ORACLE

Setup Primary Oracle Analytics Server Environment for Disaster Recovery managed by OCI Full Stack Disaster Recovery

Describes how to create Oracle Analytics Sever environment with file system, block volume and attach it to the Oracle Analytics Server Compute Instance.

May 2024, version 1.0

Public

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Revision History

The following revisions have been made to this document since its initial publication.

DATE	REVISION
May 2024	Initial publication

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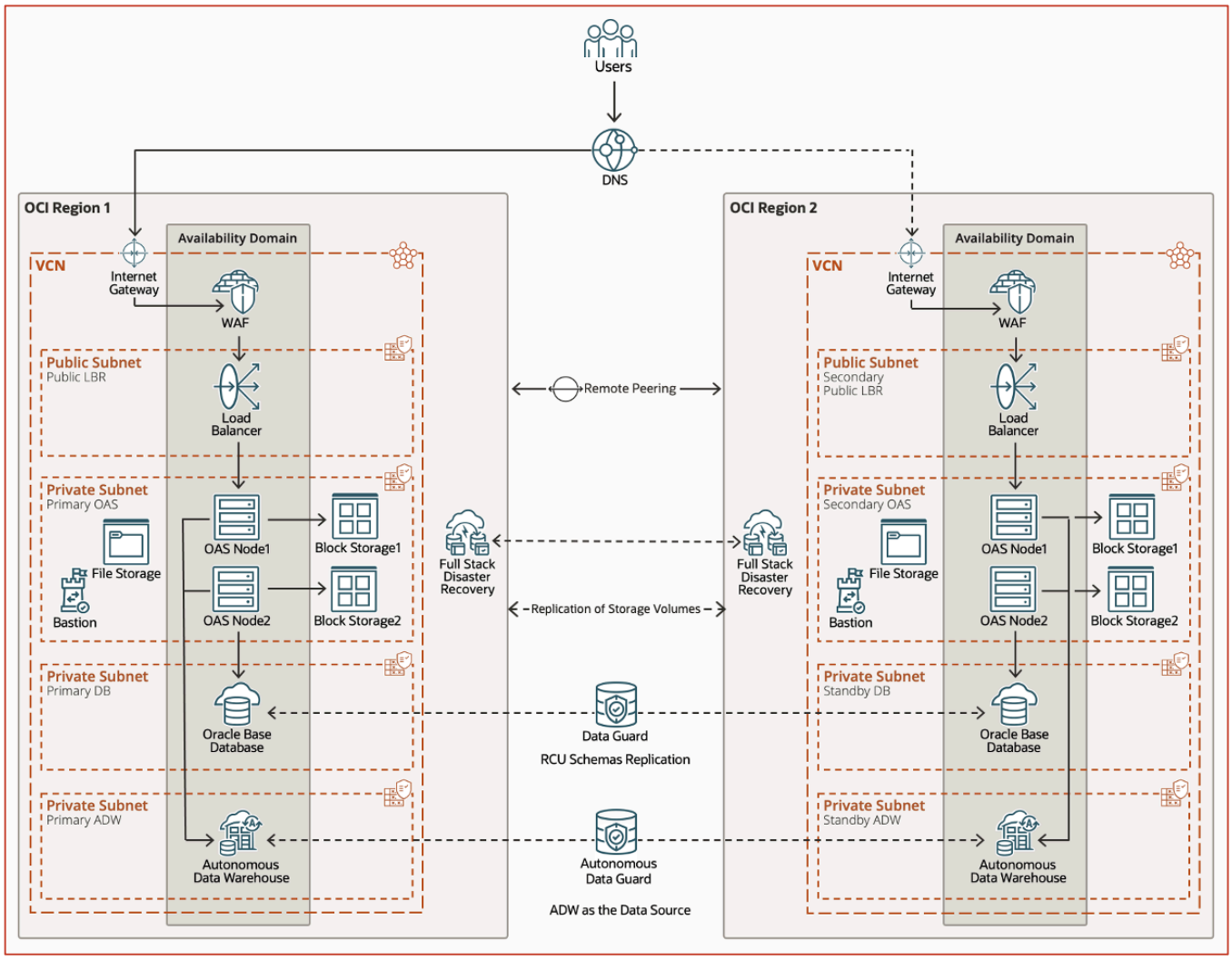
Architecture



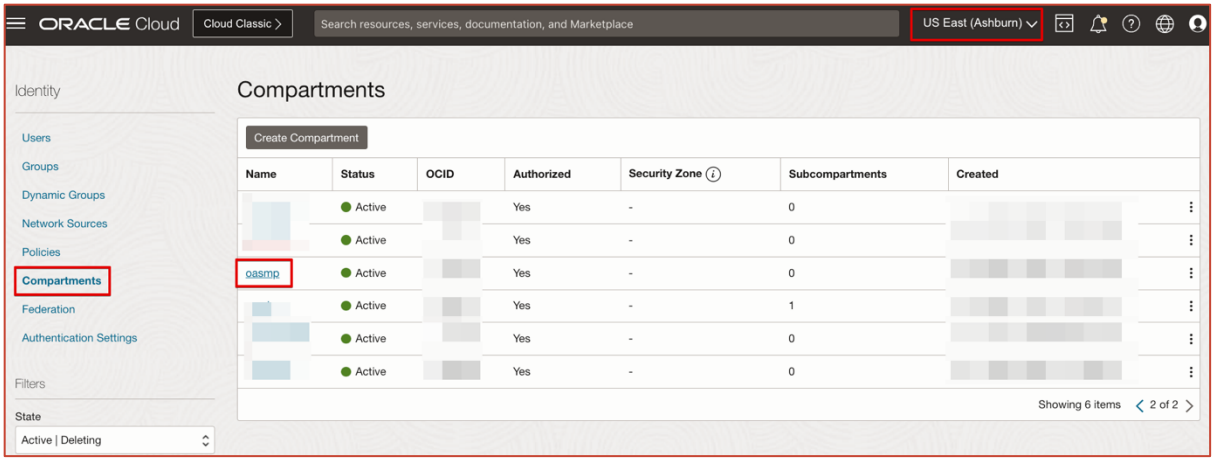
Oracle Cloud Infrastructure Primary Region (e.g., Ashburn)

Sign-in to OCI Console

- Create a Compartment
- Create a Virtual Cloud Network (VCN)
- Create an Oracle Analytics Server Instance with the domain in the Private Subnet of the VCN

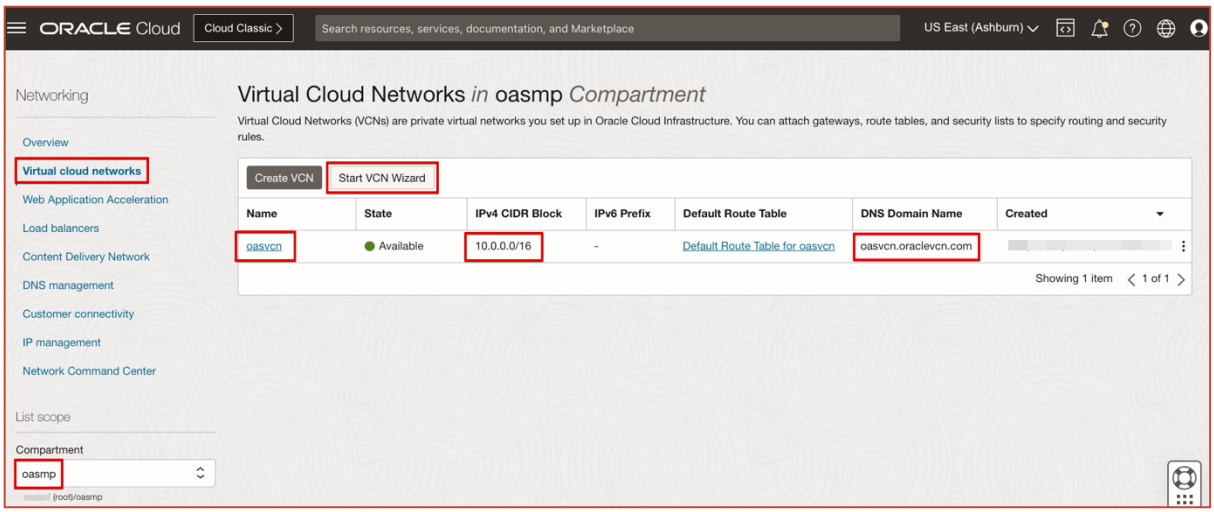
Create a Compartment

Create a compartment under the root compartment.

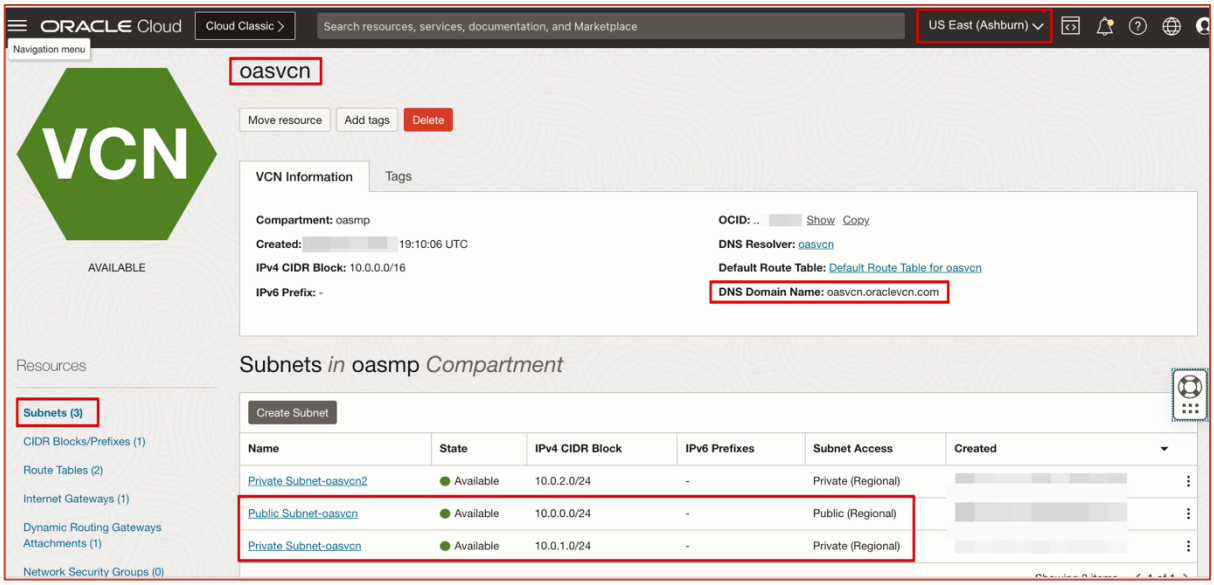


Create a Virtual Cloud Network

Create a Virtual Cloud Network (VCN) in the compartment using the wizard.



Public and Private Subnets are created while creating the VCN using the wizard.



Create an OAS Marketplace Instance

For the OAS DR using Database RCU schema replication managed by OCI Full Stack DR, we need the OAS instances to have the same hostnames, including the domain names; for example, the FQDN of the primary OAS instance and the DR instance should be the same as “oas1.oase.oasvcn.oraclevcn.com, oas2.oase.oasvcn.oraclevcn.com”.

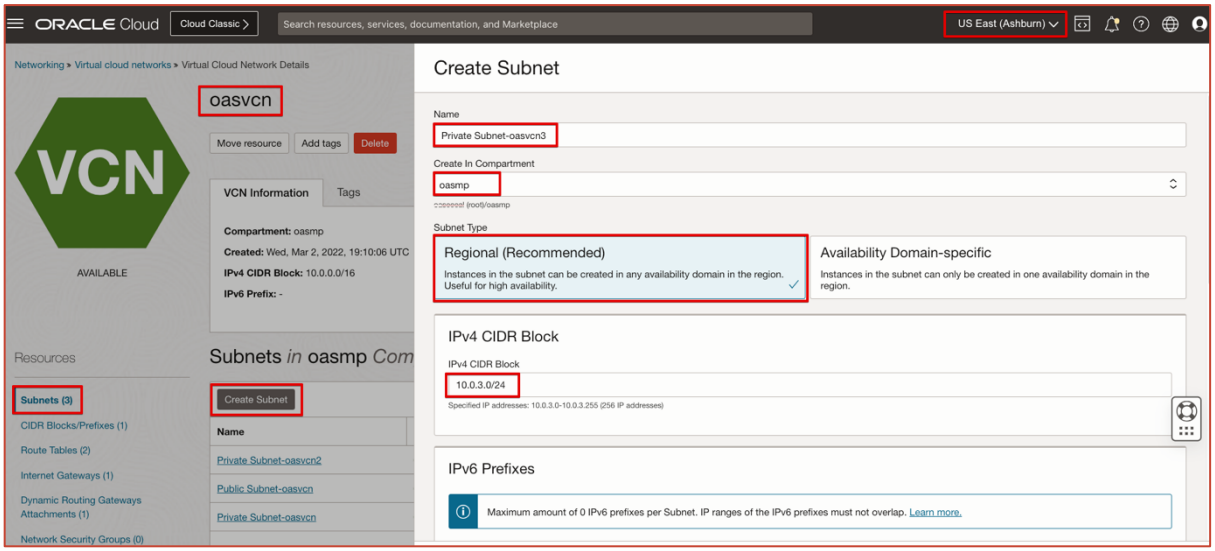
To do so, we need to create a compartment, VCN, and private subnets in OCI’s primary (home) region, for example, Ashburn, and in OCI’s DR region, for example, Phoenix, use the existing compartment and create the same VCN and private subnets.

