

Deploying Custom Operating System Images on Oracle Cloud Infrastructure

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Table of Contents

Purpose of This White Paper	3
Scope and Assumptions	3
Access Requirements for Creating Custom Images	4
Use Case 1: Custom Images	4
Key Features and Limitations of Custom Images	4
Custom Images: Step-by-Step Guide	5
Step 1: Launch a Bare Metal Instance	5
Step 2: Connect to the Instance	7
Step 3: Install Software on the Instance	7
Step 4: Create a Custom Image of the Instance	9
Step 5: Launch an Instance by Using the Custom Image	10
Step 6: Connect to the Custom Image Instance	12
Step 7: Verify That the Software Is Installed on the New Instance	12
Summary	13
Use Case 2: Bring Your Own Images	14
Key Features and Limitations of Bring Your Own Images	14
Requirements for Bring Your Own Image	14
Requirements Specific to Linux-Based Custom Images	15
Bring Your Own Images: Step-by-Step Guide	15
Step 1: Create an Object Storage Bucket	15
Step 2: Upload an OS Image to Object Storage	17
Step 3: Obtain the URL Path for the Uploaded OS Image	18
Step 4: Import the Image	19
Step 5: Launch an Instance by Using the Imported Image	20
Summary	21
Importing and Exporting Your Own Images Across Regions and Tenancies	22
Summary	24

Purpose of This White Paper

Although Oracle Cloud Infrastructure provides *standard* operating system (OS) images for launching compute instances, many scenarios require *custom* images, either based on the standard images or created by users.

This white paper describes how to create and import custom images. It provides step-by-step guidelines for the following use cases:

- Creating a custom image and using it to launch an instance
- Importing an image to Oracle Cloud Infrastructure and using it to launch an instance

Scope and Assumptions

To get the most from this paper, you should have a basic knowledge of the [Networking components of in Oracle Cloud Infrastructure](#), which are illustrated in Figure 1:

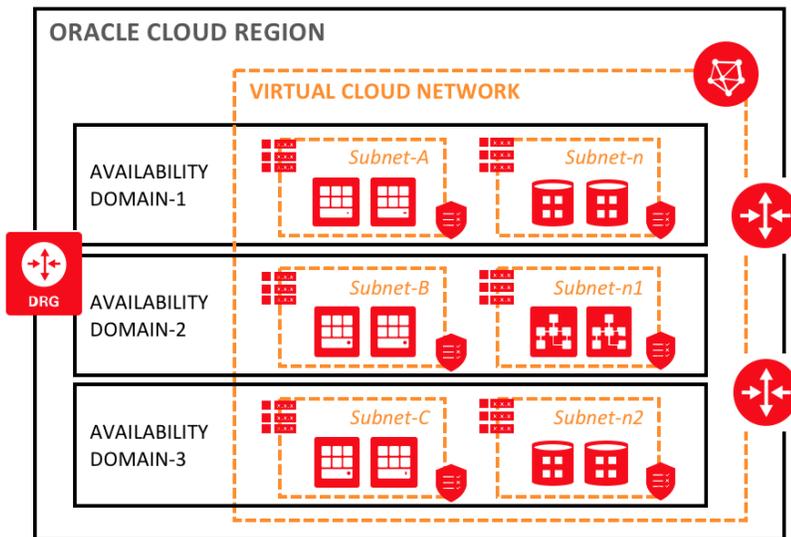


Figure 1: Oracle Cloud Infrastructure Virtual Network

You should also be familiar with or have a basic understanding of the following items:

- [Fundamentals of Oracle Cloud Infrastructure](#)
- [Oracle Cloud Infrastructure Identity and Access Management \(IAM\)](#)
- [Oracle provided OS images](#)
- [Oracle Cloud Infrastructure command line interface \(CLI\)](#)

Access Requirements for Creating Custom Images

To create and manage images, you must have been granted access in Identity and Access Management (IAM) to manage the instance family in the compartment. The following example policy gives the access required to create custom images and launch an instance using a custom image:

```
Allow group InstanceLaunchers to manage instance-family in compartment ABC
Allow group InstanceLaunchers to use volume-family in compartment ABC
Allow group InstanceLaunchers to use virtual-network-family in compartment XYZ
```

Note: If the specified group doesn't need to launch instances or attach volumes, you could simplify the policy to include only the `manage instance-family` statement, removing the statements for `volume-family` and `virtual-network-family`.

The next sections cover the prerequisites and preparatory steps for customizing a standard image and using it to launch an instance.

Use Case 1: Custom Images

You can create an image of a bare metal instance's boot disk and use it to launch other instances. Such an image is called a *custom image*. Instances that you launch from a custom image include the same customizations, configuration, and software that were installed when you created the image.

Key Features and Limitations of Custom Images

Following are the key features and limitations of custom images:

- Custom images are created from an instance's boot disk and used to launch other instances.
- Instances launched from a custom image include the customizations, configuration, and software that were installed when the image was created.
- When you create an image of a running instance, the instance shuts down and remains unavailable for several minutes. When the process is complete, the instance restarts.
- Custom images are available to all users who are authorized for the compartment in which the image was created.
- Custom images include the data from *boot* volumes only. They don't include the data from any attached *block* volumes.
- Custom images can't exceed 300 GB in size.

- You can't download or export Windows custom images.
- You can't create custom images for an Oracle Database instance.
- You can create a maximum of 25 custom images per region per root compartment.
- Two kinds of images are supported for Windows Server:
 - *Generalized* images have a generalized OS disk and are cleaned of computer-specific information.
 - *Specialized* images have an OS disk that is already fully installed, and are basically copies of the original bare metal or virtual machine image.

