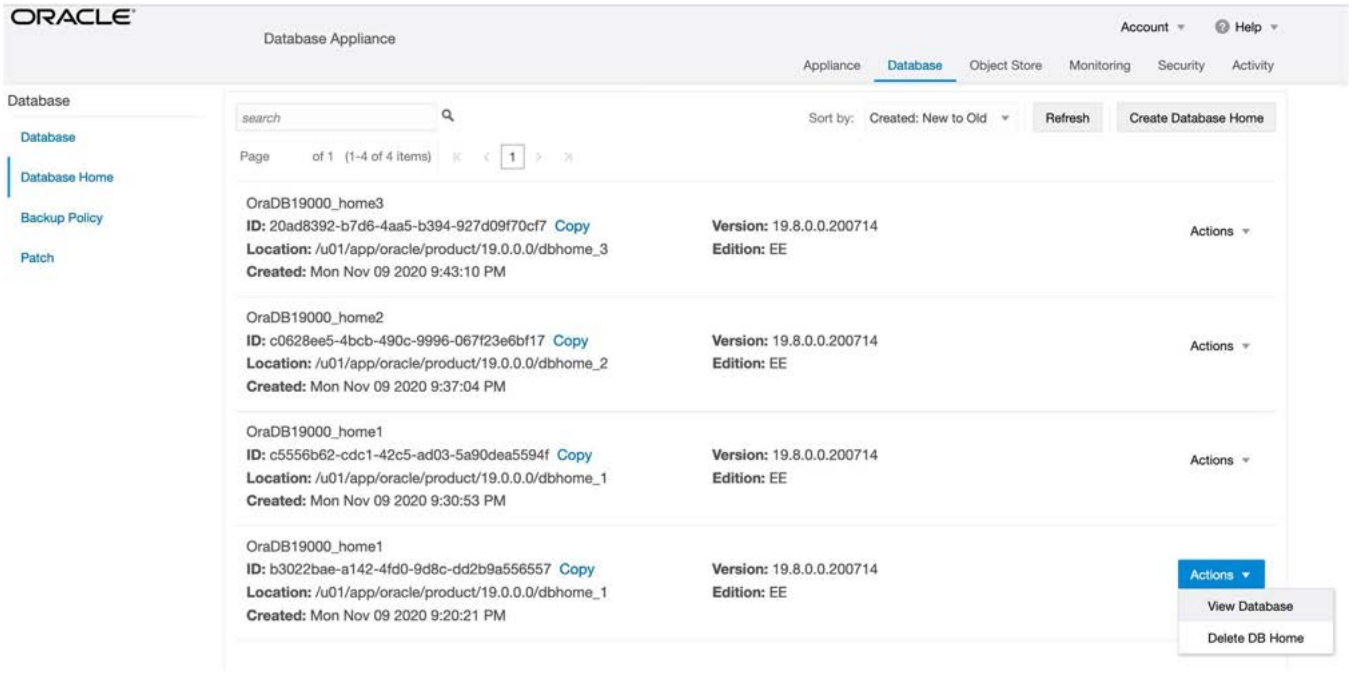
```
# odacli delete-database -i 16a51016-41eb-49db-867a-66d0131179d3

    {
      "jobId" : "5c66ec45-9f31-4351-bac7-9b8b83dffac3",
      "status" : "Running",
      "message" : null,
      "reports" : [ ],
      "createTimestamp" : "November 10, 2020 05:41:09 AM UTC",
      "resourceList" : [ ],
      "description" : "Database service deletion with db name: db2 with id : 16a51016-41eb-49db-867a-
66d0131179d3",
      "updatedTime" : "November 10, 2020 05:41:10 AM UTC"
    }

# odacli list-databases

ID                                       DB Name    DB Type  DB Version           CDB        Class    Shape    Storage    Status        DbHomeID
---------------------------------------- ---------- -------- -------------------- ---------- -------- -------- ---------- ------------ --------------------
40b87040-7a7c-4439-9fd8-9df176e307c2     db3        Rac      19.8.0.0.200714      false      Oltp     Odb1     Asm        Configured   c0628ee5-4bcb-
490c-9996-067f23e6bf17
```

And, using the CLI, create a new 19.7 database db4.

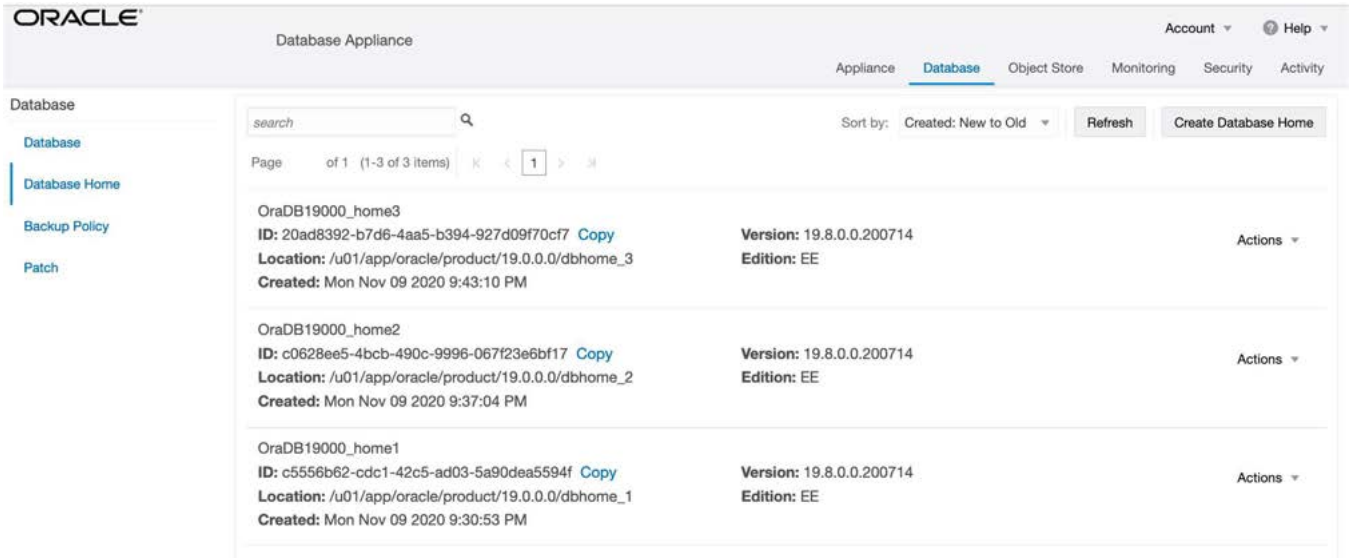
```
# odacli create-database -n db4 -v 19.8.0.0
Password for SYS,SYSTEM and PDB Admin:

Job details
----------------------------------------------------------------
                     ID:  5e9b1fc6-471e-428f-9dea-35e750cbe2bf
            Description:  Database service creation with db name: db4
                 Status:  Created
                Created:  November 10, 2020 5:43:08 AM UTC
                Message:

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


# odacli list-databases

ID                                       DB Name    DB Type  DB Version           CDB        Class    Shape    Storage    Status       DbHomeID
---------------------------------------- ---------- -------- -------------------- ---------- -------- -------- ---------- ------------ ------------------
--------------------
40b87040-7a7c-4439-9fd8-9df176e307c2     db3        Rac      19.8.0.0.200714      false      Oltp     Odb1     Asm        Configured   c0628ee5-4bcb-
490c-9996-067f23e6bf17
bab8738a-861d-4c97-90a9-b5da1f4e92c9     db4        Rac      19.8.0.0.200714      false      Oltp     Odb1     Asm        Configured   20ad8392-b7d6-
4aa5-b394-927d09f70cf7
```

Step 6: Delete a Database Home

You can delete a database home via 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 the home1 database home has been deleted.



Step 7: Create Database Backup on local disk, external NFS storage or on the Oracle Cloud

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

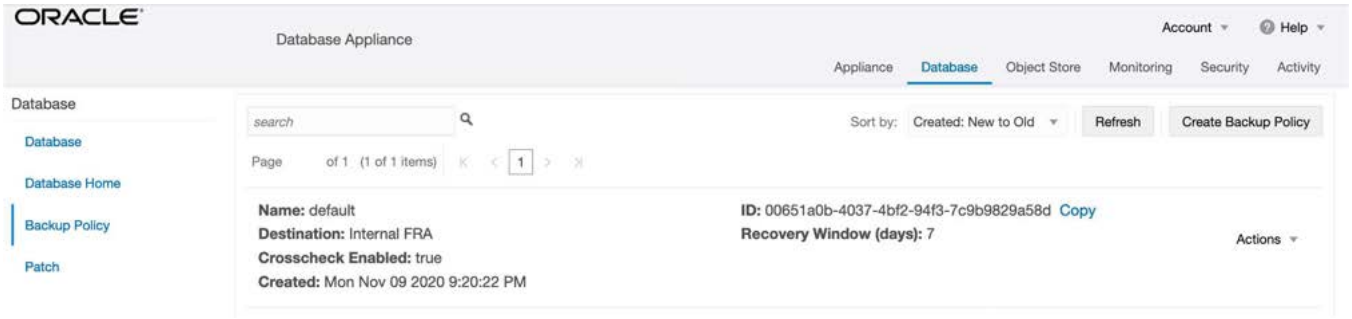
1. Create a backup policy

2. Attach a backup policy to a database

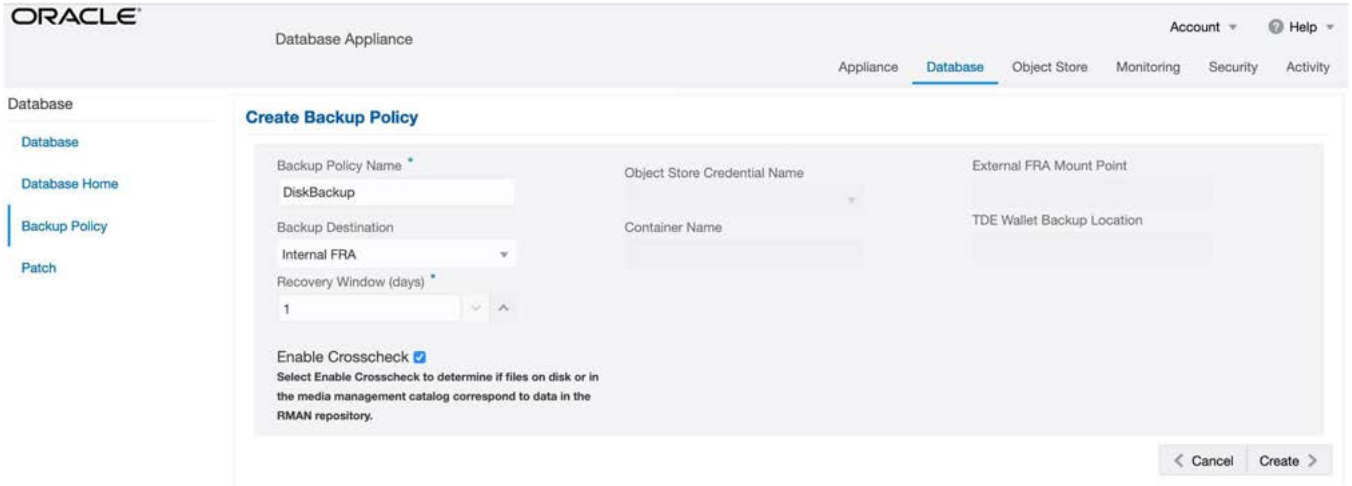
To back up to an external NFS storage, you must create an NFS mount point first.

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

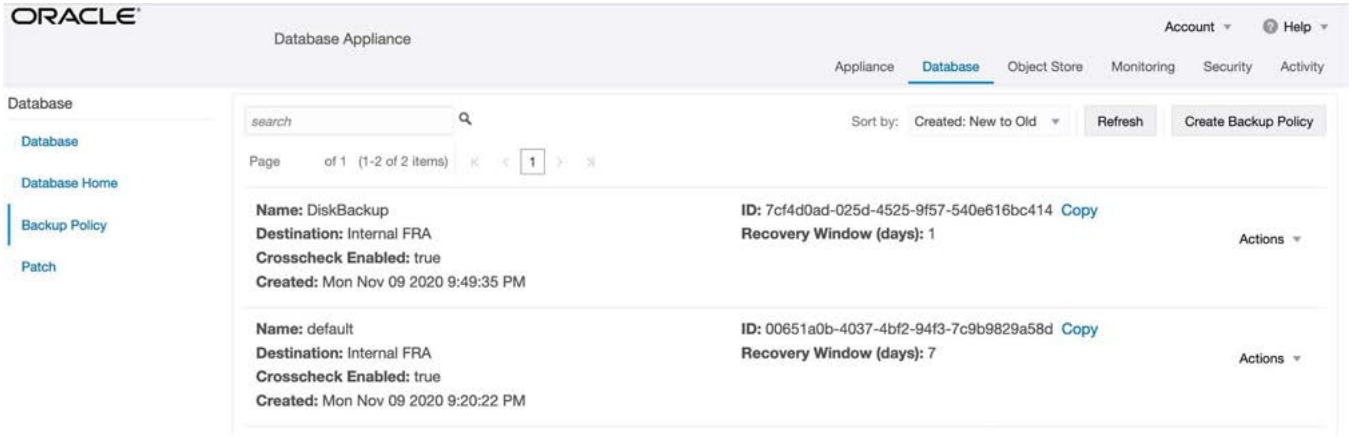
There's a default backup policy associated with the database, to create a new backup policy, click on "Backup Policy" tab and then "Create Backup Policy"



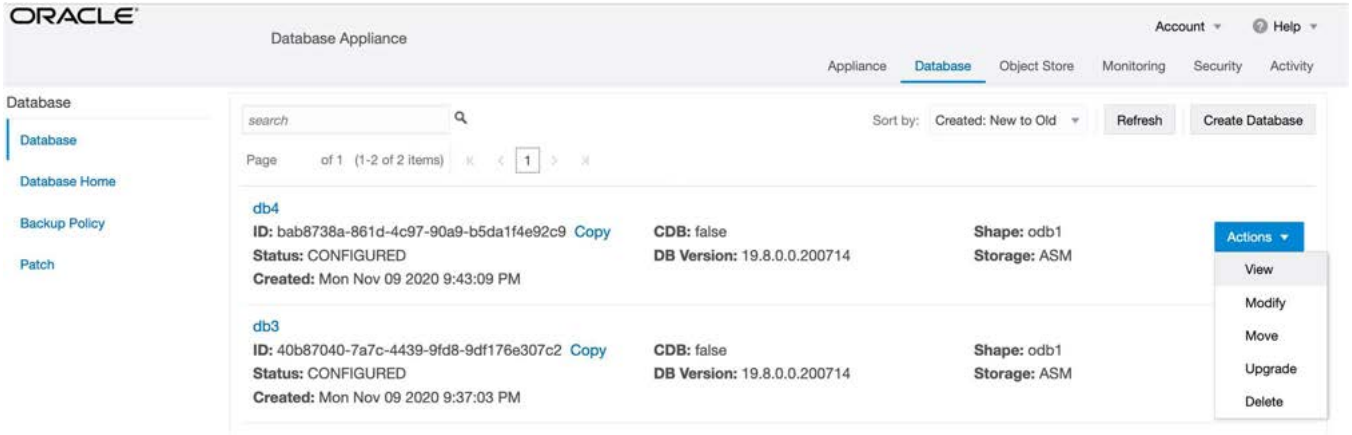
Then name the Backup Policy (i.e. DiskBackup), Backup Destination (Internal FRA/Local Disk or External FRA/External NFS Storage or Object Store/Oracle Cloud), and Recovery Window in days, then click "Create". To back a database to an external NFS storage, you need to specify a mount point such as /u03/app/oracle/oradata/nfs_backup.



