

Setup Cross Region Block Volume Replication for Oracle Analytics Server Disaster Recovery using RCU Schemas Replication

Describes how to create block volume and attach it to the Oracle Analytics Server Compute Instance.

Also explains how to replicate the block volume to OCI DR region and attach the new block volume to the DR Oracle Analytics Server Compute Instance.

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Public

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Revision History

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

DATE	REVISION
March 2024	Initial publication

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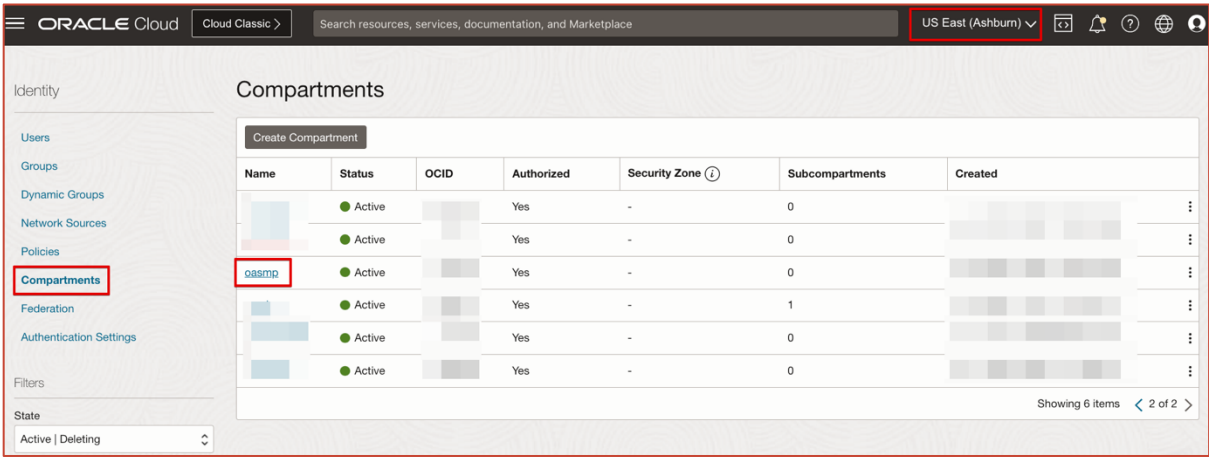
In the Oracle Cloud Infrastructure Home Region (Ashburn)

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

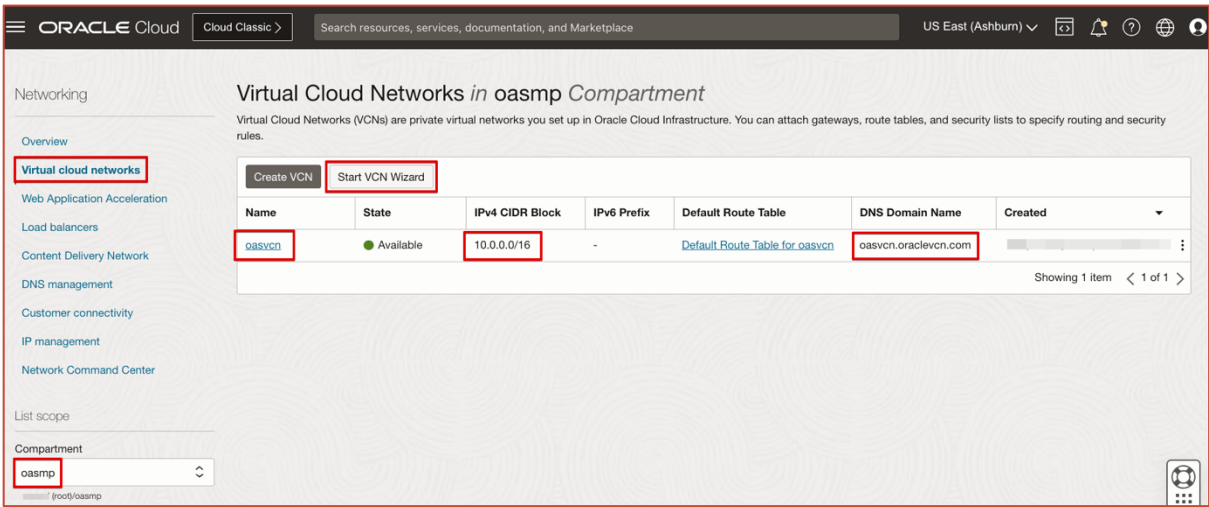
Create a Compartment

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.

oasvcn

Move resource Add tags Delete

VCN Information Tags

Compartment: oasmp
Created: 19:10:06 UTC
IPv4 CIDR Block: 10.0.0.0/16
IPv6 Prefix: -

OCID: .. Show Copy
DNS Resolver: oasvcn
Default Route Table: Default Route Table for oasvcn
DNS Domain Name: oasvcn.oraclevcn.com

Subnets in oasmp Compartment

Create Subnet

Name	State	IPv4 CIDR Block	IPv6 Prefixes	Subnet Access	Created
Private Subnet-oasvcn2	Available	10.0.2.0/24	-	Private (Regional)	
Public Subnet-oasvcn	Available	10.0.0.0/24	-	Public (Regional)	
Private Subnet-oasvcn	Available	10.0.1.0/24	-	Private (Regional)	

Create an OAS Marketplace Instance

For the OAS DR using Database RCU schema replication, 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 “oas.oase.oasvcn.oraclevcn.com”.

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

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

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

Create Private Subnets

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

oasvcn

Move resource Add tags Delete

VCN Information Tags

Compartment: oasmp
Created: Wed, Mar 2, 2022, 19:10:06 UTC
IPv4 CIDR Block: 10.0.0.0/16
IPv6 Prefix: -

Create Subnet

Name: Private Subnet-oasvcn3

Create In Compartment: oasmp

Subnet Type: Regional (Recommended) [Selected] Availability Domain-specific

IPv4 CIDR Block: 10.0.3.0/24

IPv6 Prefixes: Maximum amount of 0 IPv6 prefixes per Subnet. IP ranges of the IPv6 prefixes must not overlap. Learn more.

ORACLE Cloud Cloud Classic Search resources, services, documentation, and Marketplace US East (Ashburn)

Networking > Virtual cloud networks > Virtual Cloud Network Details

oasvcn

VCN Information Tags

Compartment: oasmp

Created: Wed, Mar 2, 2022, 19:10:06 UTC

IPv4 CIDR Block: 10.0.0.0/16

IPv6 Prefix: -

Subnets in oasmp Compartment

Create Subnet

Route Table Compartment in oasmp (Change compartment)

Route Table for Private Subnet-oasvcn

Subnet Access

Private Subnet Prohibit public IP addresses for instances in this Subnet ☒ Public Subnet Allow public IP addresses for instances in this Subnet

DNS Resolution

☒ Use DNS hostnames in this Subnet Allows assignment of DNS hostname when launching an Instance.

