



Block Storage: Create, and Attach a Block Volume

Lab 6-1 Practices

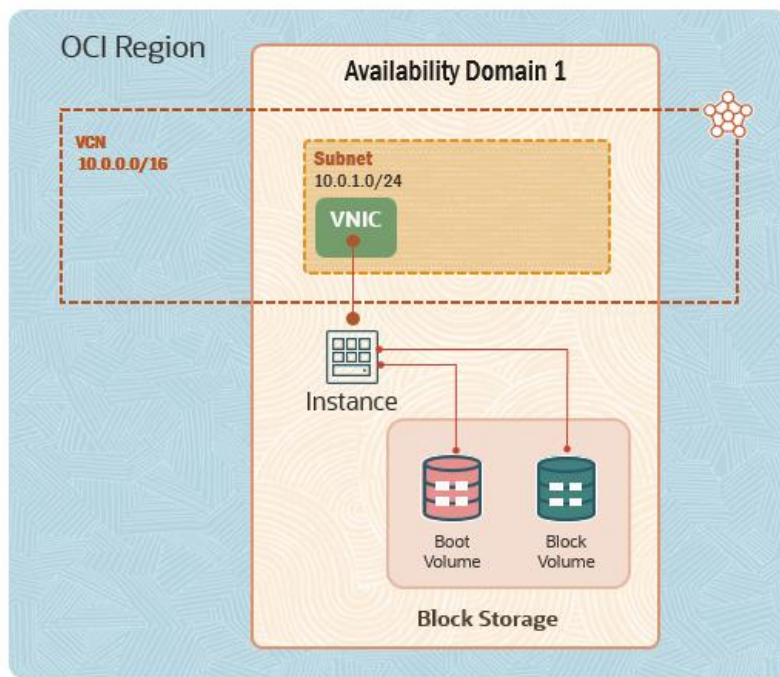
Get Started

Overview

The Oracle Cloud Infrastructure (OCI) Block Volume service lets you dynamically provision and manage block storage volumes. You can create, attach, connect, and move volumes, as well as change volume performance, as needed, to meet your storage, performance, and application requirements.

In this lab, you will:

- a. Create a Virtual Cloud Network and its components
- b. Create a VM instance
- c. Create a block volume
- d. Attach a block volume to a compute instance



Prerequisites

- You have access to the OCI Console.

Assumptions

- In this lab, we are considering US East (Ashburn, Region Key – IAD) as your region.
- You must be familiar with navigating the OCI Console.

Create a Virtual Cloud Network and Its Components

In this practice, you will learn how to create a Virtual Cloud Network (VCN), subnet, and Internet gateway, and add route rules in the Route Table.

Tasks

1. Sign in to the OCI Console.
2. In the Console ribbon at the top of the screen, click the **Region** icon to expand the menu. Ensure that you are in the correct region, **US East (Ashburn)**.
3. From the **Main Menu**, select **Networking**, and then click **Virtual Cloud Networks**.
4. Click **Create VCN**.
5. Enter the following:
 - a. **Name:** Enter `IAD-FA-LAB06-1-VCN-01`.
 - b. **Create in Compartment:** Select the *<compartment name>* assigned to you.
 - c. **IPv4 CIDR Blocks:** Type `10.0.0.0/16` and press **Enter**.

Note: You can leave all the other options as default.
6. Click **Create VCN**. The VCN is now created successfully.
7. Click **Create Subnet**.
8. In the Create Subnet dialog box, do the following:
 - a. **Name:** Enter `IAD-FA-LAB06-1-SNET-01`.
 - b. **Create in Compartment:** Select the *<compartment name>* assigned to you.
 - c. **Subnet Type:** Select **Regional**.
 - d. **IPv4 CIDR Blocks:** Enter `10.0.1.0/24`.
 - e. **Subnet Access:** Select **Public Subnet**.

Note: You can leave all the other options as default.
9. Click **Create Subnet**. The subnet is now created successfully, and the state is **Available**.

