

# Resizing Compute Instances on Oracle Cloud Infrastructure

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## Revision History

The following revisions have been made to this white paper since its initial publication:

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Date	Revision
January 4, 2019	Initial version

You can find the most recent versions of the Oracle Cloud Infrastructure white papers at <https://cloud.oracle.com/iaas/technical-resources>.



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## Overview

Oracle Cloud Infrastructure offers the choice, flexibility, control, and performance that your applications and workloads need. Oracle Cloud Infrastructure Compute instances are the building blocks for applications from small websites to the largest enterprise applications. You can launch instances based on bare metal or virtual machine shapes. A shape is a template that determines the number of CPUs, amount of memory, and other resources allocated to a newly created instance, like local NVMe disks, network bandwidth, and the maximum number of VNICs.

After you launch an instance, you might encounter new compute requirements to accommodate new demand. For example, an increasing in number of users might require more CPU power to support their applications, or an application might need to move from a development environment to test and production environments.

This paper outlines the process and best practices for resizing standard compute resources in Oracle Cloud Infrastructure. The process is illustrated by resizing a Windows 2012 R2 Server instance that is deployed and running a domain controller and Active Directory.

## Instance Resizing Process

You can think of resizing an instance as assigning a new compute shape to an existing boot volume. Unlike other cloud providers, Oracle Cloud Infrastructure lets you to terminate your instance and keep the boot volume for a new instance. All the data installed on the volume is automatically available on the new instance. If you don't want to terminate the instance, you can clone the boot volume or generate a new custom image from the same volume.

To avoid any data or file corruption, we recommend that you first gracefully shut down all your running applications and then [disconnect](#) any block volumes attached to the instance. After that, you launch a new instance by selecting the boot volume. After the instance is created, you can add secondary IP addresses and attach block volumes.

Following are some best practices for managing your instances and applications to avoid reinstalling your applications during this process:

- If possible, add a secondary IP address to a VNIC that is attached to the instance. Then, map the secondary IP address (rather than the primary IP address) to your applications' endpoints or services. This gives you the flexibility to detach a secondary IP address from one instance and attach it to another within the same subnet, as part of a failover process.

In the example scenario presented here, when creating a DNS server, clients should point to the secondary IP address of the server.

- Create a custom image every time you change the OS or boot volume.
- Back up all your storage volumes regularly.
- Local attached NVMe disks available on DenseIO compute shapes are not protected in any way. Protect your data by replicating it to a separate instance or backing it up. This process is outside the scope of this white paper and is covered in the service [documentation](#).

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**Note:** Secondary IP addresses must be statically assigned at the OS level.

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## Resizing a Windows Server 2012 R2 Instance

Before describing the resizing process, this section shows the infrastructure and OS resources set up in this paper to illustrate the process. The example uses a Windows Server 2012 R2 instance that contains a DNS server and a domain controller and Active Directory, with one additional attached block volume that contains some files.













### Sample Environment Details

Following are the details of the example instance, including infrastructure and OS components:

Instance Settings												
Shape	<b>Shape:</b> VM.Standard2.4 <b>Image:</b> Windows-Server-2012-R2-Standard-Edition-VM-Gen2-2018.08.14-0											
	<div style="border: 1px solid #ccc; padding: 5px;"> <p><b>Instance Information</b></p> <table border="0"> <tr> <td><b>Availability Domain:</b> mPRJ:US-ASHBURN-AD-1</td> <td><b>Image:</b> <a href="#">Windows-Server-2012-R2-Standard-Edition-VM-Gen2-2018.08.14-0</a></td> </tr> <tr> <td><b>Fault Domain:</b> FAULT-DOMAIN-1</td> <td><b>OCID:</b> ...44lrra <a href="#">Show Copy</a></td> </tr> <tr> <td><b>Region:</b> iad</td> <td><b>Launched:</b> Sat, 15 Sep 2018 00:10:44 GMT</td> </tr> <tr> <td><b>Shape:</b> VM.Standard2.4</td> <td><b>Compartment:</b> pts-igomes</td> </tr> <tr> <td><b>Username:</b></td> <td><b>Virtual Cloud Network:</b> <a href="#">mycustomer-vcn</a></td> </tr> <tr> <td><b>Initial Password:</b></td> <td><b>Launch Mode:</b> NATIVE</td> </tr> </table> </div>	<b>Availability Domain:</b> mPRJ:US-ASHBURN-AD-1	<b>Image:</b> <a href="#">Windows-Server-2012-R2-Standard-Edition-VM-Gen2-2018.08.14-0</a>	<b>Fault Domain:</b> FAULT-DOMAIN-1	<b>OCID:</b> ...44lrra <a href="#">Show Copy</a>	<b>Region:</b> iad	<b>Launched:</b> Sat, 15 Sep 2018 00:10:44 GMT	<b>Shape:</b> VM.Standard2.4	<b>Compartment:</b> pts-igomes	<b>Username:</b>	<b>Virtual Cloud Network:</b> <a href="#">mycustomer-vcn</a>	<b>Initial Password:</b>
<b>Availability Domain:</b> mPRJ:US-ASHBURN-AD-1	<b>Image:</b> <a href="#">Windows-Server-2012-R2-Standard-Edition-VM-Gen2-2018.08.14-0</a>											
<b>Fault Domain:</b> FAULT-DOMAIN-1	<b>OCID:</b> ...44lrra <a href="#">Show Copy</a>											
<b>Region:</b> iad	<b>Launched:</b> Sat, 15 Sep 2018 00:10:44 GMT											
<b>Shape:</b> VM.Standard2.4	<b>Compartment:</b> pts-igomes											
<b>Username:</b>	<b>Virtual Cloud Network:</b> <a href="#">mycustomer-vcn</a>											
<b>Initial Password:</b>	<b>Launch Mode:</b> NATIVE											



### Instance Settings

<b>VNICs/private IP addresses</b>	<p><b>Primary:</b> 10.0.111.7 <b>Secondary:</b> 10.0.111.111</p> <div data-bbox="332 478 873 783"><h4>IP Addresses</h4><p><a href="#">Assign Private IP Address</a></p><table border="1"><tr><td></td><td><b>Private IP Address:</b> 10.0.111.7 (Primary IP) <b>Private IP OCID:</b> ...riieha <a href="#">Show</a> <a href="#">Copy</a> <b>Private IP Assigned:</b> Sat, 15 Sep 2018 00:10:50 GMT</td></tr><tr><td></td><td><b>Private IP Address:</b> 10.0.111.111 <b>Private IP OCID:</b> ...be43ma <a href="#">Show</a> <a href="#">Copy</a> <b>Private IP Assigned:</b> Sat, 15 Sep 2018 00:13:38 GMT</td></tr></table></div>		<b>Private IP Address:</b> 10.0.111.7 (Primary IP) <b>Private IP OCID:</b> ...riieha <a href="#">Show</a> <a href="#">Copy</a> <b>Private IP Assigned:</b> Sat, 15 Sep 2018 00:10:50 GMT		<b>Private IP Address:</b> 10.0.111.111 <b>Private IP OCID:</b> ...be43ma <a href="#">Show</a> <a href="#">Copy</a> <b>Private IP Assigned:</b> Sat, 15 Sep 2018 00:13:38 GMT
	<b>Private IP Address:</b> 10.0.111.7 (Primary IP) <b>Private IP OCID:</b> ...riieha <a href="#">Show</a> <a href="#">Copy</a> <b>Private IP Assigned:</b> Sat, 15 Sep 2018 00:10:50 GMT				
	<b>Private IP Address:</b> 10.0.111.111 <b>Private IP OCID:</b> ...be43ma <a href="#">Show</a> <a href="#">Copy</a> <b>Private IP Assigned:</b> Sat, 15 Sep 2018 00:13:38 GMT				
<b>Boot volume</b>	<p><b>Name:</b> win2012-dc <b>Image:</b> Windows-Server-2012-R2-Standard-Edition-VM-Gen2-2018.08.14-0</p> <div data-bbox="332 894 971 1140"><h4>Boot Volume</h4><table border="1"><tr><td></td><td><b>win2012-dc</b> <b>OCID:</b> ...2wwwvq <a href="#">Show</a> <a href="#">Copy</a> <b>Image:</b> <a href="#">Windows-Server-2012-R2-Standard-Edition-VM-Gen2-2018.08.14-0</a></td><td><b>Size:</b> 256.0 GB</td></tr></table></div>		<b>win2012-dc</b> <b>OCID:</b> ...2wwwvq <a href="#">Show</a> <a href="#">Copy</a> <b>Image:</b> <a href="#">Windows-Server-2012-R2-Standard-Edition-VM-Gen2-2018.08.14-0</a>	<b>Size:</b> 256.0 GB	
	<b>win2012-dc</b> <b>OCID:</b> ...2wwwvq <a href="#">Show</a> <a href="#">Copy</a> <b>Image:</b> <a href="#">Windows-Server-2012-R2-Standard-Edition-VM-Gen2-2018.08.14-0</a>	<b>Size:</b> 256.0 GB			
<b>Block volume</b>	<p><b>Name:</b> demo-bv</p> <div data-bbox="332 1209 1000 1465"><h4>Attached Block Volumes</h4><p><a href="#">Attach Block Volume</a></p><table border="1"><tr><td></td><td><b>demo-bv</b> <b>OCID:</b> ...lvc7q <a href="#">Show</a> <a href="#">Copy</a></td><td><b>Attachment Type:</b> iscsi <b>Attachment Access:</b> Read/Write <b>Block Volume Compartment:</b> nts-lnomes</td><td><b>Size:</b> 50.0 GB</td></tr></table></div>		<b>demo-bv</b> <b>OCID:</b> ...lvc7q <a href="#">Show</a> <a href="#">Copy</a>	<b>Attachment Type:</b> iscsi <b>Attachment Access:</b> Read/Write <b>Block Volume Compartment:</b> nts-lnomes	<b>Size:</b> 50.0 GB
	<b>demo-bv</b> <b>OCID:</b> ...lvc7q <a href="#">Show</a> <a href="#">Copy</a>	<b>Attachment Type:</b> iscsi <b>Attachment Access:</b> Read/Write <b>Block Volume Compartment:</b> nts-lnomes	<b>Size:</b> 50.0 GB		

