

OCI Fast Track

Hands On Lab Guide



OCI Fast track

Hands On Lab Guide

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The Load Balancer creation screen is a Wizard Based model, where you'll be guided on the process by the interface. In the main screen, you'll provide the information below :	60
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Introduction

On this guide, we're going to work on creating some Oracle Cloud virtual machines, following different processes and good implementation techniques

We'll explore each and every one of the available resources on Infrastructure as Code (IaaS), going from network, storage, virtual machines, and Load Balancer. To begin, it's important to check if the user has a clear understanding of OCI's basic components like : Regions, Compartments, and Availability Domains

Through this guide, we're going to provision :

- Network (VCN, and subnets)
- Compute Instances (Linux and Windows)
- Block Storage
- Object Storage
- Load Balancer

Our goal is that, in the end of this workshop, attendees will be able to deploy their own infrastructure segments following OCI's best practices

Tools used on this Workshop

This lab will require the user to download and install :

- [PuTTY](#) e PuTTY KeyGen (for Windows Users)

PuTTY



PuTTY is a telnet and SSH client developed to grant Windows users, access to Linux/Unix Servers. Putty is a Open Source Software.

PuTTY can be downloaded on <https://www.putty.org/>.

Used Images

This LAB will basically use 2 different images :

- Oracle Linux 7.6
- Microsoft Windows 2016 Standard

Lab 1.

Accessing Oracle Cloud

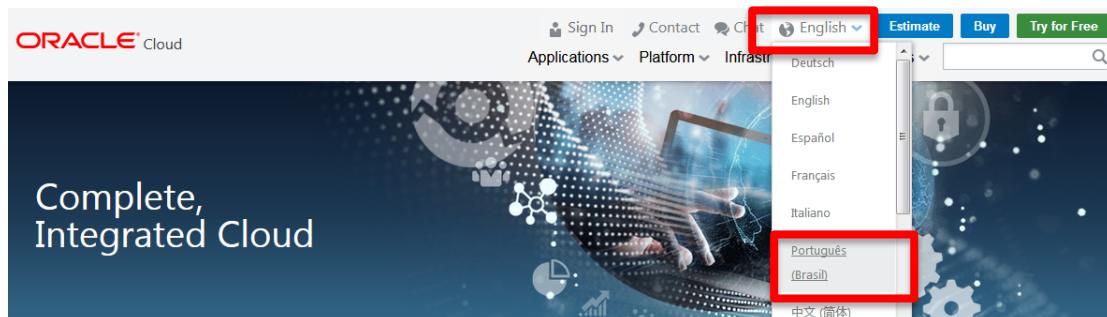
Lab 1. Accessing Oracle Cloud

Objectives

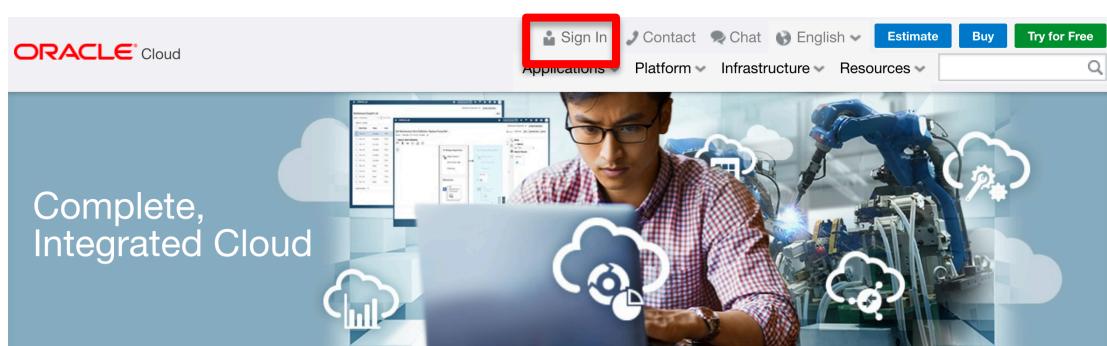
- Access Oracle Cloud Console
- Known IaaS and PaaS Services
- Become acquainted with OCI Interface