Custom Images: Step-by-Step Guide

In this section, you launch a bare metal instance by using an Oracle provided Linux image, install custom software on this instance, and then create a custom image. You then use this custom image to launch another instance and validate that the newly launched instance has the same custom software installed on it.

Step 1: Launch a Bare Metal Instance

Follow these steps to launch a bare metal instance on Oracle Cloud Infrastructure:

1. Log in to the Oracle Cloud Infrastructure Console.
2. From the **Compute** tab, select **Instances**.
3. Choose a compartment in which you have permission to work.
4. Click **Create Instance**.
5. In the **Create instance** dialog box, provide the following information:
 - Enter a name for the instance.
 - Choose an availability domain.
 - Choose **Oracle-Provided OS Image** as the boot volume
 - Choose an operating system for the image. This example uses **Oracle Linux 7.4**.
 - Choose **Bare Metal Machine** as the shape type.
 - Choose a shape for the bare metal machine. This example uses **BM.Standard1.36**.
 - Choose the latest image version.
 - Choose to upload or paste SSH keys (public keys).

- Choose a virtual cloud network (VCN).
- Choose a subnet.

6. Click **Create Instance**.

The screenshot shows the 'Create Instance' configuration page in the Oracle Cloud console. The 'Instance' section includes fields for Name (NG_Webserver), Availability Domain (eurR:US-ASHBURN-AD-1), Boot Volume (Oracle-Provided OS Image), Image Operating System (Oracle Linux 7.4), Shape Type (Virtual Machine), Shape (BM.Standard1.36), and Image Version (2018.02.21-0). The Networking section shows VCN (NG_VCN) and Subnet (NG_Subnet_Web) selected, with the 'Assign Public IP Address' checkbox checked. A 'Tags' section at the bottom allows for adding metadata. A 'Create Instance' button is located at the bottom left.

Figure 2: Creating an Instance

After the instance is launched, it appears in the Console.

7. Click the instance name to see the public IP address of the instance.

Step 2: Connect to the Instance

Connect to the instance by using its public IP address. For example:

```
ssh opc@129.213.16.245
```

```
nishagup-mac:~ nishagup$ ssh opc@129.213.16.245
Enter passphrase for key '/Users/nishagup/.ssh/id_rsa':
Last login: Mon Mar 26 21:48:38 2018 from 156.151.8.12
[opc@ng-webserver ~]$
[opc@ng-webserver ~]$ uname -a
Linux ng-webserver 4.1.12-112.14.15.el7uek.x86_64 #2 SMP Thu Feb 8 09:58:19 PST 2018 x86_64 x86_64 x86_64 GNU/Linux
[opc@ng-webserver ~]$
```

Figure 3: Connecting to Instance by Using SSH

Step 3: Install Software on the Instance

Install any software on this instance. In this example, the open-source software LibreOffice is installed.

1. Verify that the software (in this example, LibreOffice) is not already installed on this host (see Figure 4).

```
rpm -qa | grep -i libreoffice
```

```
[root@ng-webserver ~]# rpm -qa | grep -i libreoffice
[root@ng-webserver ~]#
[root@ng-webserver ~]# yum update libreoffice
Loaded plugins: langpacks, ulninfo
Package(s) libreoffice available, but not installed.
No packages marked for update
[root@ng-webserver ~]#
```

Figure 4: Verifying That LibreOffice Is Not Already Installed on the Instance

2. Install the software (see Figure 5).

```
yum install libreoffice
```

```
[root@ng-websrvr ~]# yum install libreoffice
Loaded plugins: langpacks, umintro
Resolving Dependencies
--> Running transaction check
--> Package libreoffice.x86_64 1:5.0.6.2-15.0.1.el7_4 will be installed
--> Processing Dependency: libreoffice-draw = 1:5.0.6.2-15.0.1.el7_4 for package: 1:libreoffice-5.0.6.2-15.0.1.el7_4
--> Processing Dependency: libreoffice-writer = 1:5.0.6.2-15.0.1.el7_4 for package: 1:libreoffice-5.0.6.2-15.0.1.el7_4
--> Processing Dependency: libreoffice-base = 1:5.0.6.2-15.0.1.el7_4 for package: 1:libreoffice-5.0.6.2-15.0.1.el7_4
--> Processing Dependency: libreoffice-math = 1:5.0.6.2-15.0.1.el7_4 for package: 1:libreoffice-5.0.6.2-15.0.1.el7_4
--> Processing Dependency: libreoffice-impres = 1:5.0.6.2-15.0.1.el7_4 for package: 1:libreoffice-5.0.6.2-15.0.1.el7_4
--> Processing Dependency: libreoffice-calc = 1:5.0.6.2-15.0.1.el7_4 for package: 1:libreoffice-5.0.6.2-15.0.1.el7_4
--> Processing Dependency: libreoffice-emailmerge = 1:5.0.6.2-15.0.1.el7_4 for package: 1:libreoffice-5.0.6.2-15.0.1.el7_4
--> Running transaction check
```