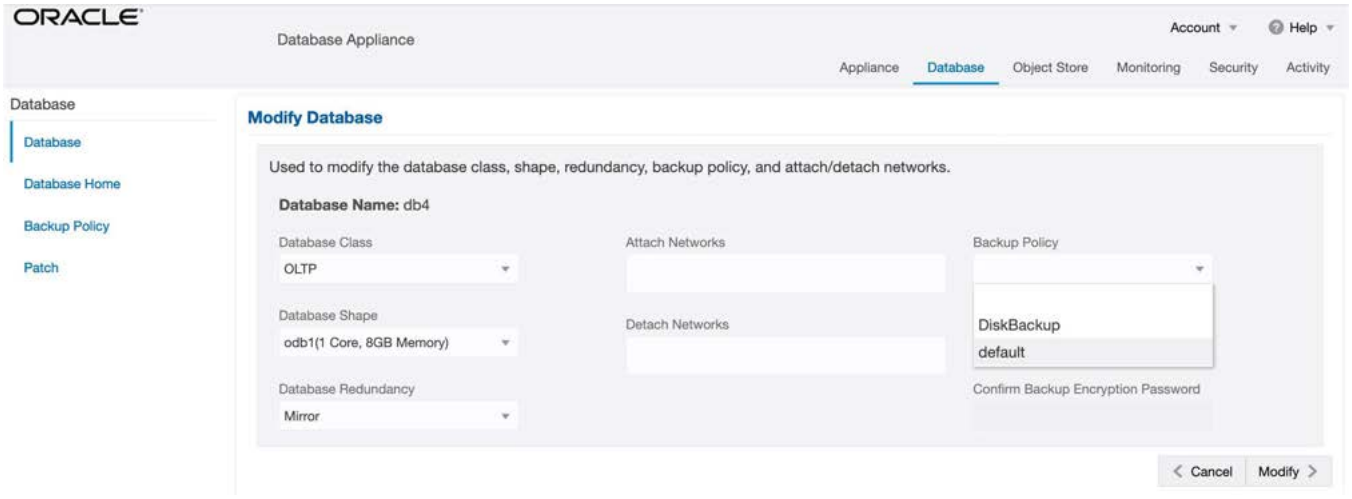
You can see the DiskBackup policy has been created.



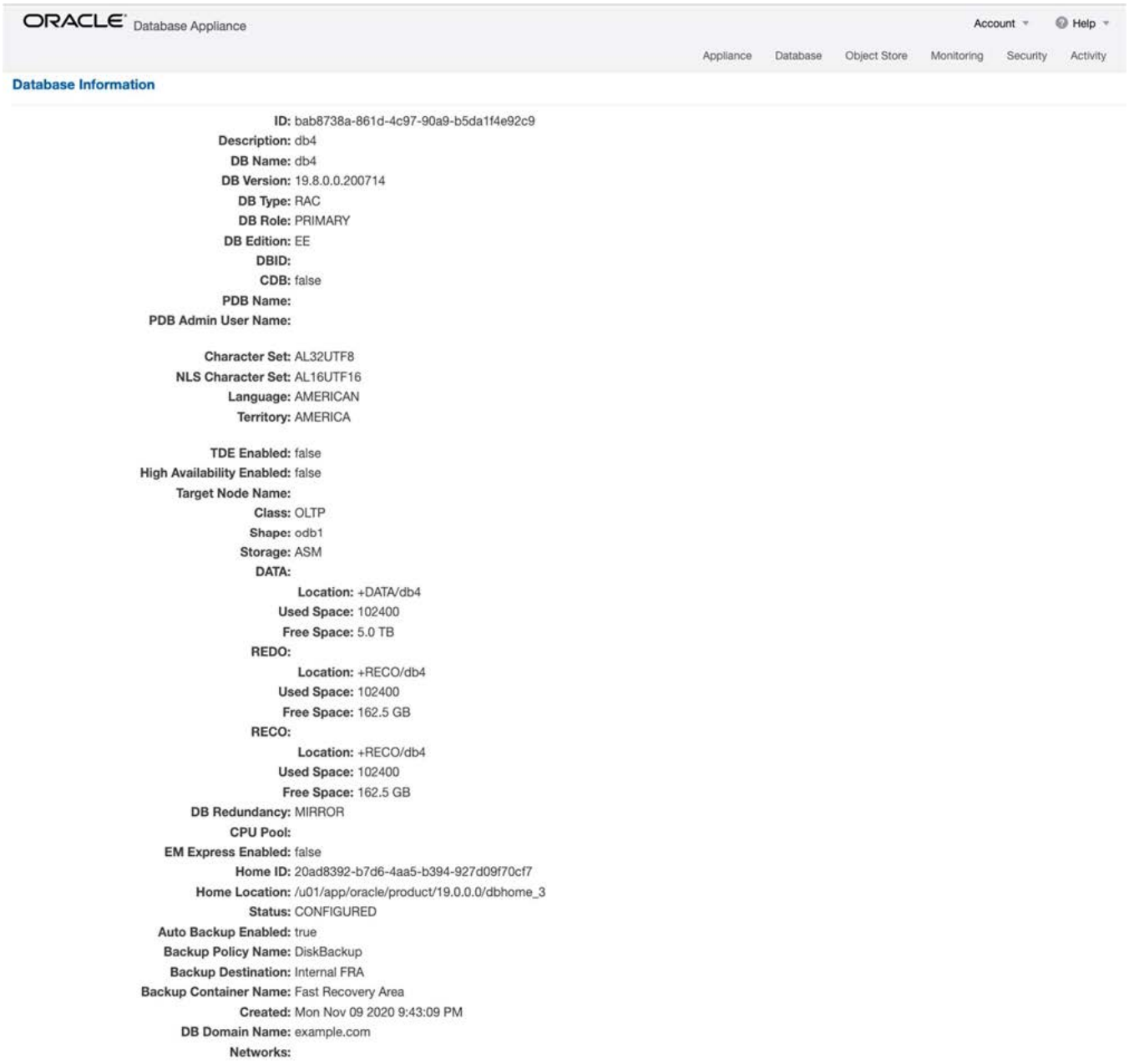
Next you select the database (i.e. db4) you want to backup. The db4 database has a default backup policy, so we will need to modify the database first by clicking "Modify" under Actions.



Select "DiskBackup" as the Backup Policy then click "Modify"

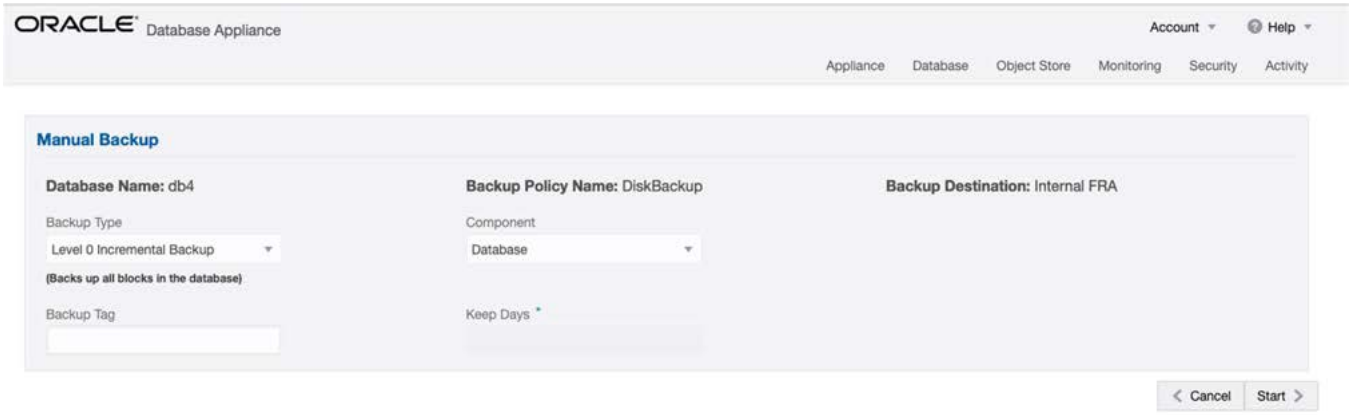


Once the job is completed, you can verify the backup policy is listed under "Database Information" of the database (i.e. db4). Once this is done, ODA will start backing up the database to the disk regularly and produce backup reports.

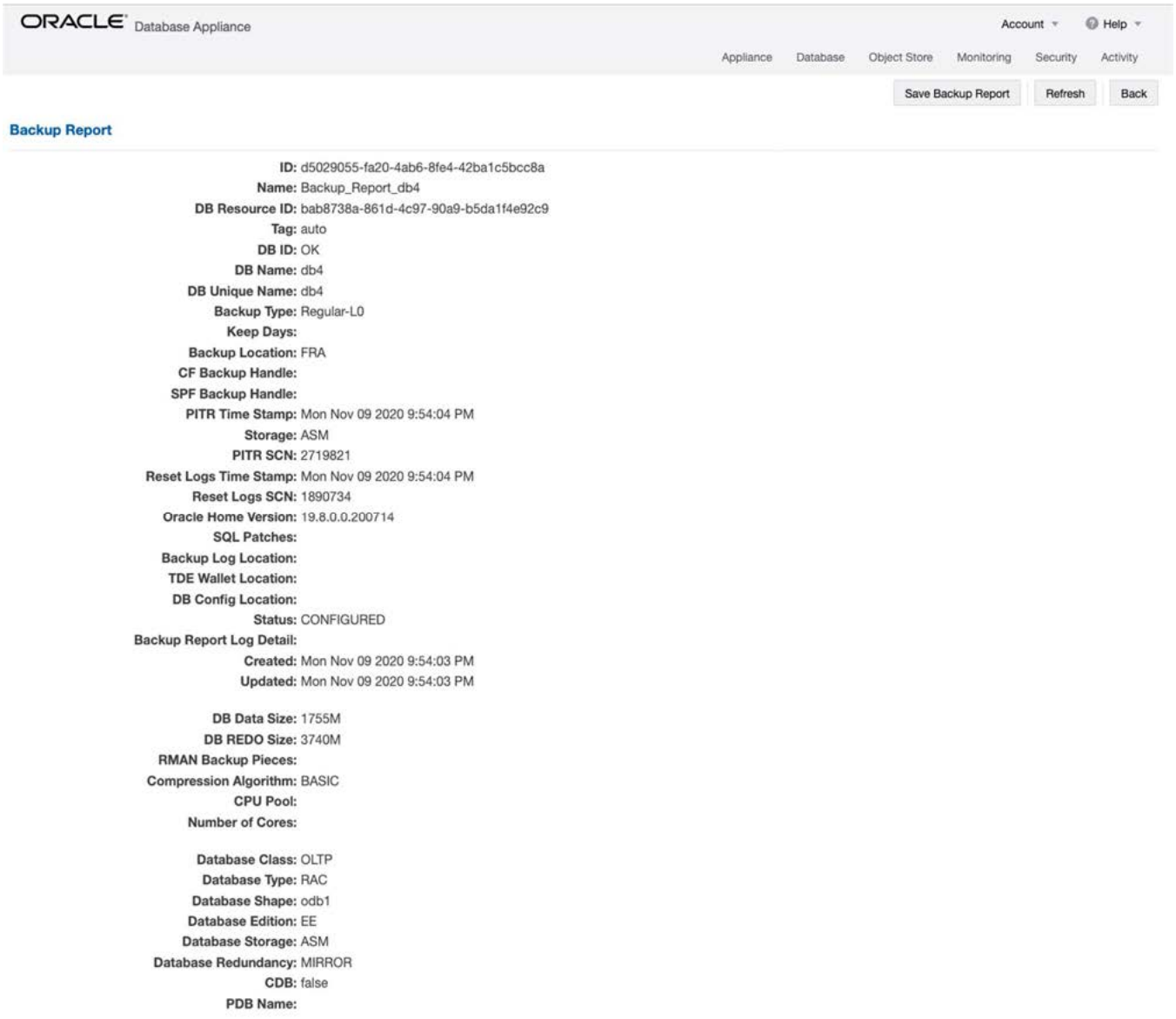


You can see the backup reports under the "Backups" heading below.

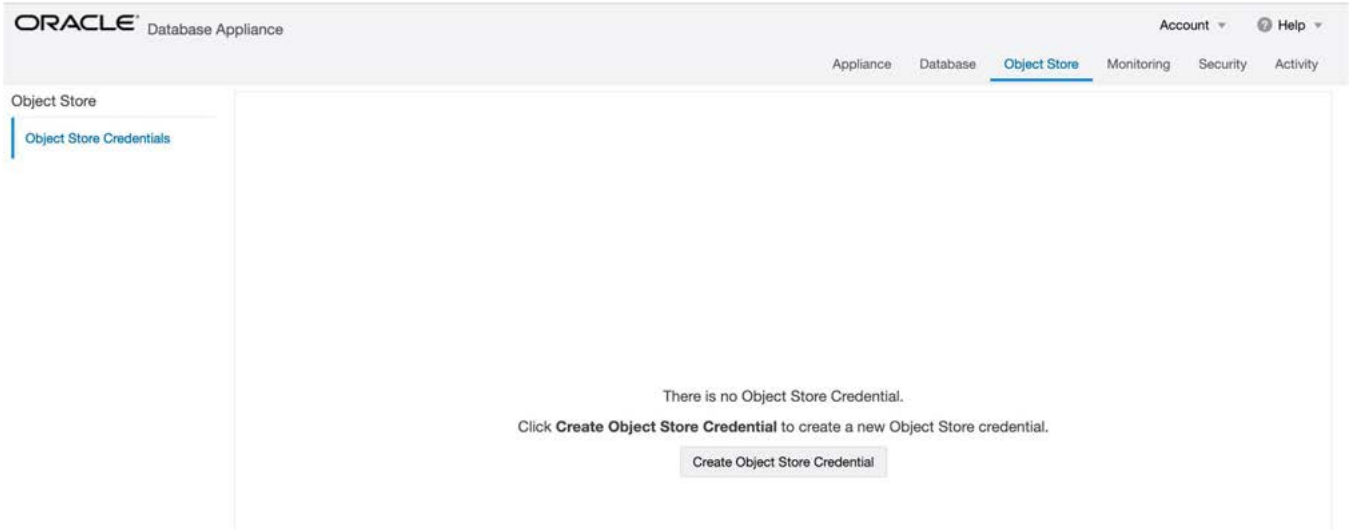
You can also click "Manual Backup", then "Start" to back up a database manually.