10. In the left navigation pane, under **Resources**, click **Internet Gateways**.
11. Click **Create Internet Gateway**.
12. Do the following:
 - a. **Name:** Enter `IAD-FA-LAB06-1-IG-01`.
 - b. **Create in Compartment:** Select the *<compartment name>* assigned to you.
13. Click **Create Internet Gateway**. The Internet gateway is now created successfully, and the state is **Available**.
14. In the left navigation pane, under **Resources**, click **Route Tables**.
15. Click **Default Route Table for IAD-FA-LAB06-1-VCN-01**.
16. Click **Add Route Rules** and do the following:
 - a. **Target Type:** Select **Internet Gateway** from the drop-down list.
 - b. **Destination CIDR Block:** Enter `0.0.0.0/0`.
 - c. **Target Internet Gateway:** Select **IAD-FA-LAB06-1-IG-01** from the drop-down list.
17. Click **Add Route Rules**. The route rule is now successfully added to the default Route Table.

Create a VM Instance

In this practice, you will learn how to create SSH keys using Cloud Shell and how to launch an instance.

Tasks

1. Sign in to the OCI Console.
2. In the Console ribbon at the top of the screen, click the **Regions** icon to expand the menu. Ensure that you are in the correct region, **US East (Ashburn)**.
3. In the Console ribbon at the top of the screen, click the **Cloud Shell** icon next to the Region selection menu.
4. Once the Cloud Shell is ready, enter the following commands:

```
$ mkdir .ssh
```

- **Important:** In case you get an error “Cannot create directory: File exists,” you can skip running this first command.

```
$ cd .ssh
```

```
$ ssh-keygen -b 2048 -t rsa -f <<sshkeyname>>
```

- **Remember:** After entering this third command, press **Enter** twice for no passphrase.

Note: Replace <<sshkeyname>> with **ocifalab6key**. Choose a key name you can remember. This will be the key name you will use to connect to the compute instance you create.

Reminder: The angle brackets «» should not appear in your code.

Reminder: Do not include the \$ symbol when pasting code into Cloud Shell.

5. Examine the two files that you just created by running the following command:

```
$ ls
```

Note: In the output, there are two files, a private key <<sshkeyname>> and a public key <<sshkeyname>>.pub. Keep the private key safe and don’t share its contents with anyone. The public key will be needed for various activities and can be uploaded to certain systems, as well as copied and pasted to facilitate secure communications in the cloud.

6. To list the contents of the public key, use the following command:

```
$ cat <<sshkeyname>>.pub
```

Note: Replace <<sshkeyname>> with **ocifalab6key**.

Reminder: The angle brackets «» should not appear in your code.

7. Copy the contents of the public key as you will need this in a subsequent step. Make sure that you remove any hard returns that may have been added when copying. The `.pub` key should be one line.
8. From the **Main Menu**, select **Compute**. Under **Compute**, click **Instances**.
9. Click **Create instance** and do the following:
 - a. **Name:** Enter `IAD-FA-LAB06-1-VM-01`.
 - b. **Create in compartment:** Select the `<compartment name>` assigned to you.
 - c. **Placement:** Select Availability Domain **AD1**. Click **Show advanced options** and select **On-demand capacity** from the **Capacity type** menu.
 - d. **Image:** Select Oracle Linux 8.
 - e. **Shape:** Click **Change Shape** and select the following:
 - 1) **Instance Type:** Virtual Machine
 - 2) **Shape Series:** Ampere
 - 3) **Shape Name:** `VM.Standard.A1.Flex`
 - 4) Leave **Number of OCPU** at one.
 - 5) Leave **Amount of memory (GB)** at six.
 - 6) Click **Select Shape**.
 - f. **Networking:** Select the existing VCN **IAD-FA-LAB06-1-VCN-01** and existing subnet **IAD-FA-LAB06-1-SNET-01 (regional)**. Under **Public IP address**, select **Assign a public IPv4 address**.
 - g. **Add SSH keys:** Select **Paste public keys** and paste the contents of the public key, which you copied in Step 6, in the box.

h. **Boot volume:** Keep the default selection.

10. Click **Create**.

Note: After a couple of minutes, you see that the instance is successfully created, and the state is **Running**.

11. Under **Instance access**, copy the **Public IP address**.

12. Click the **Cloud Shell** icon to open Cloud Shell, and use SSH to connect to your instance by using the following command:

Note: Enter **yes** in response to “Are you sure you want to continue connecting (yes/no)?”

```
$ ssh -i <private_key_file> <username>@<public-ip-address>
```

Reminders:

- `/home/username/.ssh/private_key_file` is the full path and name of the file that contains the private key associated with the instance you want to access.
- `<username>` is the default user **opc**.
- `<public-ip-address>` is the public IP address of the instance.