Figure 5: Installing LibreOffice

3. Validate that the software is installed on the instance (see Figure 6).

```
yum info libreoffice
rpm -qa | grep -i libreoffice
```

```
libreoffice-pyuno.x86_64 1:5.0.6.2-15.0.1.el7_4
libreoffice-writer.x86_64 1:5.0.6.2-15.0.1.el7_4
libreoffice-ure.x86_64 1:5.0.6.2-15.0.1.el7_4

Complete!
[root@ng-websrvr ~]# yum info libreoffice
Loaded plugins: langpacks, umintro
Installed Packages
Name      : libreoffice
Arch      : x86_64
Epoch    : 1
Version   : 5.0.6.2
Release   : 15.0.1.el7_4
Repo      : installed
From repo : oel_optional_latest
Summary   : Free Software Productivity Suite
URL       : http://www.libreoffice.org/
License   : (MPLv1.1 or LGPLv3+) and LGPLv2+ and BSD and (MPLv1.1 or GPLv2 or LGPLv2 or Netscape) and Public Domain and
ASL 2.0 and Artistic and MPLv2.0 and CC0
Description: LibreOffice is an Open Source, community-developed, office productivity suite.
: It includes the key desktop applications, such as a word processor,
: spreadsheet, presentation manager, formula editor and drawing program, with a
: user interface and feature set similar to other office suites. Sophisticated
: and flexible, LibreOffice also works transparently with a variety of file
: formats, including Microsoft Office File Formats.

[root@ng-websrvr ~]# rpm -qa | grep -i libreoffice
libreoffice-core-5.0.6.2-15.0.1.el7_4.x86_64
libreoffice-base-5.0.6.2-15.0.1.el7_4.x86_64
libreoffice-graphicfilter-5.0.6.2-15.0.1.el7_4.x86_64
libreoffice-langpack-en-5.0.6.2-15.0.1.el7_4.x86_64
libreoffice-opensymbol-fonts-5.0.6.2-15.0.1.el7_4.noarch
libreoffice-pyuno-5.0.6.2-15.0.1.el7_4.x86_64
libreoffice-calc-5.0.6.2-15.0.1.el7_4.x86_64
libreoffice-emailmerge-5.0.6.2-15.0.1.el7_4.x86_64
libreoffice-impres-5.0.6.2-15.0.1.el7_4.x86_64
libreoffice-pdfimport-5.0.6.2-15.0.1.el7_4.x86_64
libreoffice-5.0.6.2-15.0.1.el7_4.x86_64
libreoffice-ure-5.0.6.2-15.0.1.el7_4.x86_64
libreoffice-writer-5.0.6.2-15.0.1.el7_4.x86_64
libreoffice-math-5.0.6.2-15.0.1.el7_4.x86_64
libreoffice-draw-5.0.6.2-15.0.1.el7_4.x86_64
```

Figure 6: Verifying That LibreOffice Is Installed

Step 4: Create a Custom Image of the Instance

Follow these steps to create a custom image:

1. In the Oracle Cloud Infrastructure Console, click the **Compute** tab and select **Instances**.
2. Click name of the instance that you created earlier.
3. Click **Create Custom Image** and specify the following information in the dialog box:
 - Choose the compartment.
 - Enter a name for the custom image. This example uses **custom-webserver-image**.
4. Click **Create Custom Image**.

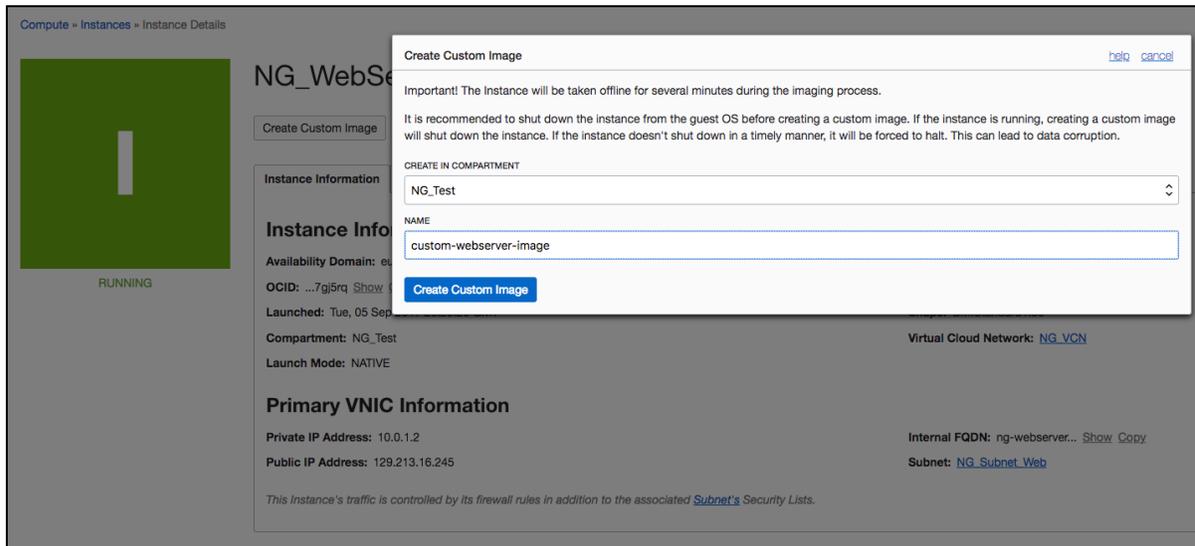


Figure 7: Creating a Custom Image

The instance is shut down to create a consistent image. After the image is created, the instance restarts, and a custom image is available on the Compute page under **Images**.

5. Click the image name to view its details.

All the compatible instance shapes with which this image can be used are listed (see Figure 8).