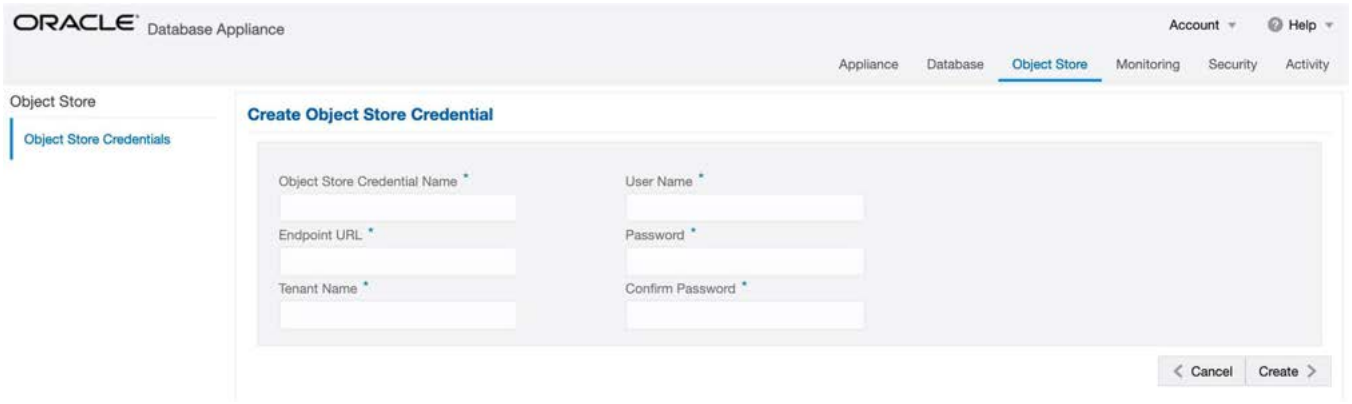
You can see the details of the Backup Report by clicking on the Backup Report ID.



In addition to backing up to local disk, you can back up to the Oracle Cloud. To backup databases in ODA to the Oracle Cloud, you must obtain Object Store credentials first. Once that's done, you can click "Object Store" tab, then "Create Object Store Credential"



Enter the required Object Store Credentials including the name. Once that's done, then you can create a backup policy, attached a database to the policy, and specify the Object Store as the backup destination. ODA will then 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.

You will use the CLI to update the repository and BUI to update the ODA infrastructure including DCS agent and the server.

You will also use the web BUI to update a database home (update database 19.8 to 19.9) and upgrade a database (18.12 to 19.9)

Step 1: Update the ODA Repository with Latest Patches

Patches for ODA are posted in the Oracle Database Appliance Release Notes. There you will find the links to the patches. The ODA X8-2-HA appliance has one patch that must be applied: 1. A server patch that also includes RDBMS patches. The server patch will patch the firmware, OS, Grid Infrastructure, and the databases. You must patch the server before you patch the databases. When patching databases, you can choose to patch a subset if required (although we recommend all databases be kept current on patching). We have downloaded simulated 19.9.0.0.0 patches for the server and database to your simulator.

Before you start patching the server, you can check the current installed components from the web console. Go to Appliance tab, click on Patch Manager on the left. Note all the installed 19.8.0.0 components. Since you have not updated the repository to 19.9.0.0, everything is shown up to date.

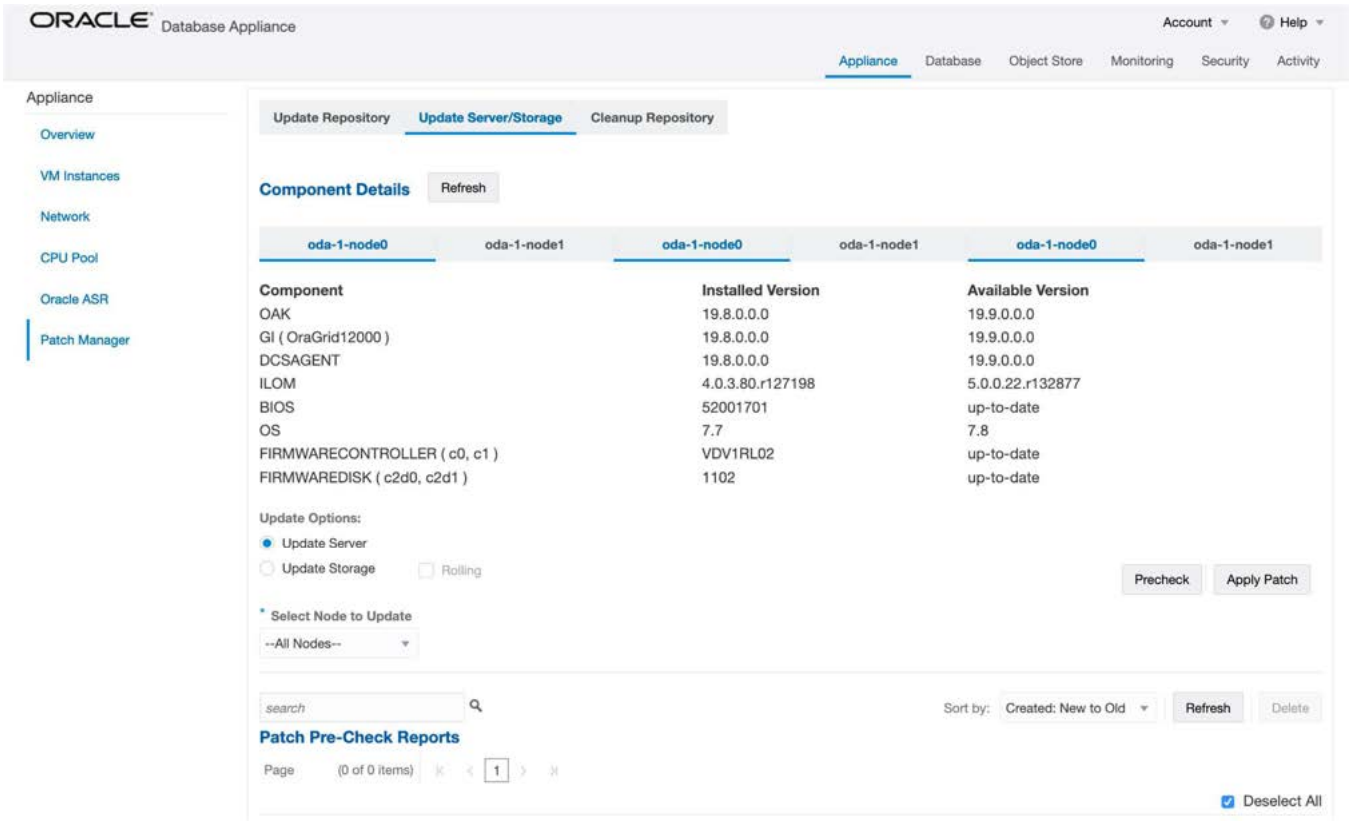
The server patch is oda-sm-19.9.0.0.0-201020-server.zip. The server patch also includes latest database updates for 19.x, 18.x, 12.2.1.2, 12.1.0.2 and 11.2.0.4.

You also need to update repository with the 19.9 clone files if you want to create a 19.9 database.

Type the following to update the ODA repository with these patches. **You must use the full path for the file names**

```
# odacli update-repository -f /opt/oracle/dcs/patchfiles/oda-sm-19.9.0.0.0-201020-server.zip
{
  "jobId" : "151f6bf2-36de-462d-8e6c-e519abc2d6d7",
  "status" : "Running",
  "message" : "/opt/oracle/dcs/patchfiles/oda-sm-19.9.0.0.0-201020-server.zip",
  "reports" : [ ],
  "createTimestamp" : "November 10, 2020 05:58:59 AM UTC",
  "resourceList" : [ ],
  "description" : "Repository Update",
  "updatedTime" : "November 10, 2020 05:59:04 AM UTC"
}

# odacli update-repository -f /opt/oracle/dcs/patchfiles/odacli-dcs-19.9.0.0.0-201020-DB-19.9.0.0.zip
{
  "jobId" : "9bb6e918-f0d1-4c02-a2c4-3914ab349060",
  "status" : "Running",
  "message" : "/opt/oracle/dcs/patchfiles/odacli-dcs-19.9.0.0.0-201020-DB-19.9.0.0.zip",
  "reports" : [ ],
  "createTimestamp" : "November 10, 2020 06:00:16 AM UTC",
  "resourceList" : [ ],
  "description" : "Repository Update",
  "updatedTime" : "November 10, 2020 06:00:21 AM UTC"
}
```

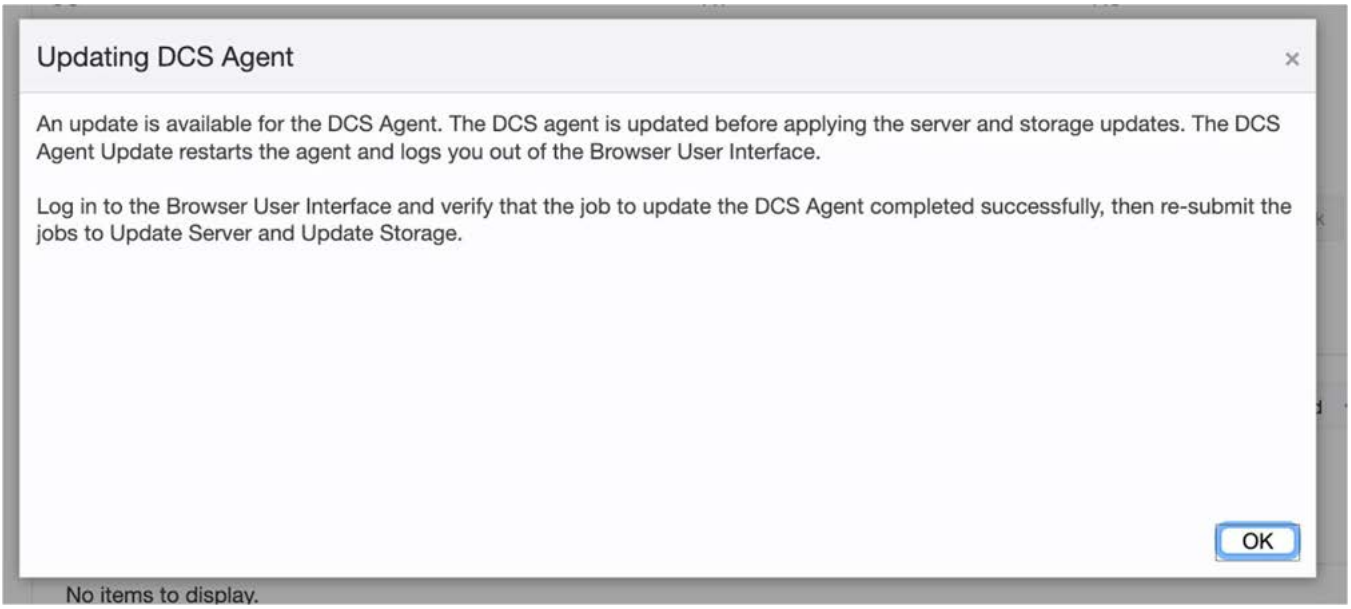
Now you can use the web console to see the 19.9.0.0.0 available component versions.



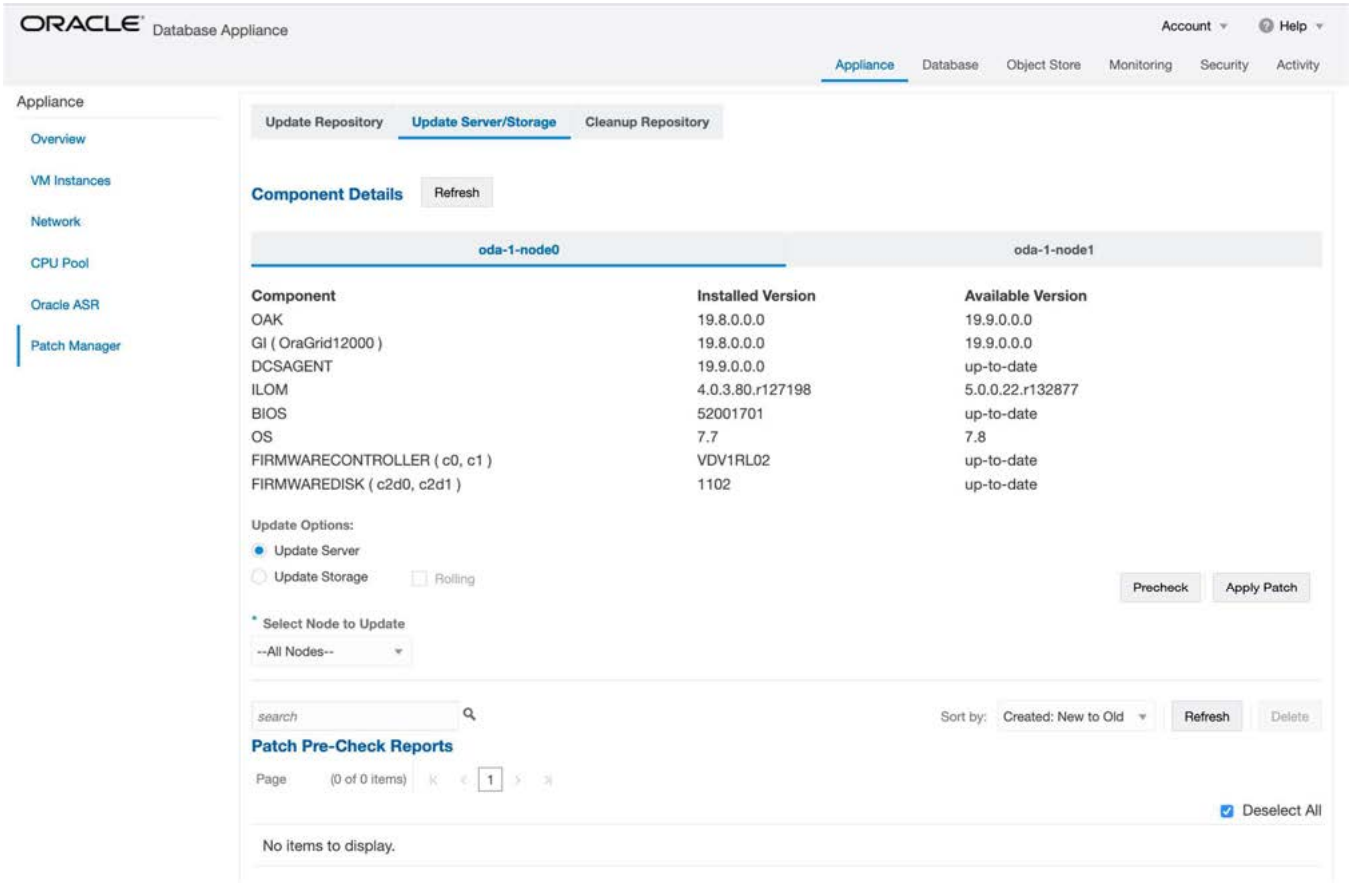
We recommend that you run the precheck for OS, ILOM, and GI before patching by click the "Precheck" button.

Step 2: Update the DCS Agent

The next step is to update the DCS Agent on both nodes with the web console before actually updating the server. The DCS Agent is the Oracle Database Appliance software that provides the intelligence and automation. Select "Update Server" radio button, select "Apply Patch", then Submit, then click OK on Updating DCS Agent.