DNS Label

oase

DNS Domain Name Read-only

<dns-label>.oasvcn.oraclecloud.com

Dhcp Options Compartment in oasmp (Change compartment)

Select DHCP options

Security Lists

You can associate up to 5 network security lists with the subnet.

Security List Compartment in oasmp (Change compartment)

Resources

Subnets (3)

CIDR Blocks/Prefixes (1)

Route Tables (2)

Internet Gateways (1)

Dynamic Routing Gateways Attachments (1)

Network Security Groups (0)

Subnets in oasmp Compartment

Create Subnet

Name

Private Subnet-oasvcn2

Public Subnet-oasvcn

Private Subnet-oasvcn

Dhcp Options Compartment in oasmp (Change compartment)

Select DHCP options

Security Lists

You can associate up to 5 network security lists with the subnet.

Security List Compartment in oasmp (Change compartment)

Security List for Private Subnet-oasvcn

+ Another Security List

Show Tagging Options

Create Subnet Cancel

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.

ORACLE Cloud Cloud Classic Search resources, services, documentation, and Marketplace US West (Phoenix)

Networking > Virtual cloud networks > Virtual Cloud Network Details

oasvcn

VCN Information Tags

Compartment: oasmp

Created: , 19:56:59 UTC

IPv4 CIDR Block: 172.0.0.0/16

IPv6 Prefix: -

OCID: ...tn3zq Show Copy

DNS Resolver: oasvcn

Default Route Table: Default Route Table for oasvcn

DNS Domain Name: oasvcn.oraclecloud.com

Subnets in oasmp Compartment

Create Subnet

Name	State	IPv4 CIDR Block	IPv6 Prefixes	Subnet Access	Created
Private Subnet-oasvcn3	Available	172.0.3.0/24	-	Private (Regional)	
Private Subnet-oasvcn2	Available	172.0.2.0/24	-	Private (Regional)	
Private Subnet-oasvcn	Available	172.0.1.0/24	-	Private (Regional)	
Public Subnet-oasvcn	Available	172.0.0.0/24	-	Public (Regional)	

Private Subnet-oasvcn3

OCID: ...2pkiva Show Copy

IPv4 CIDR Block: 172.0.3.0/24

IPv6 Prefix: -

Virtual Router MAC Address: -

Subnet Type: Regional

Compartment: oasmp

DNS Domain Name: oase.oasvcn.oraclevcn.com Hide Copy

Subnet Access: Private Subnet

DHCP Options: Default DHCP Options for oasvcn

Route Table: Route Table for Private Subnet-oasvcn

Security Lists

Name	State	Compartment	Created
Security List for Private Subnet-oasvcn	Available	oasmp	19:57:02 UTC

Create the primary OAS Marketplace instance with a domain in the OCI's home region, for example, Ashburn.

Oracle Analytics Server Domain Configuration

☒ Create Oracle Analytics Server Domain

Select to create and configure an Oracle Analytics Server domain after installation. Domain creation takes about 30 minutes to complete after this stack job finishes.

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

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

Oracle Analytics Server - BYOL

Fast Deployment of Oracle Analytics Server on Oracle Cloud Infrastructure

Oracle Analytics Server

Categories: Business Applications

Type: Stack

Version: OAS 2023 0201 (6/12...)

Compartment: oasmp

Software price per OCPU: BYOL (Bring your own license)

There are additional fees for the infrastructure usage.

☒ I have reviewed and accept the Oracle standard Terms and Restrictions.

Launch Stack

RMJ

IN PROGRESS

While this job is running, only partial logs are available. You can get a complete log when the job is finished.

ormjob20230905202055

Edit job Download Terraform configuration Add tags Cancel job

Job information Tags

OCID: ...o32bjq Show Copy

Job type: Apply

State: In progress

Start time: Tue, Sep 5, 2023, 20:20:55 UTC

Compartment: oaseceal (root)/oasmp

Plan job ID: Automatically approved

Working directory: Not specified

End time: N/A

Similarly, create an OAS marketplace instance without domain config in OCI's DR region, for example, Phoenix, with the same hostname.

ORACLE Cloud Cloud Classic Search resources, services, documentation, and Marketplace US West (Phoenix)

Marketplace » Oracle Analytics Server - BYOL

Oracle Analytics Server - BYOL

Fast Deployment of Oracle Analytics Server on Oracle Cloud Infrastructure

Oracle Analytics Server

Categories: Business Applications

Type Stack

Version OAS 2023 0201 (6/12...)

Compartment oasmp

Software price per OCPU BYOL (Bring your own license)

There are additional fees for the infrastructure usage.

☒ I have reviewed and accept the Oracle standard Terms and Restrictions.

Launch Stack

ORACLE Cloud Cloud Classic Search resources, services, documentation, and Marketplace US West (Phoenix)

Create stack

1 Stack information 2 Configure variables 3 Review

VCN Compartment oasmp

Virtual Cloud Network oasvcn

Subnet Compartment oasmp

Subnet Private Subnet-oasvcn3 (Regional)

☐ Assign a public IP address to the compute instance

Oracle Analytics Server Domain Configuration

☐ Create Oracle Analytics Server Domain

Previous Next Cancel

ORACLE Cloud Cloud Classic Search resources, services, documentation, and Marketplace US West (Phoenix)

Resource Manager » Stacks » Stack details » Job details

RMJ IN PROGRESS

ormjob20230905202827

Edit job Download Terraform configuration Add tags Cancel job

Job information Tags

OCID: ...gtmaja Show Copy

Job type: Apply

State: In progress

Start time: Tue, Sep 5, 2023, 20:28:27 UTC

Compartment: oaseceal (root)/oasmp

Plan job ID: Automatically approved

Working directory: Not specified

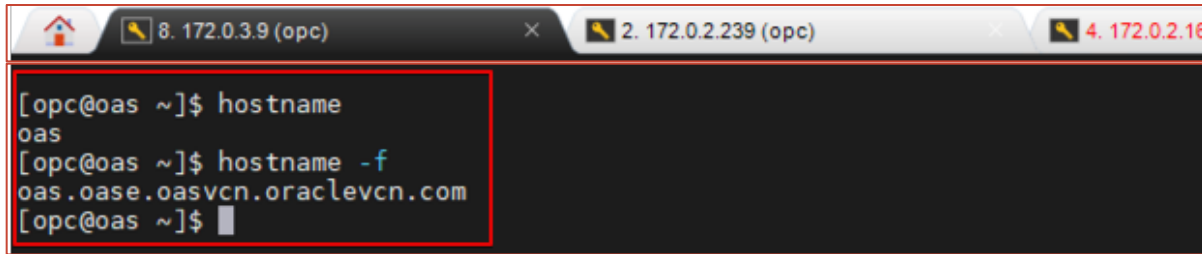
End time: N/A

Check the hostnames of both the OAS instances.