## Operating System and Server Manager

### IP configuration (primary and secondary IP addresses)

```

PS C:\Users\Administrator> ipconfig /all

Windows IP Configuration

Host Name . . . . . : win-dc
Primary Dns Suffix . . . . . : lgomeslab.com
Node Type . . . . . : Hybrid
IP Routing Enabled. . . . . : No
WINS Proxy Enabled. . . . . : No
DNS Suffix Search List. . . . . : lgomeslab.com

Ethernet adapter Ethernet:

Connection-specific DNS Suffix . . . :
Description . . . . . : Broadcom NetXtreme-E Virtual Function
Physical Address. . . . . : 02-00-17-00-59-11
DHCP Enabled. . . . . : No
Autoconfiguration Enabled . . . . . : Yes
Link-local IPv6 Address . . . . . : fe80::d505:adf7:3a02:6a75%12 (Preferred)
IPv4 Address. . . . . : 10.0.111.7 (Preferred)
Subnet Mask . . . . . : 255.255.255.0
Lease Obtained. . . . . : Saturday, September 15, 2018 12:12:20 AM
Lease Expires . . . . . : Tuesday, October 22, 2154 6:47:36 AM
IPv4 Address. . . . . : 10.0.111.111 (Preferred)
Subnet Mask . . . . . : 255.255.255.0
Default Gateway . . . . . : 10.0.111.1
DNS Servers . . . . . : ::1
                          127.0.0.1
NetBIOS over Tcpip. . . . . : Enabled
    
```

Name: demo-blv

### Disk attachments

The screenshot displays the Windows Server Manager interface. On the left, a navigation pane shows 'Disks' selected. The main area is divided into three sections:

- DISKS:** A table showing two virtual disks for 'win-dc'.
 

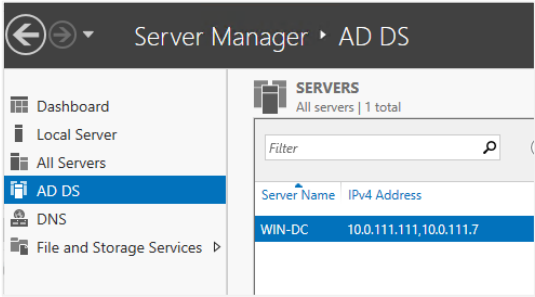
Number	Virtual Disk	Status	Capacity	Unallocated	Partition	Read Only	Clustered	Subsystem	Bus Type	Name
0		Online	256 GB	0.00 B	GPT			ISCSI		ORACLE BlockVolume SCSI Disk Device
1		Online	50.0 GB	0.00 B	GPT			ISCSI		ORACLE BlockVolume SCSI Disk Device
- VOLUMES:** A table showing one volume for 'win-dc'.
 