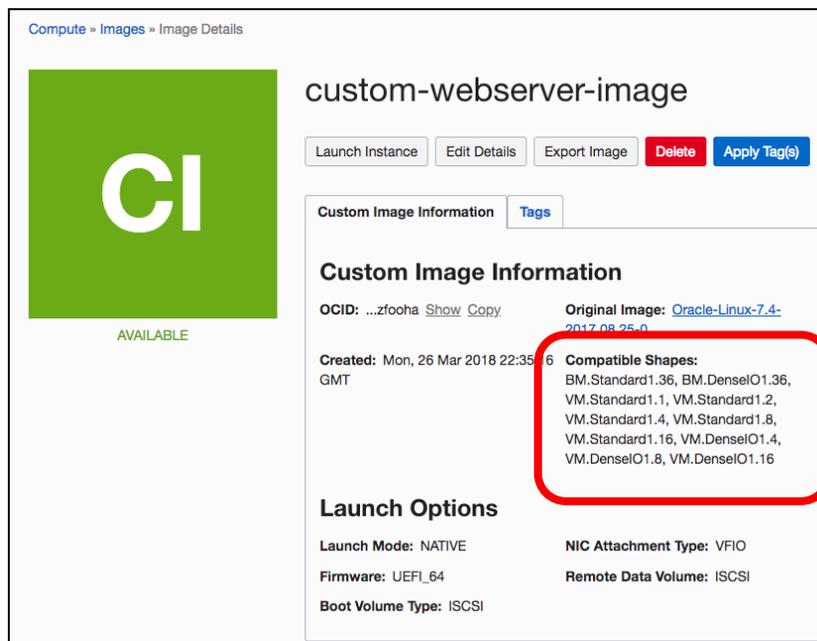


Figure 8: Custom Image Information

Step 5: Launch an Instance by Using the Custom Image

Follow these steps to launch a bare metal instance on Oracle Cloud Infrastructure by using your newly created custom image:

1. From the **Compute** tab, select **Instances**.
2. Choose a compartment in which you have permission to work.
3. Click **Create Instance**.
4. In the **Create Instance** dialog box, provide the following information:
 - Enter a name for the instance.
 - Choose an availability domain.
 - Choose **Custom Image** as the boot volume.
 - Choose the custom image to use. This example uses **custom-webserver-image**.
 - Choose **Virtual Machine** as the shape type.

- Choose a shape (only compatible shapes are available). This example uses **VM.Standard1.16**.
- Choose to upload or paste SSH keys (public keys).
- Choose a VCN.
- Choose a subnet.

5. Click **Create Instance**.

The screenshot shows the 'Create Instance' configuration page. The 'Instance' section is highlighted with a red box. It contains the following settings:

- NAME:** custom-image-instance
- AVAILABILITY DOMAIN:** eurP1IS-ASHBURN-AD-1
- BOOT VOLUME:** ORACLE-PROVIDED OS IMAGE CUSTOM IMAGE BOOT VOLUME IMAGE OCID
- IMAGE:** custom-webserver-image
- BOOT VOLUME SIZE (IN GB):** Selected image's default boot volume size: 46.6 GB
- SHAPE TYPE:** VIRTUAL MACHINE BARE METAL MACHINE
- SHAPE:** VM.Standard1.16 (16 OCPUs, 112GB RAM)
- SSH KEYS:** CHOOSE SSH KEY FILES PASTE SSH KEYS
- SSH Key files (pub) from your computer:** id_rsa.pub

Below the 'Instance' section, the 'Networking' section is visible with the following settings:

- VIRTUAL CLOUD NETWORK:** NG_VCN
- SUBNET:** NG_Subnet_Web
- ASSIGN PUBLIC IP ADDRESS:**

At the bottom, there is a 'TAGS' section with a table for TAG NAMESPACE, TAG KEY, and VALUE. The 'View detail page after this instance is launched' checkbox is checked. A 'Create Instance' button is at the bottom left.

Figure 9: Creating an Instance from a Custom Image

After the instance is launched, it appears in the Console.

- Click the instance name to see the public IP address of the instance. The **Image** field on the right side shows that this instance is based on the custom image that you created.