Ashburn:

```
28. 10.0.3.242 (opc)
[opc@oas ~]$ hostname
oas
[opc@oas ~]$ hostname -f
oas.oase.oasvcn.oraclevcn.com
[opc@oas ~]$
```

Phoenix:

A terminal window with three tabs. The first tab is titled '8. 172.0.3.9 (opc)' and contains the following commands and output:

```
[opc@oas ~]$ hostname
oas
[opc@oas ~]$ hostname -f
oas.oase.oasvcn.oraclevcn.com
[opc@oas ~]$
```

Test that the Domain is created successfully and the OAS URL is accessible from the primary OAS instance on the OCI's home region.

Stop all the services on OAS primary compute instance.

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

Since no domain is created in the OAS DR compute instance, run the script to open the required ports in the compute instance as the **root** user.

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

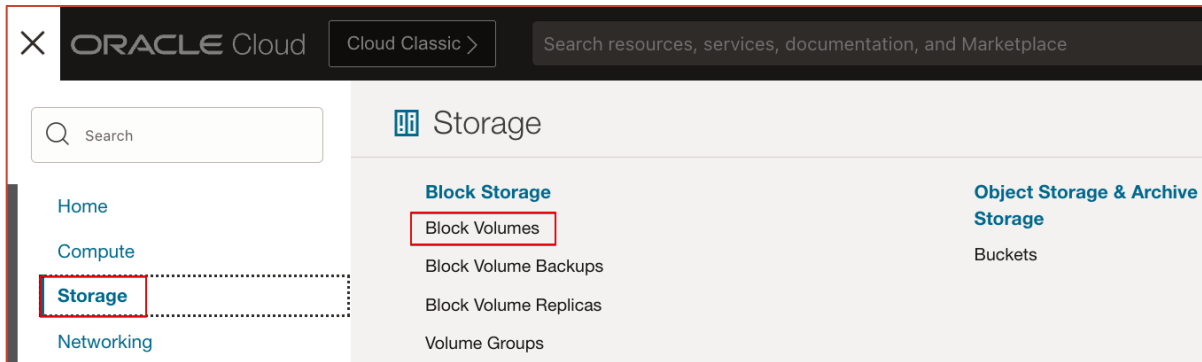
Create a Block Volume

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 (primary) compute instance in OCI's home region, for example, Ashburn.

Sign-in to OCI Console

Navigate to Storage → Block Volumes



Create Block Volume

Block volumes provide high-performance network storage for Oracle Cloud. [Learn more](#)

Create Block Volume

Name:

Create in compartment:

Availability domain:

Volume size and performance

☒ Default ☐ Custom

Volume size:

Volume performance: Balanced

IOPS: 25,000 IOPS (60 IOPS/GB)

Throughput: 480 MB/s (480 KB/s/GB)

Backup policies

Select backup policy in **oasmp** [\(Change compartment\)](#)

Daily incremental backups at midnight. Retain 7 days. Weekly incremental backups. At midnight Sunday. Retain 4 weeks. Monthly incremental backups. At midnight

[Create Block Volume](#) [Save as stack](#) [Cancel](#)

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.

Block volumes provide high-performance network storage for Oracle Cloud. [Learn more](#)

Create block volume

Cross region replication

Enables asynchronous cross region volume replication. [Learn more](#)

☒ ON ☐ OFF

REGION: AVAILABILITY DOMAIN: NAME:

Once this feature is enabled, the volume will be replicated in the selected region and availability domain and your bill will include applicable storage and networks costs for the volume replica in the destination region. [Learn more](#)

☒ Confirm

Encryption

☒ Encrypt using Oracle-managed keys

Leaves all encryption-related matters to Oracle

☐ Encrypt using customer-managed keys

Requires you to have access to a valid Key Management key.

[Show Tagging Options](#)

☒ View detail page after this block volume is created

[Create Block Volume](#) [Save as stack](#) [Cancel](#)

Enable cross-region replication to the OCI's DR region, for example, Phoenix.

ORACLE Cloud Cloud Classic Search resources, services, documentation, and Marketplace US East (Ashburn)

Block Storage > Block Volumes > Block Volume Details

oas2023bv

Edit Move resource Add tags Terminate

Block volume information Tags

Availability domain: yBdo:US-ASHBURN-AD-1
 Compartment: root/oasmp
 OCID: [Show](#) [Copy](#)
 Created: 15:36:33 UTC
 Size: 1024 GB

Hydrated: true
 Encryption key: Oracle-managed key [Assign](#)
 Volume group: None

Scheduled backups

Managed by: Volume
 Backup policy: [Gold](#)
 Cross region copy target: None

Cross region replication

Managed by: Volume
 Target region: US West (Phoenix)
 Availability domain: yBdo:PHX-AD-1

Auto-tune performance policies

Performance based auto-tune: Off
 Detached volume auto-tune: Off

Performance

Performance: Balanced (VPU/GB:10)
 IOPS: 25,000 IOPS
 Throughput: 480 MB/s
 Default performance: Balanced (VPU/GB:10)

ORACLE Cloud Cloud Classic Search resources, services, documentation, and Marketplace US East (Ashburn)

Block volume replicas

Name	OCID	Region	Availability domain
oas2023bv	Show Copy	US West (Phoenix)	yBdo:PHX-AD-1

Showing 1 item < 1 of 1 >

Check the same in the OCI's DR region. For example, Phoenix.

ORACLE Cloud Cloud Classic Search resources, services, documentation, and Marketplace US West (Phoenix)

Block Storage

Block Volumes
 Block Volume Backups
Block Volume Replicas
 Boot Volumes
 Boot Volume Backups
 Boot Volume Replicas
 Volume Groups
 Volume Group Backups
 Volume Group Replicas
 Backup Policies

Block volume replicas in oasmp Compartment

Volume replicas enable ongoing automatic asynchronous replication of volumes across regions.