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

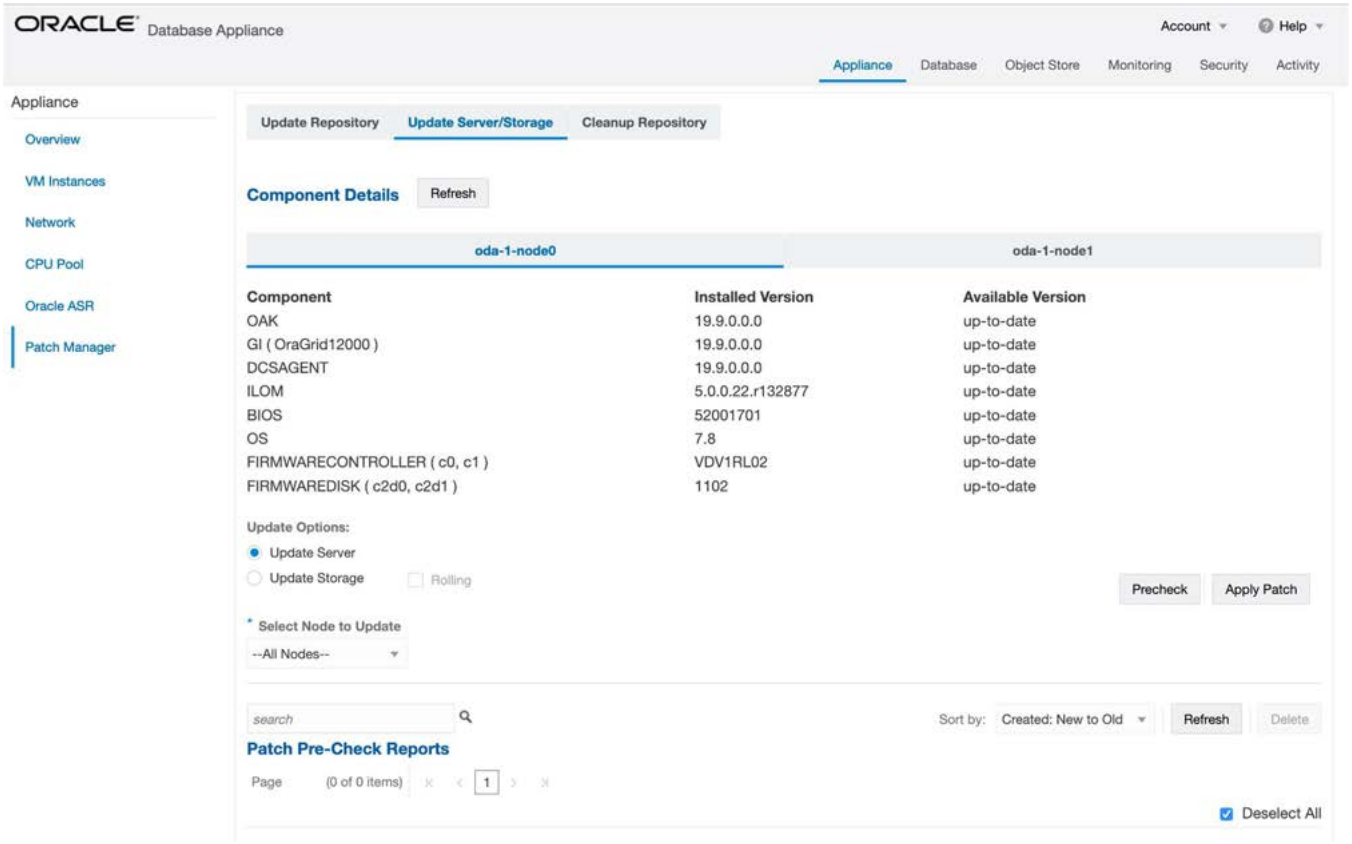


Step 3: Update the server

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

To update Server, select Update Server, pick All Nodes, then hit Apply Patch.

After the job is completed, you can refresh the browser to see that the both node0 and node1 tabs have all 19.9.0.0.0 components installed, and everything is up-to-date.

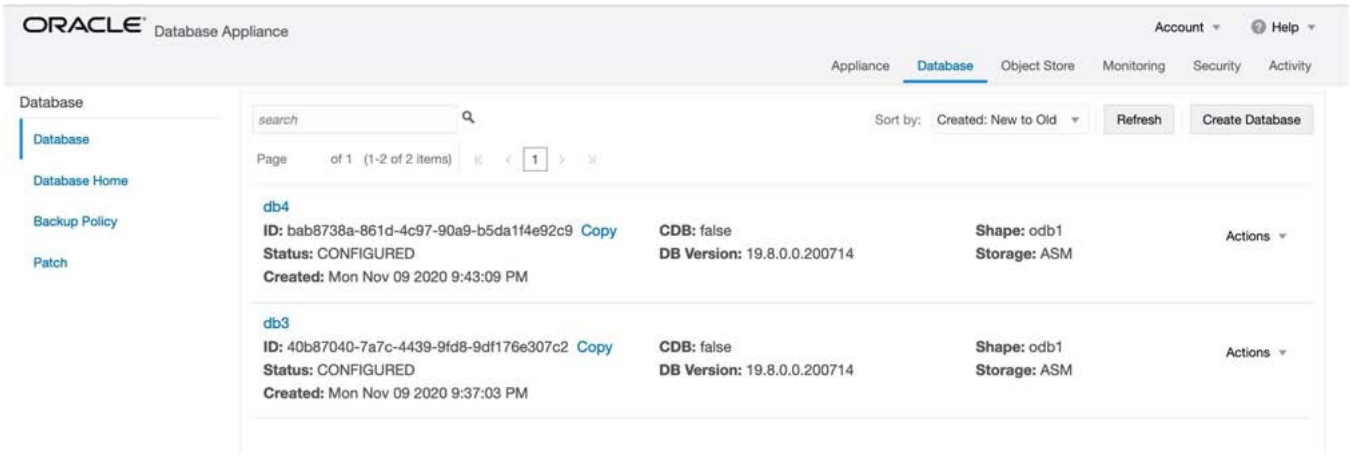


Patching a real ODA will take some time, the simulator speeds up the whole process. The Linux prompt returns immediately and the patch runs in the background. You can monitor the progress of the patch job by checking the Activity tab.

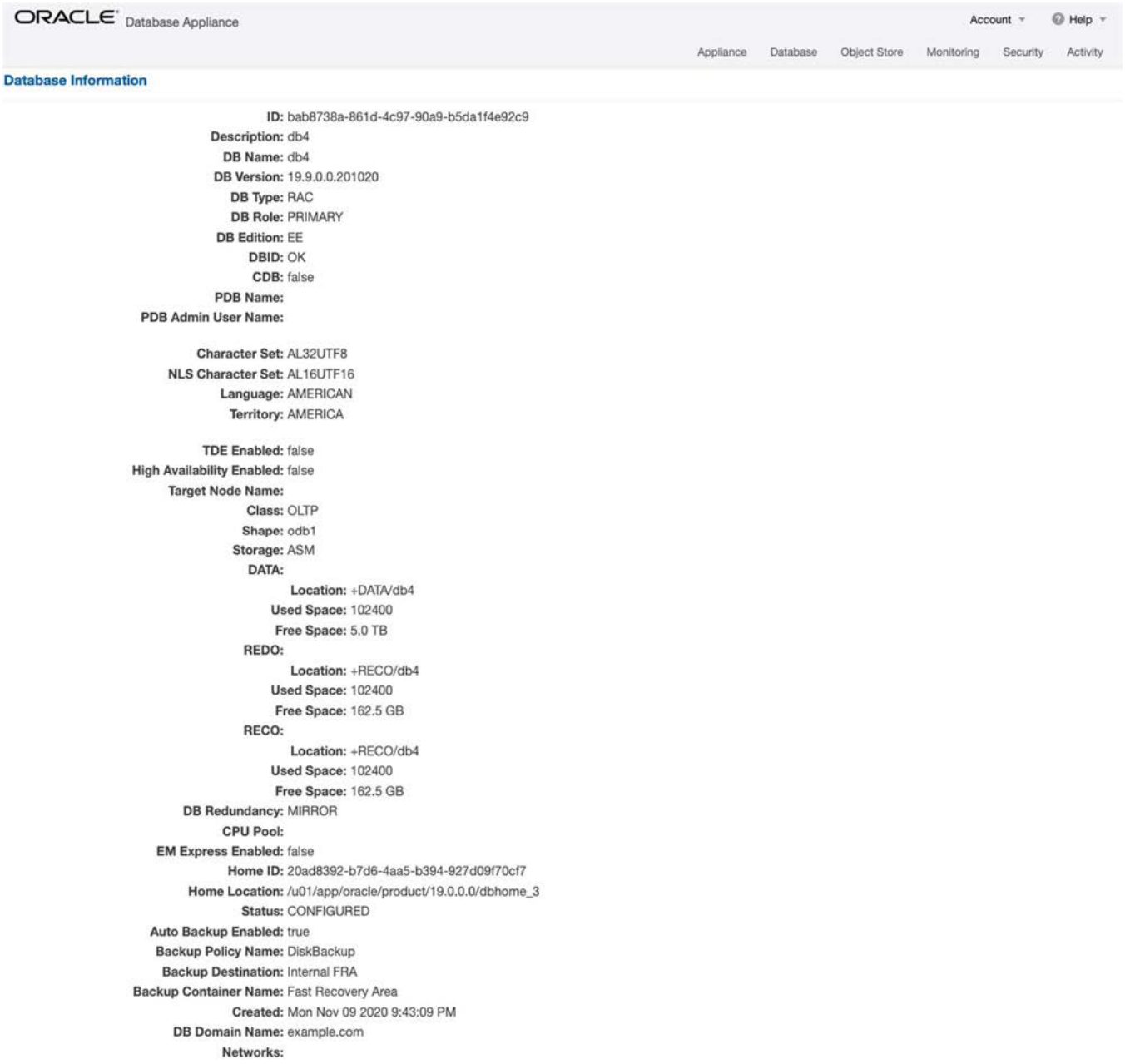
Step 4: Patch Database Homes (Updating Database)

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, and …



…click on the database name (e.g. db4) to identify the database home ID for patching.



Note either the Home ID, or the Home location. You will need this to patch the database home.

You can use either CLI 'odacli update-dbhome' command or 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 will list 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.

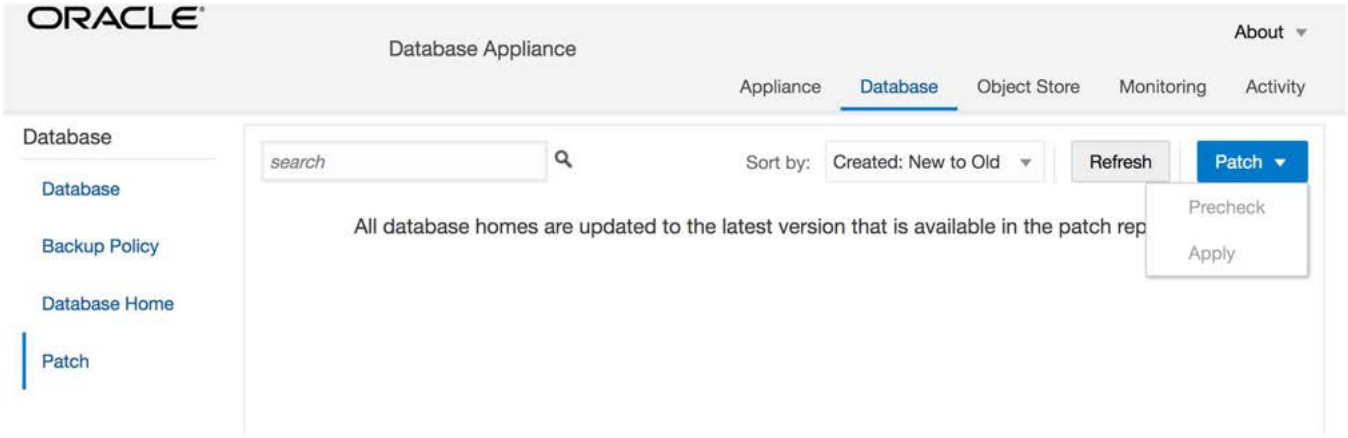
```
# odacli list-databases

ID                                       DB Name    DB Type  DB Version           CDB        Class    Shape    Storage    Status        DbHomeID
---------------------------------------- ---------- -------- -------------------- ---------- -------- -------- ---------- ------------ --------------------
--------------------
40b87040-7a7c-4439-9fd8-9df176e307c2     db3        Rac      19.8.0.0.200714      false      Oltp     Odb1     Asm        Configured   c0628ee5-4bcb-490c-
9996-067f23e6bf17
bab8738a-861d-4c97-90a9-b5da1f4e92c9     db4        Rac      19.8.0.0.200714      false      Oltp     Odb1     Asm        Configured   20ad8392-b7d6-4aa5-
b394-927d09f70cf7



# odacli list-dbhomes

ID                                       Name                 DB Version                           Home Location
Status
---------------------------------------- -------------------- ------------------------------------ ------------------------------------------ -----
-----
c5556b62-cdc1-42c5-ad03-5a90dea5594f     OraDB19000_home1     19.8.0.0.200714                      /u01/app/oracle/product/19.0.0.0/dbhome_1
Configured
c0628ee5-4bcb-490c-9996-067f23e6bf17     OraDB19000_home2     19.8.0.0.200714                      /u01/app/oracle/product/19.0.0.0/dbhome_2
Configured
20ad8392-b7d6-4aa5-b394-927d09f70cf7     OraDB19000_home3     19.8.0.0.200714                      /u01/app/oracle/product/19.0.0.0/dbhome_3
Configured
```