In this Section, you will learn more about the initial steps on Oracle Cloud Portal

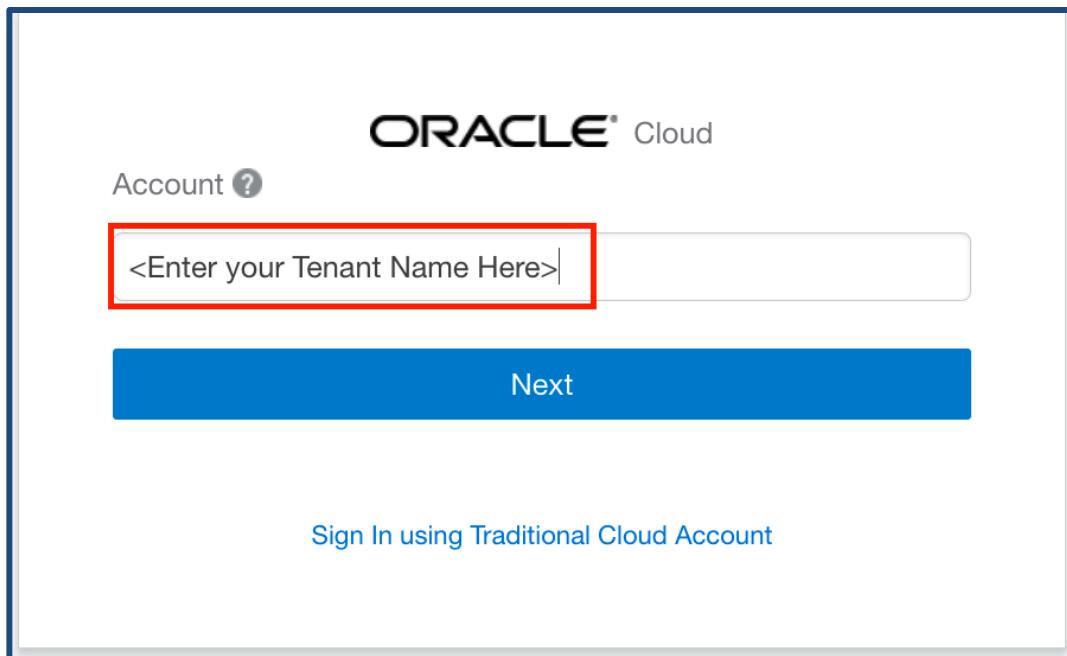
On your preferred browser, type: cloud.oracle.com. You can also change your language:



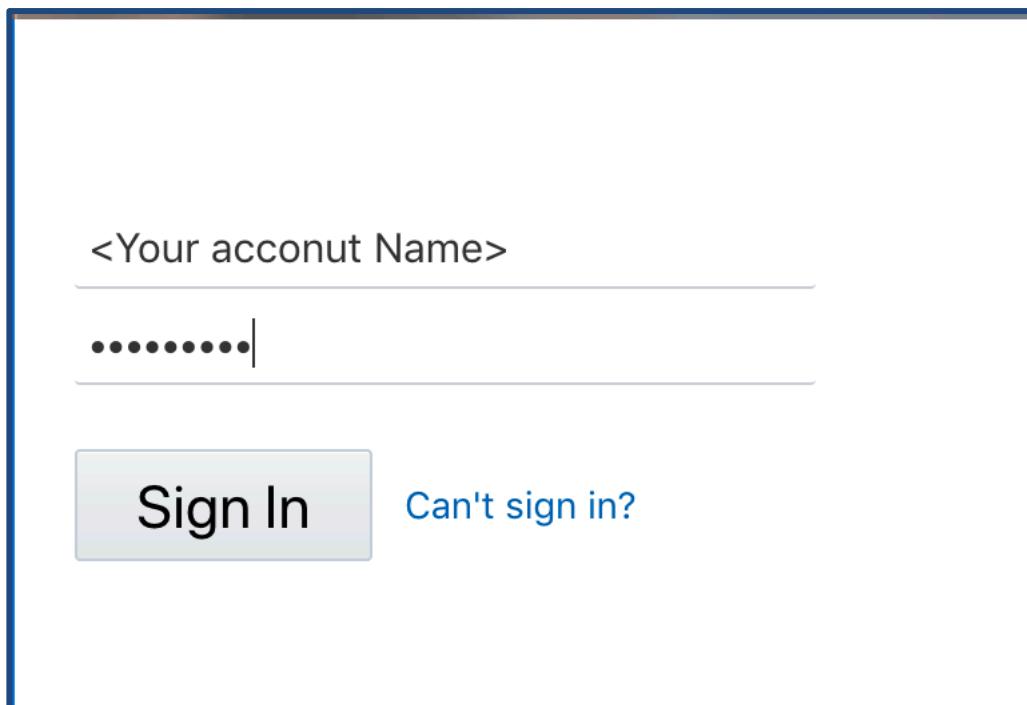
On the Site, you can Hit “Sign In”:



To more recent deployed environments, login must be made through "[Identity Cloud Service Account](#)". Where will be necessary to input "Account Name" (which is the defined name for the Tenant).



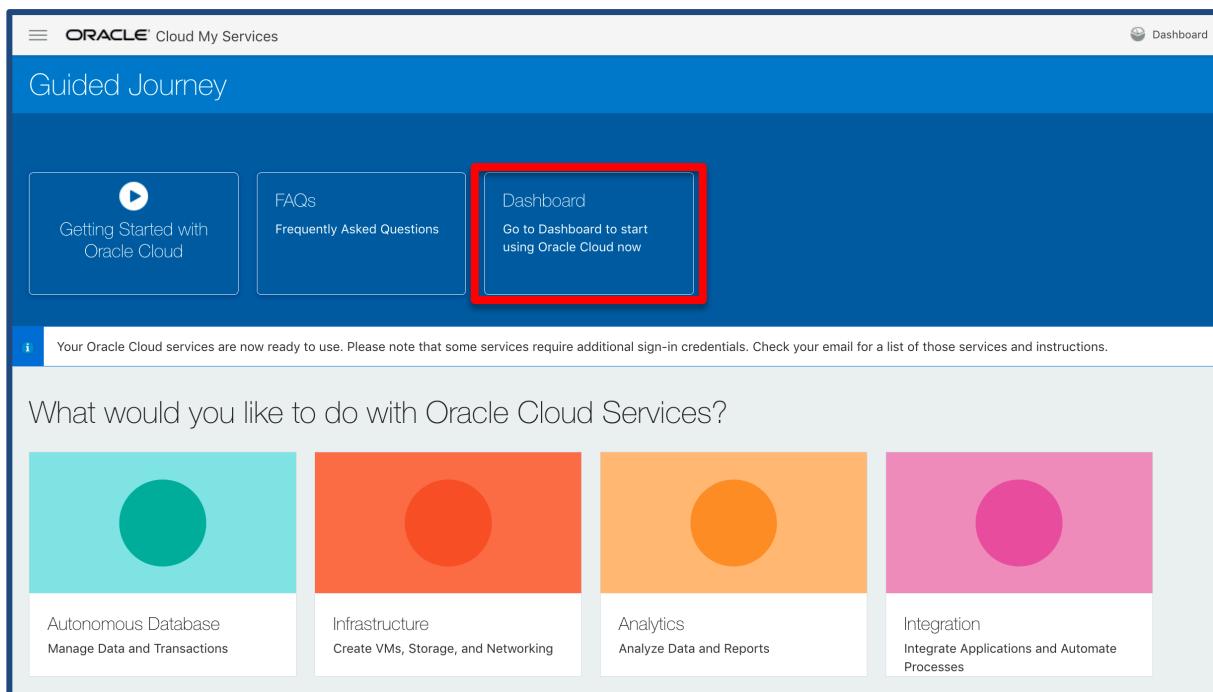
After Tenant identification, you'll be able to insert username and password for environment access