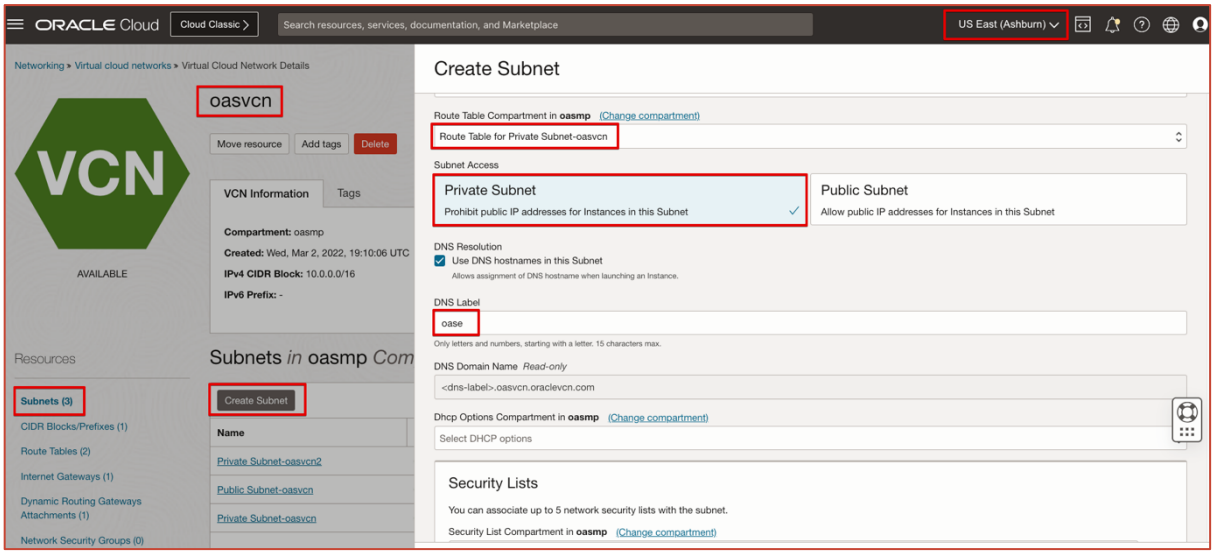
NOTE: The compartment is not limited to the OCI region; it is available in both regions once created.

Since we already have a compartment, for example, “oasmp”, use the existing one, create same VCN and Subnets.

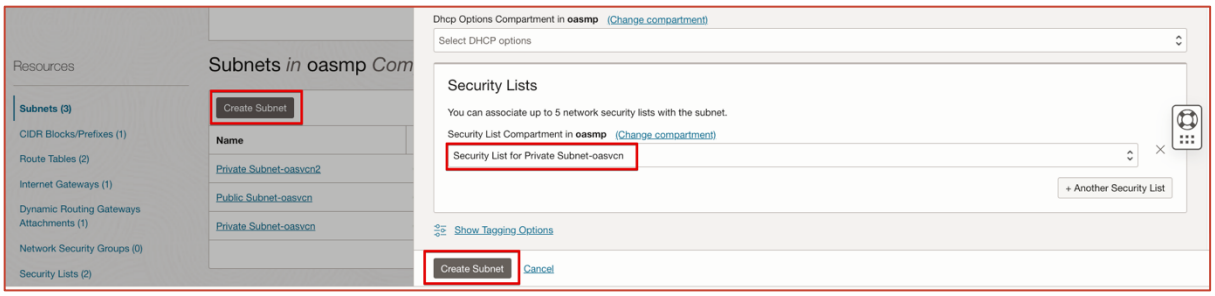
Create Private Subnets

Create a new private subnet in both regions without overlapping their CIDR blocks.



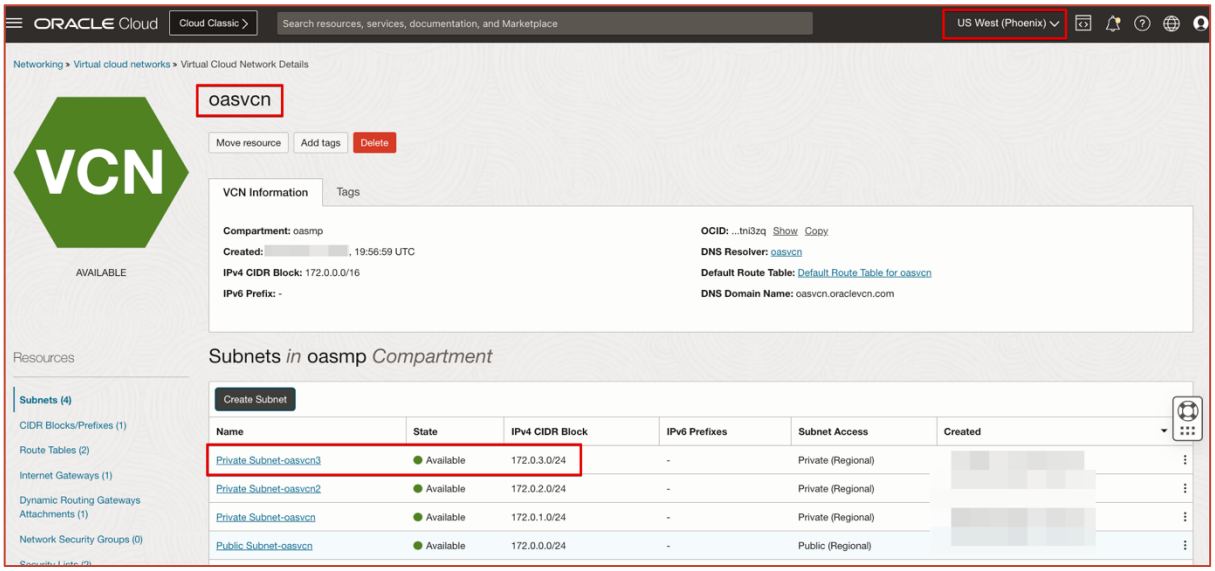


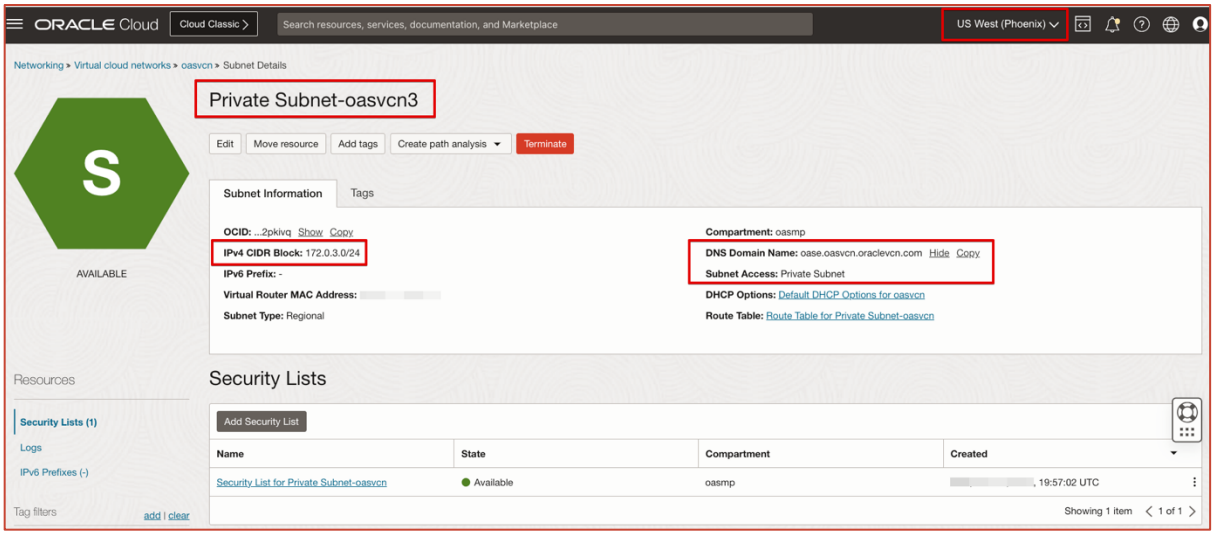
NOTE: Enter a DNS Label such as “oase” or any. Its important to give the DNS Label to maintain same FQDN of the OAS nodes.



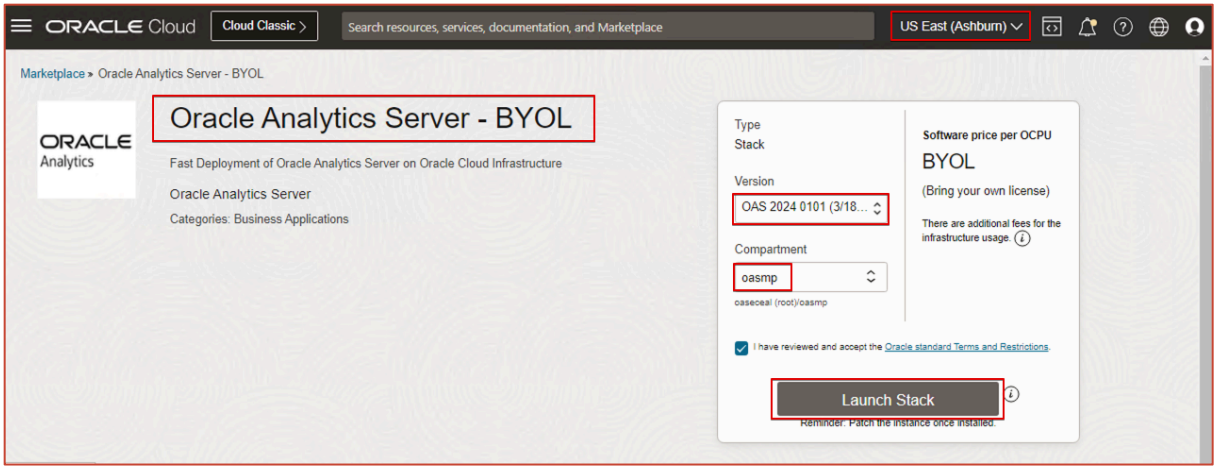
NOTE: Ensure the ingress security rules exist for the DBCS host and port from the OAS server subnet.

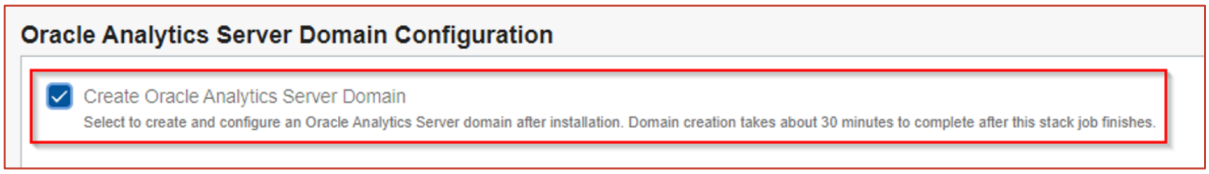
Similarly, create the same subnet in the OCI DR region, for example, Phoenix.





Create the primary OAS Marketplace instance1 with a domain in the OCI's home region, such as Ashburn, and a hostname, such as oas1.

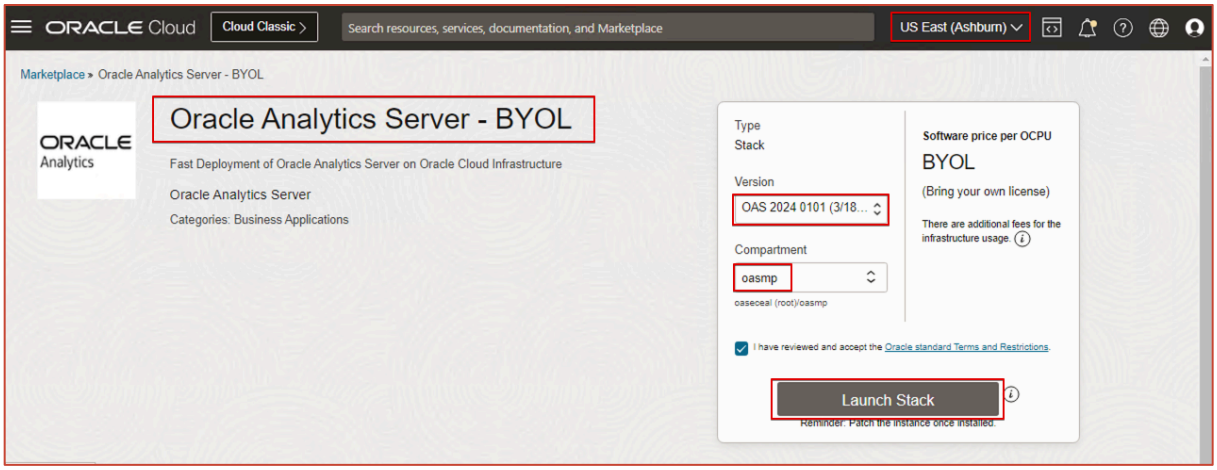


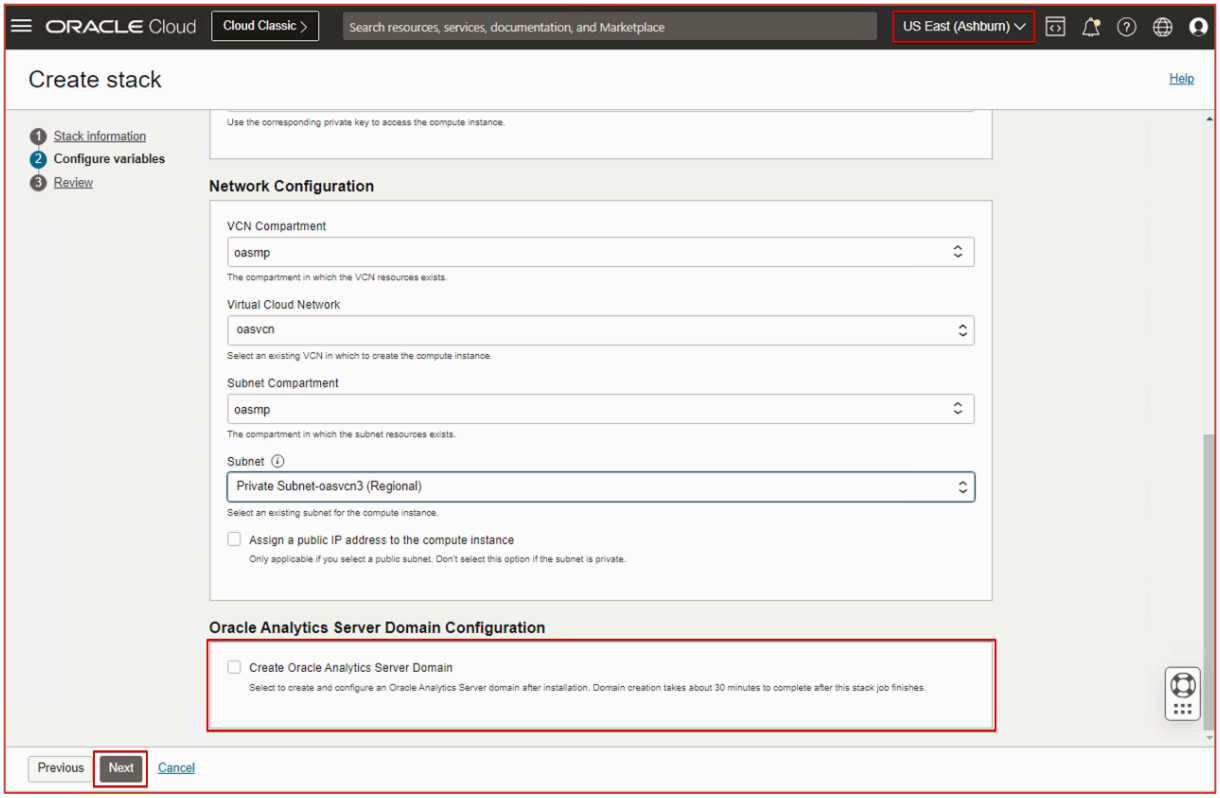


While creating the OAS instance1, use the below DBCS pluggable database connection string.

db19rac-scan.ceal.oracle.com:1521:pdb19rac.ceal.oasvcn.oraclevcn.com

Similarly, create an OAS marketplace instance2 without domain config in the same OCI home region, such as Ashburn, and a hostname, such as oas2.