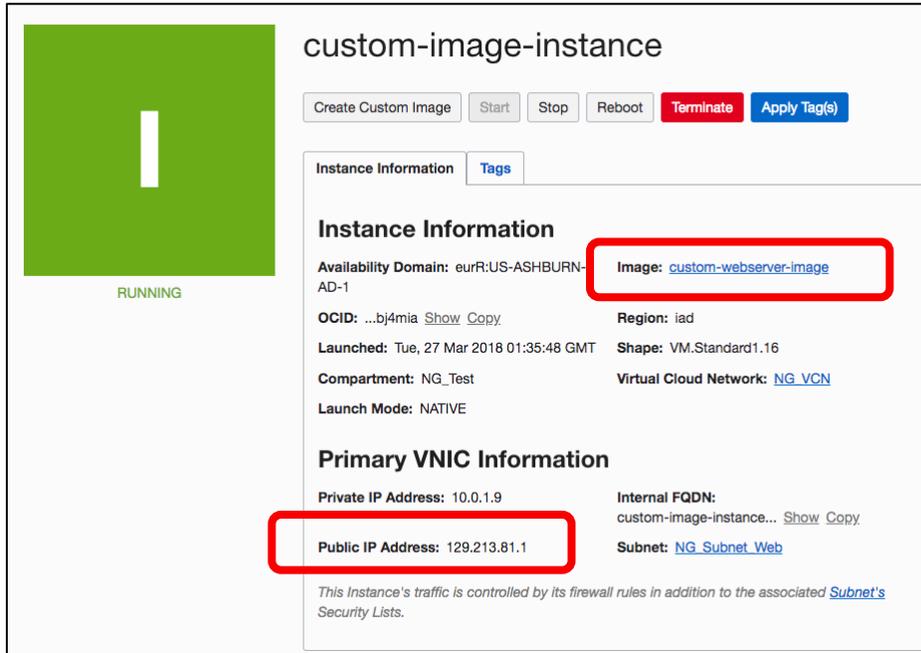


Figure 10: Custom Image Instance Information

Step 6: Connect to the Custom Image Instance

Connect to the new instance by using its public IP address. For example:

```
ssh opc@129.213.81.1
```

```
nishagup-mac:~ nishagup$ ssh opc@129.213.81.1
Enter passphrase for key '/Users/nishagup/.ssh/id_rsa':
Last login: Tue Mar 27 01:45:03 2018 from 156.151.8.14
[opc@custom-image-instance ~]$
[opc@custom-image-instance ~]$
[opc@custom-image-instance ~]$ uname -a
Linux custom-image-instance 4.1.12-112.14.15.el7uek.x86_64 #2 SMP Thu Feb 8 09:58:19 PST 2018 x86_64 x86_64 x86_64 GNU/Linux
[opc@custom-image-instance ~]$
```

Figure 11: Connecting to the Instance by Using SSH

Step 7: Verify That the Software Is Installed on the New Instance

Confirm that the software that you installed on the original instance (in this example, LibreOffice) is already installed on this instance.

```
yum info libreoffice
rpm -qa | grep -i libreoffice
```

```
[root@custom-image-instance ~]# yum info libreoffice
Loaded plugins: langpacks, yum-plugin-protectdata
Installed Packages
Name      : libreoffice
Arch      : x86_64
Epoch    : 1
Version   : 5.0.6.2
Release   : 15.0.1.el7_4
Size      : 0.0
Repo      : installed
From repo : ol7_optional_latest
Summary   : Free Software Productivity Suite
URL       : http://www.libreoffice.org/
License   : (MPLv1.1 or LGPLv3+) and LGPLv3 and LGPLv2+ and BSD and (MPLv1.1 or GPLv2 or LGPLv2 or Netscape) and Public Domain and
          : ASL 2.0 and Artistic and MPLv2.0 and CC0
Description : LibreOffice is an Open Source, community-developed, office productivity suite.
          : It includes the key desktop applications, such as a word processor,
          : spreadsheet, presentation manager, formula editor and drawing program, with a
          : user interface and feature set similar to other office suites. Sophisticated
          : and flexible, LibreOffice also works transparently with a variety of file
          : formats, including Microsoft Office File Formats.

[root@custom-image-instance ~]#
[root@custom-image-instance ~]# rpm -qa | grep -i libreoffice
libreoffice-core-5.0.6.2-15.0.1.el7_4.x86_64
libreoffice-base-5.0.6.2-15.0.1.el7_4.x86_64
libreoffice-graphicsfilter-5.0.6.2-15.0.1.el7_4.x86_64
libreoffice-langpack-en-5.0.6.2-15.0.1.el7_4.x86_64
libreoffice-opensymbol-fonts-5.0.6.2-15.0.1.el7_4.noarch
libreoffice-pyuno-5.0.6.2-15.0.1.el7_4.x86_64
libreoffice-calc-5.0.6.2-15.0.1.el7_4.x86_64
libreoffice-emailmerge-5.0.6.2-15.0.1.el7_4.x86_64
libreoffice-impress-5.0.6.2-15.0.1.el7_4.x86_64
libreoffice-pdfimport-5.0.6.2-15.0.1.el7_4.x86_64
libreoffice-5.0.6.2-15.0.1.el7_4.x86_64
libreoffice-ure-5.0.6.2-15.0.1.el7_4.x86_64
libreoffice-writer-5.0.6.2-15.0.1.el7_4.x86_64
libreoffice-math-5.0.6.2-15.0.1.el7_4.x86_64
libreoffice-draw-5.0.6.2-15.0.1.el7_4.x86_64
[root@custom-image-instance ~]#
```

Figure 12: Verifying That LibreOffice Is Installed

Summary

Based on these steps, you can customize and install software on an already running instance. You can create a custom image of your boot disk as a backup or use it as a mechanism to package your preconfigured OS image and launch new compute instances. This ability is particularly useful when you need to create multiple compute instances with similar configurations. The custom image can be used to launch any instance types or shapes: bare metal or virtual machine instances.



Use Case 2: Bring Your Own Images

In certain cases, you might want to bring customized OS images from your on-premises environment into the cloud. Oracle Cloud Infrastructure enables you to bring certain versions of OSs to the cloud as long as the underlying hardware supports it. You can import a wide range of new and legacy OSs to Oracle Cloud Infrastructure and use these images to launch instances. This ability enables you to “lift-and-shift” cloud migration projects.

For more information about bringing your own image, see [the Compute service documentation](#).

Key Features and Limitations of Bring Your Own Images

Following are the key features and limitations of bring your own images:

- You can install older or cutting-edge, experimental OSs.
- You are responsible for complying with all the licensing requirements for OS images that you supply.

Requirements for Bring Your Own Image

Custom images should meet the following requirements. For more details, see [the Compute service documentation](#).

