

Oracle Compute Cloud Service Bootable Storage Volumes

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Objectives

After completing this lesson, you should be able to:

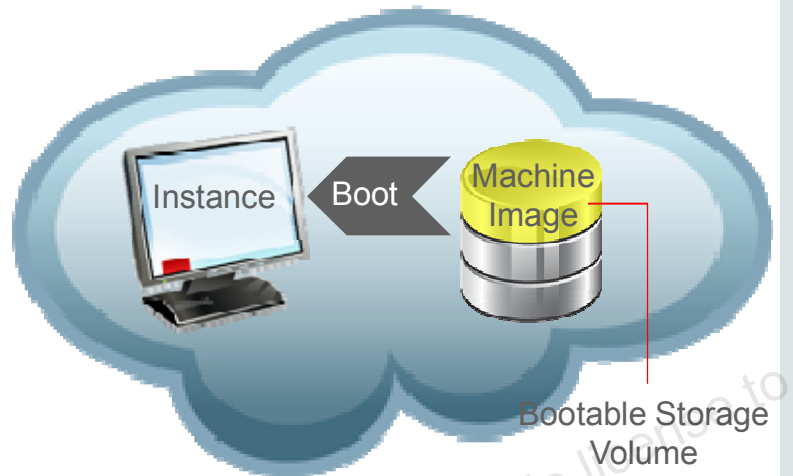
- Explain the use of a bootable storage volume
- Create a bootable storage volume
- Create an instance using a bootable storage volume

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What Is a Bootable Storage Volume?

- While creating a storage volume, you can select a machine image to be stored on the storage volume.
- You can then use this storage volume as the boot disk for an instance.



Machine Image = OS + Packages

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A storage volume is a virtual disk that provides persistent block storage space for instances in Oracle Compute Cloud Service.

To use a persistent boot disk, you can start by creating a bootable storage volume. While creating a storage volume, select the machine image that you want to use. This machine image is then stored on your bootable storage volume. When you boot an instance from such a storage volume, this machine image is used to boot the instance. Alternatively, you can retain the default option to create a boot disk when you create your instance using the web console.

If required, you can select a nonpersistent boot disk while creating an instance. However, if you use a nonpersistent boot disk, then, if you delete and re-create your instance, any changes that you made to the instance are lost. However, if you use a bootable storage volume as the boot disk for an instance, then changes that you make to the boot disk are not lost even when you delete and re-create the instance.

What Is a Machine Image?

- A machine image is a template of a virtual hard disk of a specific size with an installed operating system.
- You use machine images to create virtual machine instances in Oracle Compute Cloud Service.
- While creating instances, you can either use images provided by Oracle, or create your own custom machine images.



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Oracle-Provided Images

Oracle provides machine images for Oracle Linux 6.4 and 6.6.

The Oracle-provided images include the essential packages that are necessary to get started using the instance that you create in Oracle Compute Cloud Service. Specifically, they include the basic packages required for the following:

- Development tools: Expect, Java OpenJDK, GCC suite, GNU utilities, Perl, Ruby, Python, and so on
- Basic X11 desktop
- Remote X11 access with VNC
- Xterm client
- Security and auditing with OpenSCAP and AIDE
- Integration with name services such as OpenLDAP, Kerberos, and NIS
- System administration tools
- Firefox and Elinks web browsers
- EMACs and vim editors

How Do I Create a Bootable Block Storage Volume?

1. Go to the Oracle Compute Cloud Service web console.
2. Click the Storage tab.
3. Click Create Storage Volume.
 - The Create Storage Volume wizard starts.
4. On the Storage Details page, enter the following:
 - Name, Boot Image, Size, Storage Property, Description
5. Click Create.

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You have already learned how to create a storage volume in the previous lesson. Follow the same steps to launch the Create Storage Volume wizard.

Enter the following values for the fields in the Storage Details Page:

Name: Enter an appropriate name. For example, enter <yourfirstname>_bootable_vol_01.

Boot Image: Select the image that you want to use to create a bootable storage volume. For example, select OL-6.6-20GB-x11-RD or similar Oracle provided Oracle Linux image.

Size: Enter an appropriate size, in GB. For example, enter 22.

- **Note:** The size of the storage volume must be at least five percent larger than the selected image size.

Storage Property: Select /storage/default.

Description: Enter an appropriate description. For example, enter Bootable Storage Volume 22 GB.