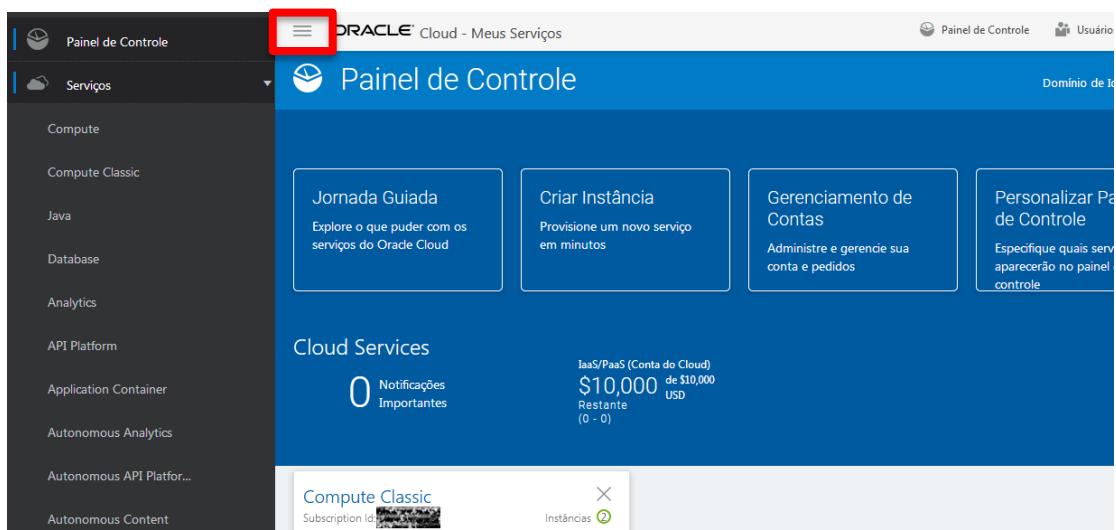
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Once identified, you'll reach Oracle's Cloud main screen, from where you can reach all the available services. Your default main screen will look like this.

If you want, you can customize this desktop, adding more info to the dashboard, using the Dashboard button below:



From the “Action Menu” (Top left corner), you can reach the available services on our console

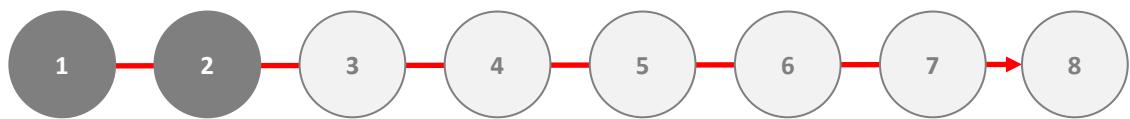


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When choosing a service, you'll be redirected to the Oracle Cloud Infrastructure console:

Lab 2.

OCI Basic Concepts



Lab 2. Understanding OCI Basic Concepts

Objectives

- Understand Availability Domain (AD) concept
- Understand Compartments
- Understand Fault Domains

In this section you'll learn about OCI's high availability architecture.

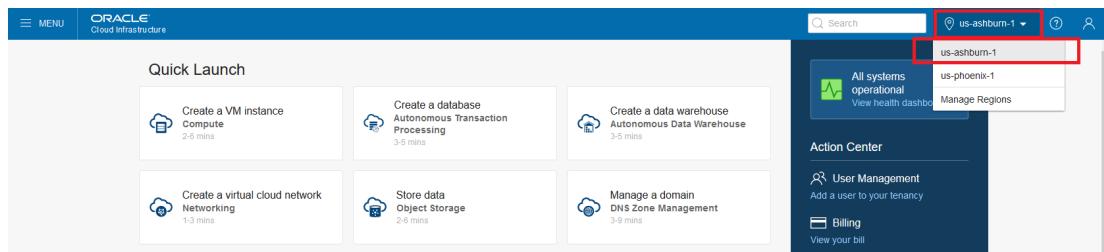
Regions

Oracle Cloud Infrastructure is hosted in regions and availability domains. A region is a localized geographic area. A region is composed of one or more availability domains. Most Oracle Cloud Infrastructure resources are either region-specific, such as a virtual cloud network, or availability domain-specific, such as a compute instance.

