

Safe harbor statement

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Compute

Level 200

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Oracle Cloud Infrastructure

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Objectives

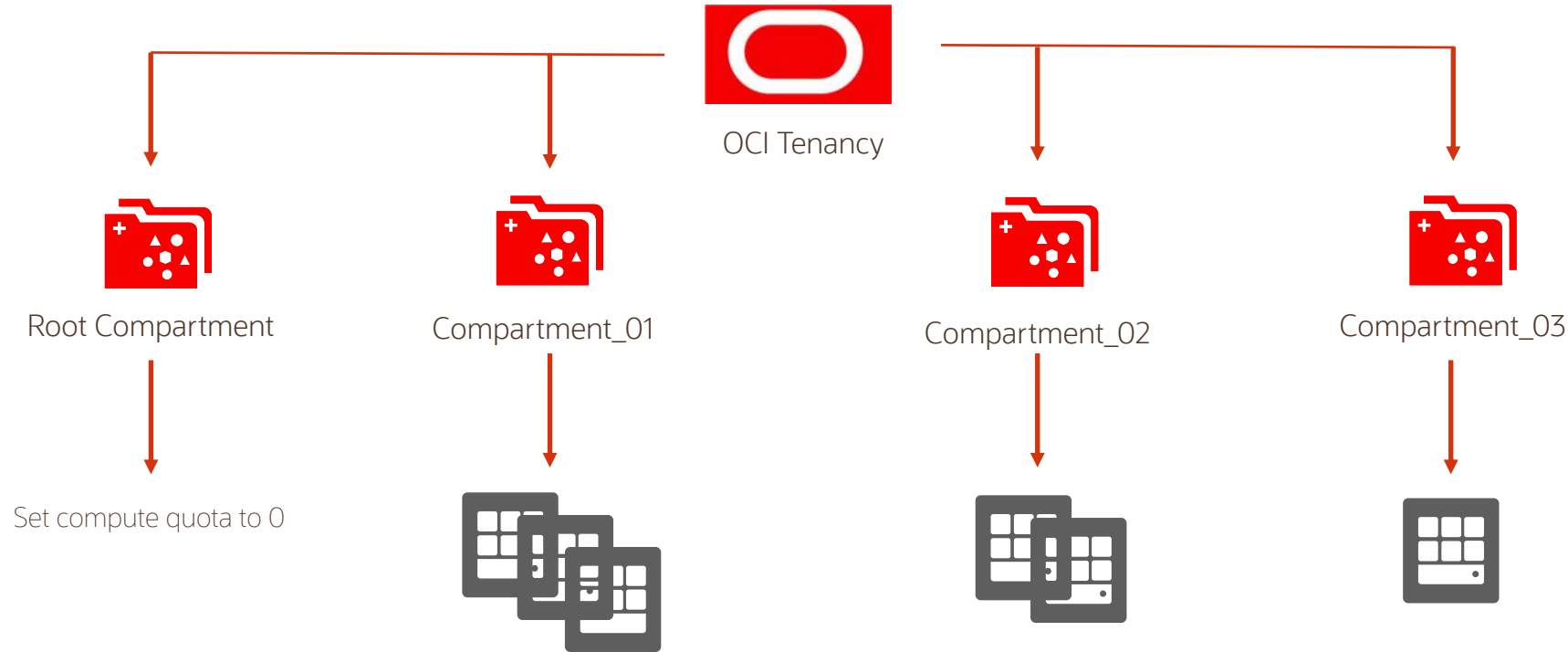
After completing this lesson, you should be able to:

- Understand how to configure Compute Quotas
- Describe Instance Configuration and Pools
- Create an Autoscaling Policy
- Describe Compute Instance Metrics
- Describe Instance Console Connections
- Describe Bring your Own Image
- Describe Bring your own Hypervisor

Part I: Compute Quotas

Compute Quotas

Compute quotas allow you to better control how resources are consumed in OCI, enabling administrators to easily allocate compute resources to compartments using the Console.



```
set compute quota vm-standard2-1-count to 3 in compartment Compartment01 where request.region = 'us-phoenix-1'
```