Check the hostnames of both the OAS instances.

Ashburn:

oas1.oase.oasvcn.oraclevcn.com

oas2.oase.oasvcn.oraclevcn.com

Test that the domain is created successfully and that the OAS URL is accessible from the OAS instance1 in the OCI's home region.

Stop all the services on the OAS compute instance1.

/u01/data/domains/bi/bitools/bin/stop.sh

Create OAS OCI Compute Instances (Silent Installation)

Install If your requirement demands that you create OCI compute VMs for OAS and install OAS without using the OCI Marketplace, you can create OCI compute VMs in the private subnet and access them through the bastion server.

Refer to the silent installation and configuration blog, Automating Oracle Analytics Server Silent Installation, Critical Patch Update, and Configuration on Linux for OAS 2024.

Automating Oracle Analytics Server Silent Installation, Critical Patch Update, and Configuration on Linux (Doc ID 3022531.1).

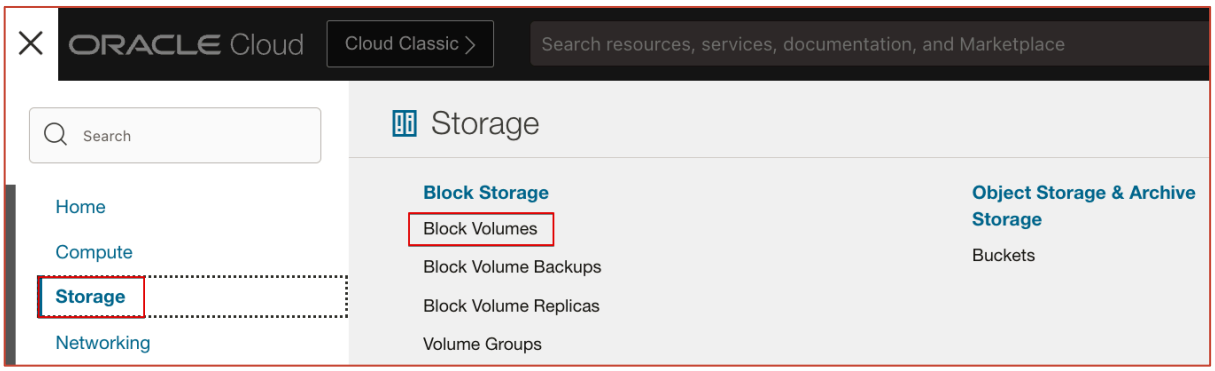
Create a Block Volume

Create a Block Volume in OCI Console, For more details, see Block Volume, see Creating a Block Volume.

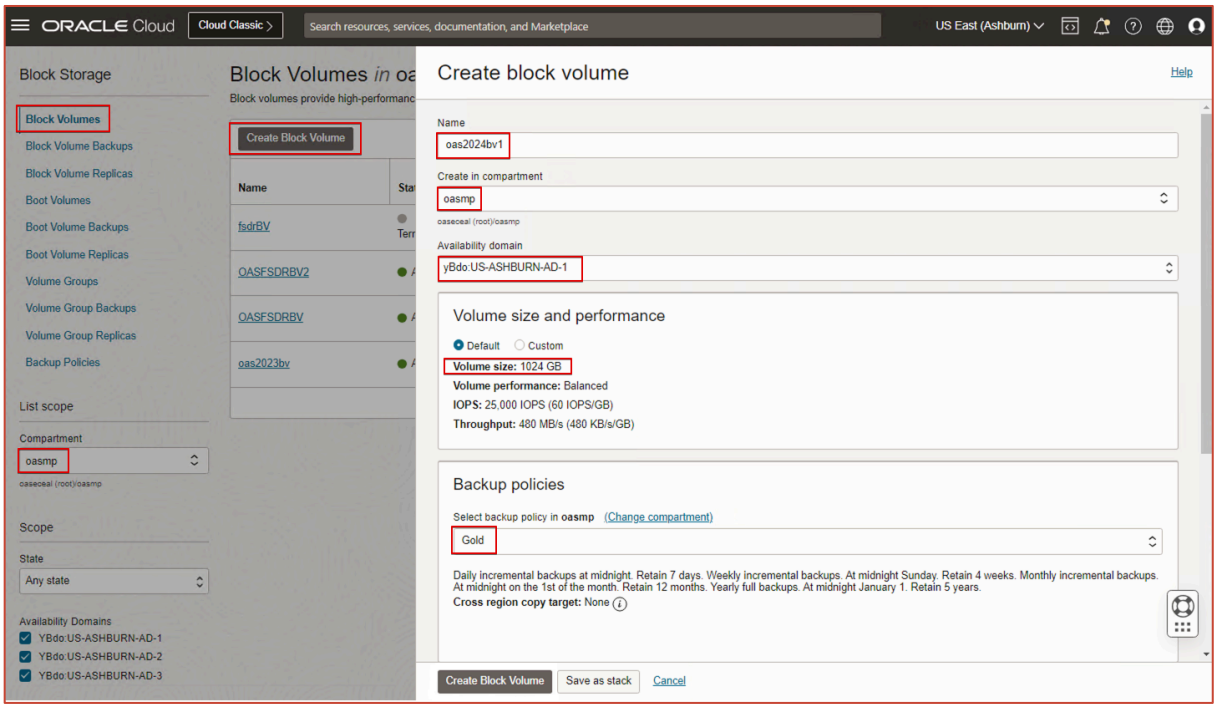
Create a block volume for the OAS compute instance1 in OCI's home region, for example, Ashburn.

Sign-in to OCI Console

Navigate to Storage → Block Volumes



Create Block Volume

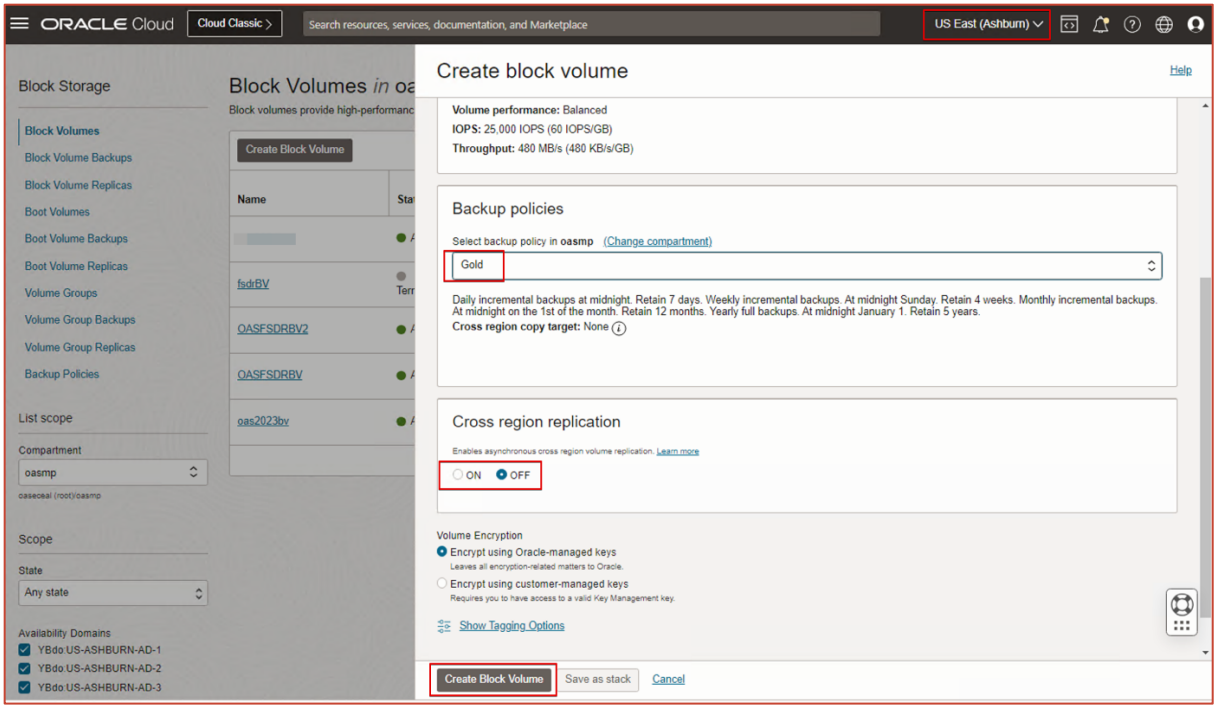


Select the same compartment as the OAS compute instance exists.

Select the volume size (1024 GB or 512 GB) per your requirement.

Select the Backup policy per your requirement between (Gold or Silver or Bronze).

For more details, see the OCI Documentation.



Do not enable cross-region replication.

Attach the Block Volume

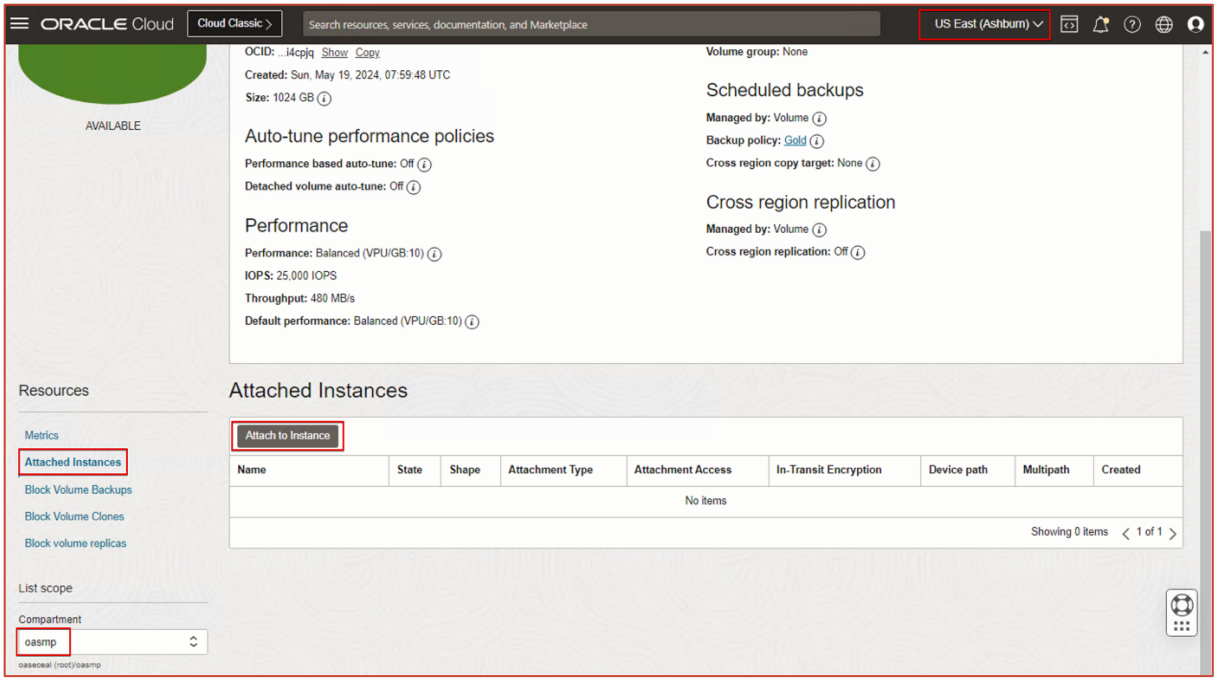
Attach the Block Volume to the OAS compute instance1, For more details, see Attaching a Volume

NOTE: Do not mount the same block volume to multiple compute instances; better to have a dedicated block volume for each compute instance.

Go to OCI's home region, such as Ashburn.

Add the block volume to the OAS compute instance1.