Regions are completely independent of other regions and can be separated by vast distances—across countries or even continents. Generally, you would deploy an application in the region where it is most heavily used, since using nearby resources is faster than using distant resources. However, you can also deploy applications in different regions to:

- mitigate the risk of region-wide events, such as large weather systems or earthquakes
- meet varying requirements for legal jurisdictions, tax domains, and other business or social criteria

After accessing the environment, is possible to change your region with just one click:



Availability Domains

In a Region, you may have up to three Availability Domains.

The availability domains within the same region are connected to each other by a low latency, high bandwidth network, which makes it possible for you to provide high-availability connectivity to the Internet and customer premises, and to build replicated systems in multiple availability domains for both high-availability and disaster recovery.

Availability domains are isolated from each other, fault tolerant, and very unlikely to fail simultaneously. Because availability domains do not share infrastructure such as power or

cooling, or the internal availability domain network, a failure at one availability domain within a region is unlikely to impact the availability of the others within the same region

Working With Compartments

When you first start working with Oracle Cloud Infrastructure, you need to think carefully about how you want to use compartments to organize and isolate your cloud resources. Compartments are fundamental to that process. Once you put a resource in a compartment, you can't move it, so it's important to think through your compartment design for your organization up front, before implementing anything.

When creating a new compartment, you must provide a name for it (maximum 100 characters, including letters, numbers, periods, hyphens, and underscores) that is unique within its parent compartment. You must also provide a description, which is a non-unique, changeable description for the compartment, between 1 and 400 characters. Oracle will also assign the compartment a unique ID called an Oracle Cloud ID

Once a resource is created in a compartment, you can't move it to another.

The Console is designed to display your resources by compartment within the current region. When you work with your resources in the Console, you must choose which compartment to work in from a list on the page.

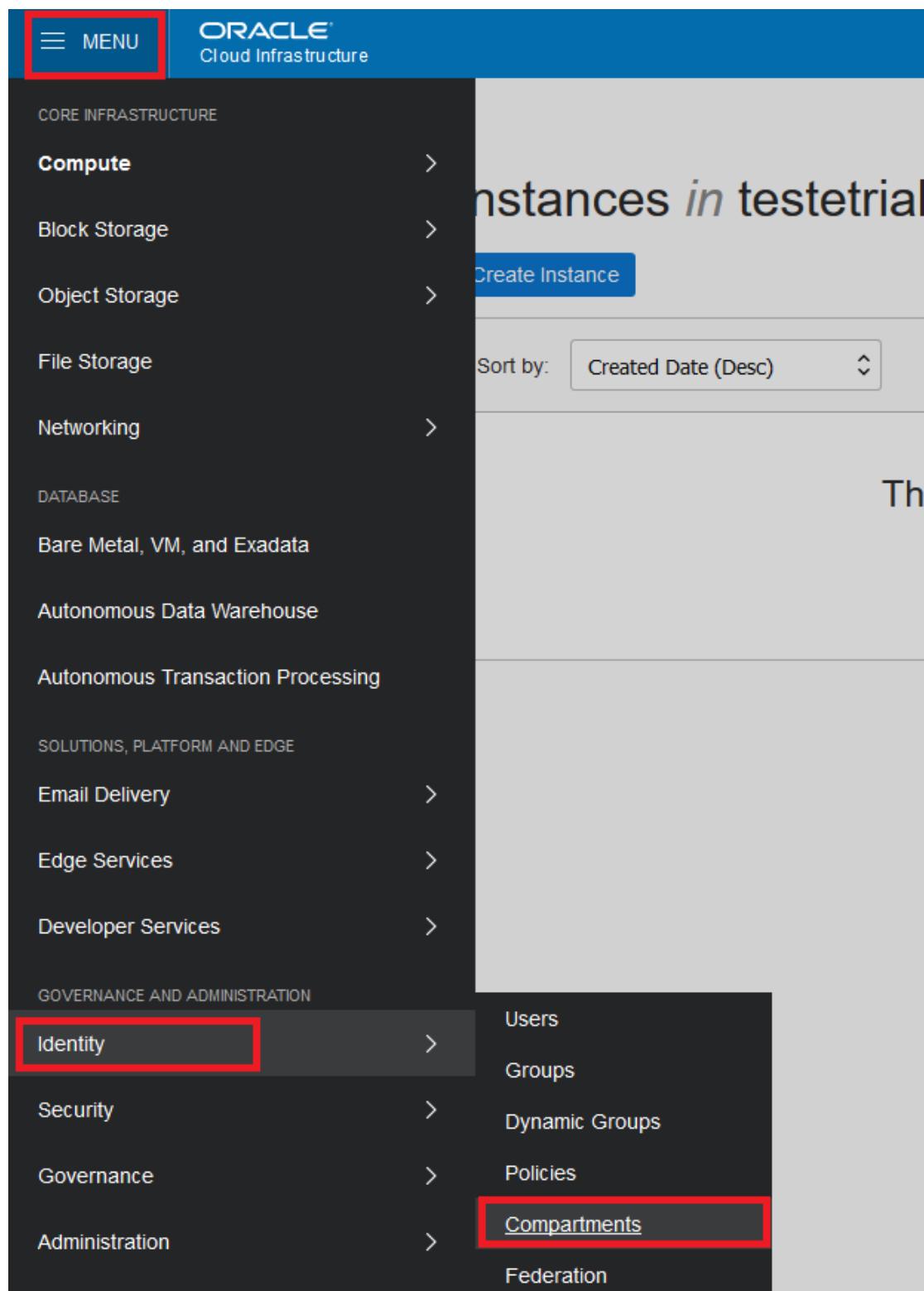
That list is filtered to show only the compartments in the tenancy that you have permission to access. If you're an administrator, you'll have permission to view all compartments and work with any compartment's resources, but if you're a user with limited access, you probably won't