Compute Quotas – Examples

- Compute Shapes

```
set compute quota vm-dense-io1-4-count to 10 in compartment <compartment-name> where  
request.region = 'us-phoenix-1'
```

- Custom Image

```
set compute quota custom-image-count to 5 in compartment <compartment-name> where  
request.region = 'us-phoenix-1'
```

- Instance Configurations

```
set compute-management quota config-count to 3 in compartment <compartment-name> where  
request.region = 'us-ashburn-1'
```

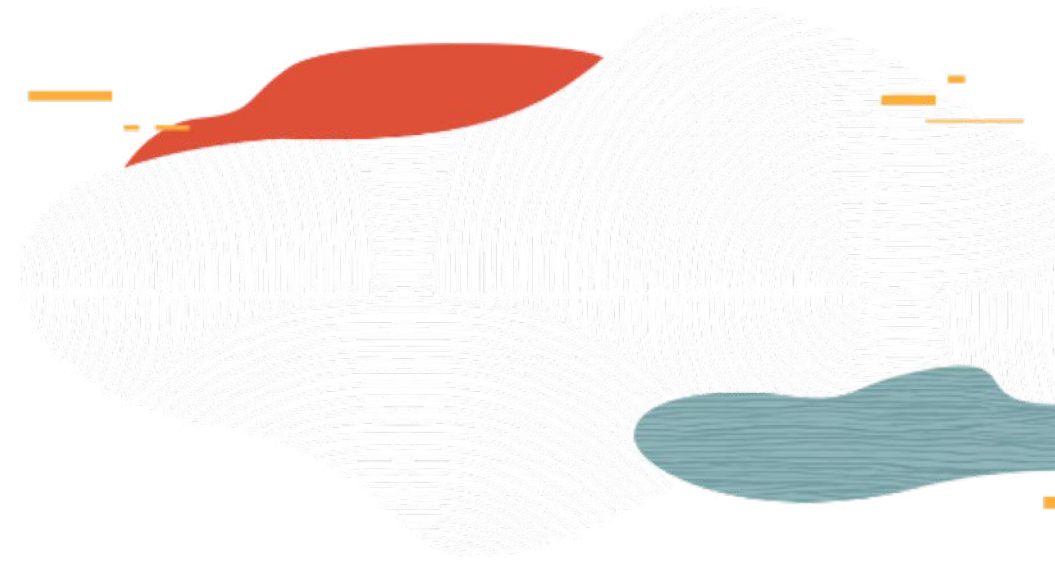
- Instance Pools

```
set compute-management quota pool-count to 3 in compartment <compartment-name> where  
request.region = 'us-ashburn-1'
```

- Autoscaling

```
set auto-scaling quota config-count to 2 in compartment <compartment-name> where  
request.region = 'us-ashburn-1'
```

Demo: Compute Quotas



Part II: Instance Configurations and Pools



Instance Configuration and Pool

Instance Configurations



Instance Pool



Instance Configuration and Pool – Use Cases

Instance Configurations

- Clone an instance and save to a configuration file
- Create standardized baseline instance templates
- Easily deploy instances from CLI with a single configuration file
- Automate the provisioning of many instances, its resources and handle the attachments

Instance Pools

- Centrally manage a group of instance workloads that are all configured with a consistent configuration
- Update a large number of instances with a single instance configuration change
- Maintain high availability and distribute instances across availability domains within a region
- Scale out instances on-demand by increasing the instance size of the pool