Use the clipboard to copy the DB Home ID for db3. Then use that with the 'odacli update-dbhome' command to update the home for db3. Verify the job has completed successfully using 'odacli describe-job'.

```
 # odacli update-dbhome -i 20ad8392-b7d6-4aa5-b394-927d09f70cf7 -v
19.9.0.0.0
{
  "jobId" : "ffc00059-3a16-489a-b5f9-bc8f4de1cba9",
  "status" : "Created",
  "message" : null,
  "reports" : [ ],
  "createTimestamp" : "November 10, 2020 07:07:30 AM UTC",
  "resourceList" : [ ],
  "description" : "DB Home Patching: Home Id is 20ad8392-b7d6-4aa5-b394-927d09f70cf7",
  "updatedTime" : "November 10, 2020 07:07:30 AM UTC"
}

# odacli describe-job -i ffc00059-3a16-489a-b5f9-bc8f4de1cba9

Job details
----------------------------------------------------------------
                     ID:  ffc00059-3a16-489a-b5f9-bc8f4de1cba9
            Description:  DB Home Patching: Home Id is 20ad8392-b7d6-4aa5-b394-927d09f70cf7
                 Status:  Success
                Created:  November 10, 2020 7:07:30 AM UTC
                Message:

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

Verify that the db3 database home has been updated to latest (201020) You can use either the BUI or CLI (odacli list-dbhomes).

You can also use the GUI web console to update the database homes by clicking "Patch" on the left panel, then select Apply in the Patch drop-down. We already updated the db4 database home via command line already.

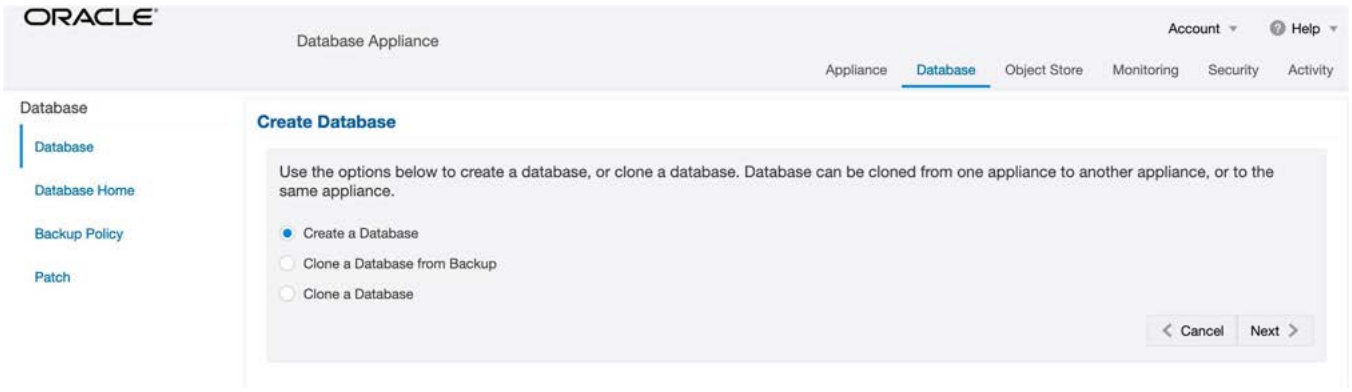


Step 5: Upgrading Database

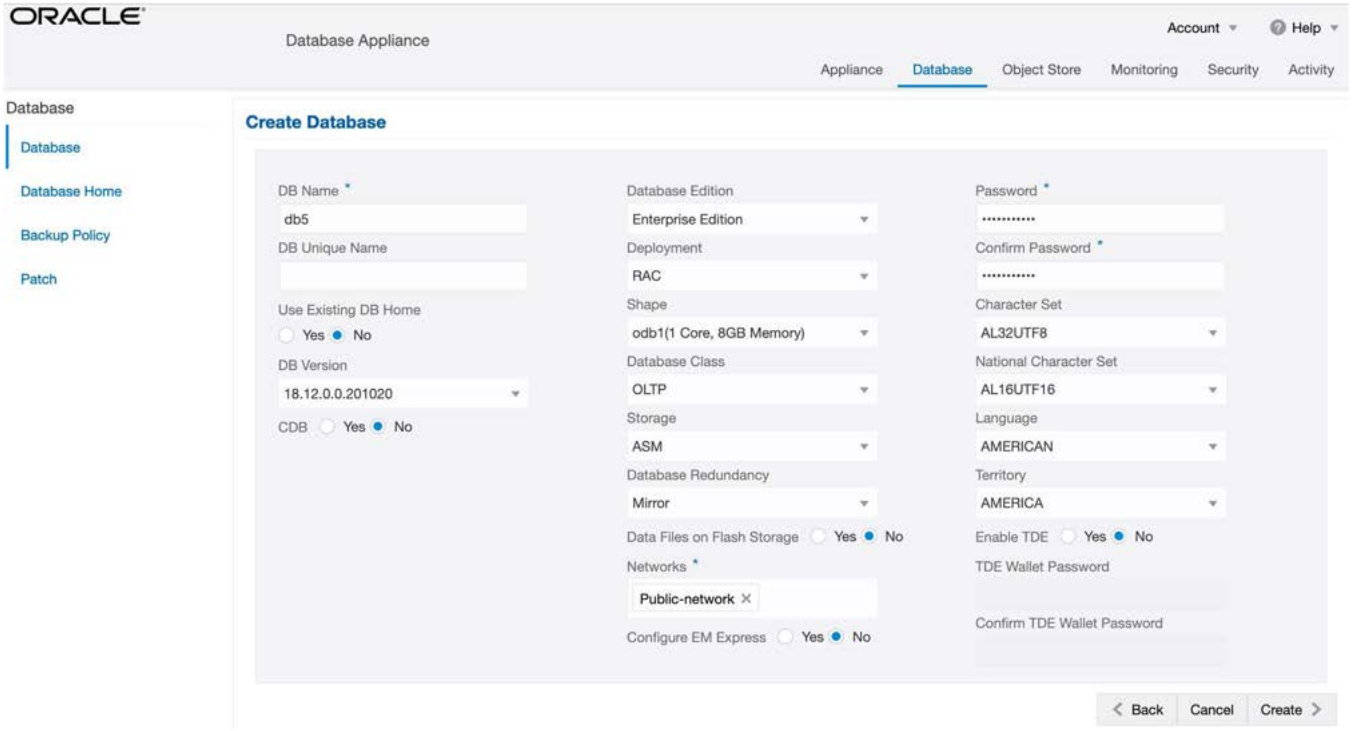
To upgrade a database, we must first have an Oracle 18.x database. We will need to update the repository and create an Oracle 18.12 database.