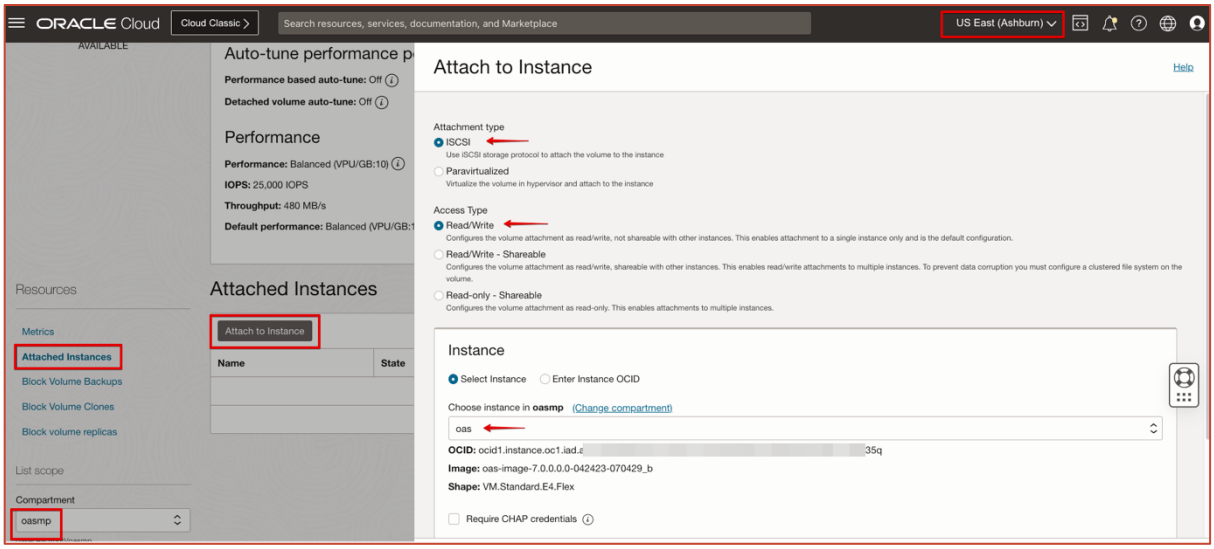
Navigate to the block volume → Attached Instances



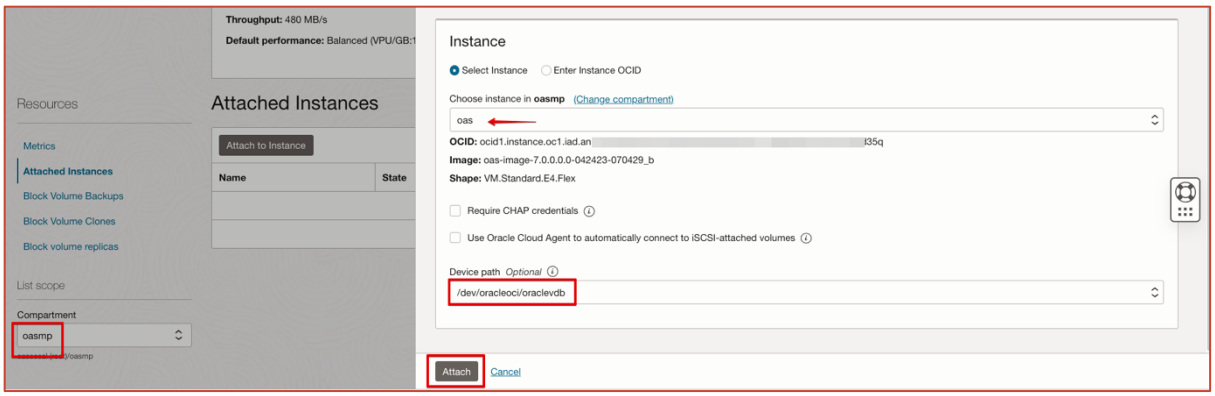
While attaching the block volume to the OAS compute instance, choose the attachment type based on your requirement. See the OCI documentation, Overview of Block Volume.

In this example, choose the **iSCSI attachment type** as the IOPS performance is better with iSCSI attachments compared to paravirtualized attachments.

For more information about iSCSI-attached volume performance, see Block Volume Performance.



Select the OAS instance for which you need to attach the Block volume.



To list the existing Device Paths on the OAS Compute instance, run the below command.

```
ll /dev/oracleoci/oraclevd*
```

```
[root@oas opc]# ll /dev/oracleoci/oraclevd*
lrwxrwxrwx. 1 root root 6 Sep  5 20:22 /dev/oracleoci/oraclevda -> ../sda
lrwxrwxrwx. 1 root root 7 Sep  5 20:22 /dev/oracleoci/oraclevda1 -> ../sda1
lrwxrwxrwx. 1 root root 7 Sep  5 20:22 /dev/oracleoci/oraclevda2 -> ../sda2
lrwxrwxrwx. 1 root root 7 Sep  5 20:22 /dev/oracleoci/oraclevda3 -> ../sda3
lrwxrwxrwx. 1 root root 7 Sep  5 20:22 /dev/oracleoci/oraclevda4 -> ../sda4
lrwxrwxrwx. 1 root root 7 Sep  5 20:22 /dev/oracleoci/oraclevda5 -> ../sda5
[root@oas opc]#
```

```
fdisk -l
```

```
[root@oas opc]# fdisk -l
WARNING: fdisk GPT support is currently new, and therefore in an experimental phase. Use at your own discretion.

Disk /dev/sda: 751.6 GB, 751619276800 bytes, 1468006400 sectors
Units = sectors of 1 * 512 = 512 bytes
Sector size (logical/physical): 512 bytes / 4096 bytes
I/O size (minimum/optimal): 4096 bytes / 1048576 bytes
Disk label type: gpt
Disk identifier: C964E8FC-5212-4DFD-9771-F2F8D1E5EE86


#         Start          End    Size  Type            Name
 1        2048       411647    200M  EFI System      EFI System Partition
 2      411648     17188863      8G  Linux swap
 3    17188864    226904063    100G  Linux filesyste
 4   226904064    436619263    100G  Microsoft basic primary
 5   436619264   1468004351  491.8G  Microsoft basic primary

Disk /dev/mapper/vg_app-vg_app--lv_app: 107.4 GB, 107369988096 bytes, 209707008 sectors
Units = sectors of 1 * 512 = 512 bytes
Sector size (logical/physical): 512 bytes / 4096 bytes
I/O size (minimum/optimal): 4096 bytes / 1048576 bytes


Disk /dev/mapper/vg_data-vg_data--lv_data: 528.1 GB, 528067067904 bytes, 1031380992 sectors
Units = sectors of 1 * 512 = 512 bytes
Sector size (logical/physical): 512 bytes / 4096 bytes
I/O size (minimum/optimal): 4096 bytes / 1048576 bytes
```

```
df -h
```

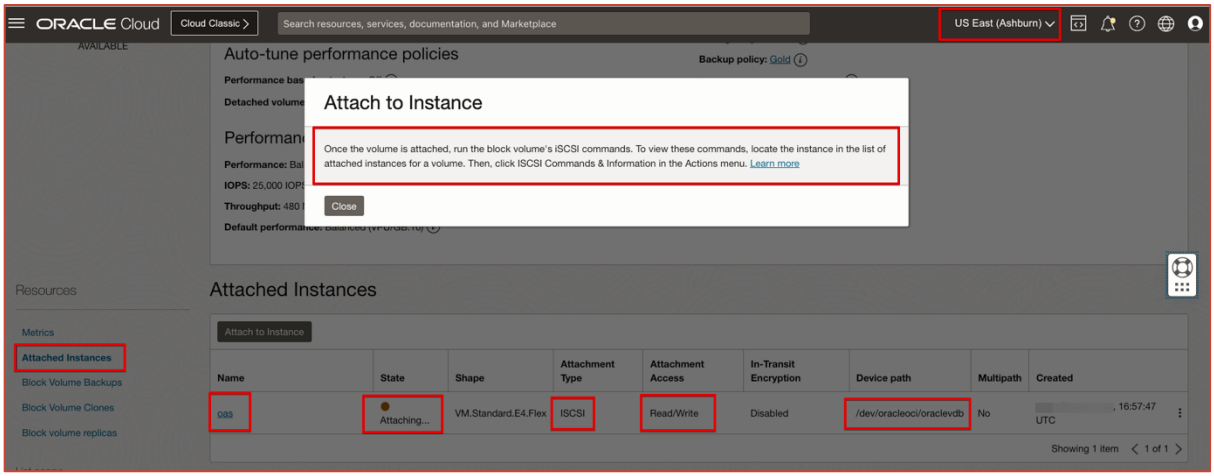
```
[root@oas opc]# df -h
Filesystem                             Size  Used Avail Use% Mounted on
devtmpfs                                32G     0   32G   0% /dev
tmpfs                                   32G     0   32G   0% /dev/shm
tmpfs                                   32G   17M   32G   1% /run
tmpfs                                   32G     0   32G   0% /sys/fs/cgroup
/dev/sda3                              100G  4.0G   97G   4% /
/dev/sda1                              200M  7.4M  193M   4% /boot/efi
/dev/mapper/vg_app-vg_app--lv_app       98G   13G   81G  14% /u01/app
tmpfs                                  6.3G     0  6.3G   0% /run/user/0
/dev/mapper/vg_data-vg_data--lv_data   484G  2.5G  456G   1% /u01/data
tmpfs                                  6.3G     0  6.3G   0% /run/user/1000
tmpfs                                  6.3G     0  6.3G   0% /run/user/994
```

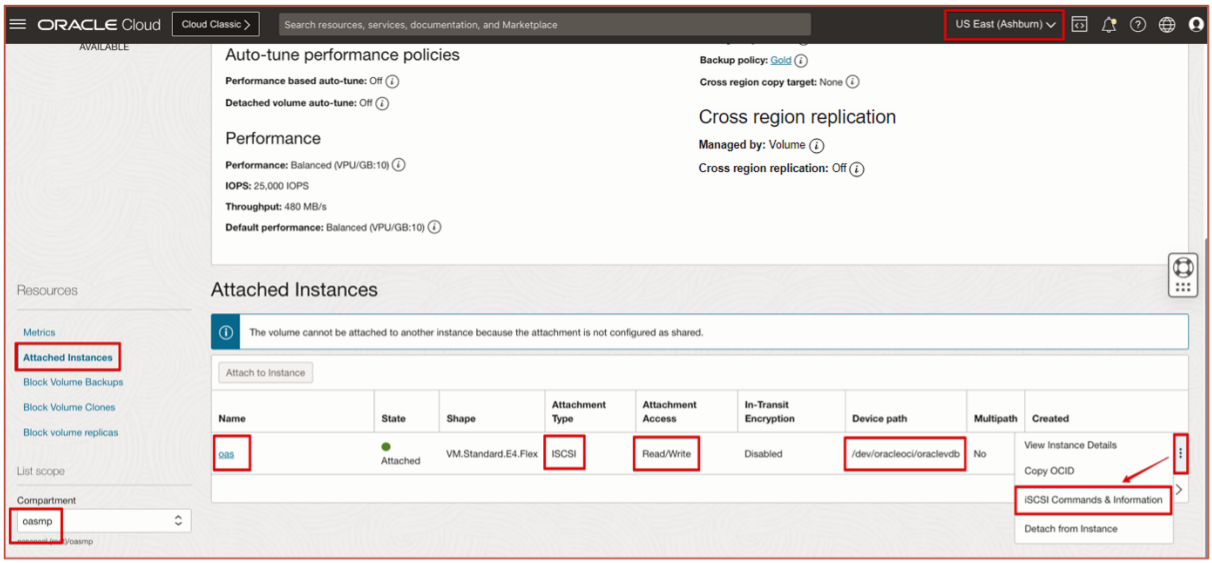
```
lsblk
```

```
[root@oas opc]# lsblk
NAME                          MAJ:MIN RM   SIZE RO TYPE MOUNTPOINT
sda                             8:0    0   700G  0 disk
├─sda4                          8:4    0   100G  0 part
│ └─vg_app-vg_app--lv_app     252:0    0   100G  0 lvm  /u01/app
├─sda2                          8:2    0     8G  0 part [SWAP]
├─sda5                          8:5    0 491.8G  0 part
│ └─vg_data-vg_data--lv_data  252:1    0 491.8G  0 lvm  /u01/data
├─sda3                          8:3    0   100G  0 part /
└─sda1                          8:1    0   200M  0 part /boot/efi
[root@oas opc]#
```

Since the device path `/dev/oracleoci/oraclevda` is already used, we can select below device path "`/dev/oracleoci/oraclevdb`".

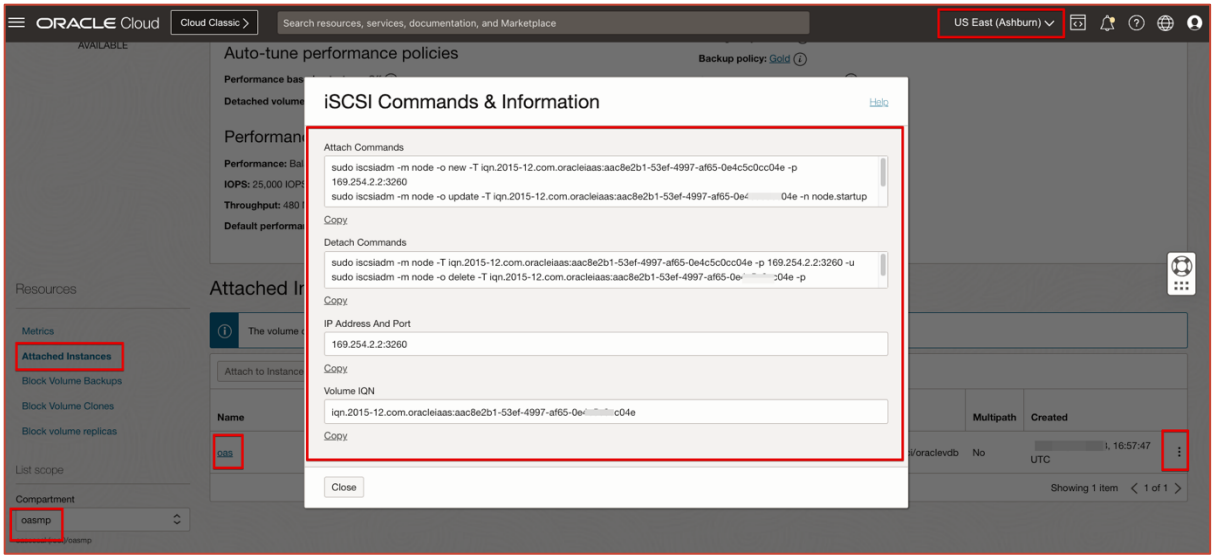
Click on Attach.



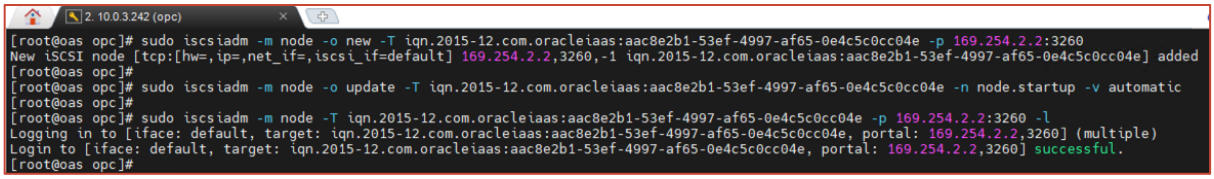


Select the **Actions** menu and click on the **iSCSI commands & Information**.

NOTE: If you chose the Attachment type as Paravirtualized, you need not run the iSCSI commands.