Volume	Status	Provisioning	Capacity	Free Space	Deduplication Rate	Deduplication Savings	Percent Used
D:	Fixed		49.9 GB	49.8 GB			
- STORAGE POOL:** Shows 'ORACLE BlockVolume S...'.

At the bottom, a 'Devices and drives (2)' section shows two drives:

- Windows (C:):** 234 GB free of 255 GB
- demo-blv (D:):** 49.7 GB free of 49.8 GB

## Operating System and Server Manager

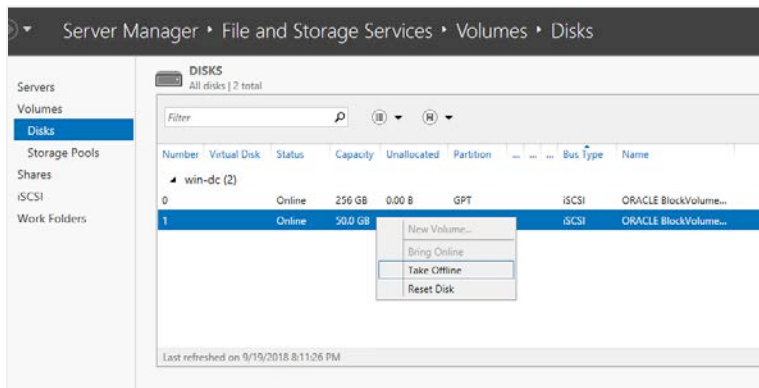
<b>Active Directory</b>	<p><b>Active Directory: WIN-DC, 10.0.111.111 and 10.0.111.7</b></p> 
<b>DNS server listening secondary IP address</b>	<p><b>DNS: WIN-DC, 10.0.111.111 and 10.0.111.7</b></p> 
<b>Domain name</b>	lgomeslab.com
<b>Windows client network configuration</b>	<p><b>DHCP Server: 169.254.169.254</b></p> 



## Shut Down Applications and Disconnect and Detach Block Volumes

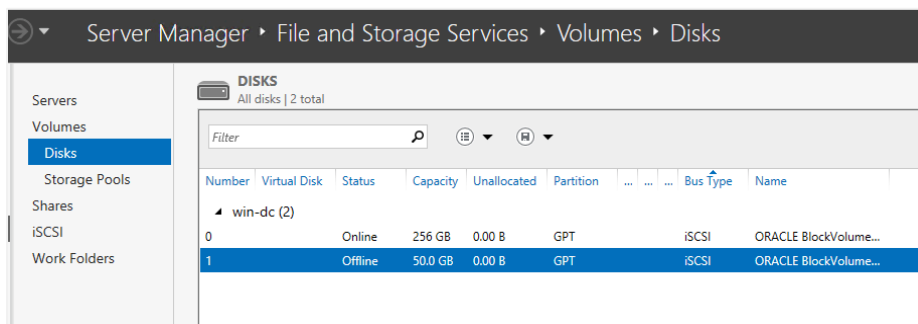
To avoid data corruption, gracefully shut down your applications and then use the following steps to disconnect any block volumes that are attached to your instance:

1. Log in to your Windows instance and open **Disk Management**.
2. In the **Disks** section of the Server Manager window, right-click the volume that you want to disconnect and select **Take Offline**.



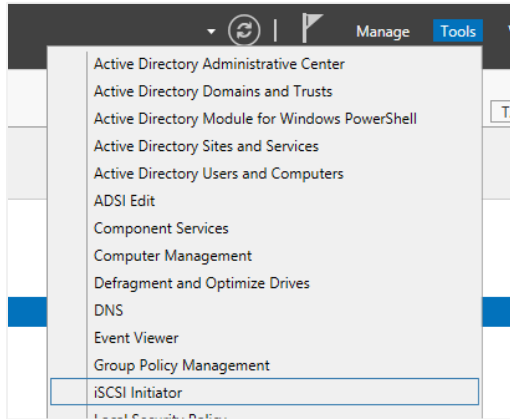
3. Confirm that you want to take the volume offline.

The status is now shown as Offline.