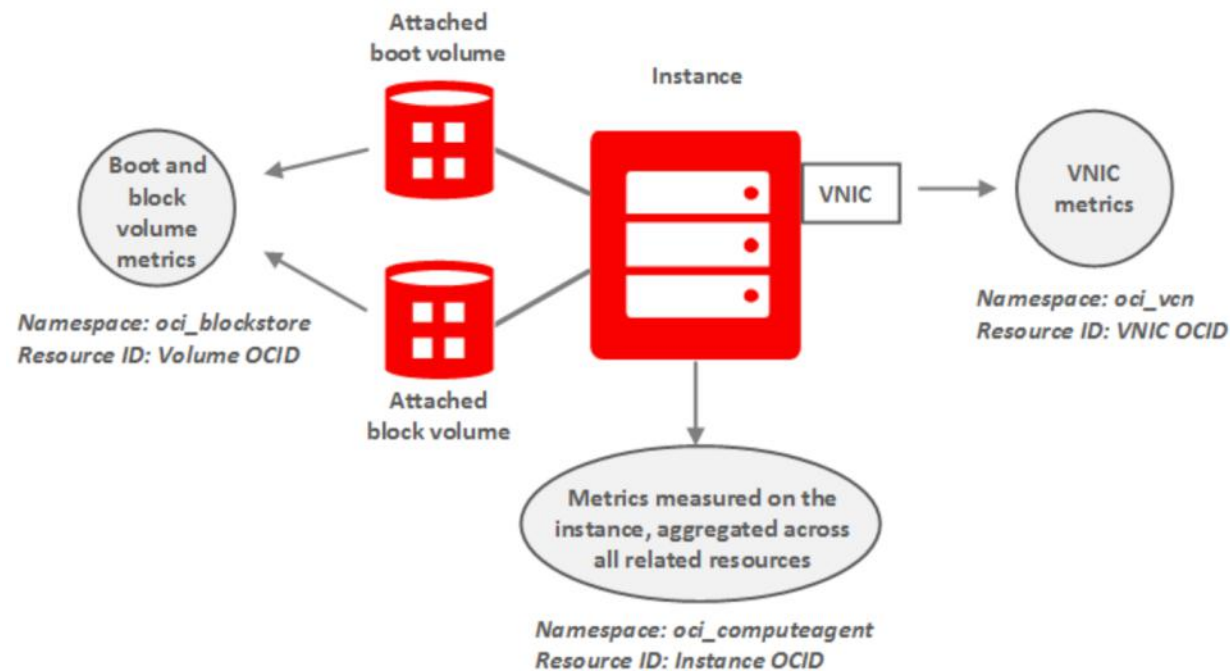
Demo: Instance Configuration and Pools

Part III: Instance Metrics and Autoscaling

Compute Instance Metrics

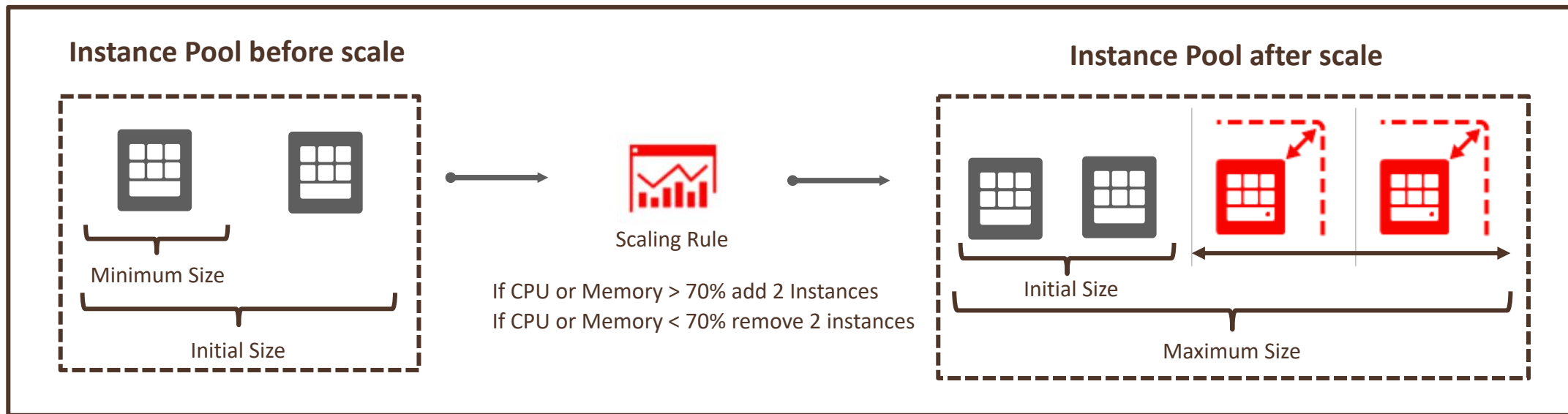
You can monitor the health, capacity, and performance of your Compute instances by using **metrics**, **alarms**, and **notifications**.