How Do I Create an Instance with this Storage Volume?

1. Go to the web console.
2. Click Create Instance.
 - i. On the Image page: Select an image.
 - ii. On the Shape page: Retain the default values.
 - iii. On the Instance page: Enter a name, select the SSH Public key generated earlier, and retain the default values in other fields.
 - iv. On the Storage page: Click Attach Existing Volume, select the bootable storage volume, select the Boot Drive option, and click Add.
 - v. On the Review page: Verify the information and click Create.

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1. On the Oracle Compute Cloud Service console, click the Instances tab, and then click Create Instance. The Create Instance wizard starts.
2. On the Image page, select the same image as the one selected while creating the Bootable Storage Volume.
3. On the Shape page, select OC3.
4. On the Instance page:
 - High Availability Policy: Retain default HA Policy, Active.
 - Name: Enter name `<yourfirstname>_instance_02`.
 - Label: Enter a label.
 - Description: Enter a description.
 - Tags: Leave this field blank for now.
 - DNS Hostname Prefix: Leave this field blank for now.
 - Public IP Address: Select `Auto Generated`.
 - Security Lists: Leave this field blank for now.
 - SSH Keys: Select the SSH Public Key created earlier.
 - Custom Attributes: Leave this field blank for now.

4. On the Storage page:
 - Attach Storage Volume: Select the storage volume that you want to attach.
 - Attach as Disk #: Retain the default number. The disk number that you specify here determines the device name. The disk attached at index 1 is named /dev/xvdb, the disk at index 2 is /dev/xvdc, the disk at index 3 is /dev/xvdd, and so on. Make a note of the disk number. You'll need it later when you mount the storage volume on the instance. This is automatically set to 1 when the storage volume is specified as a boot disk.
 - Boot Drive: Select this option to use the specified storage volume as the boot disk. When you select this option, the disk number is automatically set to 1.
5. On the Review page, verify the information that you entered and then click Create. Your instance is created.

How Do I Access the Storage Volume?

- Log in to the instance with PuTTY, the SSH client for Windows.

Device listing:

`sudo ls -l` command at the path `/dev` lists all the devices associated with the instance.

- Check for persistence of the bootable storage volume (optional)

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After logging in to the instance using PuTTY, check the path `/dev` for the list of devices attached to the instance with the command `sudo ls -l`. Identify the bootable storage volume and its attributes. The bootable storage volume by default is assigned the least index number. For example,

The result of `sudo ls -l /dev/xvd*` produces the following result:

brw-r----	1	root	disk	202, 16 Feb	9
05:09			/dev/xvdb		
brw-r----	1	root	disk	202, 17 Feb	9
05:09			/dev/xvdb1		
brw-r----	1	root	disk	202, 18 Feb	9
05:09			/dev/xvdb2		

In the above example, device `xvdb` is the bootable storage volume.

Check for Persistence

Test the persistence of the bootable storage volume by

- making changes to the boot volume by changing the value of a suitable kernel parameter in the OS image
- deleting the existing instance associated with it
- creating a new instance
- associating the new instance with the same bootable storage volume
- finally checking if the changes made to the boot volume persist

Quiz



Which of the following statements are true?

- a. When you create an Oracle Compute Cloud Service instance, a persistent boot volume is used by default.
- b. If you use a bootable storage volume as the boot disk for an instance, then changes that you make to the boot disk are not lost even when you delete and re-create the instance.
- c. You can create a custom machine image with any OS of your choice and use this machine image to create Oracle Compute Cloud Service instances.

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Quiz



If you want your instance to use a persistent boot disk, you can:

- a. Go to the Storage tab, click Create Storage Volume to create a bootable storage volume and select an instance to attach it to.
- b. Create a bootable storage volume and then click the Create Instance button on the Instances tab. In the Create Instance wizard, select the bootable storage volume while creating the instance.
- c. Create a bootable storage volume. Create an instance using the default options in the Create Instance wizard. When the instance is running, select View, and on the instance details page, attach the bootable storage volume.

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Summary

In this lesson, you should have learned how to:

- Explain the use of a bootable storage volume
- Create a bootable storage volume
- Create an instance using a bootable storage volume

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Resource: Links

For more information regarding Oracle Compute Cloud Service, visit <http://docs.oracle.com/cloud/latest/stcompute/cs/index.html>.

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