13. You are now connected to the instance IAD-FA-LAB06-1-VM-01. Run the following command to display information about the block devices:

```
$ lsblk
```

Note: You will only see the boot disk **sda**.

Create a Block Volume

The OCI Block Volume service lets you dynamically provision and manage block storage volumes.

In this practice, you will learn how to create a block volume.

Tasks

1. Sign in to the OCI Console.
2. Open the **Main Menu** and click **Storage**. Under **Block Storage**, click **Block Volumes**.
3. Click **Create Block Volume**.
4. Fill in the required volume information:
 - a. **Name:** Enter `IAD-FA-LAB06-1-BV-01`.
 - b. **Create in Compartment:** Select the `<compartment name>` assigned to you.
 - c. **Availability Domain:** Select the first availability domain.
 - d. **Volume Size and Performance:** Select **Custom** and specify the following:
 - 1) **Volume Size (in GB):** Enter `50`.
 - 2) **Target Volume Performance:** Drag the VPU/GB slider to the left to make the performance **Lower Cost**.
 - e. **Backup Policies:** Do not specify any policy.
 - f. **Cross Region Replication:** Keep the **OFF** default selection.
 - g. **Encryption:** Keep the default **Encrypt using Oracle-managed keys** selection.
5. Click **Create Block Volume**. You now see that the Block Volume state becomes **Available**.

Attach a Block Volume to a Compute Instance

You can create, attach, connect, and move volumes. You can also change volume performance, as needed, to meet your storage, performance, and application requirements. After you attach and connect a volume to an instance, you can use the volume like a regular hard drive.

In this practice, you'll learn how to attach a block volume to a compute instance and perform various configuration tasks on the attached volume.

Tasks

1. Open the **Main Menu** and click **Compute**. Under **Compute**, click **Instances**.
2. In the **Instances** list, click the instance **IAD-FA-LAB06-1-VM-01**.
3. In the left navigation pane, under **Resources**, click **Attached block volumes**.
4. Click **Attach block volume**.
5. Specify the volume you want to attach to. For example, to use the volume name, choose **Select volume**, and then select the volume **IAD-FA-LAB06-1-BV-01** from the **Volume** drop-down list.
6. If the instance supports consistent device paths, and the volume you are attaching is not a boot volume, select the path **/dev/oracleoci/oraclevd** from the **Device path** drop-down list. This enables you to specify a device path for the volume attachment that remains consistent between instance reboots.
7. In the **Attachment type** section, select **Paravirtualized**.

Note: After you attach a volume using the Paravirtualized attachment type, it is ready to use, and you do not need to run any additional commands.

8. In the **Access** section, select **Read/Write**.

Note: This is the default option for volume attachments and, with this option, an instance can read and write data to the volume.

9. Click **Attach**. You now see the state as Attached and, since the attachment type is Paravirtualized, you can use the volume without running any additional commands.

10. Ensure that you are connected to the instance **IAD-FA-LAB06-1-VM-01**.

Note: For help with this, refer to Step 11 in the **Create a VM Instance** practice.

11. Run the following command to display information about the block devices:

```
$ lsblk
```

Note: You now see that the system recognizes a new disk device, and the size is 50 GB.

12. To verify that the volume is attached to the instance, run the following command:

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

13. To partition the disk using `fdisk`, run the following command:

```
$ sudo fdisk /dev/oracleoci/oraclecvdb
```

Note: Enter the following responses as seen in Cloud Shell:

- a. Command (m for help): Enter `n` to create a new partition.
- b. Select (default p): Enter `p`.
- c. Partition number (1,4, default 1): Press **Enter**.
- d. First sector: Press **Enter**.
- e. Last sector: Press **Enter**.
- f. Command (m for help): Enter `w` to write the new partition.

14. To format the partition, run the following command:

```
$ sudo mkfs -t ext4 /dev/oracleoci/oraclecvdb1
```

15. To mount the partition, run the following commands:

```
$ sudo mkdir -p /mnt/volume1
```

```
$ sudo mount /dev/oracleoci/oraclecvdb1 /mnt/volume1
```

Note: On Linux instances, if you want to automatically mount volumes on an instance boot, you need to set some specific options in the `/etc/fstab` file.

16. To display information about the block devices, run the following command:

```
$ lsblk
```

Note: You now see the partition and the mountpoint `/mnt/volume1`.