Name	State	OCID	Source region	Last sync	Created
oas2023bv	Available	Show Copy	US East (Ashburn)	15:51:10 UTC	15:36:35 UTC

Showing 1 item < 1 of 1 >

The replicated block volume is listed under the Block Volume Replicas.

Attach the Block Volume

Attach the Block Volume to the OAS compute instance, For more details, see [Attaching a Volume](#)

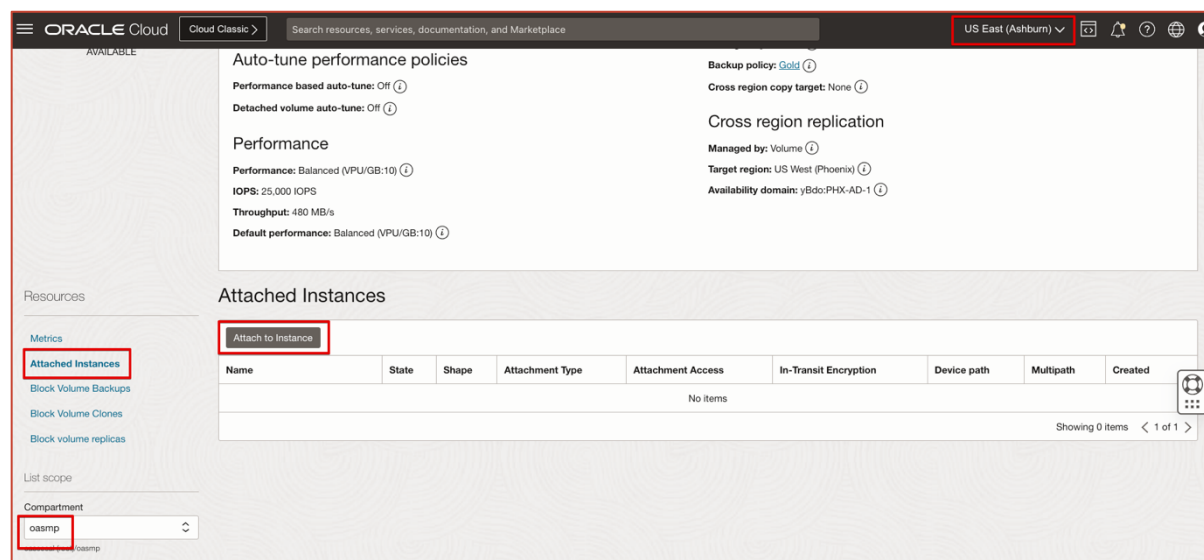
NOTE: Do not mount the same block volume to multiple compute instances; better to have a dedicated block volume for each compute instance.

In the case of OAS with clustered nodes, create the SSD with NFS mount. For more details, see [Mounting File Systems](#) and [Mounting OCI File Storage](#).

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

Add the block volume to the OAS (primary) compute instance.

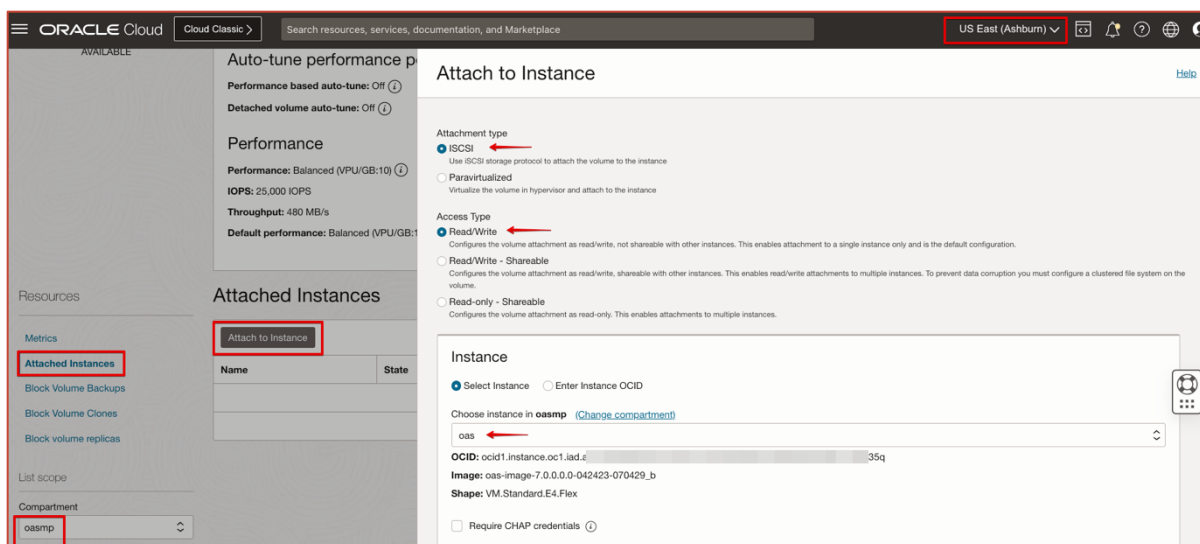
Navigate to the block volume → Attached Instances



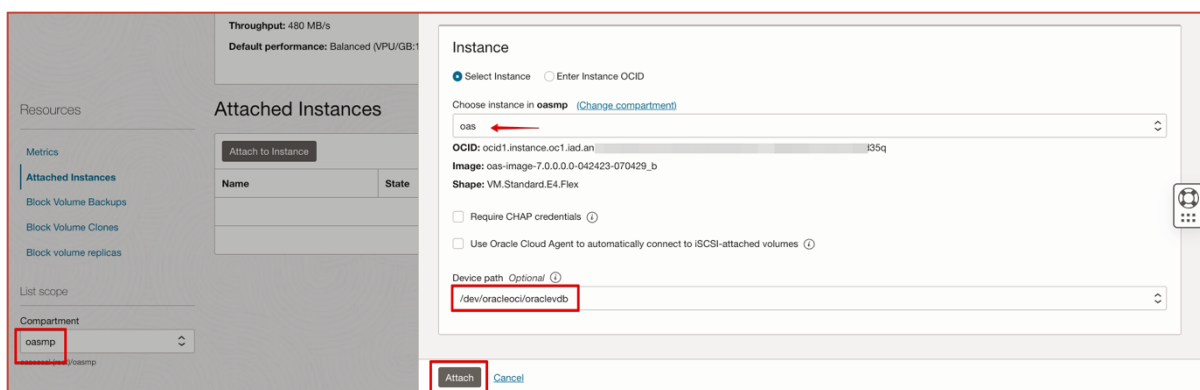
While attaching the block volume to the OAS compute instance, choose the attachment type based on your requirement. See the OCI documentation, [Overview of Block Volume](#).