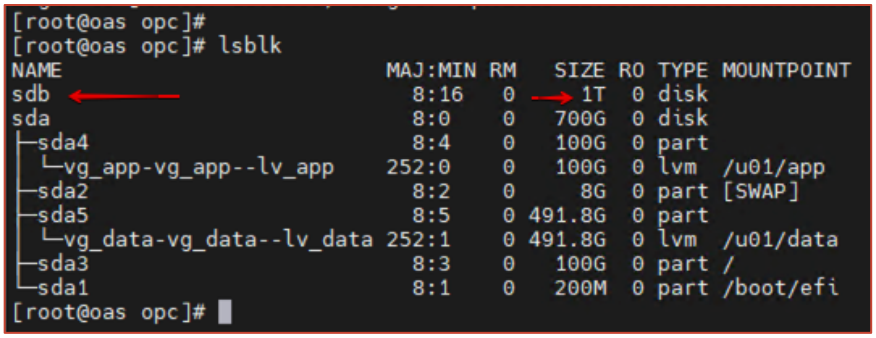


Attach commands should be run on the Target OAS compute instance.



Run the command to check the attachment.

`lsblk`



`fdisk -l`

```
[root@oas opc]# fdisk -l
WARNING: fdisk GPT support is currently new, and therefore in an experimental phase. Use at your own discretion.

Disk /dev/sda: 751.6 GB, 751619276800 bytes, 1468006400 sectors
.config          2023-04-24 05:38   opc   opc   drwxrwxr-x
I/O size (minimum/optimal): 4096 bytes / 1048576 bytes
Disk label type: gpt
Disk identifier: C964E8FC-5212-4DFD-9771-F2F8D1E5EE86


#         Start          End    Size  Type            Name
 1         2048       411647    200M  EFI System      EFI System Partition
 2       411648     17188863      8G  Linux swap
 3     17188864    226904063    100G  Linux filesyste
 4    226904064    436619263    100G  Microsoft basic primary
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Disk /dev/mapper/vg_app-vg_app--lv_app: 107.4 GB, 107369988096 bytes, 209707008 sectors
Units = sectors of 1 * 512 = 512 bytes
Sector size (logical/physical): 512 bytes / 4096 bytes
I/O size (minimum/optimal): 4096 bytes / 1048576 bytes


Disk /dev/mapper/vg_data-vg_data--lv_data: 528.1 GB, 528067067904 bytes, 1031380992 sectors
Units = sectors of 1 * 512 = 512 bytes
Sector size (logical/physical): 512 bytes / 4096 bytes
I/O size (minimum/optimal): 4096 bytes / 1048576 bytes


Disk /dev/sdb: 1099.5 GB, 1099511627776 bytes, 2147483648 sectors
Units = sectors of 1 * 512 = 512 bytes
Sector size (logical/physical): 512 bytes / 4096 bytes
I/O size (minimum/optimal): 4096 bytes / 1048576 bytes
```

`ll /dev/oracleoci/oraclevd*`

```
[root@oas opc]# ll /dev/oracleoci/oraclevd*
lrwxrwxrwx. 1 root root 6 Sep  5 20:22 /dev/oracleoci/oraclevda -> ../sda
lrwxrwxrwx. 1 root root 7 Sep  5 20:22 /dev/oracleoci/oraclevda1 -> ../sda1
lrwxrwxrwx. 1 root root 7 Sep  5 20:22 /dev/oracleoci/oraclevda2 -> ../sda2
lrwxrwxrwx. 1 root root 7 Sep  5 20:22 /dev/oracleoci/oraclevda3 -> ../sda3
lrwxrwxrwx. 1 root root 7 Sep  5 20:22 /dev/oracleoci/oraclevda4 -> ../sda4
lrwxrwxrwx. 1 root root 7 Sep  5 20:22 /dev/oracleoci/oraclevda5 -> ../sda5
lrwxrwxrwx. 1 root root 6 Sep  6 17:20 /dev/oracleoci/oraclevdb -> ../sdb
[root@oas opc]#
```

`/dev/sdb` is created as `xfs` file system, change it to `ext4` file system.

Run the command: `mkfs.ext4 /dev/sdb`

```
[root@oas u01]# mkfs.ext4 /dev/sdb
mke2fs 1.45.4 (23-Sep-2019)
Discarding device blocks: done
Creating filesystem with 268435456 4k blocks and 67108864 inodes
Filesystem UUID: f402aa8f-beaf-4bc9-ba16-a1bade079e36
Superblock backups stored on blocks:
        32768, 98304, 163840, 229376, 294912, 819200, 884736, 1605632, 2654208,
        4096000, 7962624, 11239424, 20480000, 23887872, 71663616, 78675968,
        102400000, 214990848

Allocating group tables: done
Writing inode tables: done
Creating journal (262144 blocks): done
Writing superblocks and filesystem accounting information: done

[root@oas u01]#
```

Check the file system, run the command: `sudo blkid`

```
[root@oas u01]# sudo blkid
/dev/sda3: UUID="544006b2-b9e2-4a20-8fc3-9c9857d2f741" TYPE="xfs" PARTUUID="c8d76213-0a0a-4d29-9f5f-29b5c05847f2"
/dev/sda1: SEC_TYPE="msdos" UUID="6AA8-4D0D" TYPE="vfat" PARTLABEL="EFI System Partition" PARTUUID="11d0e5a8-1560-4e2
b-9c25-3e040e8f6073"
/dev/sda2: UUID="04bcf4b0-6498-4157-8d46-cefd16d0079c" TYPE="swap" PARTUUID="ba42ad6a-9ebc-444f-9b06-0d8d97173961"
/dev/sda4: UUID="zQP7wh-ylKM-NXQ3-QSzb-xv6V-5cJG-enXotK" TYPE="LVM2_member" PARTLABEL="primary" PARTUUID="2a5a43cd-1d
df-43f9-b32a-5abf20408daf"
/dev/sda5: UUID="nh8SxO-Gn8G-98hF-r5OB-s22F-vg6y-fQMIlr" TYPE="LVM2_member" PARTLABEL="primary" PARTUUID="d924ff91-f0
e3-41e8-89b0-10cfddac5b1b"
/dev/mapper/vg_app-vg_app--lv_app: UUID="c8e08d0d-6431-47c8-859a-a3a9d6cde4b7" TYPE="ext4"
/dev/mapper/vg_data-vg_data--lv_data: UUID="8751d458-3767-47e7-bcfb-17e0db58fb8b" TYPE="ext4"
/dev/sdb: UUID="f402aa8f-beaf-4bc9-ba16-a1bade079e36" TYPE="ext4"
[root@oas u01]#
```

As root user

```
cd /
```

```
ls -l
```

```
[root@oas /]# ls -l
total 36
lrwxrwxrwx.   1 root   root      7 Sep 26  2022 bin -> usr/bin
dr-xr-xr-x.   4 root   root   4096 Sep  5 20:22 boot
drwxr-xr-x.  22 root   root   3340 Sep  6 17:20 dev
drwxr-xr-x.  95 root   root   8192 Sep  6 17:36 etc
drwxr-xr-x.   4 root   root     31 Apr 24 05:25 home
lrwxrwxrwx.   1 root   root      7 Sep 26  2022 lib -> usr/lib
lrwxrwxrwx.   1 root   root      9 Sep 26  2022 lib64 -> usr/lib64
drwxr-xr-x.   2 root   root      6 Apr 11  2018 media
drwxr-xr-x.   2 root   root      6 Apr 11  2018 mnt
drwxr-xr-x.   4 root   root     48 Jun  1 11:30 opt
dr-xr-xr-x. 241 root   root      0 Sep  5 20:22 proc
dr-xr-x---.   6 root   root   4096 Sep  6 16:38 root
drwxr-xr-x.  32 root   root   1080 Sep  6 17:16 run
lrwxrwxrwx.   1 root   root      8 Sep 26  2022 sbin -> usr/sbin
drwxr-xr-x.   2 root   root      6 Apr 11  2018 srv
dr-xr-xr-x.  13 root   root      0 Sep  5 20:22 sys
drwxrwxrwt.  17 root   root   4096 Sep  6 15:06 tmp
drwxrwxrwx.   4 oracle oracle   29 Sep  5 20:22 u01
drwxr-xr-x.  13 root   root   4096 Sep 26  2022 usr
drwxr-xr-x.  21 root   root   4096 Apr 24 05:10 var
```

Rename the `/u01` folder to `/u01_bkp`

```
mv /u01 /u01_bkp
```

```
[root@oas /]# mv /u01 /u01_bkp
[root@oas /]# ls -l
total 32
lrwxrwxrwx.   1 root   root      7 Sep 26  2022 bin → usr/bin
dr-xr-xr-x.   4 root   root   4096 Sep  5 20:30 boot
drwxr-xr-x.  22 root   root   3340 Sep  6 20:20 dev
drwxr-xr-x.  95 root   root   8192 Sep  6 16:26 etc
drwxr-xr-x.   4 root   root     31 Apr 24 05:25 home
lrwxrwxrwx.   1 root   root      7 Sep 26  2022 lib → usr/lib
lrwxrwxrwx.   1 root   root      9 Sep 26  2022 lib64 → usr/lib64
drwxr-xr-x.   2 root   root      6 Apr 11  2018 media
drwxr-xr-x.   2 root   root      6 Apr 11  2018 mnt
drwxr-xr-x.   4 root   root     48 Jun  1 11:30 opt
dr-xr-xr-x. 241 root   root      0 Sep  5 20:29 proc
dr-xr-x---.   6 root   root   4096 Sep  6 15:15 root
drwxr-xr-x.  32 root   root   1080 Sep  6 20:11 run
lrwxrwxrwx.   1 root   root      8 Sep 26  2022 sbin → usr/sbin
drwxr-xr-x.   2 root   root      6 Apr 11  2018 srv
dr-xr-xr-x.  13 root   root      0 Sep  5 20:29 sys
drwxrwxrwt.  10 root   root   4096 Sep  6 20:13 tmp
drwxrwxrwx.   4 oracle oracle   29 Sep  5 20:29 u01_bkp
drwxr-xr-x.  13 root   root   4096 Sep 26  2022 usr
drwxr-xr-x.  21 root   root   4096 Apr 24 05:10 var
[root@oas /]#
```

Create a folder `/u01` and mount the `/dev/sdb` path which is the path due to attaching the Block volume.

As root user

```
mkdir /u01
```

Take backup of `/etc/fstab` file.

```
cp /etc/fstab /etc/fstab_orig
```

Edit the `/etc/fstab` and add the line to mount the path

Change the existing mount points

From:

```
/dev/vg_app/vg_app-lv_app /u01/app
```

```
/dev/vg_data/vg_data-lv_data /u01/data
```

To:

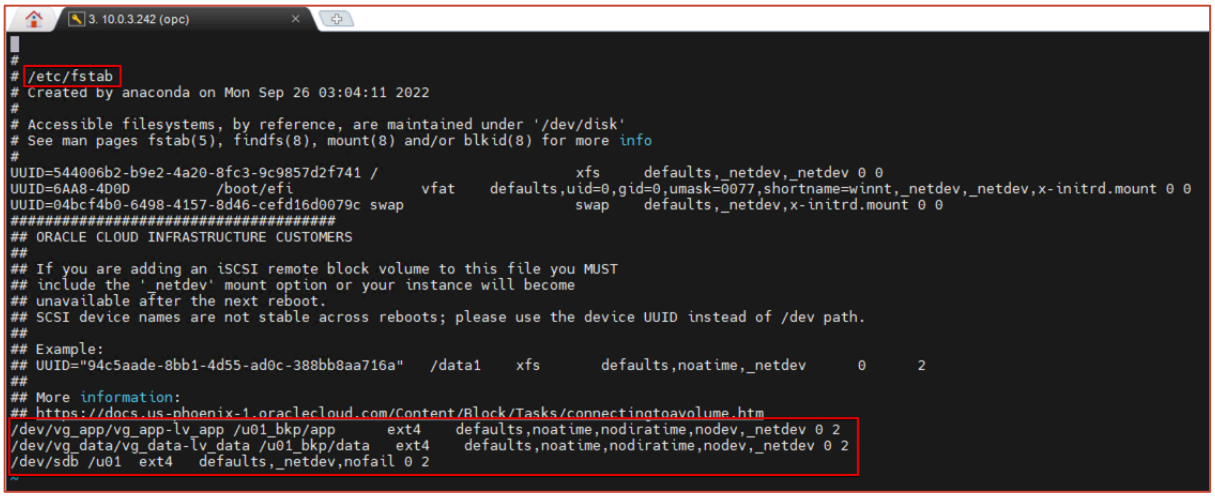
`/dev/vg_app/vg_app-lv_app /u01_bkp/app`

`/dev/vg_data/vg_data-lv_data /u01_bkp/data`

Add new line to mount the attached block volume device path `/dev/sdb` as `/u01`

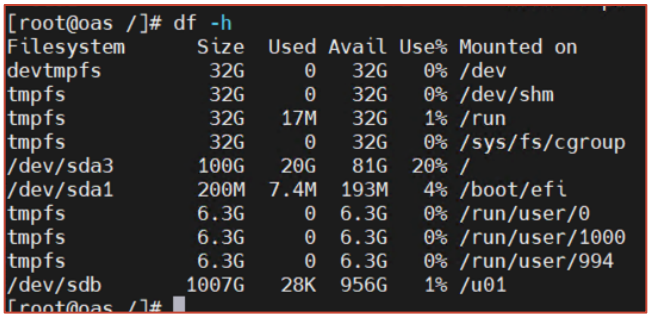
`fdisk -l` command shows that the attached path as `/dev/sdb`

`/dev/sdb /u01 ext4 defaults,_netdev,nofail 0 2`



`sudo mount -a`

`df -h`

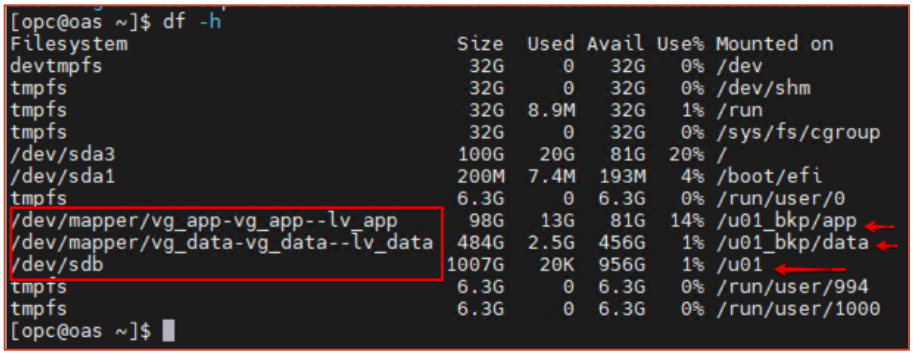


Reboot the OAS compute instance either from the ssh terminal or from the OCI console

`reboot -f`

After restart, check the mount point.