Here is an overall picture of the different types of metrics available for an instance and its storage and network devices.



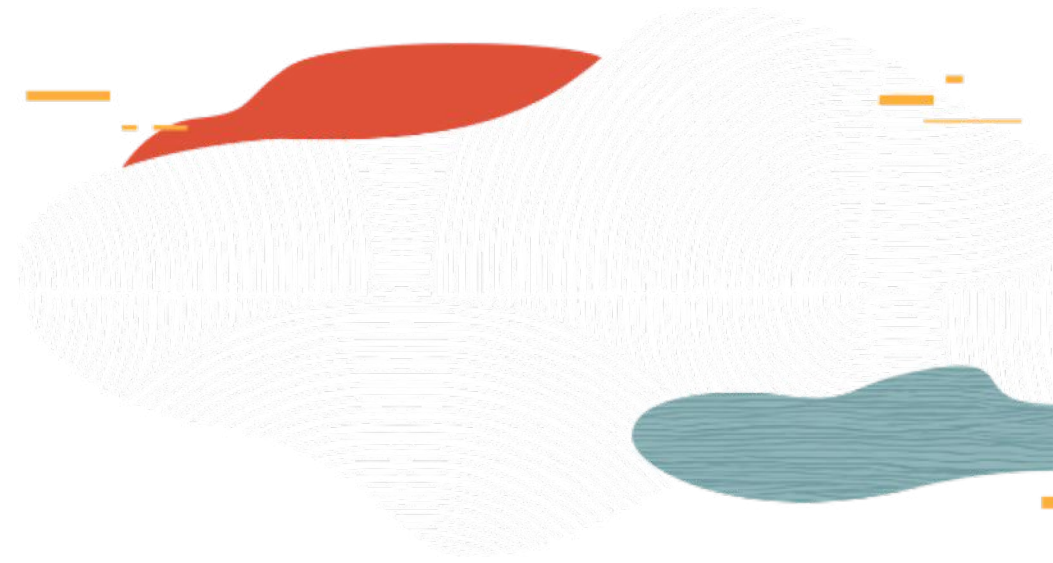
Autoscaling Configurations

- Autoscaling enables you to automatically adjust the number of Compute instances in an instance pool based on **performance metrics** such as **CPU** or **Memory** utilization.
- When an instance pool scales in, instances are terminated in this order: the number of instances is balanced across availability domains, and then balanced across fault domains. Finally, within a fault domain, the oldest instance is terminated first.





Demo: Autoscaling



Part IV: Instance Console Connections

Instance Console Connections

Oracle Cloud Infrastructure Compute service provides console connections that enable you to remotely troubleshoot malfunctioning instances, such as:

- Add or reset the SSH keys for the opc user
- Edit system configuration files
- An imported or customized image that does not complete a successful boot.
- A previously working instance that stops responding.

There are two types of instance console connections:

- Serial console connections
- VNC console connections

Connecting to the Serial Console

```
# ssh -o ProxyCommand='ssh -W %h:%p -p 443  
ocid1.instanceconsoleconnection.oc1.phx.abyhqljsmcdaieuxew3hml2jyhhz7ji5mmassdahclt7jcod  
gavraxuw6bka@instance-console.us-phoenix-1.oraclecloud.com'  
ocid1.instance.oc1.phx.abyhqljs5vlfdsosrokb7la6kuergjt7mqbniroy26icpzgz7mshr3cn7z2na
```

- SSH on port 443
- **Username:** ocid1.instanceconsoleconnection.oc1.phx....
- **Console Connection Server:** instance-console.us-phoenix-1.oraclecloud.com
- **Instance OCID:** ocid1.instance.oc1.phx.abyhqljs5vlfdsosrokb7la6kuergjt7mqbniroy26icpzgz7mshr3cn7z2na