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](#).

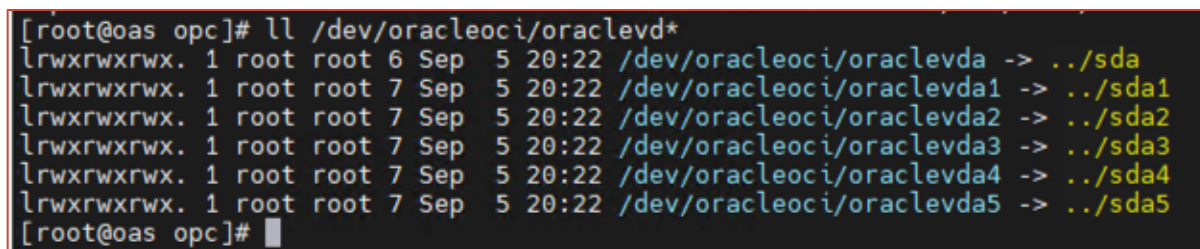


Select the OAS instance for which you need to attach the Block volume.



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

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



```
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 filesystem
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
```

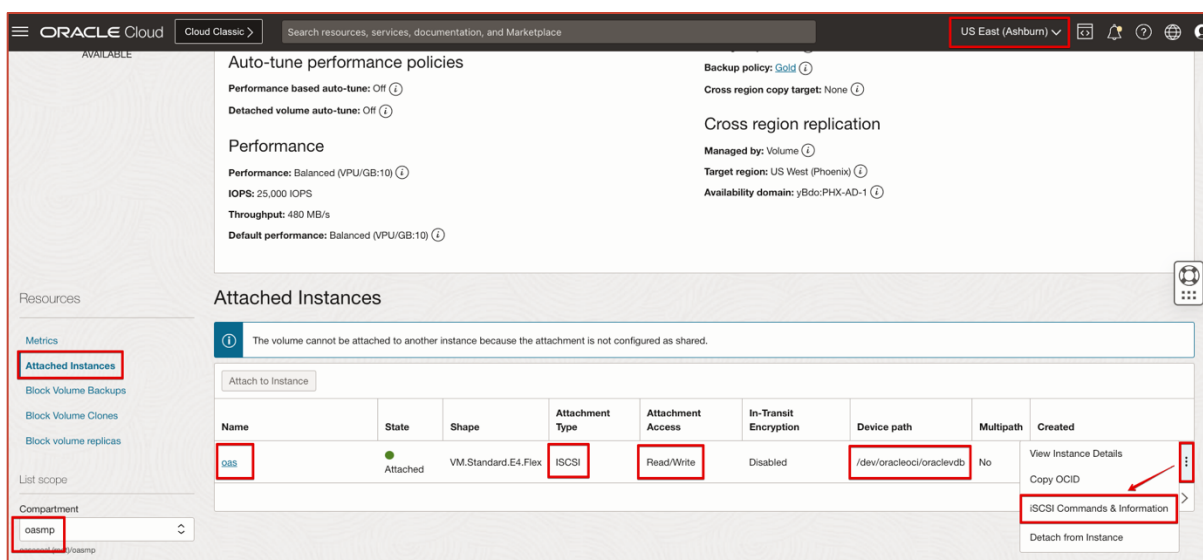
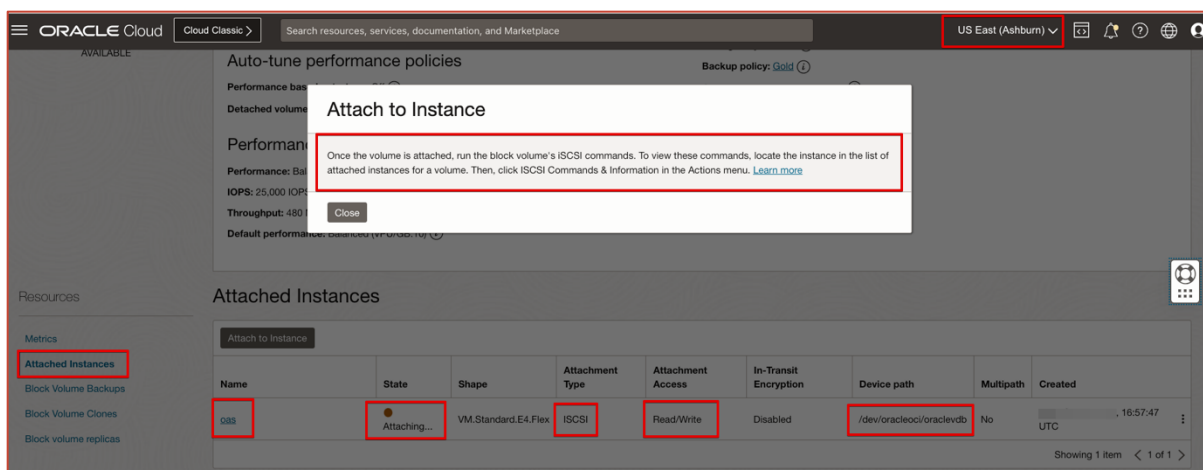
lsblk

```
[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
```

Since the device path `/dev/oracleoci/oracleevda` is already used, we can select below

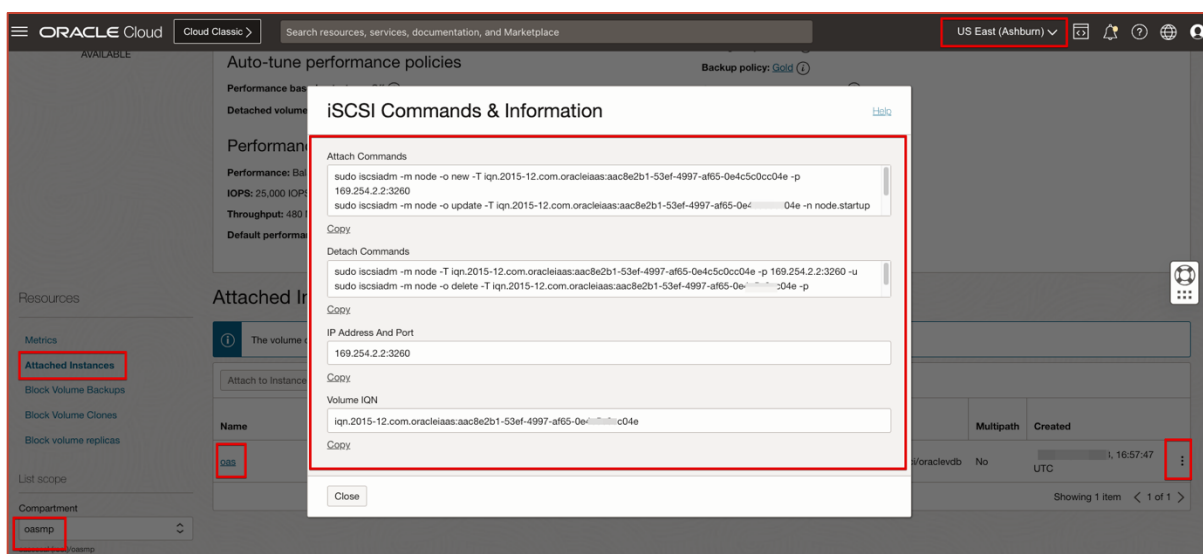
device path `"/dev/oracleoci/oracleevdb"`.