`df -h`



```
chown -R oracle:oracle /u01

chmod 777 /u01
```

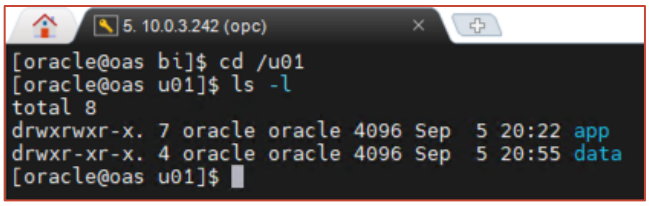
Copy the app and data folder from `/u01_bkp` to `/u01`

```
cd /u01_bkp

cp -rp * /u01

cd /u01

ls -l
```



Start the services in the OAS instance1 and test the access of the OAS.

After the test, stop all services in the OCI home region OAS instance1.

Since the block volume oas2024bv1 is attached to the OAS instance1 and the app and data folders are copied from the /u01_bkp to /u01, the block volume has the data.

Repeat the steps, creating a Block Volume (oas2024bv2), attaching it, and mounting it to the OAS compute instance for the second OAS node2 in the Cluster environment.

You can automate these steps using the OCI CLI and bash scripts if needed.

Setup Shared Files and Directories between the two OAS nodes

Create the singleton data directory (SSD) with OCI File System Storage for an OAS cluster environment and mount it as a shareable folder with read/write permissions between the OAS server's cluster nodes.

For more details, see Mounting File Systems and Mounting OCI File Storage.

The singleton data directory (SDD) stores the metadata. The default location is set to:

`/u01/data/domains/bi/bidata`

The SDD path is defined in the file bi-environment.xml, located at

`/u01/data/domains/bi/config/fmwconfig/bienv/core/bi-environment.xml`

Edit the `bi-environment.xml` modify **`$DOMAIN_HOME/bidata/`** to **`/sdd/bidata/`**

`<bi:singleton-data-directory>`**`/sdd/bidata/`**`</bi:singleton-data-directory>`

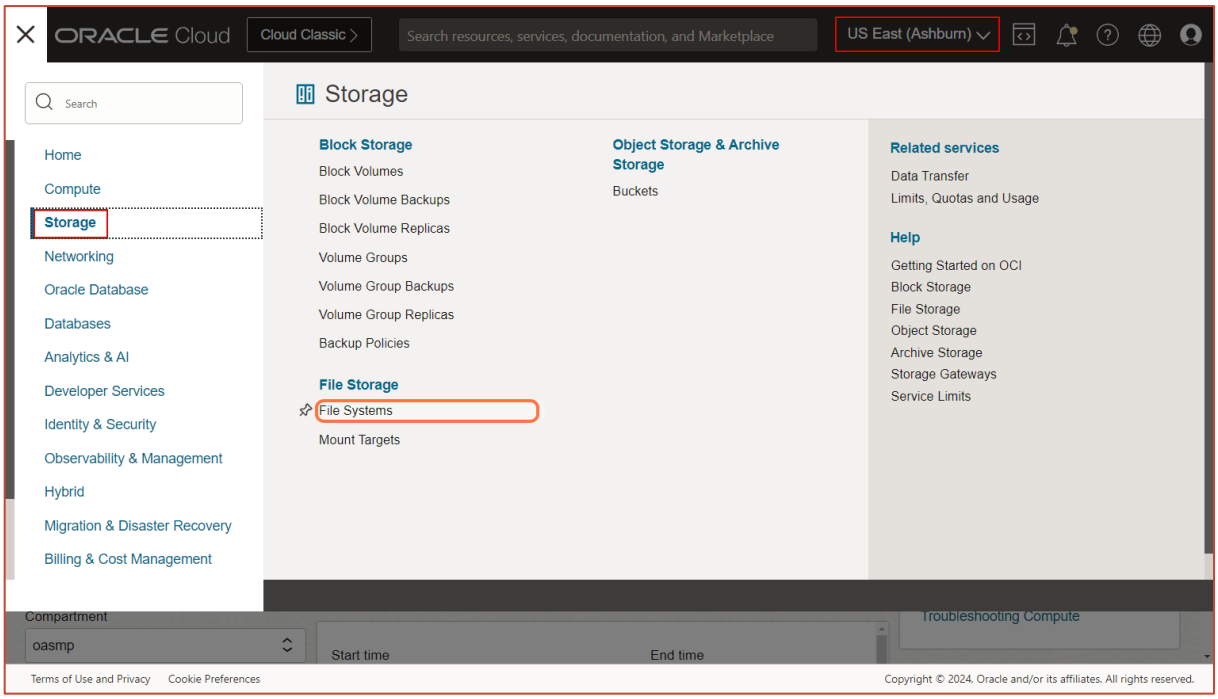
Create an OCI File System Storage and mount it as /sdd on all the nodes of the OAS cluster environment.

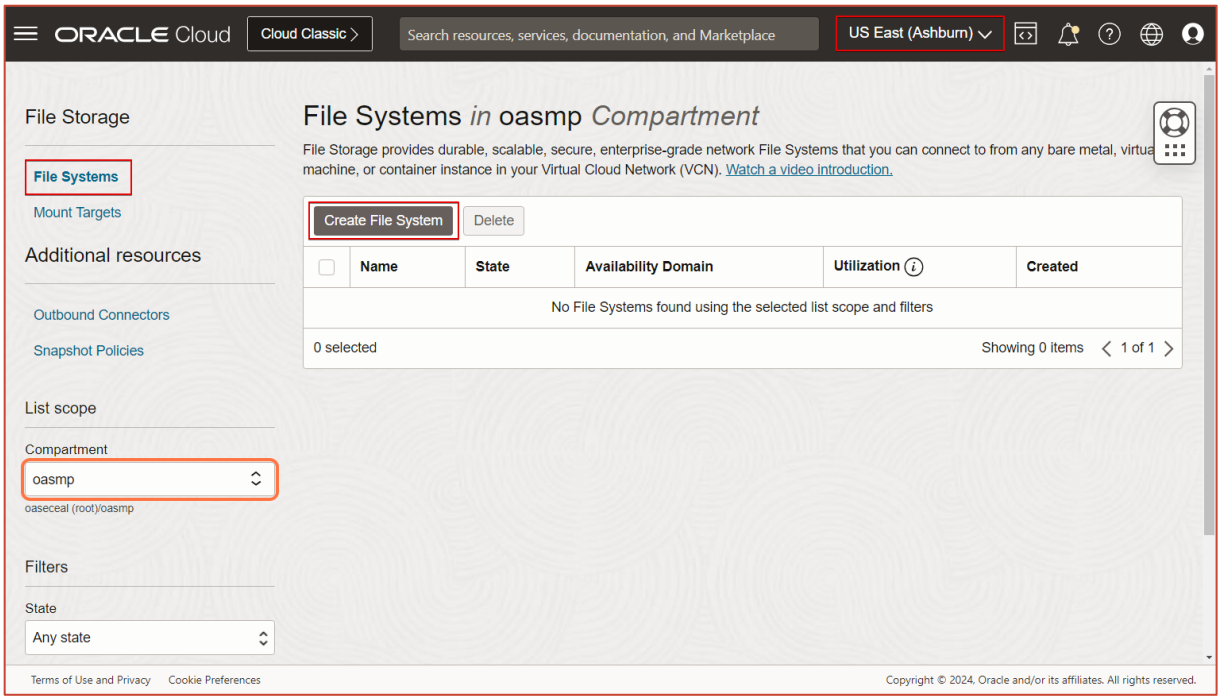
After mounting the OCI File System as /sdd, copy the /u01/data/domains/bi/bidata to /sdd

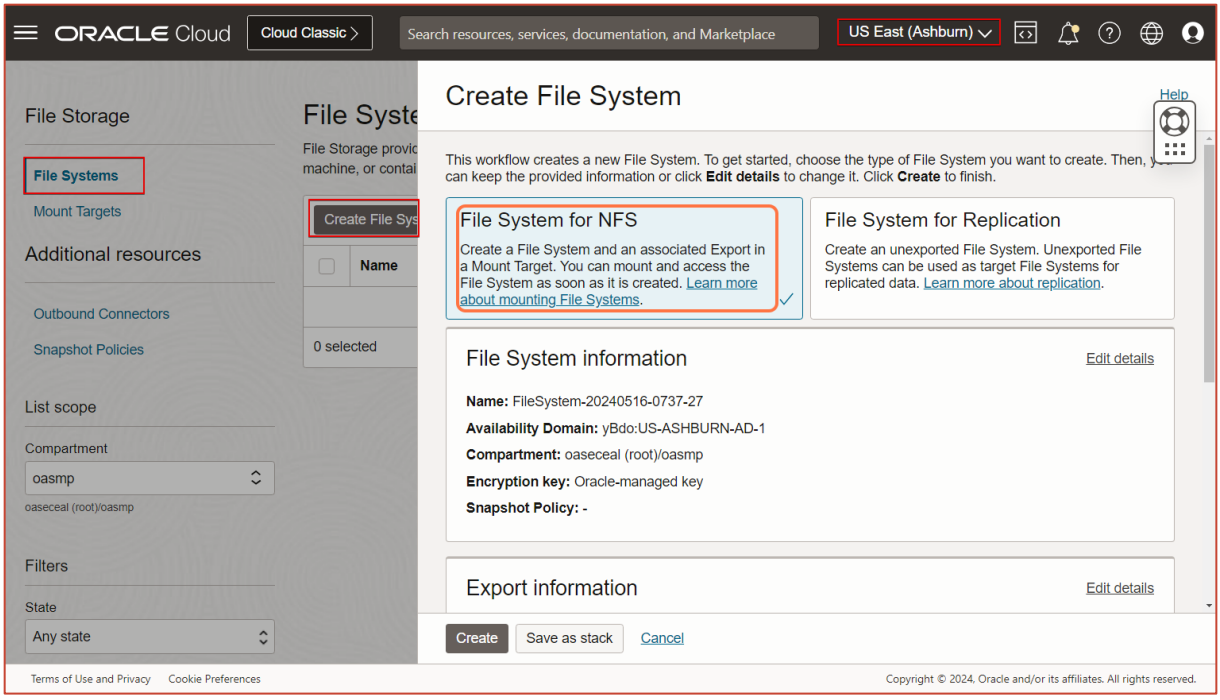
```
cp -rp /u01/data/domains/bi/bidata /sdd
```

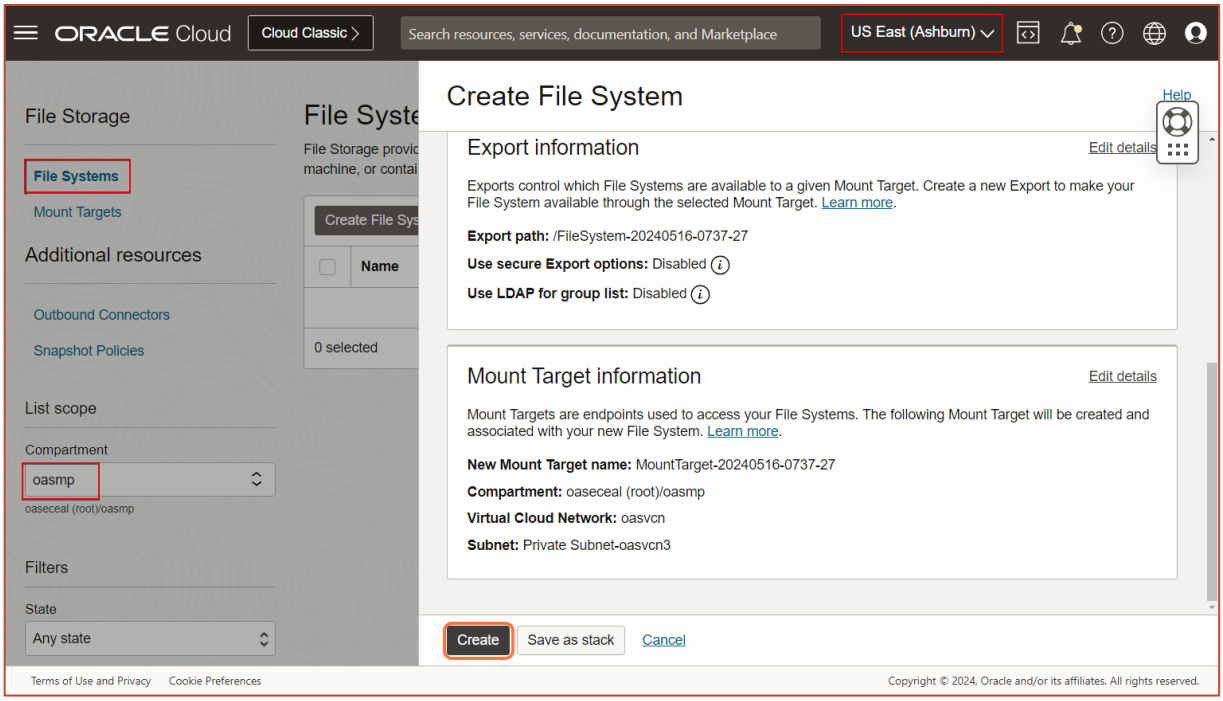
Create a File System Storage

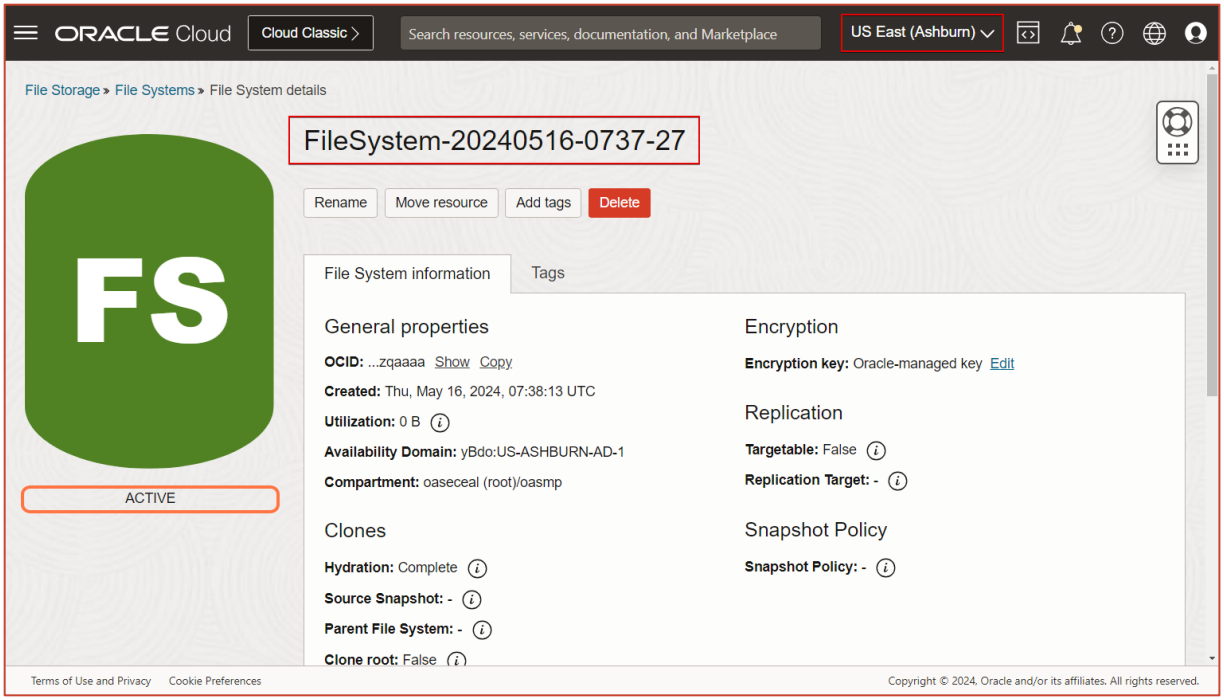
In the OCI console, navigate to storage → File Storage → File System