- The image must be set up for BIOS boot.
- The maximum image size is 300 GB.
- Only one disk is supported, and it must be the boot drive with a valid Master Boot Record (MBR) and boot loader. You can migrate additional data volumes after the image's boot volume has been imported.
- The boot process must not require additional data volumes to be present for a successful boot.
- The disk image can't be encrypted.
- The disk image must be a VMDK or QCOW2 file. VMDK files must be either the “single growable” (monolithicSparse) type or the “stream optimized” (streamOptimized) type, both of which consist of a single VMDK file. All other VMDK formats, such as those that use multiple files, split volumes, or contain snapshots, aren't supported.
- Existing network interfaces aren't re-created. Instead, a single network interface is created after the import process is complete. You should use DHCP on this interface to discover the network settings.



Requirements Specific to Linux-Based Custom Images

- The boot loader should use LVM or UUID to locate the boot volume.
- The network configuration should not hard-code the MAC address for the network interface.

Bring Your Own Images: Step-by-Step Guide

In this section, you upload a custom image from your local machine to Oracle Cloud Infrastructure Object Storage. You then import this image as a custom image that can be used to launch instances. Finally, you launch an instance by using this image.

Step 1: Create an Object Storage Bucket

A *bucket* is a container for storing objects in a compartment within an Object Storage namespace. Follow these steps to create a bucket:

1. Log in to the Oracle Cloud Infrastructure Console.
2. From the **Storage** tab, select **Object Storage**.
3. Choose a compartment in which you have permission to work.
4. Click **Create Bucket**.
5. In the Create Bucket dialog box, specify the following information:
 - Enter a name for the bucket.
 - Choose **Standard** as the storage tier.

6. Click **Create Bucket**.

Create Bucket [help](#) [cancel](#)

Specify the storage tier for this bucket. Storage tier for a bucket can only be specified during creation.

BUCKET NAME
my-on-prem-images

STORAGE TIER
 STANDARD
 ARCHIVE

TAGS
Tagging is a metadata system that allows you to organize and track resources within your tenancy. Tags are composed of keys and values which can be attached to resources.
[Learn more about tagging](#)

TAG NAMESPACE TAG KEY VALUE
None (apply a free-fo) [] []
+

Create Bucket

Figure 13: Creating a Bucket

An empty bucket is created.

Storage » Object Storage » Bucket Details

my-on-prem-images

[Change Compartment](#) [Update Visibility](#) [Delete](#) [Apply Tag\(s\)](#)

Bucket Information [Tags](#)

Namespace: bmcsoutbound **Created:** Wed, 04 Apr 2018 01:32:09 GMT
Storage Tier: Standard **Compartment:** ...sfd2ja [Show](#) [Copy](#)
eTag: c93dcefb-4b23-47e3-959a-13c8683e287b **Visibility:** Private
[Developer tools](#) are available for advanced object operations.

Resources
[Objects \(0\)](#)
[Pre-Authenticated Requests \(0\)](#)

Objects

[Upload Object](#)

No Objects were found.

Figure 14: Bucket That Has Been Created

Step 2: Upload an OS Image to Object Storage

To upload an image to Object Storage, you can use the Console or the Oracle Cloud Infrastructure CLI. The CLI is a tool that enables you to work with Oracle Cloud Infrastructure objects and services.

The maximum file size that you can upload by using the Console is 5 GB. Because OS images are generally several GB in size, we recommend using the multipart upload feature of the CLI to upload the image. Multipart upload allows you to upload large objects in smaller parts in parallel to reduce the amount of upload time.

Note: Refer to the Oracle Cloud Infrastructure documentation for instruction on [installing and configuring OCI the CLI](#). The following steps require that you have CLI installed and configured to be used with your tenancy.

Follow these steps to upload an OS image to Object Storage by using the CLI:

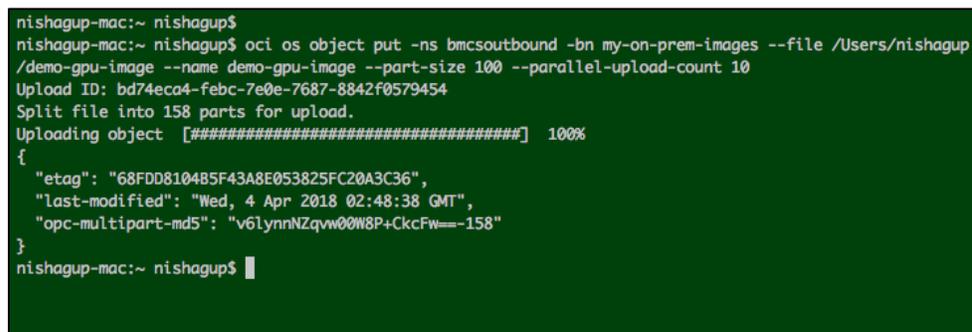
1. Open the command prompt.
2. Run the multipart upload command.

```
oci os object put -ns <object_storage_namespace> -bn <bucket_name> --file
<file_name_and_location> --name <object_name> --part-size
<upload_part_size_in_MB> --parallel-upload-count
<maximum_number_parallel_uploads>
```

Following is an example of the command:

```
oci os object put -ns bmcsoutbound -bn my-on-prem-images --file
/Users/nishagup/demo-gpu-image --name demo-gpu-image --part-size 100
--parallel-upload-count 10
```