```
# odacli update-repository -f /opt/oracle/dcs/patchfiles/odacli-
dcs-19.9.0.0.0-201020-DB-18.12.0.0.zip
{
  "jobId" : "9bb6e918-f0d1-4c02-a2c4-3914ab349060",
  "status" : "Running",
  "message" : "/opt/oracle/dcs/patchfiles/odacli-dcs-19.9.0.0.0-201020-DB-
18.12.0.0.zip",
  "reports" : [ ],
  "createTimestamp" : "November 10, 2020 06:00:16 AM UTC",
  "resourceList" : [ ],
  "description" : "Repository Update",
  "updatedTime" : "November 10, 2020 06:00:21 AM UTC"
```

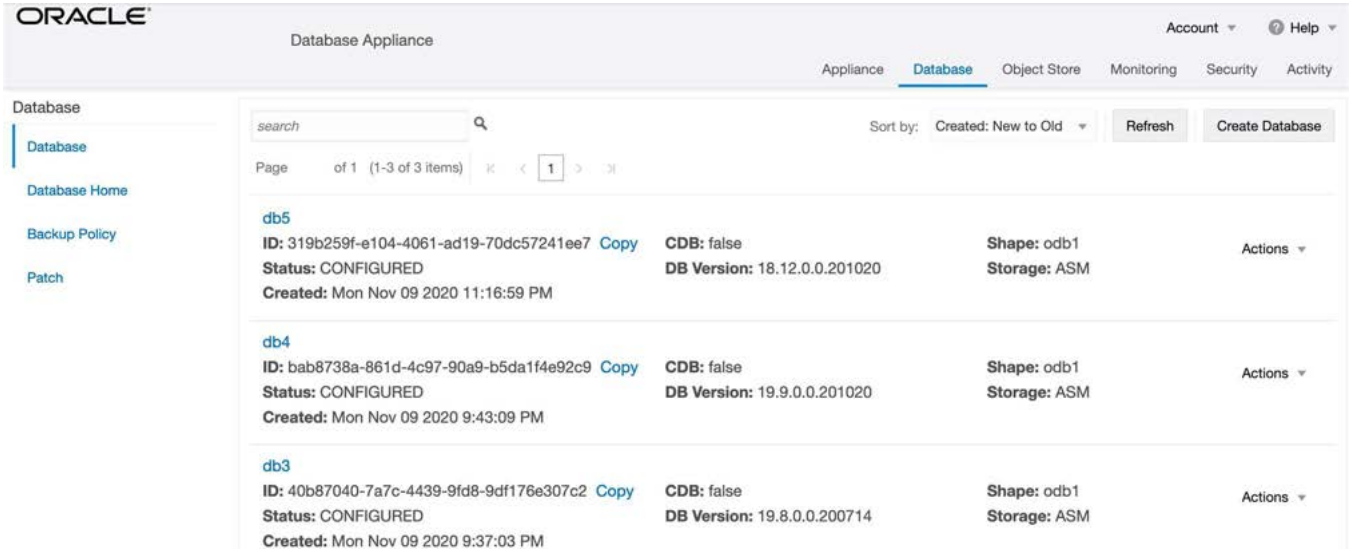
We can now create an Oracle 18.11 database (db5). Select "Create a Database", then "Next"



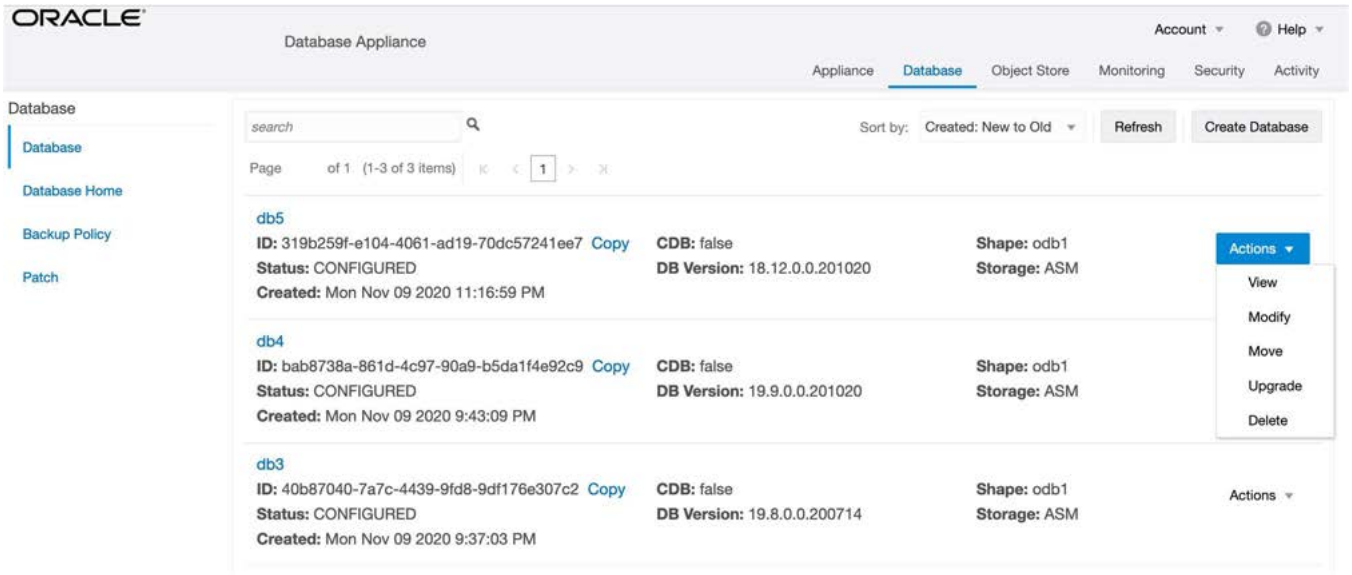
Fill in the information and click "Create"



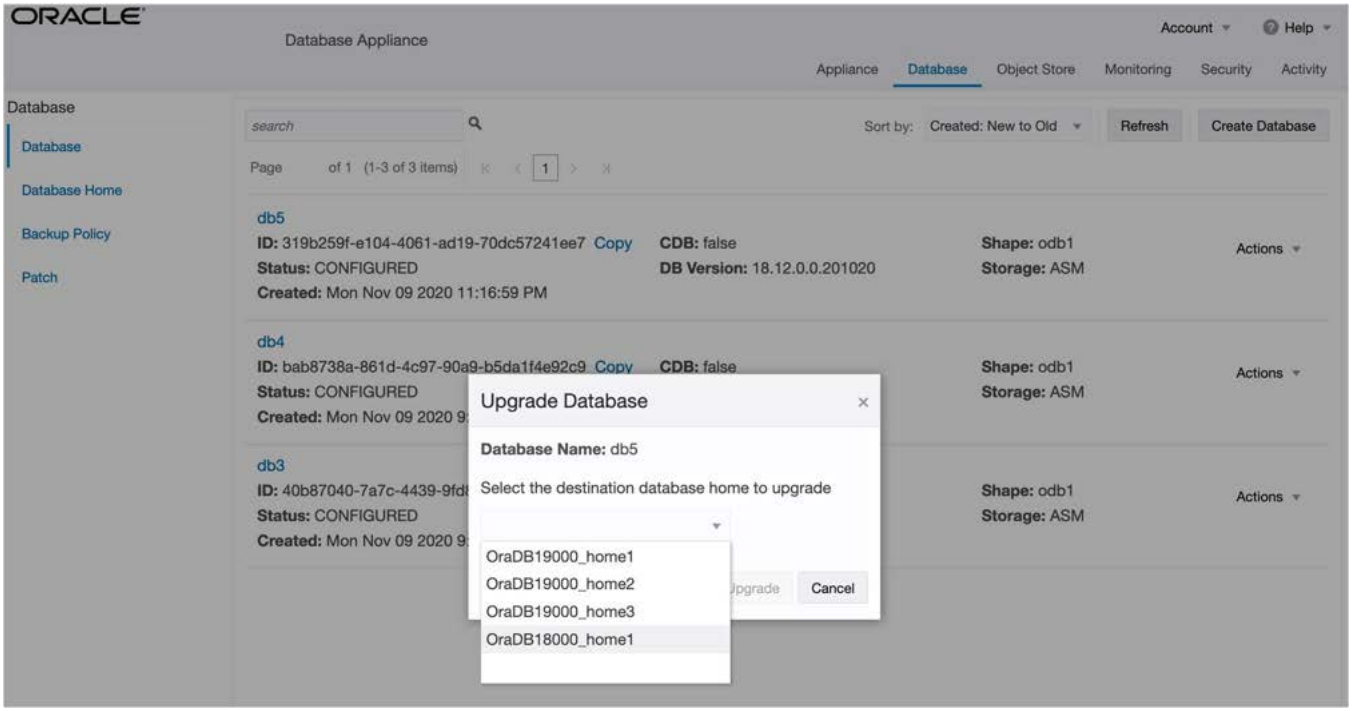
You can see Oracle database 18.12 (db5) is created.



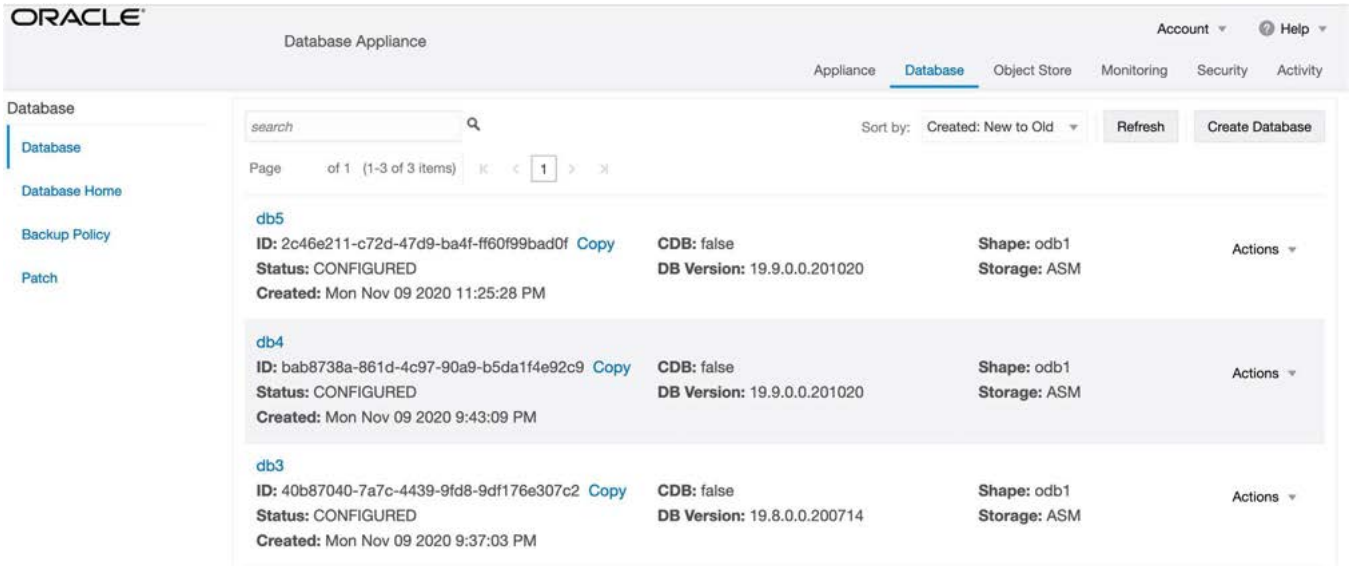
Now we will upgrade database db5 from 18.12 to 19.9 by click Actions button and select Upgrade.



Then select a new database home (i.e. OraDB19000_home3). Database upgrade is an out-of-place operation, which existing home is not touched.



You can see db5 has been upgraded from 18.12 to 19.9

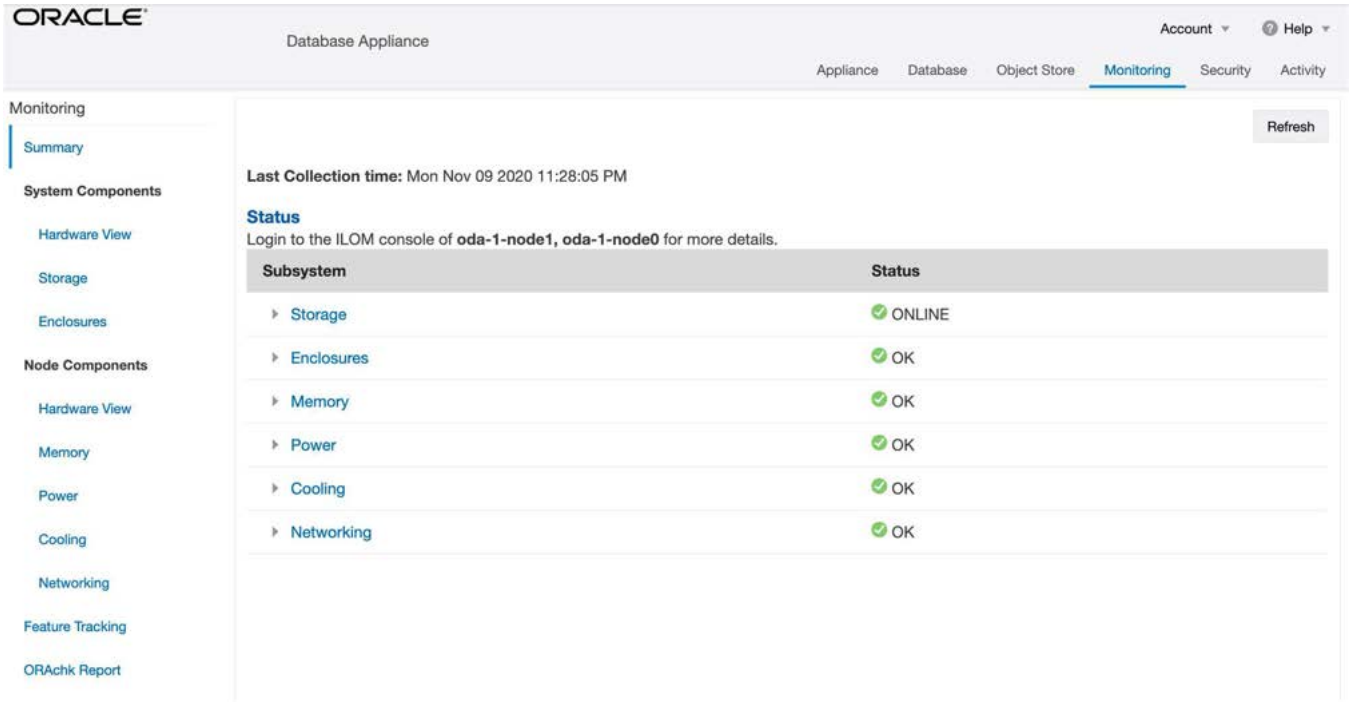


This concludes Lab 3.

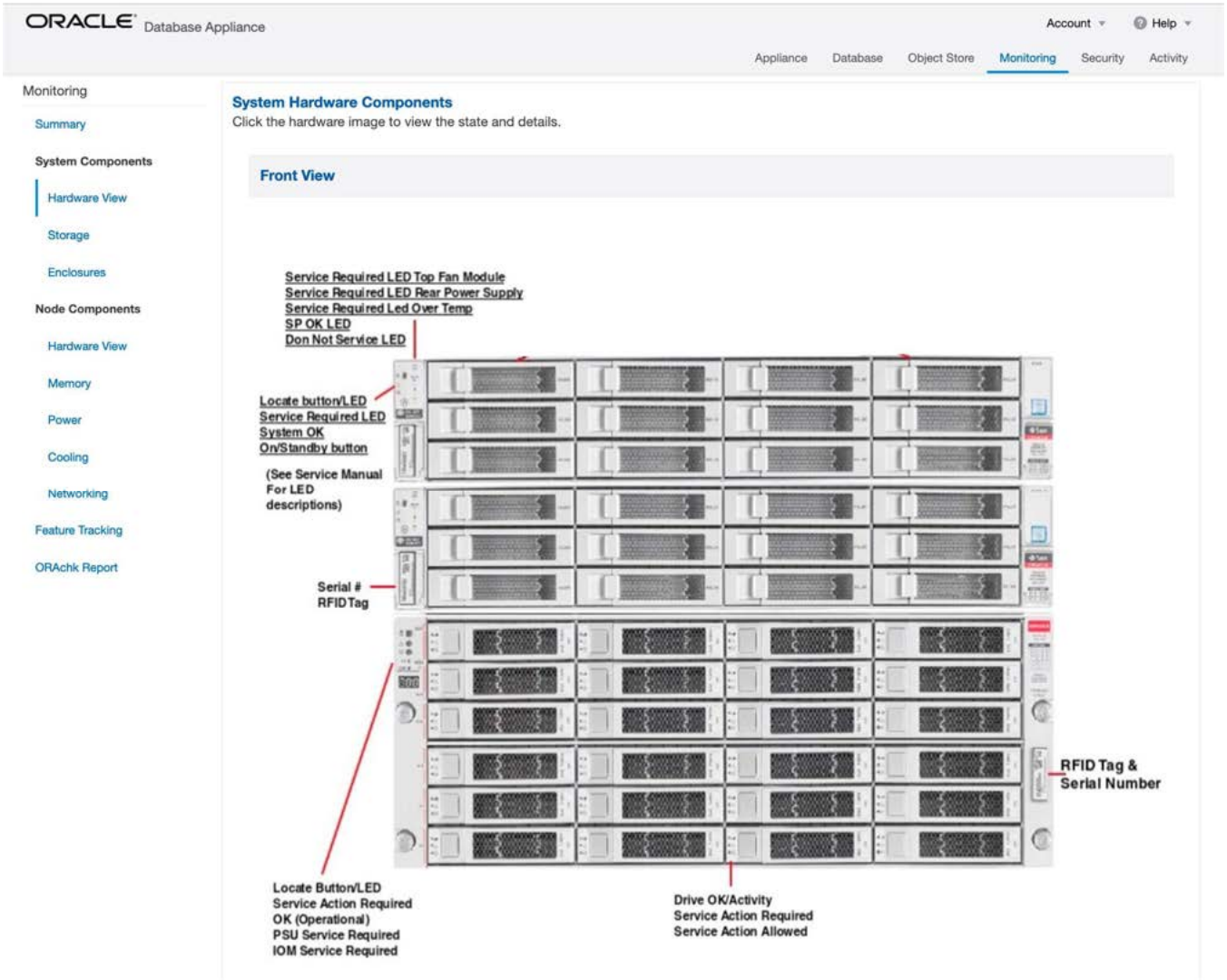
Lab 4: Monitoring and Administration

Step 1: BUI Hardware Monitoring and Feature Tracking

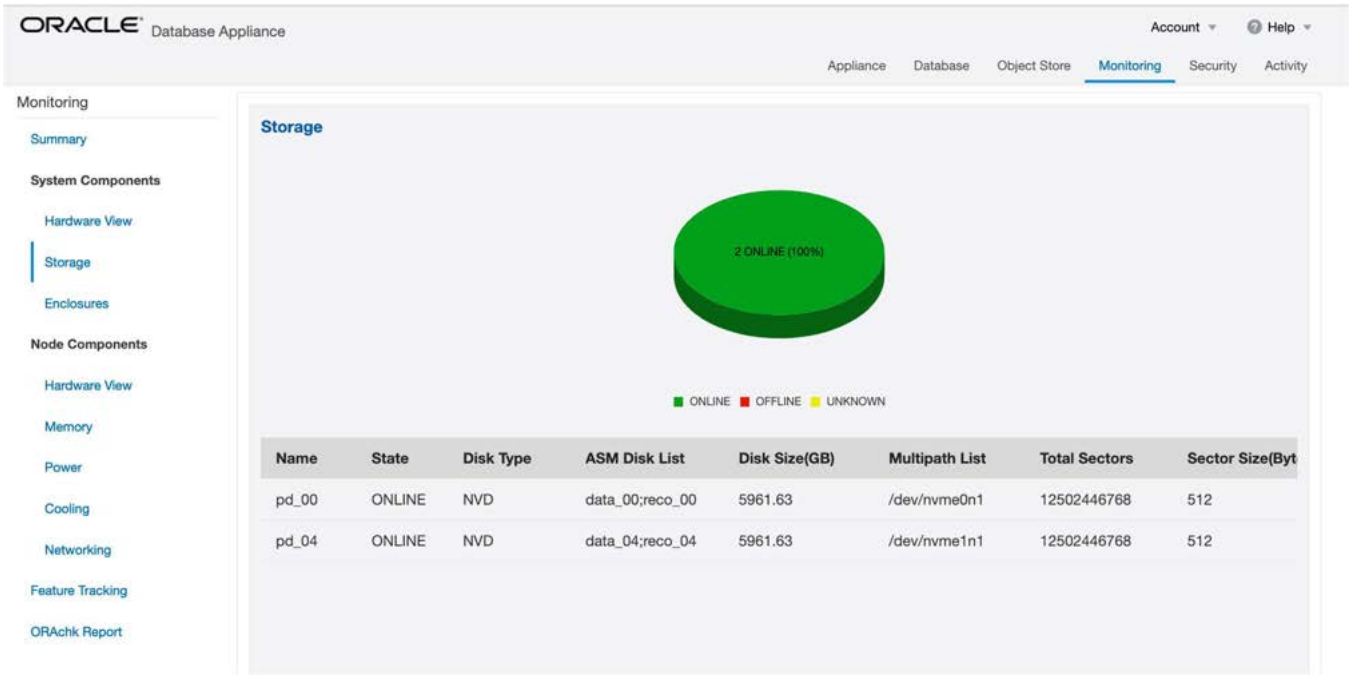
The BUI shows ODA hardware status and tracks feature usage including High Water Marks.



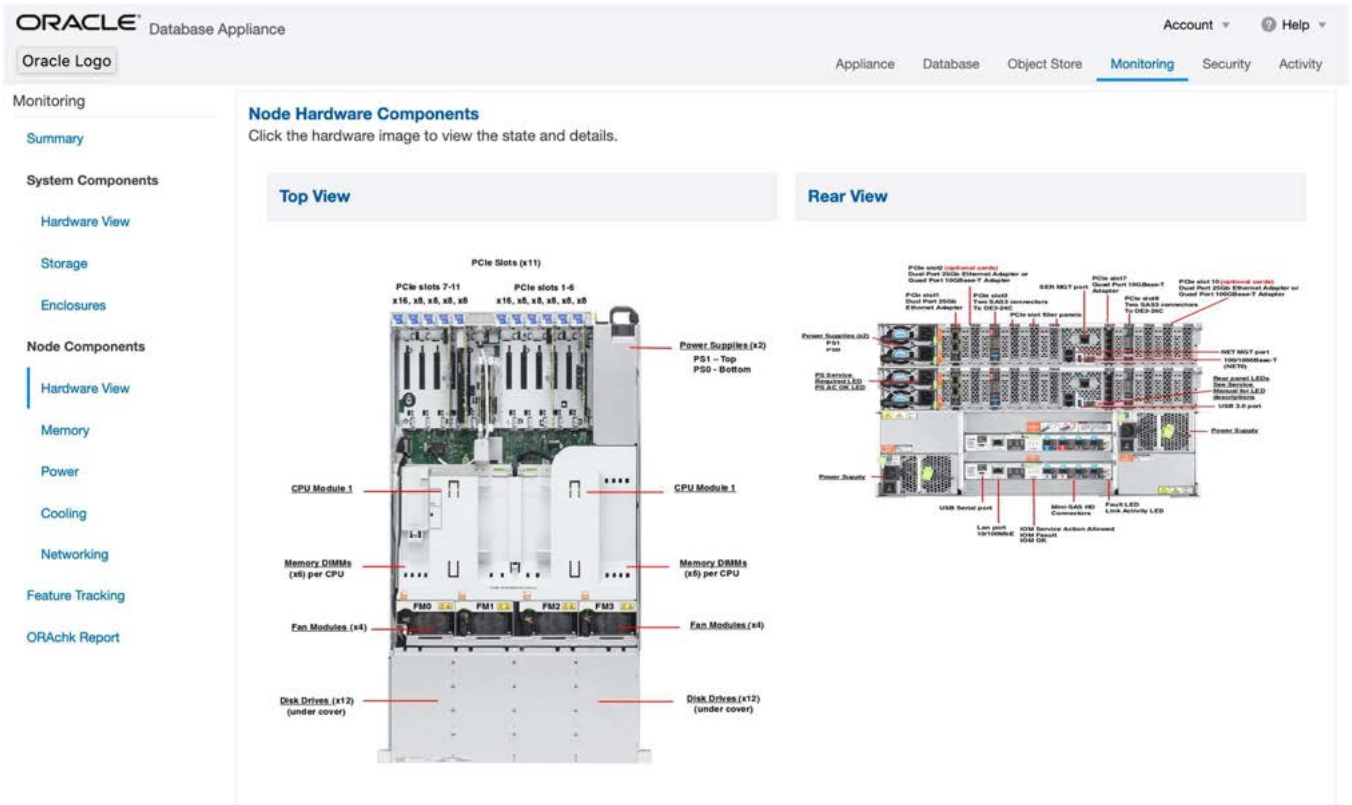
Hardware Status


ORACLE Database Appliance
Account
Help
Appliance
Database
Object Store
Monitoring
Security
Activity
Monitoring
Summary
System Components
Hardware View
Storage
Enclosures
Node Components
Hardware View
Memory
Power
Cooling
Networking
Feature Tracking
ORAchk Report
System Hardware Components
Click the hardware image to view the state and details.
Front View
Service Required LED Top Fan Module
Service Required LED Rear Power Supply
Service Required Led Over Temp
SP OK LED
Don Not Service LED
Locate button/LED
Service Required LED
System OK
On/Standby button
(See Service Manual
For LED
descriptions)
Serial #
RFID Tag
RFID Tag &
Serial Number
Locate Button/LED
Service Action Required
OK (Operational)
PSU Service Required
IOM Service Required
Drive OK/Activity
Service Action Required
Service Action Allowed

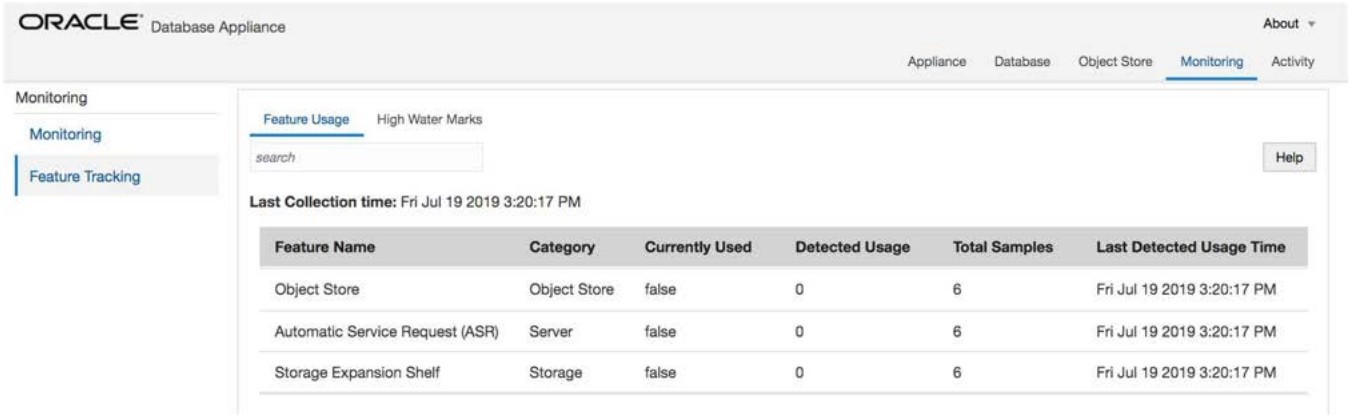
Storage



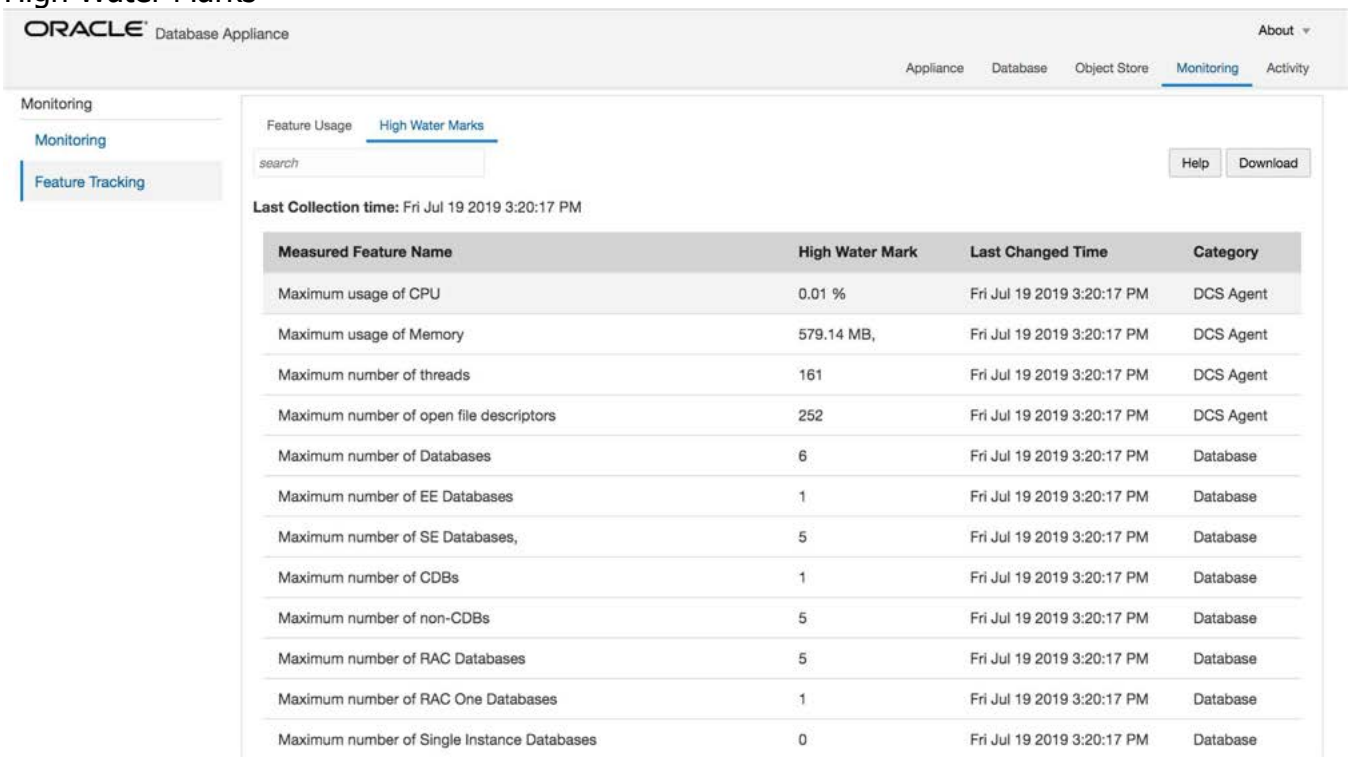
Hardware View



Feature Tracking



High Water Marks



The Oracle Appliance Manager command line interfaces (odacli, odaadmcli) are tools that can also be used to install, configure, and interrogate the status of ODA. They are free with the Oracle Database Appliance to assist in the fast deployment and easy management of the Oracle Database Appliance, and the fast deployment, patching and maintenance of Oracle.

Some basic odaadmcli commands to explore the ODA configuration are outlined in the following sections.

Step 2: Review Appliance Configuration

Below are sample output. Please see ODA Documentation for details.

odaadmcli show server

Show the server/node status, including ILOM IP address, firmware version, power consumption, etc. This is helpful for an at-a-glance view of basic server/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 Availability 1750XD0003
     Locator Light            : Off
     Actual Power Consumption : 302 watts
     Ambient Temperature      : 20.250 degree C
     Open Problems Report     : System is healthy
```

```
$ sudo odacli describe-system

Appliance Information
----------------------------------------------------------------
                     ID: oda
               Platform:
        Data Disk Count: 9
         CPU Core Count: 36
                Created: July 19, 2019 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
```