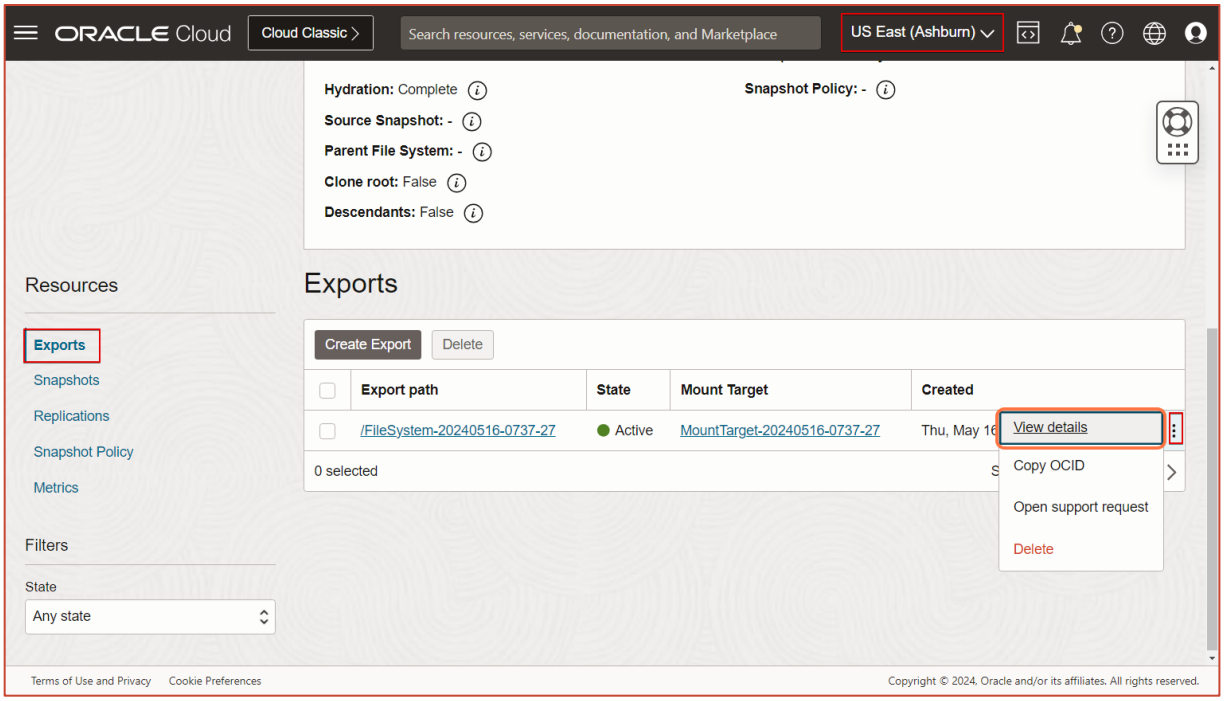


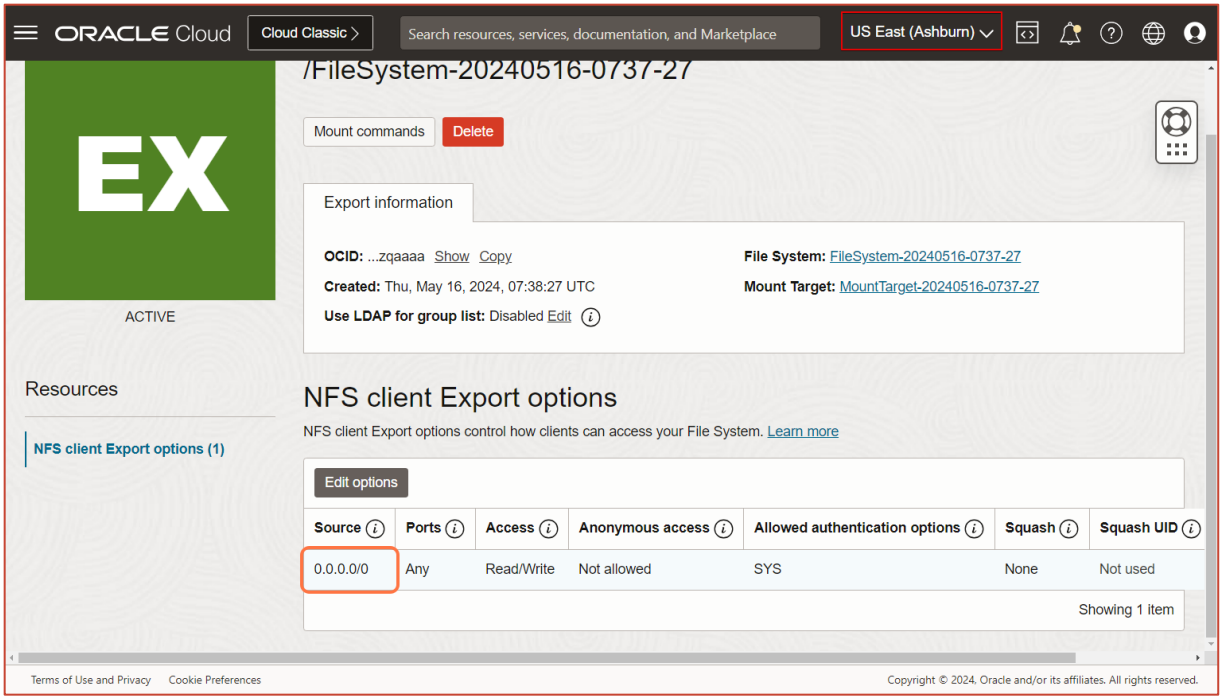


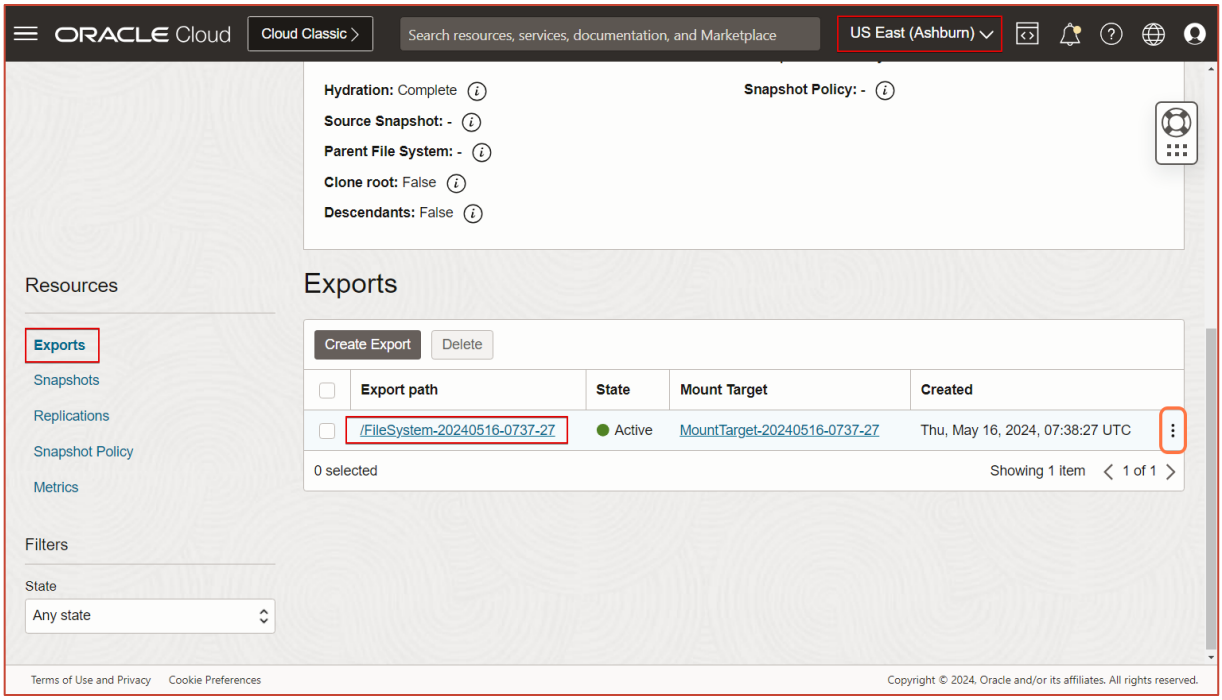


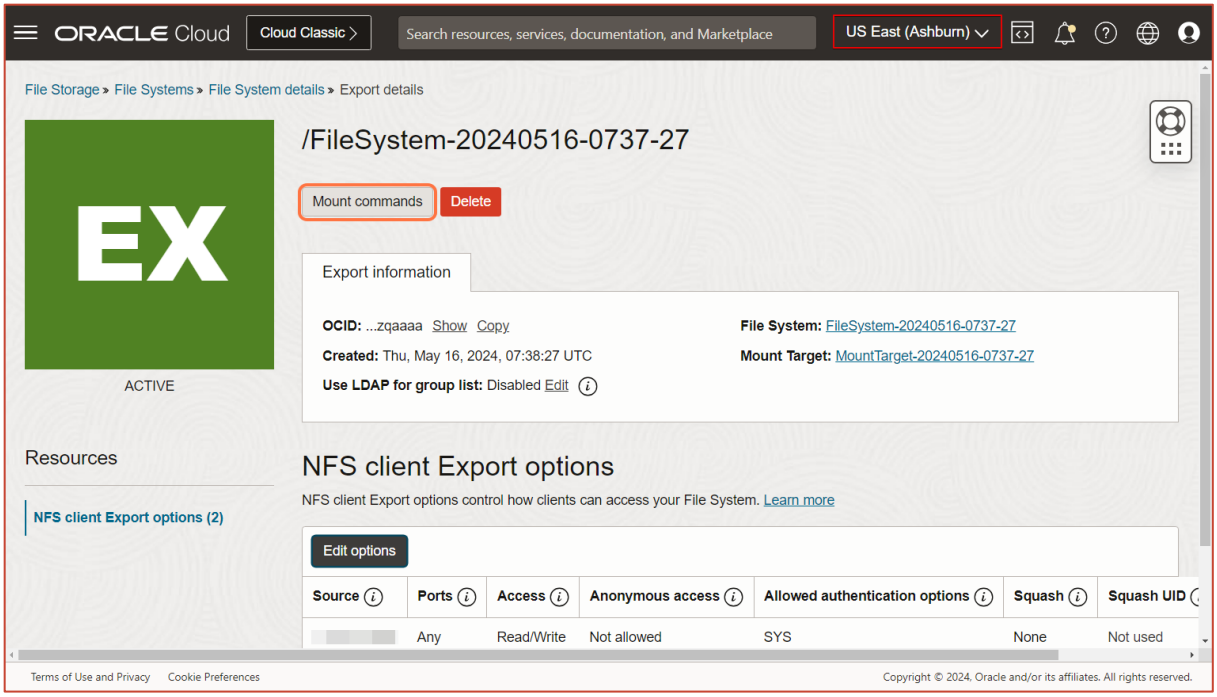




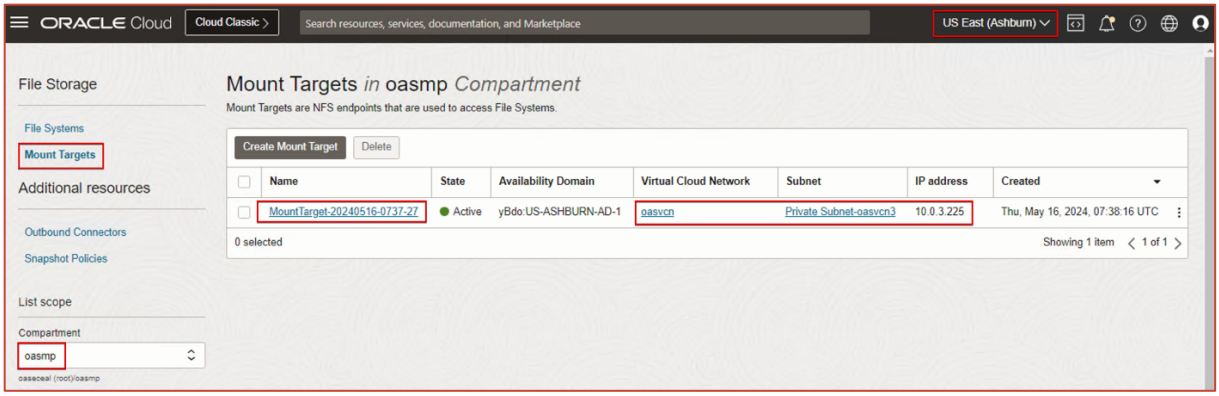


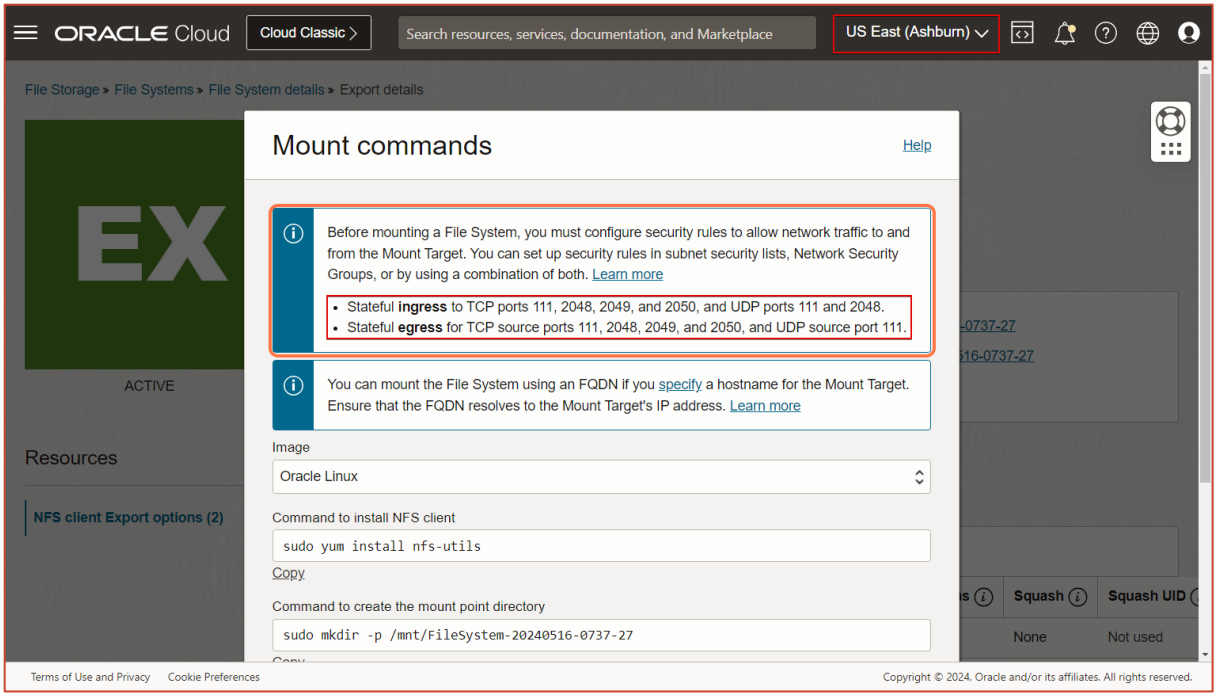






Mount Target also created.





Add the Ingress and Egress security rules for the private subnet (10.0.3.0/24) used for OAS compute VMs with the required ports and protocols TCP and UDP.

Ingress:

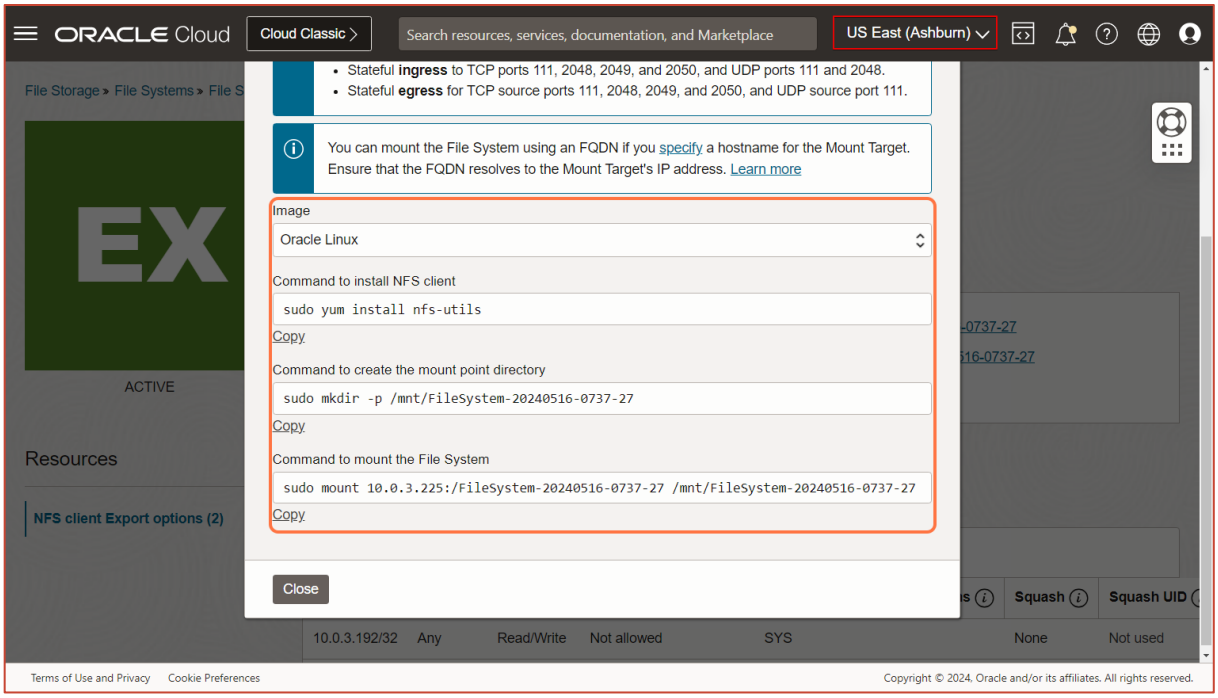
TCP: 111,2048,2049,2050.

UDP: 111,2048.

Egress:

TCP: 111,2048,2049,2050

UDP: 111.



To mount the OCI File System storage, execute the above commands in each OAS node.

As root user

```
mkdir /sdd
```

```
mount 10.0.3.225:/FileSystem-20240516-0737-27 /sdd
```

Add the above mount command in the **/etc/fstab** file as:

```
10.0.3.225:/FileSystem-20240516-0737-27 /sdd
```

You can also add as below:

```
10.0.3.225:/FileSystem-20240516-0737-27 /sdd nfs defaults,nofail,nosuid,resvport 0 0
```

After mounting the OCI File System as /sdd, copy the /u01/data/domains/bi/bidata to /sdd

```
cp -rp /u01/data/domains/bi/bidata /sdd
```

Mount the same File System to OAS node2 using the same mount commands.

Reboot all the OAS compute VMs in the cluster.

After attaching the block volume and the file system to all the nodes in the cluster, start the OAS services on OAS node1.

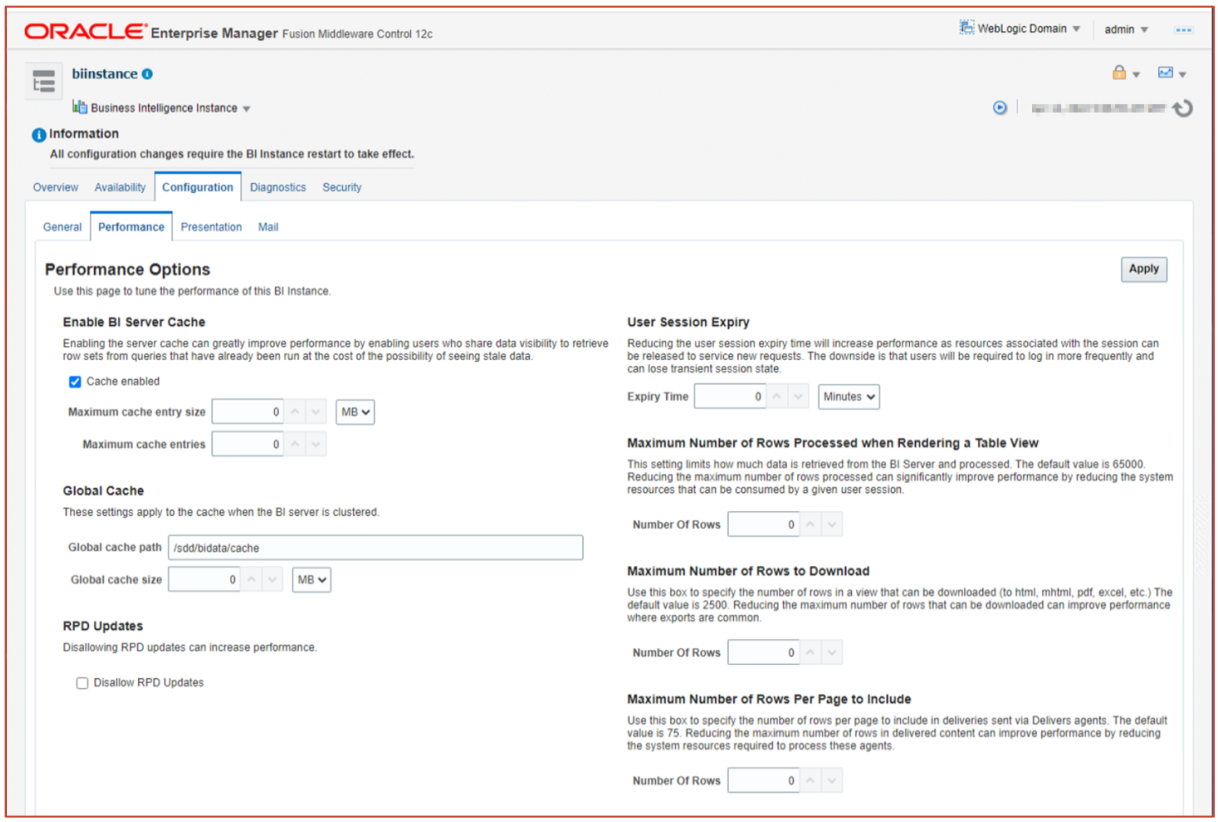
Test if the OAS services start without issues.

If you want to use the OAS Node1 as the NFS server and mount the local folder as the /sdd directory, skip the creation and mounting of the OCI File System and use the NFS Server setup and mounting steps from the OAS scale-out blog, Scale Out Oracle Analytics Server on Oracle Cloud and On-Premises.

Setup Global Cache

In the EM enable Global Cache and set a path

Create a folder cache under /sdd/bidata and use the path /sdd/bidata/cache



NOTE: These settings can also be set in the DV Console System Settings and respective backend configuration files like instanceconfig.xml.

Scale-Out OAS Server

Clone the Domain on Node 1 and Scale-out on Node 2

On Node1:

Shutdown all services:

/u01/data/domains/bi/bitools/bin/stop.sh

Run clone script:

/u01/data/domains/bi/bitools/bin/clone_bi_machine.sh -m oas2 oas2.oase.oasvcn.oraclevcn.com /sdd/bidata/oas2.jar

On Node2:

Install Oracle WebLogic Server and Oracle Analytics Server (already done while creating the OAS Marketplace instance oasn2.

Run unpack script:

/u01/app/Oracle/Middleware/Oracle_Home/oracle_common/common/bin/unpack.sh -template=/sdd/bidata/oas2.jar -domain=/u01/data/domains/bi -nodemanager_type=PerDomainNodeManager

Start the Following Components in the Sequence

On Node2:

Start the NodeManager and Managed Server and let the system components remain down.

This is to create the config.xml on Node2

Open the Required Ports for OAS on Node2

cd /u01/app/oas-scripts