When you execute the command, the CLI uploads the file in multiple parts in parallel. It displays the progress of the upload on screen and prints some metadata about the object.



```
nishagup-mac:~ nishagup$
nishagup-mac:~ nishagup$ oci os object put -ns bmcsoutbound -bn my-on-prem-images --file /Users/nishagup
/demo-gpu-image --name demo-gpu-image --part-size 100 --parallel-upload-count 10
Upload ID: bd74eca4-febc-7e0e-7687-8842f0579454
Split file into 158 parts for upload.
Uploading object [#####] 100%
{
  "etag": "68FDD8104B5F43A8E053825FC20A3C36",
  "last-modified": "Wed, 4 Apr 2018 02:48:38 GMT",
  "opc-multipart-md5": "v6lynnNZqvw0W8P+CkcFw==-158"
}
nishagup-mac:~ nishagup$
```

Figure 15: Multipart Upload of an OS Image to Object Storage

Step 3: Obtain the URL Path for the Uploaded OS Image

To use the image to launch an instance, you must import the image as a custom image. To do that, you first need the URL path of the image object in Object Storage. Follow these steps to obtain the URL path:

1. From the **Storage** tab, select **Object Storage**.
2. Click the name of the bucket in which you uploaded the OS image.
3. Click the **Actions** icon (⋮) next to the object that you uploaded and choose **Details** from the menu.



Figure 16: Object Details

4. In the Object Details dialog box, copy the **URL Path (URI)** value.

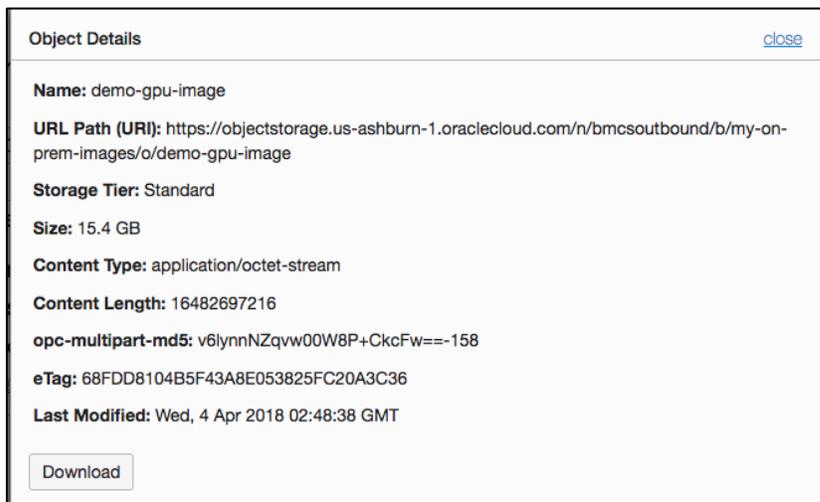


Figure 17: Object URL Path

Step 4: Import the Image

Before your on-premises image can be used to launch an instance, you must import it as a custom image by following these steps:

1. From the **Compute** tab, select **Custom Images**.
2. Click **Import Image**.
3. In the **Import Image** dialog box, specify the following information:
 - Choose the compartment to import the image into.
 - Enter a name for the image. This example uses **my-on-prem-gpu-image**.
 - Specify the Object Storage URL for the image that you obtained in the previous step.
 - Choose **VMDK** as the image type.
 - Choose **Emulated Mode** as the launch mode.
4. Click **Import Image**.

Import Image [help](#) [cancel](#)

CREATE IN COMPARTMENT
Demo_HPC

NAME
my-on-prem-gpu-image

OBJECT STORAGE URL
https://objectstorage.us-ashburn-1.oraclecloud.com/n/bmcsoutbound/b/my-on-prem-images/o/demo-gp

See [Object Storage URLs](#) for more information. See [instructions](#) for creating a pre-authenticated request.

IMAGE TYPE
 VMDK
 QCOW2

LAUNCH MODE
 EMULATED MODE
Select this option for images not generated from Oracle Cloud Infrastructure instances; for example, your on-premise physical or virtual machines.
[Show Launch Options](#)

NATIVE MODE
Select this option for images exported from Oracle Cloud Infrastructure.
[Show Launch Options](#)

TAGS
Tagging is a metadata system that allows you to organize and track resources within your tenancy. Tags are composed of keys and values which can be attached to resources.
[Learn more about tagging](#)

TAG NAMESPACE	TAG KEY	VALUE
None (apply a free-form tag) ↕		

View detail page after this image is imported

Import Image

Figure 18: Importing an Image

The Console shows that the image is being imported.

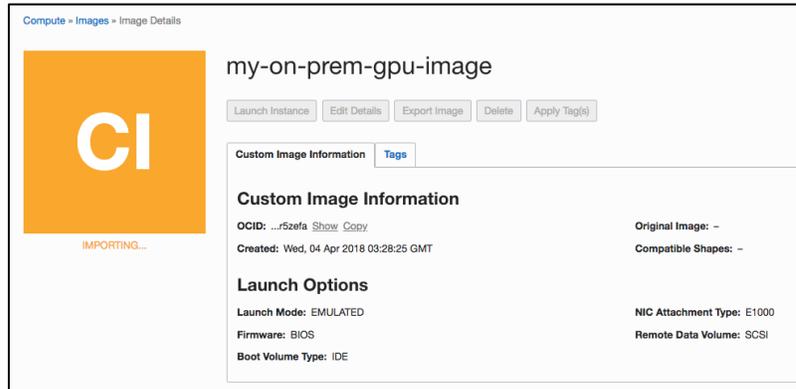


Figure 19: Importing an Image

Step 5: Launch an Instance by Using the Imported Image

Follow these steps to launch an instance by using the imported image:

1. From the **Compute** tab, select **Instances**.
2. Click **Create Instance**.
3. In the **Create Instance** dialog box, specify the following information:
 - Enter a name for the instance.
 - Choose an availability domain
 - Choose **Custom Image** as the boot volume.
 - Choose the imported image. This example uses **my-on-prem-gpu-image**.
 - Choose **Bare Metal Machine** as the shape type.
 - Choose a shape (only compatible shapes are available). This example uses **BM.Standard2.52**.
 - Choose to upload or paste SSH keys (public keys).
 - Choose a VCN.
 - Choose a subnet.