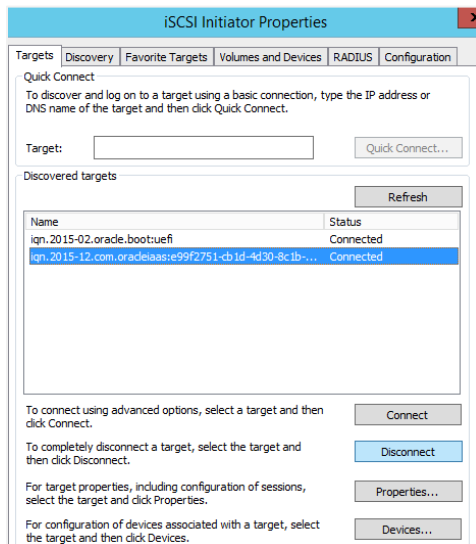


The following steps describe how to disconnect the iSCSI target.

4. In the Server Manager window, select **Tools** and then select **iSCSI Initiator**.

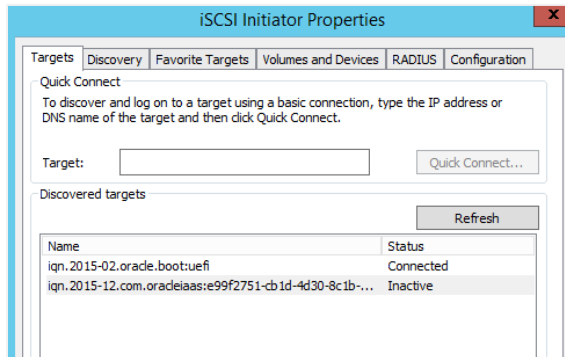


5. In the iSCSI Initiator Properties dialog box, go to the **Targets** tab, select the target, and then click **Disconnect**.

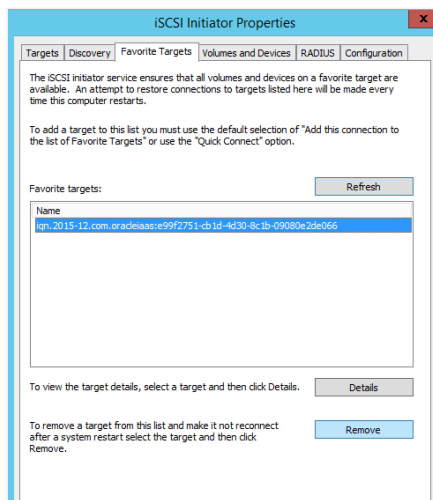


6. Confirm the session termination.

The status is now shown as Inactive.



7. In the iSCSI Initiator Properties dialog box, go to the **Favorite Targets** tab, select the target that you are disconnecting, and then click **Remove**.



8. In the iSCSI Initiator Properties dialog box, go to the **Volumes and Devices** tab, select the volume from the **Volume List**, and then click **Remove**.

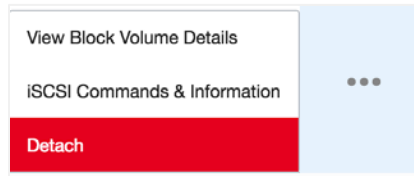
---

**Note:** When you took the disk offline, it might have automatically been removed from the list.

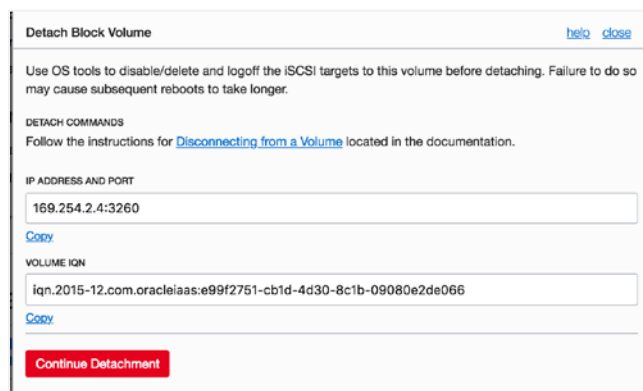
---

9. In the Oracle Cloud Infrastructure Console, go to the Instance Details page for the instance.
10. Under **Resources**, click **Attached Block Volumes**.

11. Select the block volume, click the actions icon (three dots), and select **Detach**.



12. In the Detach Block Volume dialog box, click **Continue Detachment** to complete the operation.



## Clone the Boot Volume or Terminate the Instance

At this point, you can use two different methods to achieve your goal, depending on your situation:

- If you don't have any applications that depend on the primary IP address or fully qualified domain name (FQDN) of your VNICs, you can clone the boot volume, stop your existing instance, and then create a new instance based on the cloned volume.
- If you need to ensure that all the VNICs follow exactly the same configuration defined on the original instance, we recommend that you terminate your instance and create a new instance based on the original boot volume.