Connecting to the Serial Console

```
flpere@flpere-mac:~/Oracle-Content/my-ssh-key$ ssh -i flavio-ssh-key -o ProxyCommand='ssh -i flavio-ssh-key -W %h:%p -p 443 zntsu3oz4c4wxznuzbqqiq@instance-console.us-ashburn-1.oraclecloud.com' ocid1.instance.oc1.iad.abuwcljsygpqlj4rimjpcayn2mdmf53g2

Oracle Linux Server 7.5
Kernel 4.1.12-124.14.1.el7uek.x86_64 on an x86_64

oracle-linux-75 login:
Oracle Linux Server 7.5
Kernel 4.1.12-124.14.1.el7uek.x86_64 on an x86_64

oracle-linux-75 login: █
```

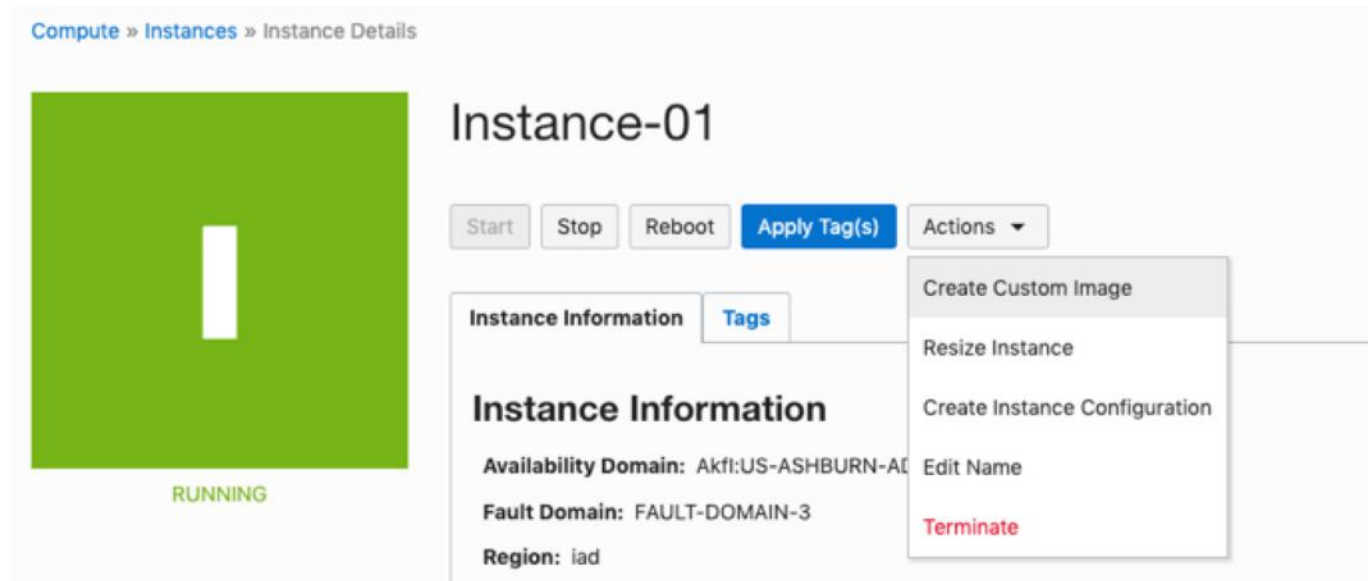
- Once you are finished with the serial console and have terminated the SSH connection, you should delete the serial console connection.
- If you do not disconnect from the session, Oracle Cloud Infrastructure will terminate the serial console session after 24 hours and you will need to re-authenticate to connect again.