4. Click **Create Instance**.

The screenshot shows the 'Create Instance' configuration page in Oracle Cloud. At the top right, there are links for 'help' and 'cancel'. Below the title, a note states: 'If the image, Virtual Cloud Network, or Subnet is in a different Compartment than the Instance, [click here](#) to enable Compartment selection for those resources.'

The main configuration area is titled 'Instance' and contains the following fields and options:

- NAME:** A text input field containing 'my-instance'.
- AVAILABILITY DOMAIN:** A dropdown menu showing 'eurR:US-ASHBURN-AD-1'.
- BOOT VOLUME:** Radio buttons for 'ORACLE-PROVIDED OS IMAGE', 'CUSTOM IMAGE' (which is selected), 'BOOT VOLUME', and 'IMAGE OCID'.
- IMAGE:** A dropdown menu showing 'my-on.prem-gpu-image'.
- BOOT VOLUME SIZE (IN GB):** A section indicating 'Selected image's default boot volume size: 46.6 GB' and a checkbox for 'CUSTOM BOOT VOLUME SIZE' which is unchecked.
- SHAPE TYPE:** Radio buttons for 'VIRTUAL MACHINE' and 'BARE METAL MACHINE' (which is selected).
- SHAPE:** A dropdown menu showing 'BM.Standard2.52 (52 OCPUs, 768GB RAM)'.
- SSH KEYS:** Radio buttons for 'CHOOSE SSH KEY FILES' (selected) and 'PASTE SSH KEYS'. Below this is a text area labeled 'Choose SSH Key files (.pub) from your computer:'.

Figure 20: Launching an Instance by Using an Imported Image

This action launches an instance that uses your own image that you imported to Oracle Cloud Infrastructure.

Summary

Based on the preceding steps, you can import a wide range of new and legacy production OS images to Oracle Cloud Infrastructure and use these images to launch instances. This ability enables you to "lift-and-shift" cloud migration projects.

Importing and Exporting Your Own Images Across Regions and Tenancies

You can use the image export/import feature to share custom images with other regions and tenancies, so that you don't need to re-create an image manually in each region. You must complete the required steps to manually create the image in one of the regions, but after the image is created, you can export the image to make it available for import in additional tenants and regions. The exported image format is QCOW2.

When using import/export across tenants and regions, you need to create a pre-authenticated Object Storage URL by following these steps:

1. From the **Storage** tab in the Oracle Cloud Infrastructure Console, select **Object Storage**.
2. Click the name of the bucket in which your custom image resides.
3. Click the **Actions** icon (⋮) next to the image object and select **Create Pre-Authenticated Request**.



Figure 21: Creating a Pre-Authenticated Request

4. In the **Create Pre-Authenticated Request** dialog box, specify the following information:
 - Enter a name for the pre-authenticated request.
The **Pre-Authenticated Target Request** value should automatically populate with **Object**.
 - Choose **Permit Reads On The Object** as the access type.
 - Choose an expiration date for the pre-authenticated request.

5. Click **Create Pre-Authenticated Request**.

Create Pre-Authenticated Request [help](#) [cancel](#)

NAME
my-image

PRE-AUTHENTICATED REQUEST TARGET
 BUCKET
 OBJECT
demo-gpu-image

ACCESS TYPE
 PERMIT READS ON THE OBJECT
 PERMIT WRITES TO THE OBJECT
 PERMIT READS TO AND WRITES FROM THE OBJECT

EXPIRATION DATE/TIME
2018-04-11 17:57 GMT

Create Pre-Authenticated Request

Figure 22: Pre-Authenticated Request Values

The Pre-Authenticated Request Details box appears.

6. Copy the pre-authenticated request URL that is displayed.

Note: This is the only time that the pre-authenticated request URL is displayed, so you must copy it from here. This is the Object Storage URL that you specify for import/export. If you do not copy this URL and close this box, you must create a new pre-authenticated URL.

Pre-Authenticated Request Details [close](#)

NAME
my-image

PRE-AUTHENTICATED REQUEST URL
https://objectstorage.us-ashburn-1.oraclecloud.com/p/v9ZoVnZrRNElv2Ly8E5X9toZ2uuNohP-msn6ZqVNd-w/n/bmcsoutbound/b/my-on-pi

[Copy](#)
Copy this URL for your records. It will not be shown again.

Close

Figure 23: URL for Pre-Authenticated Request

After you create a pre-authenticated request URL, you can follow “Step 4: Import the Image” to import this image in another region or tenancy by using this URL.



Summary

The ability to use custom images is an important feature for any public cloud infrastructure as a service (IaaS) offering. Oracle Cloud Infrastructure offers you the flexibility to bring and run your own OS images on Oracle Cloud Infrastructure Compute instances. This paper has demonstrated how you can easily create a custom image from a running Compute instance or create and import your own custom image from the outside. You can use these custom images to launch bare metal or virtual machine Compute instances.



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Integrated Cloud Applications & Platform Services

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