### Clone the Boot Volume

If you choose to work on a cloned version (snapshot) of your boot volume rather than the original disk, perform the following steps:

1. In the Oracle Cloud Infrastructure Console, go to the Instance Details page for the instance.
2. Under **Resources**, click **Boot Volume**, and then click the boot volume.

- Under **Resources** on the Boot Volume details page, click **Clones**, click **Create Clone**, and then provide the necessary information to create the clone.
- When the cloning process is complete, go back to the Instance Details page, and click **Stop** to stop the instance.

The boot volume file is available from the Compute page, under **Boot Volumes**.

## Terminate the Instance

If you want to reuse the original disk, you can terminate the instance without deleting the boot volume.

- On Instance Details page, click **Terminate**.
- In the confirmation window, *do not* select the check box.

A confirmation dialog box titled "Confirm" with a "cancel" link in the top right corner. The main text asks: "Are you sure you want to terminate the Instance named 'win-2012-dc-scale'?". Below this is a checkbox labeled "Permanently delete the attached Boot Volume", which is currently unchecked. At the bottom, there are two buttons: "Cancel" and "Terminate Instance".

The instance is eventually shown in the Terminated state, but the boot volume is still available from the from the Compute page, under **Boot Volumes**.

A screenshot of a "Boot Volume" card. On the left is a green circle with "BV" and the word "AVAILABLE" below it. The main text includes:
 

- win2012-dc** (with a link to show details)
- OCID:** ...2wvvvq (with "Show" and "Copy" links)
- Image:** Windows-Server-2012-R2-Standard-Edition-VM-Gen2-2018.08.14-0
- Availability Domain:** mPRJ:US-ASHBURN-AD-1
- Size:** 256.0 GB

 On the right side, it shows:
 

- Attached Instance:** None in this compartment.
- Created:** Fri, 14 Sep 2018 23:27:05 GMT
- Backup Policy:** -
- Source:** win-dc (Boot Volume) (with a link)

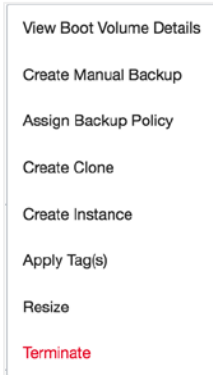
## Create an Instance from an Existing Boot Volume

Now you can create an instance from the existing boot volume (original or cloned). This instance should be based on a different compute shape.

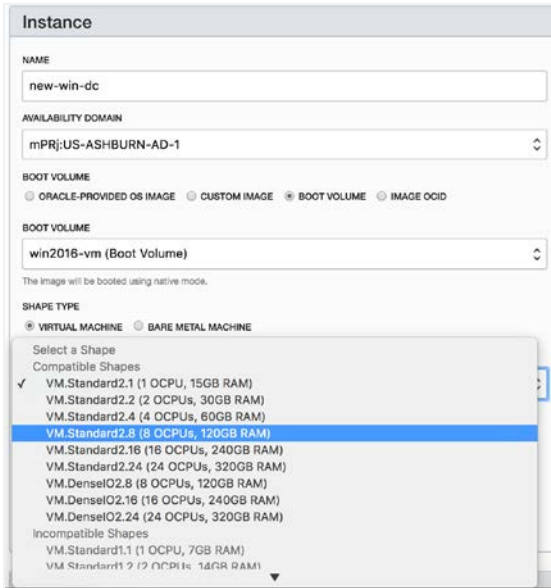
- Select the volume that you want to use to create the instance.

Note that the **Attached Instance** field should have the value **None in this compartment**.