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.

```
[root@oas opc]# sudo iscsiadm -m node -o new -T iqn.2015-12.com.oracleiaas:aac8e2b1-53ef-4997-af65-0e4c5c0cc04e -p 169.254.2.2:3260
New iSCSI node [tcp:[hw=,ip=,net_if=,iscsi_if=default] 169.254.2.2:3260,-1 iqn.2015-12.com.oracleiaas:aac8e2b1-53ef-4997-af65-0e4c5c0cc04e] added
[root@oas opc]#
[root@oas opc]# sudo iscsiadm -m node -o update -T iqn.2015-12.com.oracleiaas:aac8e2b1-53ef-4997-af65-0e4c5c0cc04e -n node.startup -v automatic
[root@oas opc]#
[root@oas opc]# sudo iscsiadm -m node -T iqn.2015-12.com.oracleiaas:aac8e2b1-53ef-4997-af65-0e4c5c0cc04e -p 169.254.2.2:3260 -l
Logging in to [iface: default, target: iqn.2015-12.com.oracleiaas:aac8e2b1-53ef-4997-af65-0e4c5c0cc04e, portal: 169.254.2.2:3260] (multiple)
Login to [iface: default, target: iqn.2015-12.com.oracleiaas:aac8e2b1-53ef-4997-af65-0e4c5c0cc04e, portal: 169.254.2.2:3260] successful.
[root@oas opc]#
```

Run the command to check the attachment.

lsblk

```
[root@oas opc]#
[root@oas opc]# lsblk
NAME                                MAJ:MIN RM   SIZE RO TYPE MOUNTPOINT
sdb                                  8:16   0    1T  0 disk
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]#
```

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-5212-40FD-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 filesystem
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

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/oraclelvd*

```
[root@oas opc]# ll /dev/oracleoci/oraclelvd*
lrwxrwxrwx. 1 root root 6 Sep  5 20:22 /dev/oracleoci/oraclelvd1 -> ../sda
lrwxrwxrwx. 1 root root 7 Sep  5 20:22 /dev/oracleoci/oraclelvd1 -> ../sda1
lrwxrwxrwx. 1 root root 7 Sep  5 20:22 /dev/oracleoci/oraclelvd2 -> ../sda2
lrwxrwxrwx. 1 root root 7 Sep  5 20:22 /dev/oracleoci/oraclelvd3 -> ../sda3
lrwxrwxrwx. 1 root root 7 Sep  5 20:22 /dev/oracleoci/oraclelvd4 -> ../sda4
lrwxrwxrwx. 1 root root 7 Sep  5 20:22 /dev/oracleoci/oraclelvd5 -> ../sda5
lrwxrwxrwx. 1 root root 6 Sep  6 17:20 /dev/oracleoci/oraclelvd6 -> ../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="11d0e5a8-1560-4e2b-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-1ddf-43f9-b32a-5abf20408daf"
/dev/sda5: UUID="nh8Sx0-Gn8G-98hf-r50B-s22F-vg6y-fQMILr" TYPE="LVM2_member" PARTLABEL="primary" PARTUUID="d924ff91-f0e3-41e8-89b0-10cfddac5b1b"
/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-bcfe-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-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-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
```

```

# /etc/fstab
# Created by anaconda on Mon Sep 26 03:04:11 2022
#
# Accessible filesystems, by reference, are maintained under '/dev/disk'
# See man pages fstab(5), findfs(8), mount(8) and/or blkid(8) for more info
#
UUID=544006b2-b9e2-4a20-8fc3-9c9857d2f741 / xfs defaults,_netdev,_netdev 0 0
UUID=6AA8-4D0D /boot/efi vfat defaults,uid=0,gid=0,umask=0077,shortname=winnt,_netdev,_netdev,x-initrd.mount 0 0
UUID=04bcf4b0-6498-4157-8d46-cefd16d0079c swap swap defaults,_netdev,x-initrd.mount 0 0
#####
## ORACLE CLOUD INFRASTRUCTURE CUSTOMERS
##
## If you are adding an iSCSI remote block volume to this file you MUST
## include the '_netdev' mount option or your instance will become
## unavailable after the next reboot.
## SCSI device names are not stable across reboots; please use the device UUID instead of /dev path.
##
## Example:
## UUID="94c5aade-8bb1-4d55-ad0c-388bb8aa716a" /data1 xfs defaults,noatime,_netdev 0 2
##
## More information:
## https://docs.us-phoenix-1.oraclecloud.com/Content/Block/Tasks/connectingtoavolume.htm
/dev/vg_app/vg_app-lv_app /u01_bkp/app ext4 defaults,noatime,nodiratime,nodev,_netdev 0 2
/dev/vg_data/vg_data-lv_data /u01_bkp/data ext4 defaults,noatime,nodiratime,nodev,_netdev 0 2
/dev/sdb /u01 ext4 defaults,_netdev,nofail 0 2

```

sudo mount -a

df -h

```

[root@oas /]# 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  20G   81G  20% /
/dev/sda1       200M  7.4M  193M   4% /boot/efi
tmpfs           6.3G   0   6.3G   0% /run/user/0
tmpfs           6.3G   0   6.3G   0% /run/user/1000
tmpfs           6.3G   0   6.3G   0% /run/user/994
/dev/sdb        1007G  28K  956G   1% /u01