Compartments are global, across regions, when you create a compartment, it is available in every region that your tenancy is subscribed to.

The screenshot shows the OCI Compute Instances page. The left sidebar has 'Compute' selected under 'Instances'. The main area title is 'Instances in testetrial (root) Compartment'. A 'Create Instance' button is at the top right. Below it is a sorting dropdown set to 'Created Date (Desc)'. A message says 'There are no Instances in testetrial (root) Compartment'. A 'Create' button is at the bottom right. A red box highlights the 'COMPARTMENT' dropdown menu, which shows 'testetrial (root)' selected. Below the dropdown is a search bar and a list of compartments: COMPUTE-TESTS, ManagedCompartmentForPaaS, OnPrem, Vitor-for-PaaS, and VPN-Compartment. At the bottom, there's a 'AVAILABILITY DOMAIN' section with three checked options: TMYY:US-ASHBURN-AD-1, TMYY:US-ASHBURN-AD-2, and TMYY:US-ASHBURN-AD-3.

Creating Compartments

On the main menu, Hit “Identity”, then choose “Compartments”



Click on “Create Compartment” and fill the information:

Name: Compartimento-Trial

Description: Compartimento para recursos de testes

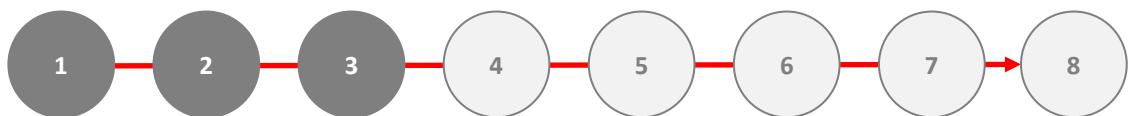
Parent Compartment: root

The screenshot shows the Oracle Cloud Infrastructure (OCI) Compartments creation interface. At the top, there's a navigation bar with 'MENU' and the 'ORACLE Cloud Infrastructure' logo. Below the navigation, the word 'Identity' is displayed next to a 'Compartments' section title. A 'Create Compartment' button is located within this section, also highlighted with a red box. The main form area is titled 'Create Compartment' and includes fields for 'NAME' (containing 'Compartimento-Trial'), 'DESCRIPTION' (containing 'Compartimento para recursos de testes'), 'PARENT COMPARTMENT' (set to 'testetrial (root)'), and 'TAGS'. A 'What is tagging?' link is present. Below the tags section, there's a table for adding tags, with columns for 'TAG NAMESPACE' (dropdown menu showing 'None (apply a free-form tag)'), 'TAG KEY' (empty input field), 'VALUE' (empty input field), and a '+ Additional Tag' button. Finally, another 'Create Compartment' button is at the bottom of the form.