2. Click the actions icon (three dots) and select **Create Instance**.

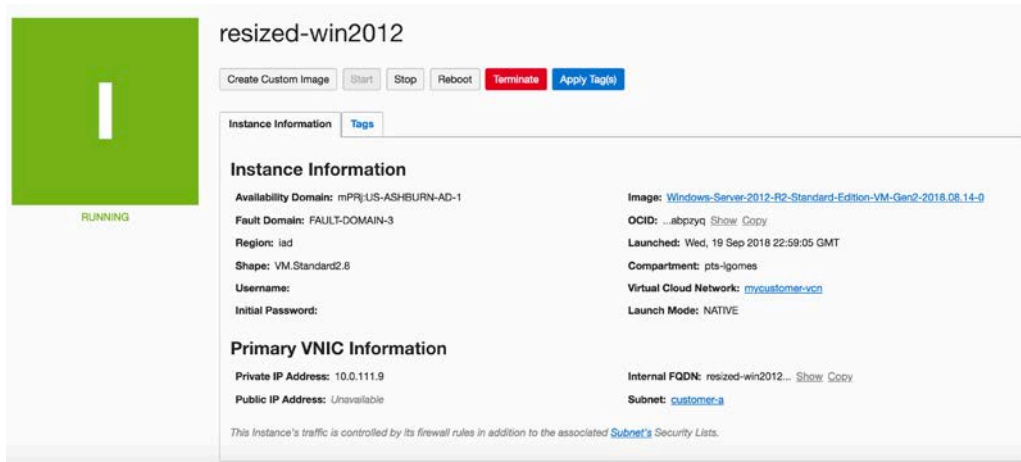


3. Create an instance from the existing boot volume, selecting a larger (or smaller) compute shape. To avoid driver incompatibility, you can't select a compute shape from a different family.



4. Provide values based on your network settings and **Create Instance**.

The new instance is provisioned based on the existing boot volume.



5. Attach the secondary IP addresses to your VNICs. Be sure to add the same IP addresses that you entered before to avoid any rework.
  - A. On the Instance Details page, under **Resources**, click **Attached VNICs**.
  - B. Select the VNIC that hosts the server IP address (for example, DNS), and under **Resources**, click **IP Addresses**.
  - C. Click **Assign Private IP Address**.
  - D. Enter the private IP address of the secondary IP address (in this example, 10.0.111.111) and select the **Unassign If Already Assigned to Another VNIC** check box.

### Assign Private IP Address

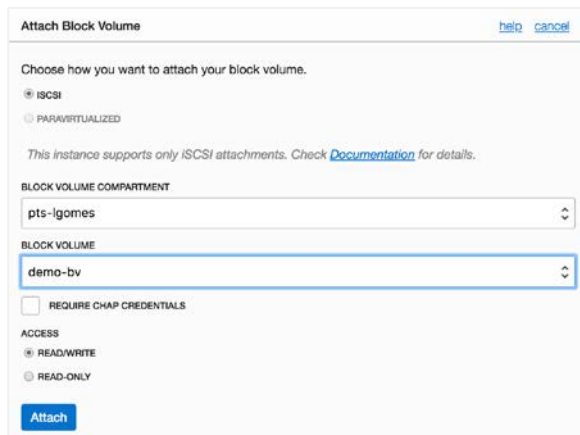
#### Private IP Address

PRIVATE IP ADDRESS (Optional)

Must be within 10.0.111.2 to 10.0.111.254. Cannot be in current use.

UNASSIGN IF ALREADY ASSIGNED TO ANOTHER VNIC

6. Attach the block volume to the new instance.
  - A. On the Instance Details page, under **Resources**, click **Attached Block Volumes**.
  - B. Click **Attach Block Volume**.
  - C. Select the block volume that was attached to the old instance and click **Attach**.



The screenshot shows a dialog box titled "Attach Block Volume" with "help" and "cancel" links in the top right. The main text says "Choose how you want to attach your block volume." There are two radio buttons: "iSCSI" (selected) and "PARAVIRTUALIZED". Below this is a note: "This instance supports only iSCSI attachments. Check [Documentation](#) for details." There are two dropdown menus: "BLOCK VOLUME COMPARTMENT" with "pts-igomes" selected, and "BLOCK VOLUME" with "demo-bv" selected. There is a checkbox for "REQUIRE CHAP CREDENTIALS" which is unchecked. Under "ACCESS", there are two radio buttons: "READ/WRITE" (selected) and "READ-ONLY". At the bottom left is a blue "Attach" button.

- D. When a message appears about attaching the disk at the OS level, click **Close** to continue.
7. From the Instance Details page, reboot your instance.

When the instance reboots, you can use Remote Desktop Protocol (RDP) to access your instance again.
8. Log in to your server. All clients should authenticate against the domain controller, if there's no dependency on the block volumes.
9. Attach all the block volumes at the OS level and start your applications.

## Conclusion

Oracle Cloud Infrastructure gives you the ability to manage a boot volume independently of the life cycle of an instance. This ability is the key for resizing your workloads. When you terminate an instance, you can keep the associated boot volume and use it to launch a new instance using a different compute shape.







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