Demo: Instance Console Connection

Part V: Custom Image Import/Export and BYOI

Custom Images from running Instances

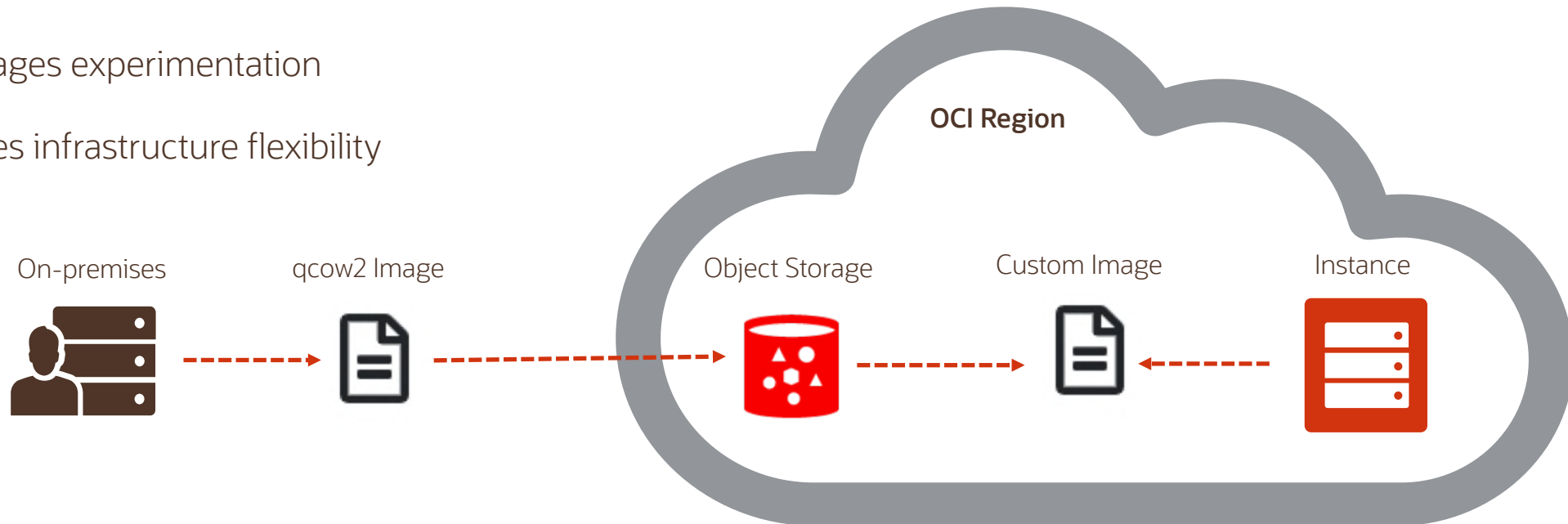
- Create a custom image of an instance's boot disk and use it to launch other instances
- Instances you launch from your custom image include customizations, configuration, and software installed when you created the image
- During the process, instance shuts down and remains unavailable for several minutes. The instance restarts when the process completes
- Custom images do not include the data from any attached block volumes
- The maximum size for creating a custom image is 300 GB



Bring your own Image (BYOI)

The Bring Your Own Image (BYOI) feature enables you to bring your own versions of operating systems to the cloud as long as the underlying hardware supports it. The BYOI can help with the following scenarios:

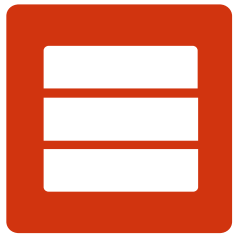
- Enables lift-and-shift cloud migration projects
- Supports both old and new operating systems
- Encourages experimentation
- Increases infrastructure flexibility



NOTE: You must comply with all licensing requirements when you upload and start instances based on OS images that you supply.

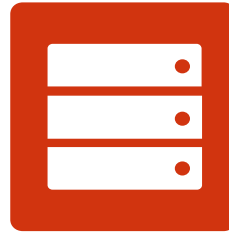
Image Import Modes

Emulation Mode



- Fully emulated NIC, block boot, legacy BIOS boot.
- Pro's: compatibility with wide range of older/custom OS
- Con's: Low Performance – 20% less compared with Native mode

Para-virtualized Mode



- Current OCI VM experience offering maximum performance with modern OS's.
- Pro's: Available for Oracle provided smaller set of modern OS's only
- Con's: incompatibility with wide range of older OS