Lab 3.

Virtual Cloud Network and

It's Resources



Lab 3. Virtual Cloud Network and It's Resources

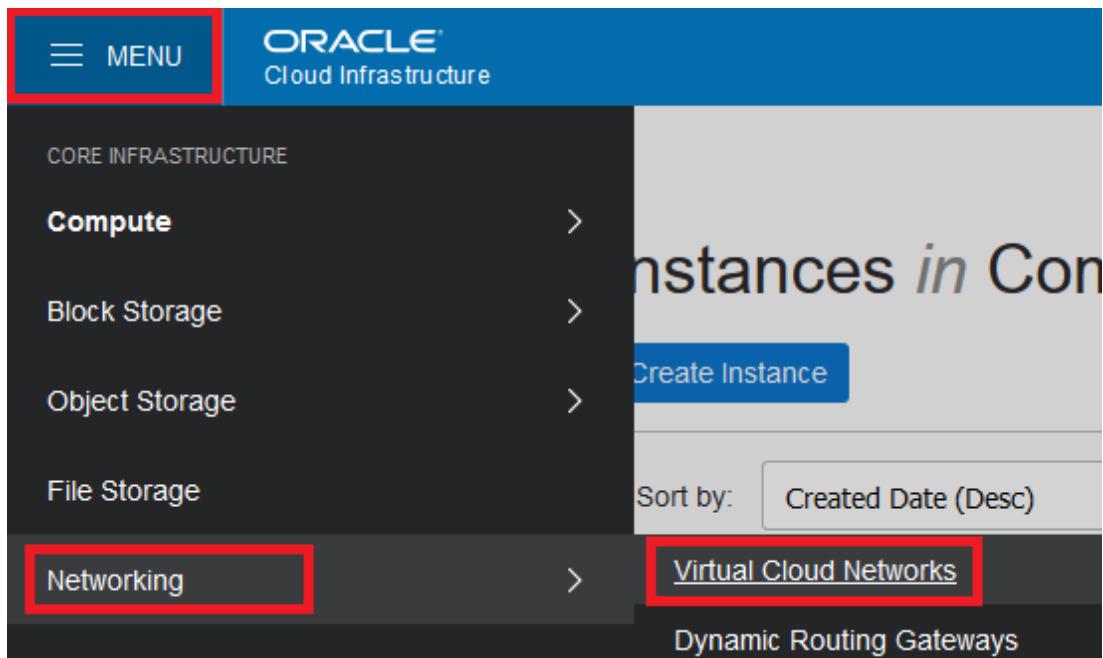
Objectives

- Create Oracle Cloud Network (VCN)
- Configure 3 subnets on 3 Ads
- Provision an Internet Gateway, which will allow your VCN access to public internet
- Configure Route Table

Create Oracle Cloud Network (VCN)

To create a network, remember to choose your compartment, than hit : Networking>>Virtual Cloud Networks, on main menu.

The screenshot shows the Oracle Cloud Infrastructure Compute Instances page. The top navigation bar includes a 'MENU' icon, the 'ORACLE Cloud Infrastructure' logo, and a search bar. The left sidebar has 'Compute' selected and lists 'Instances', 'Instance Configurations', 'Instance Pools', 'Custom Images', 'Boot Volumes', and 'Boot Volume Backups'. The main content area is titled 'Instance' and contains a 'Create Instance' button, a 'Sort by:' dropdown set to 'Create', and a large empty table for listing instances. At the bottom, there is a 'List Scope' section with a 'COMPARTMENT' dropdown menu. The 'Compartimento-Trial' option is highlighted with a red box.