odaadmcli show processor

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
```

odaadmcli show 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
```

odaadmcli show power

```
$ sudo odaadmcli show power

        NAME           HEALTH HEALTH_DETAILS PART_NO. SERIAL_NO.         LOCATION INPUT_POWER OUTPUT_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
```

odaadmcli show cooling

```
$ 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 3: Review the Storage Configuration

odaadmcli show disk

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

        NAME            PATH            TYPE            STATE           STATE_DETAILS

        e0_pd_00        /dev/sdbv       HDD             ONLINE          Good
        e0_pd_01        /dev/sdbw       HDD             ONLINE          Good
        e0_pd_02        /dev/sdbx       HDD             ONLINE          Good
        e0_pd_03        /dev/sdby       HDD             ONLINE          Good
        e0_pd_04        /dev/sdbz       HDD             ONLINE          Good
        e0_pd_05        /dev/sdca       HDD             ONLINE          Good
        e0_pd_06        /dev/sdcb       HDD             ONLINE          Good
        e0_pd_07        /dev/sdcc       HDD             ONLINE          Good
        e0_pd_08        /dev/sdcd       HDD             ONLINE          Good
        e0_pd_09        /dev/sdce       HDD             ONLINE          Good
        e0_pd_10        /dev/sdcf       HDD             ONLINE          Good
        e0_pd_11        /dev/sdcg       HDD             ONLINE          Good
        e0_pd_12        /dev/sdch       HDD             ONLINE          Good
        e0_pd_13        /dev/sdci       HDD             ONLINE          Good
        e0_pd_14        /dev/sdcj       HDD             ONLINE          Good
        e0_pd_15        /dev/sdck       SSD             ONLINE          Good
        e0_pd_16        /dev/sdcl       SSD             ONLINE          Good
        e0_pd_17        /dev/sdcm       SSD             ONLINE          Good
        e0_pd_18        /dev/sdcn       SSD             ONLINE          Good
        e0_pd_19        /dev/sdco       SSD             ONLINE          Good
        e0_pd_20        /dev/sdcp       SSD             ONLINE          Good
        e0_pd_21        /dev/sdcq       SSD             ONLINE          Good
        e0_pd_22        /dev/sdcr       SSD             ONLINE          Good
        e0_pd_23        /dev/sdcs       SSD             ONLINE          Good
```

odaadmcli show diskgroup

List ASM diskgroups that have been configured by Appliance Manager on the ODA's storage.

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 database's backups, archive logs, and redo logs are stored.
REDO is where the database's redo logs are stored.

```
$  sudo odaadmcli show diskgroup

DiskGroups
----------
DATA
FLASH
RECO
REDO
```

odaadmcli show fs

```
$  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
```

List the details on the ODA X7-2-HA file systems, including total Space, Free Space, Disk Group, etc. **Note: Due to a simulator bug, your output will look slightly different. The output below is what you should really see.**

odaadmcli show raidsyncstatus

List the status of the boot disk HW RAID.

```
$ sudo odaadmcli show raidsyncstatus

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

odaadmcli show storage

The following command shows 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   H7210A520SUN010T
       /dev/sdab       HGST             HDD 9796gb slot:  1  exp:  0   H7210A520SUN010T
       /dev/sdac       HGST             HDD 9796gb slot:  2  exp:  0   H7210A520SUN010T
       /dev/sdad       HGST             HDD 9796gb slot:  3  exp:  0   H7210A520SUN010T
       /dev/sdae       HGST             HDD 9796gb slot:  4  exp:  0   H7210A520SUN010T
       /dev/sdaf       HGST             HDD 9796gb slot:  5  exp:  0   H7210A520SUN010T
       /dev/sdag       HGST             HDD 9796gb slot:  6  exp:  0   H7210A520SUN010T
       /dev/sdah       HGST             HDD 9796gb slot:  7  exp:  0   H7210A520SUN010T
       /dev/sdai       HGST             HDD 9796gb slot:  8  exp:  0   H7210A520SUN010T
       /dev/sdaj       HGST             HDD 9796gb slot:  9  exp:  0   H7210A520SUN010T
       /dev/sdak       HGST             HDD 9796gb slot: 10  exp:  0   H7210A520SUN010T
       /dev/sdal       HGST             HDD 9796gb slot: 11  exp:  0   H7210A520SUN010T
       /dev/sdam       HGST             HDD 9796gb slot: 12  exp:  0   H7210A520SUN010T
       /dev/sdan       HGST             HDD 9796gb slot: 13  exp:  0   H7210A520SUN010T
       /dev/sdao       HGST             HDD 9796gb slot: 14  exp:  0   H7210A520SUN010T
       /dev/sdap       HGST             SSD 3200gb slot: 15  exp:  0   HBCAC2DH2SUN3.2T
       /dev/sdaq       HGST             SSD 3200gb slot: 16  exp:  0   HBCAC2DH2SUN3.2T
       /dev/sdar       HGST             SSD 3200gb slot: 17  exp:  0   HBCAC2DH2SUN3.2T
       /dev/sdas       HGST             SSD 3200gb slot: 18  exp:  0   HBCAC2DH2SUN3.2T
       /dev/sdat       HGST             SSD 3200gb slot: 19  exp:  0   HBCAC2DH2SUN3.2T
       /dev/sdau       HGST             SSD  800gb slot: 20  exp:  0   HBCAC2DH4SUN800G
       /dev/sdav       HGST             SSD  800gb slot: 21  exp:  0   HBCAC2DH4SUN800G
       /dev/sdaw       HGST             SSD  800gb slot: 22  exp:  0   HBCAC2DH4SUN800G
       /dev/sdax       HGST             SSD  800gb slot: 23  exp:  0   HBCAC2DH4SUN800G
==== END STORAGE DUMP =========
```

Step 4: Review Network Status

odaadmcli show network

Show the MAC address, health status and temp of the network ports.

```
$  sudo odaadmcli show network

        NAME           HEALTH HEALTH_DETAILS LOCATION PART_NO MANUFACTURER MAC_ADDRESS        LINK_DETECTED DIE_TEMP

       Ethernet_NIC_0 OK     -              NET0     i210    INTEL        00:10:E0:DA:CD:62  no (em1)      N/A
       Ethernet_NIC_1 OK     -              NET1     BCM57417Broadcom     00:10:E0:DA:CD:63  yes (em2)     N/A
       Ethernet_NIC_2 OK     -              NET2     BCM57417Broadcom     00:10:E0:DA:CD:64  yes (em3)     N/A
       Ethernet_NIC_3 -      -              NET3     X540    INTEL        00:0A:F7:CF:36:38  yes (p1p2)    -
       Ethernet_NIC_4 -      -              NET4     X540    INTEL        00:0A:F7:CF:36:30  yes (p1p1)    -
```

This concludes Lab 4.

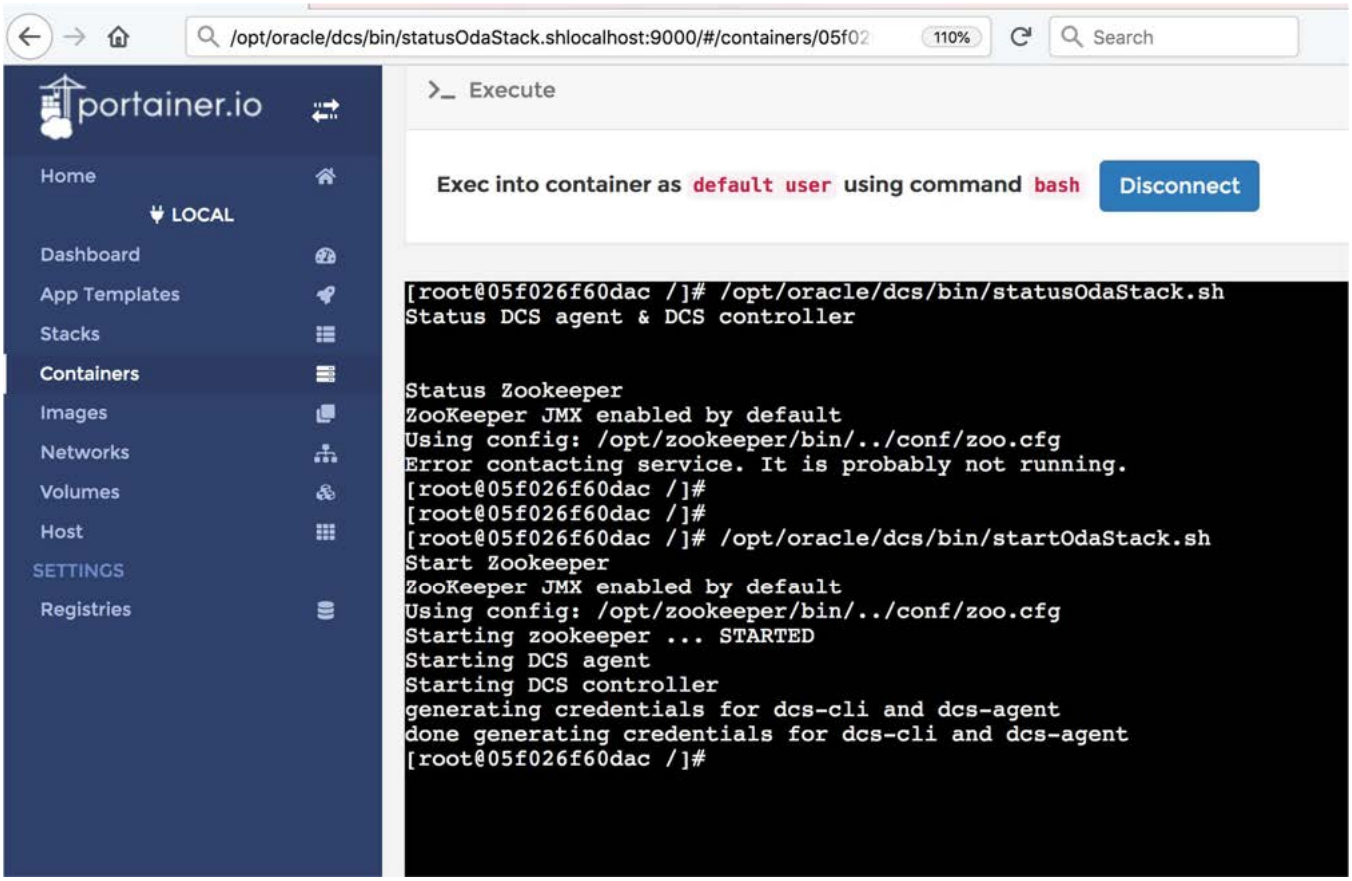
Troubleshooting

Restarting ODA Simulator in a Container

If the odacli configure-firstnet commands fails, you can check if the ODA Simulator is running in the container.