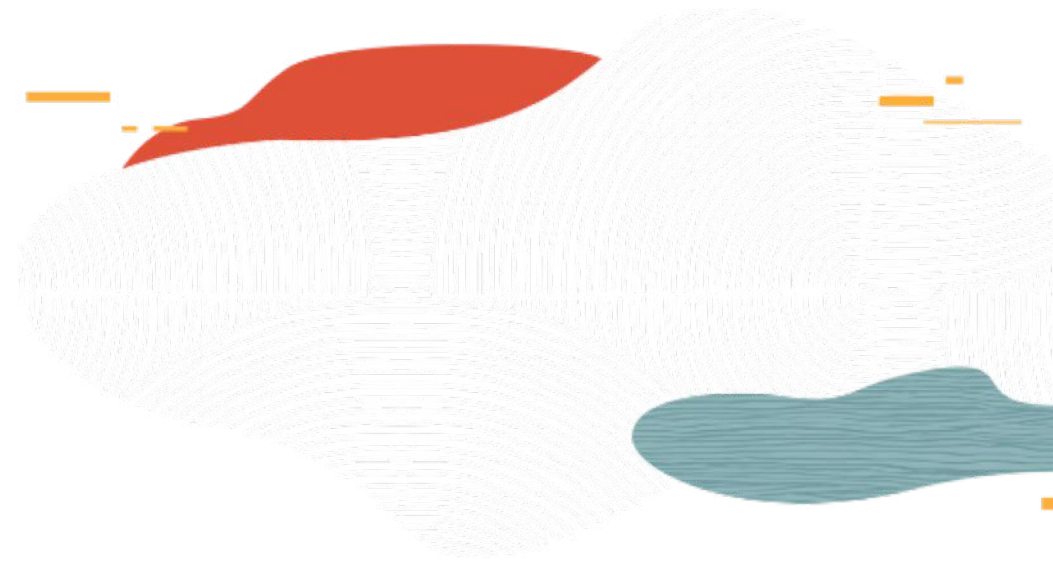
Native Mode



- Balance between performance and compatibility
- Pro's: Support a wide range of older and new OS as long it works with virtio driver
- Con's: Minimal performance gap between virtio and iSCSI

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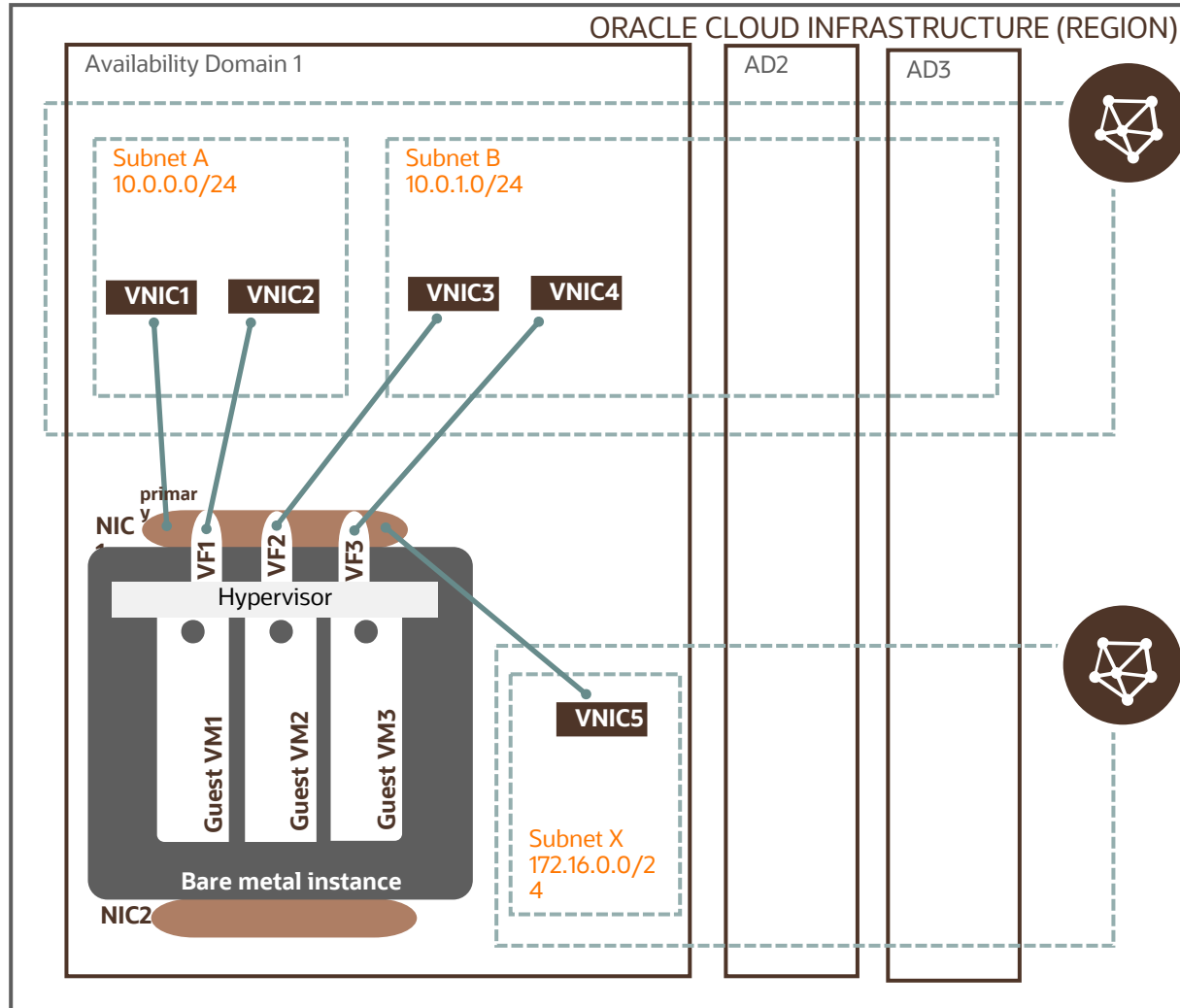
Demo: Custom Image