```

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

```

[opc@oas ~]$ df -h
Filesystem      Size  Used Avail Use% Mounted on
devtmpfs        32G   0   32G   0% /dev
tmpfs           32G   0   32G   0% /dev/shm
tmpfs           32G  8.9M   32G   1% /run
tmpfs           32G   0   32G   0% /sys/fs/cgroup
/dev/sda3       100G  20G   81G  20% /
/dev/sda1       200M  7.4M  193M   4% /boot/efi
tmpfs           6.3G   0   6.3G   0% /run/user/0
/dev/mapper/vg_app-vg_app--lv_app  98G  13G   81G  14% /u01_bkp/app ←
/dev/mapper/vg_data-vg_data--lv_data 484G  2.5G  456G   1% /u01_bkp/data ←
/dev/sdb        1007G  20K  956G   1% /u01 ←
tmpfs           6.3G   0   6.3G   0% /run/user/994
tmpfs           6.3G   0   6.3G   0% /run/user/1000

```

chown -R oracle:oracle /u01

chmod 777 /u01

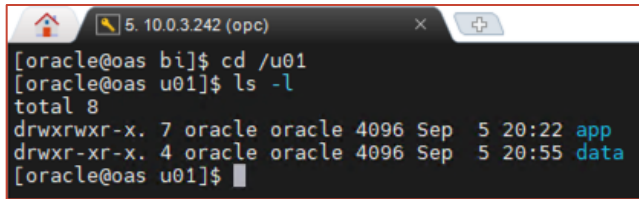
Copy the app and data folder from /u01_bkp to /u01

cd /u01_bkp

cp -rp * /u01

cd /u01

```
ls -l
```

A terminal window with a dark background and light text. The prompt is [oracle@oas bi]\$. The user enters 'cd /u01'. The prompt changes to [oracle@oas u01]\$. The user enters 'ls -l'. The output shows a directory listing for /u01 with two files: 'app' and 'data'. The 'app' file has permissions 'drwxrwxr-x', size 7, owner 'oracle', group 'oracle', mode '4096', date 'Sep 5 20:22', and type 'app'. The 'data' file has permissions 'drwxr-xr-x', size 4, owner 'oracle', group 'oracle', mode '4096', date 'Sep 5 20:55', and type 'data'. The prompt returns to [oracle@oas u01]\$.

```
[oracle@oas bi]$ cd /u01
[oracle@oas u01]$ ls -l
total 8
drwxrwxr-x. 7 oracle oracle 4096 Sep  5 20:22 app
drwxr-xr-x. 4 oracle oracle 4096 Sep  5 20:55 data
[oracle@oas u01]$
```

Start the services in the primary OAS instance and test the access of the OAS.

After the test, stop all services in the OCI primary (home) region OAS instance.

Since the primary (Ashburn) block volume oas2023bv is attached to the primary OAS instance and the app and data folders are copied from the /u01_bkp to /u01, the block volume has the data.

The source block volume oas2023bv continues to replicate to the block volume replica in the OCI DR region, for example, Phoenix.

In the Oracle Cloud Infrastructure DR Region (Phoenix)

Create a new Block Volume from the Replica

Using the block volume replica, create a new block volume by activating the replica and attach it to the OAS compute instance.

The source block volume continues to replicate the block volume replica, which is created from the source block volume.

NOTE: If new data is created in the source block volume, it will be replicated continuously in the block volume replica.

Activating the block volume replica creates a point-in-time copy of the block volume replica as a new block volume.

In the case of OAS with clustered nodes, create the SSD with nfs mount. For more details, see [Mounting File Systems](#) and [Mounting OCI File Storage](#).

NOTE: The source block volume and the new block volume that you copied from the replica are now two different block volumes.

NOTE: If the source block volume of the primary OAS instance changes, you need to detach the existing block volume from the OAS DR instance, create a new block volume from the replica, and attach it to the OAS DR instance.

NOTE: For any changes in the OAS DR instance during the DR, you need to replicate the block volume on the DR instance, create a new block volume from the replica, and attach it to the primary OAS compute instance.

Activate the Block Volume Replica to create a Block volume from the replica.

Sign in to the OCI console and change the region to OCI's DR region, for example, Phoenix.

Navigate to the Block Volume Replicas.

Select the compartment, for example, oasmp.

ORACLE Cloud Cloud Classic Search resources, services, documentation, and Marketplace US West (Phoenix)

Block Storage > Block Volume Replicas > Block Volume Replica Details

VR **oas2023bv** **Activate**

Block Volume Replica Information Tags

Availability domain: yBdo-PHX-AD-1
 Compartment: (root)/oasmp
 OCID: Show Copy
 Size: 1024 GB
 Created: 15:36:35 UTC

Source volume OCID: Show Copy
 Source region: US East (Ashburn)
 Last sync: 15:55:56 UTC
 Total Data Transferred: 0 GB

Resources

Metrics
 Metrics are measurements that let you monitor the health, capacity, and performance of your resources.

Start time: 4:59:36 UTC End time: 15:59:36 UTC Quick selects: Last hour Reset charts

Time since last cross region replica was synced

Activate the Block Volume Replica

ORACLE Cloud Cloud Classic Search resources, services, documentation, and Marketplace US West (Phoenix)

Block Storage > Block Volume Replicas > Block Volume Replica Details

VR **oas2023bv** **Activate**

Activate replica

Activating a replica creates a clone of the replicated volume.

Name: oas2023bvdr

Create in compartment: oasmp

Volume size and performance

Default Custom
 Volume size: 1024 GB
 Volume performance: Balanced
 IOPS: 25,000 IOPS
 Throughput: 480 MB/s

Cross region replication
 Enables asynchronous cross region volume replication. Learn more

ON OFF

Encryption

Activate replica Cancel

ORACLE Cloud Cloud Classic Search resources, services, documentation, and Marketplace US West (Phoenix)

Block Storage > Block Volume Replicas > Block Volume Replica Details

VR **oas2023bv** **Activate**

Block Volume Replica Information Tags

Availability domain: yBdo-PHX-AD-1
 Compartment: (root)/oasmp
 OCID: Show Copy
 Size: 1024 GB
 Created: 15:36:35 UTC

Source volume OCID: Show Copy
 Source region: US East (Ashburn)
 Last sync: 16:01:07 UTC
 Total Data Transferred: 0 GB

Resources

Activated Volumes

Activated Volumes in oasmp Compartment
 Activating a volume from the replica creates a clone of the source volume. Learn more

Name	State	Size (in GB)	Hydrated	Created
oas2023bvdr	Available	1024	true	16:05:25 UTC

Showing 1 item < 1 of 1 >

Compartment: oasmp

NOTE: If new data is created in the source block volume, it will get replicated to the block volume replica continuously.

Activating the Block Volume Replica, the point-in-time copy of the block volume replica is created as a new Block Volume and should be listed in the available Block Volumes.

