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Revision History

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

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<tr>
<th>Date</th>
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<tr>
<td>January 4, 2019</td>
<td>Initial version</td>
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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.

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

### 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:

<table>
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<tr>
<th>Instance Settings</th>
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<tbody>
<tr>
<td><strong>Shape</strong>: VM.Standard2.4</td>
</tr>
<tr>
<td><strong>Image</strong>: Windows-Server-2012-R2-Standard-Edition-VM-Gen2-2018.08.14-0</td>
</tr>
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</table>

**Instance Information**

- **Availability Domain**: mPR-US-AD/BUYN-AD-1
- **Fault Domain**: FAULT-DOMAIN-1
- **Region**: tpd
- **Shape**: VM.Standard2.4
- **Username**:
- **Initial Password**
Instance Settings

**VNICS/private IP addresses**

Primary: 10.0.111.7  
Secondary: 10.0.111.111

**IP Addresses**

- Private IP Address: 10.0.111.7 (Primary IP)
- Private IP CIDR: /24
- Private IP Assigned: Sat, 15 Sep 2018 00:10:50 GMT

- Private IP Address: 10.0.111.111
- Private IP CIDR: /24
- Private IP Assigned: Sat, 15 Sep 2018 00:13:38 GMT

**Boot volume**

Name: win2012-dc  

**Boot Volume**

- Name: win2012-dc  
- Size: 256.0 GB

**Block volume**

Name: demo-bv

**Attached Block Volumes**

- Name: demo-bv  
- Size: 50.0 GB

- Attachment Type: fc
- Attachment Access: Read/Write
- Block Volume Compartment: rds.vncos
Operating System and Server Manager

IP configuration (primary and secondary IP addresses)

Name: demo-blv

Disk attachments
### Operating System and Server Manager

**Active Directory: WIN-DC, 10.0.111.111 and 10.0.111.7**

![Active Directory](server_manager.png)

**DNS: WIN-DC, 10.0.111.111 and 10.0.111.7**

![DNS](server_manager.png)

**Domain name**

| Igameslab.com |

**DHCP Server: 169.254.169.254**

![DHCP Server](windows_powershell.png)
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.

![ISCSI Initiator Properties dialog box](image)

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**.

![Favorite Targets tab](image)

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.

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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.
3. Under **Resources** on the Boot Volume details page, click **Clones**, click **Create Clone**, and then provide the necessary information to create the clone.

4. 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.

1. On Instance Details page, click **Terminate**.

2. In the confirmation window, do *not* select the check box.

   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**.

**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.

1. 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.
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.
   
   ![Attach Block Volume](image)

   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.
Integrated Cloud Applications & Platform Services

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Resizing Compute Instances on Oracle Cloud Infrastructure
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