As part of /u01/app/oas-scripts/OASFirewallPortsFix.xml, ports defined to open are 9500-9508, 7001, 9704, and 9556

Open 9506 port of NodeManager on Node2 Firewall

Add port 9506 also to the file (OASFirewallPortsFix.xml) and run script below

/u01/app/oas-scripts/open_oas_firewall_ports.sh

Or you can open the 9506 port using the below commands

sudo firewall-cmd --zone=public --permanent --add-port=9506/tcp

sudo firewall-cmd --complete-reload

Start NodeManger:

nohup /u01/data/domains/bi/bin/startNodeManager.sh &

NOTE: Start the bi_server2 from node1 start.sh script.

On Node1:

cd /u01/data/domains/bi/bitools/bin

./start.sh -i AdminServer,bi_server1,obis1,obips1,obiccs1,obijh1,obisch1,bi_server2

On Node2:

Re-synchronize the data source On Node2:

/u01/data/domains/bi/bitools/bin/sync_midtier_db.sh

On Node1:

cd /u01/data/domains/bi/bitools/bin

./start.sh -i obis2,obips2,obiccs2,obijh2,obisch2

```
Status of Domain: /oas/oas_install/Oracle/Middleware/Oracle_Home/user_projects/domains/bi
NodeManager (oasn1:9506:SSL): RUNNING

Name            Type            Machine                 Restart Int Max Restart  Status
----            ----            -------                 ----------- -----------  ------
AdminServer     Server          oasn1                   unknown     unknown      RUNNING
bi_server1      Server          oasn1                   unknown     unknown      RUNNING
bi_server2      Server          oasn2                   unknown     unknown      RUNNING
obips1          OBIPS           oasn1                   3600        5000         RUNNING
obijh1          OBIJH           oasn1                   3600        5000         RUNNING
obiccs1         OBICCS          oasn1                   3600        5000         RUNNING
obisch1         OBISCH          oasn1                   3600        5000         RUNNING
obis1           OBIS            oasn1                   3600        5000         RUNNING
obips2          OBIPS           oasn2                   3600        5000         RUNNING
obijh2          OBIJH           oasn2                   3600        5000         RUNNING
obiccs2         OBICCS          oasn2                   3600        5000         RUNNING
obisch2         OBISCH          oasn2                   3600        5000         RUNNING
obis2           OBIS            oasn2                   3600        5000         RUNNING
```

Summary

You have understood the steps to create and attach a block volume to the OAS compute instances.
It also covered the steps to create a File System Storage and mount it to the OAS compute instances.

Using such an environment, you have scaled out the node1 domain to node2 for cluster configuration of OAS.
Further, you can follow the Full Stack DR steps to replicate the block volume and file system to the OCI DR region and configure a DR execution plan for OAS.

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