The screenshot shows the Oracle Cloud console interface. On the left, the 'Block Volumes' link is highlighted in the navigation menu. The main content area is titled 'Block Volumes in oasmp Compartment'. A table lists the available block volumes:

Name	State	Size	Default performance	Auto-tuned performance	Cross region replication	Availability domain	Backup policy	Created
oas2023bvdv	Available	1024 GB	VPU:10	VPU:10	Off	yBdo:PHX-AD-1	-	16:05:25 UTC

The volume 'oas2023bvdv' is highlighted with a red box. The compartment 'oasmp' is also highlighted in the left sidebar.

Attach the Block Volume

Repeat the steps to Attach the Block volume to the OAS DR instance.

The screenshot shows the 'Attached Instances' page in the Oracle Cloud console. A message at the top states: 'The volume cannot be attached to another instance because the attachment is not configured as shared.' Below this, a table lists the attached instances:

Name	State	Shape	Attachment Type	Attachment Access	In-Transit Encryption	Device path	Multipath	Created
oas	Attached	VM.Standard.E4.Flex	ISCSI	Read/Write	Disabled	/dev/oracleoci/oraclevdv	No	UTC, 20:45:38

The volume 'oas' is highlighted with a red box. The compartment 'oasmp' is also highlighted in the left sidebar.

Block volume attachment to the DR OAS compute instance is successful.

Since we have a single-node OAS environment, we selected the Block volume without a shareable option, so we cannot attach the same volume to another instance again.

```

[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 6 20:49 boot
drwxr-xr-x. 22 root root 3340 Sep 6 20:49 dev
drwxr-xr-x. 95 root root 8192 Sep 6 20:49 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. 245 root root 0 Sep 6 20:49 proc
dr-xr-xr-x. 6 root root 4096 Sep 6 15:15 root
drwxr-xr-x. 32 root root 1060 Sep 6 20:49 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 6 20:49 sys
drwxrwxrwt. 10 root root 4096 Sep 6 20:50 tmp
drwxrwxrwx. 4 oracle oracle 4096 Sep 6 19:43 u01
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 ~]#

```

Reboot the compute instance.

Check the mount points /u01

```

[root@oas ~]# cd /u01
[root@oas u01]# ls -l
total 8
drwxrwxr-x. 7 oracle oracle 4096 Sep 5 20:22 app
drwxr-xr-x. 4 oracle oracle 4096 Sep 5 20:55 data
[root@oas u01]# cd data/domains/bi
[root@oas bi]# ls
autodeploy      bin                blankline.txt      derbyShutdown.log  JRFWSAsyncFileStore_auto_1  nodemanager        server
backup_config   BpJmsStore_auto_1 common             edit.lock           json                     orchestration       startManagedWebLogic_readme.txt
bidata         bisearch           config             featureflags        lib                      original            startWebLogic.sh
BInferJmsFileStore_auto_1  bisysman          console-xml        fileRealm.properties lifecycle-config.xml    pending            store
BInferFileStore_auto_1    bitools           debugMagicThreadDumpFile  generated_classes  lifecycle-config.xml.lock resources           system
biilogs         biupgrade          derby.log          init-info           modules                  security            system_components
[root@oas bi]#

```

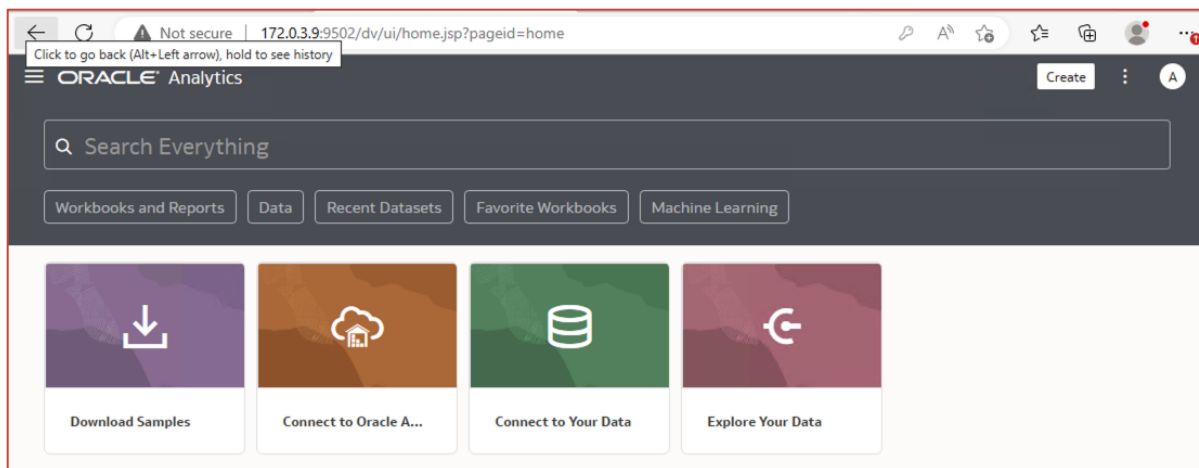
The domain home configured in the primary OAS instance is available in the DR OAS instance.

NOTE: If you need the latest updated data from the source block volume since it gets continuously replicated to the block volume replica, repeat the steps to activate the replica to create a new block volume and attach it to the OAS DR compute instance.

If needed, you can automate these steps using the OCI CLI and bash scripts.

Switchover the DBCS instance in the OCI DR region from Standby to Primary.

Start the services in the DR OAS instance.



NOTE: Use the OAS DR instance only for consuming tasks and don't create new reports or upload new Datasets in the OAS DR instance, as the DR block volume needs to be replicated to the primary region, and a new block volume needs to be created and attached to the primary OAS instance.

NOTE: The source block volume and the new block volume that you copied from the replica are now two different block volumes.

NOTE: For any changes in the source block volume of the primary OAS instance, you need to detach the existing block volume from the OAS DR instance, create a new block volume from the replica, and attach it to the OAS DR instance.

NOTE: For any changes in the OAS DR instance during the DR, you need to replicate the block volume on the DR instance, create a new block volume from the replica, and attach it to the primary OAS compute instance.

If you need point-to-point replicated content (with a delay) from Source to DR, use RSYNC or FPSYNC to copy files from Region to Region.

Summary

Here you have understood the steps to create a block volume and attach it to the OAS compute instance. You also covered the steps to replicate the block volume, create a new block volume from the replica, and attach it to the DR OAS compute instance.

You also know the limitations of the block volume replication, so use the DR OAS instance for DR availability and not create new objects in the OAS instance.

If you have created new objects in the DR OAS instance, you may need to replicate the DR block volume to the primary OAS block volume.

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