To ensure that the ODA Simulator is running in the container, you can run the following status command:
 # /opt/oracle/dcs/bin/statusOdaStack.sh

If it's not running, run the following start command:
 # /opt/oracle/dcs/bin/startOdaStack.sh

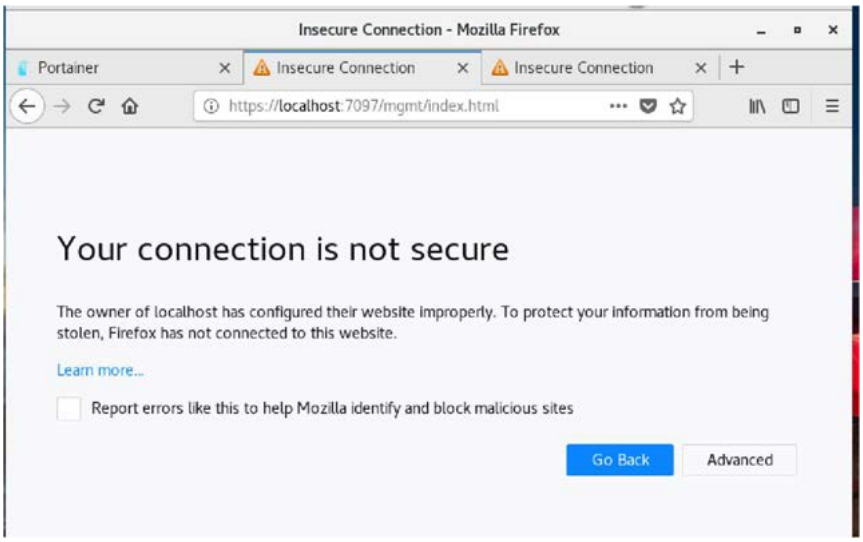


BUI Agent Certificate Issue

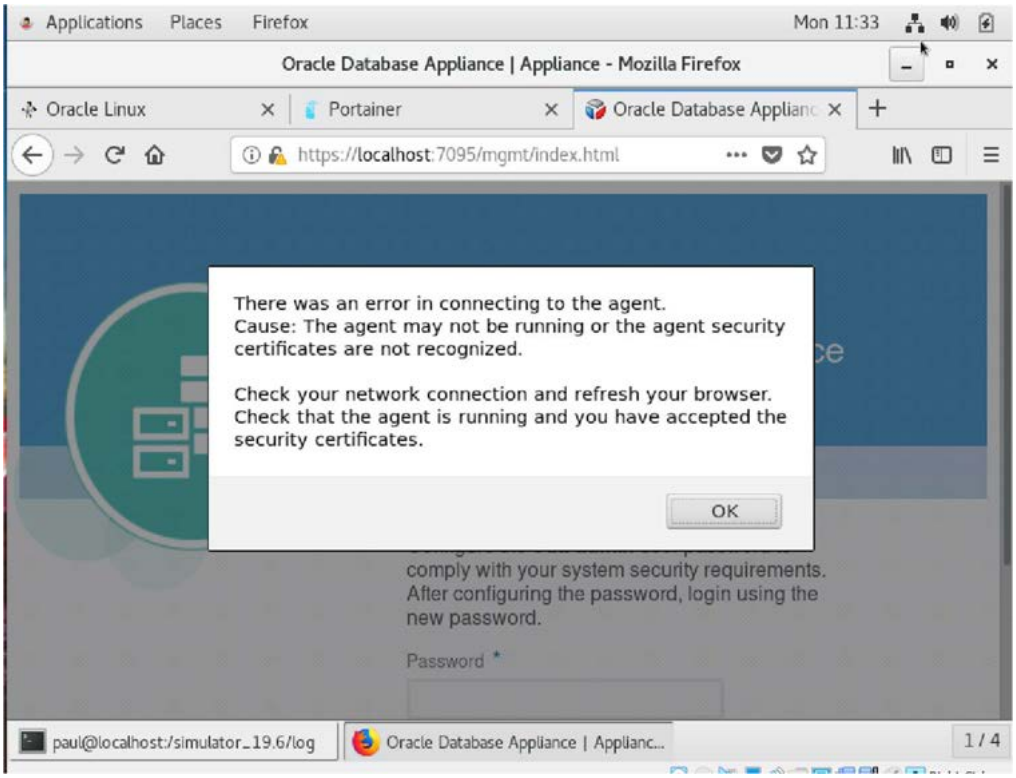
You may run into a BUI agent certificate issue. See the example below.

*https://<server IP>:**7097**/mgmt./index.html* (your assigned port number maybe different)

You'll see the "Your connection is not secure" message.

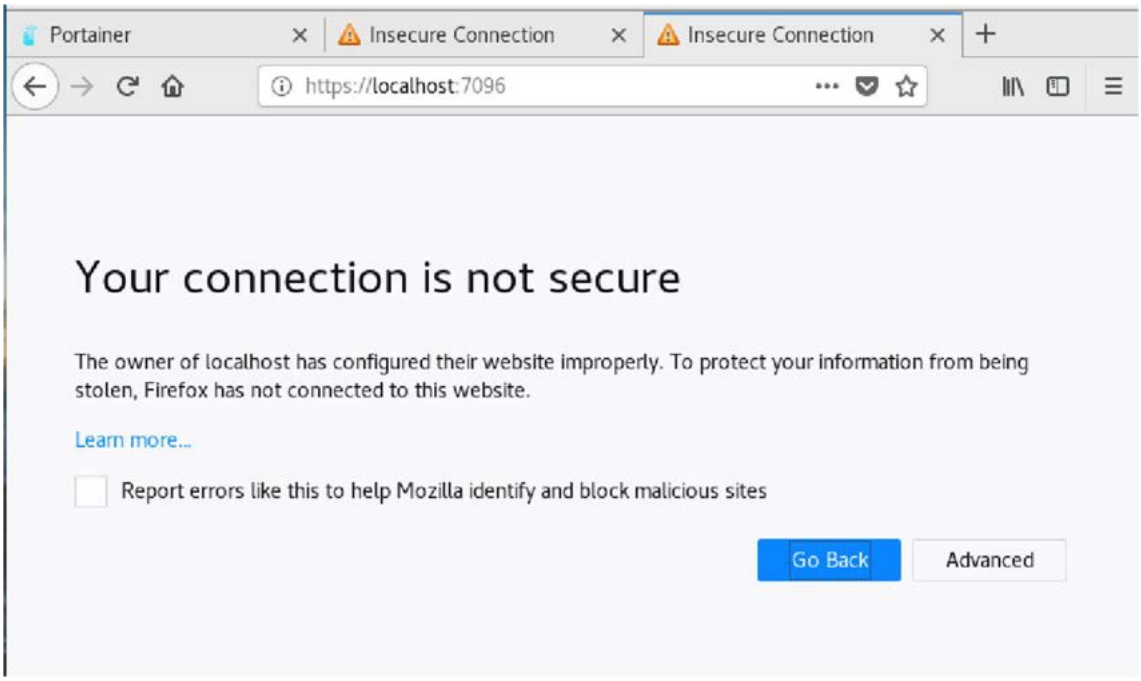


You go through the certificate exception process but still get the following error message.

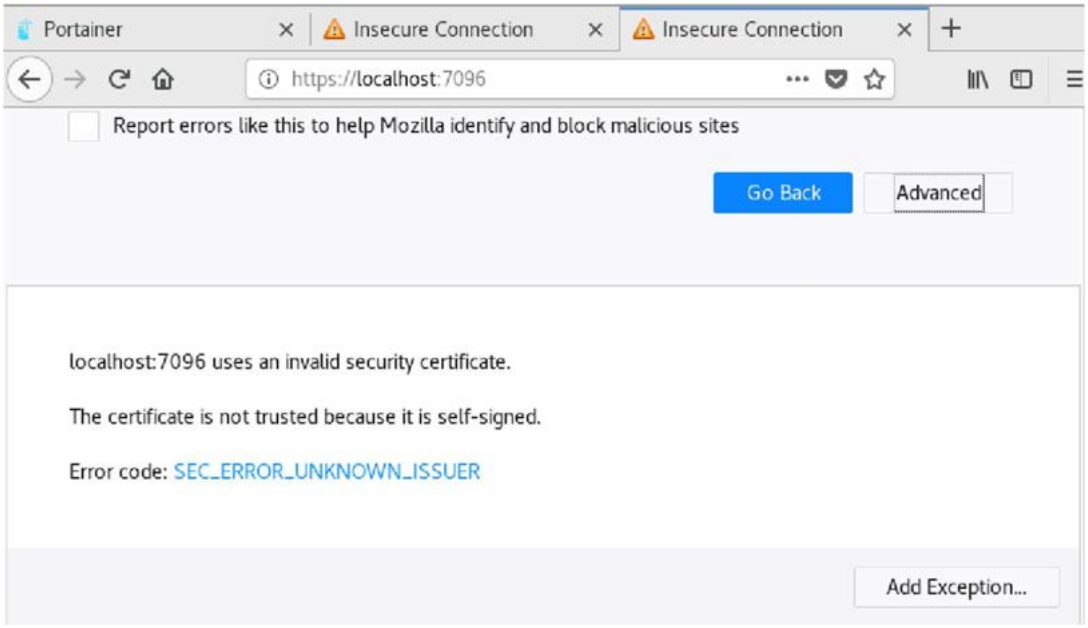


To fix it, you need to add a certificate exception to the BUI agent port, with is your assigned port number -1. In this case, it's 7097-1 or 7096.

https://<server IP>:**7096**/mgmt./index.html (you port number maybe different)

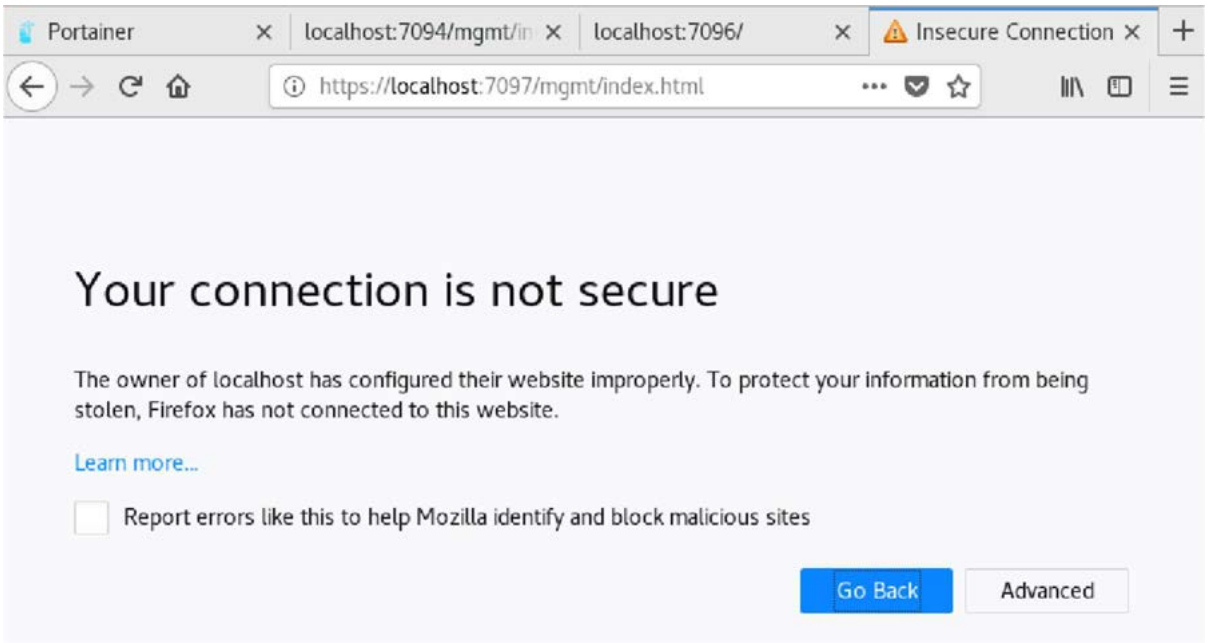


Go through the certificate exception process and add the exception.

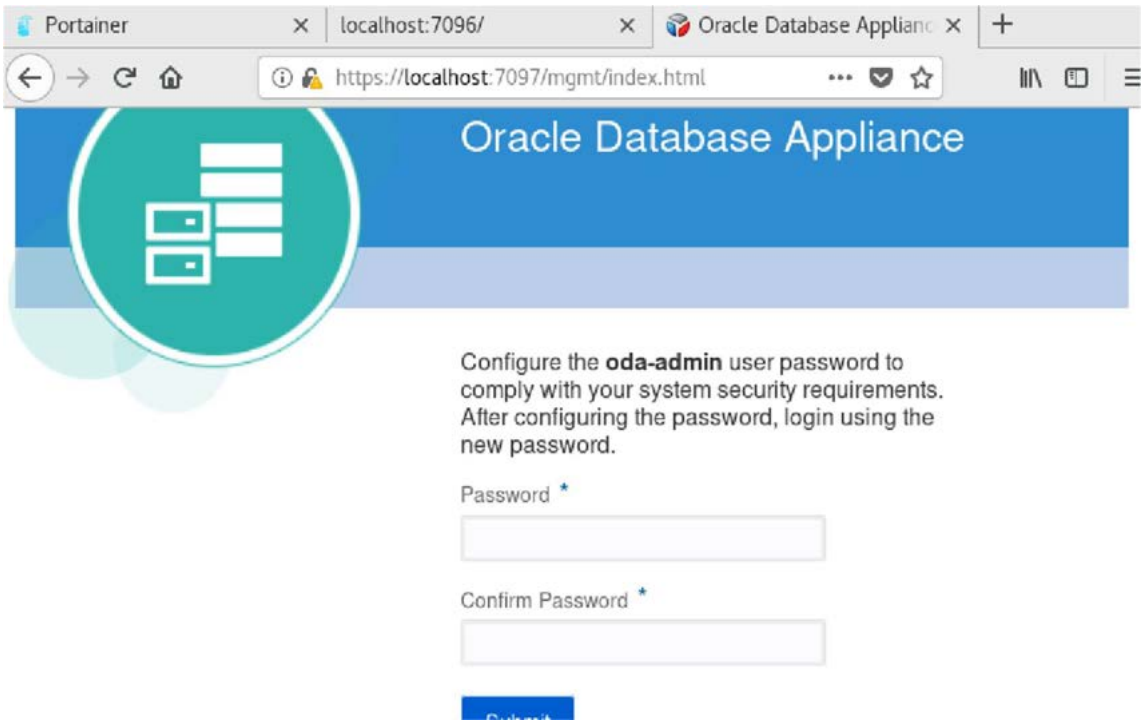


Then go back to your assigned port number.

*https://<server IP>:**7097**/mgmt./index.html*



Go through the certificate exception process again and add the exception. Then you'll be able to access the BUI to create the Appliance.



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Oracle Database Appliance Licensing Information User Manual, Release 19.8

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