Part VI: Bring your own Hypervisor

BYOH

Multiple VNICs on bare metal instances for BYOH



- In a BYOH scenario, each guest VM can get one or more secondary VNICs.
- In case SR-IOV virtual functions (VF) are being used by the hypervisor to provide network access to the guest VMs, each VF can be configured with the VLAN tag and MAC address of a secondary VNIC.
- Guest-VM can have a private and a public IP associated
- Each Shape has a limit on the amount of VNICs you can have. Please check [compute shapes documentation](#) for more information

Bring your own Hypervisor



The ability to bring hypervisors is unique to Oracle and is enabled by using several Oracle Cloud Infrastructure features like Storage, Network and Compute resources. Bring your own Hypervisor in a cloud environment has two benefits:

- It allows the extension of existing on-premises environments into the Oracle Cloud
- It provides the ability to install legacy operating systems and prepackaged virtual machines to use within your environment.

Oracle Linux KVM Image for Oracle Cloud Infrastructure



Oracle Linux KVM Image

Easily set up a KVM host using Oracle Linux and Oracle Cloud

- Oracle Linux KVM image is available for deployment as as part of Oracle Images
- This Oracle packaged image simplifies the deployment of virtual machines (VMs) by integrating with services such as block storage and virtual network interfaces through the use of scripted tools
- These tools include support for defining the VM guest domain, allocating a specific block device or VNIC and launching and removing VMs on Oracle Cloud Infrastructure
- Currently, **BM.Standard** and **BM.DenseIO** shapes are supported
- Users should be familiar with managing virtual guests using libvirt, specifically virsh and virt-install

[Getting Started: Oracle Linux KVM Image for OCI guide](#)

Demo: KVM Image from Marketplace

Summary

- Understand Instance Configuration and Pool
- Use Autoscaling Configurations
- Describe and validate instance console connections
- Use Custom images to create templates and customize your OS
- Understand Emulated and Native mode when Bring your own image
- Use pre-build KVM image for OCI to take advantage of Bring your own Hypervisor



Oracle Cloud always free tier:

oracle.com/cloud/free/

OCI training and certification:

oracle.com/cloud/iaas/training

oracle.com/cloud/iaas/training/certification

education.oracle.com/oracle-certification-path

OCI hands-on labs:

ocitraining.qcloudable.com/provider/oracle

Oracle learning library videos on YouTube:

youtube.com/user/OracleLearning