Create in Compartment: Compartimento-Trial

Name: VCN-Trial

- CREATE VIRTUAL CLOUD NETWORK ONLY

CIDR Block: 100.0.0.0/16



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Create Virtual Cloud Network [help](#) [cancel](#)

CREATE IN COMPARTMENT

Compartimento-Trial
testetrial (root)/Compartimento-Trial

NAME OPTIONAL

VCN-Trial

CREATE VIRTUAL CLOUD NETWORK ONLY
 CREATE VIRTUAL CLOUD NETWORK PLUS RELATED RESOURCES

Creates a Virtual Cloud Network only. You'll still need to set up at least one Subnet, Gateway, and Route Rule to have a working Virtual Cloud Network.

CIDR BLOCK

100.0.0.0/16
Specified IP addresses: 100.0.0-100.0.255.255 (65,536 IP addresses)

DNS RESOLUTION

USE DNS HOSTNAMES IN THIS VCN
Allows assignment of DNS hostname when launching an Instance

DNS LABEL

vcntrial

Only letters and numbers, starting with a letter. 15 characters max.

DNS DOMAIN NAME (READ-ONLY)

vcntrial.oraclevcn.com

TAGS

Tagging is a metadata system that allows you to organize and track resources within your tenancy. Tags are composed of keys and values that can be attached to resources.

[Learn more about tagging](#)

TAG NAMESPACE

None (apply a free-form tag) ▼

TAG KEY

VALUE

+ Additional Tag

VIEW DETAIL PAGE AFTER THIS RESOURCE IS CREATED

Create Virtual Cloud Network

When you choose “...Plus Related resources” option, OCI will create the VCN and the complete set of necessary items to let you quickly work with your resources

When ready, will be shown as below:

☰ MENU ORACLE Cloud Infrastructure

Virtual Cloud Networks in Compartimento-Trial Compartment

Create Virtual Cloud Network

Sort by: Created Date (Desc) ▼

VCN	OCID: mno4za	CIDR Block: 100.0.0.0/16	Default Route Table: Default Route Table for VCN-Trial	DNS Domain Name: vcntrial...	Created: Wed, 09 Jan 2019 16:15:00 GMT
AVAILABLE					***

Displaying 1 Virtual Cloud Networks < Page 1 >

Displaying 1 Virtual Cloud Networks < Page 1 >

Subnets inside a VCN

A VCN is a software-defined network that you set up in the Oracle Cloud Infrastructure data centers in a particular . A subnet is a subdivision of a VCN. For an overview of VCNs, allowed size, default VCN components, and scenarios for using a VCN, see [Overview of Networking](#).

Each subnet in a VCN consists of a contiguous range of IP addresses that do not overlap with other subnets in the VCN. Example: 172.16.1.0/24. The first two IP addresses and the last in the subnet's CIDR are reserved by the Networking service. You can't change the size of the subnet after creation, so it's important to think about the size of subnets you need before creating them.

VCN is a cross-AD object. Inside it, we can create objects that will be positioned in any AD, inside he same region.

To create a subnet, hit the name of the VCN, then “Create Subnet”

Virtual Cloud Networks *in* Compartimento-Trial Compartment

Create Virtual Cloud Network

Sort by: Created Date (Desc)				
 VCN OCID: ...mno4za Show Copy <small>AVAILABLE</small>	VCN-Trial CIDR Block: 100.0.0.0/16 Default Route Table: Default Route Table for VCN-Trial DNS Domain Name: vcntrial... Show Copy			

Networking » Virtual Cloud Networks » Virtual Cloud Network Details

VCN-Trial

[Terminate](#) [Apply Tag\(s\)](#)

VCN Information	Tags
CIDR Block: 100.0.0.0/16 Compartment: testetrial (root)/Compartimento-Trial Created: Wed, 09 Jan 2019 16:15:00 GMT	OCID: ...mno4za Show Copy Default Route Table: Default Route Table for VCN-Trial DNS Domain Name: vcntrial... Show Copy

Resources

[Subnets \(0\)](#) Subnets (0)

Route Tables (1)
Internet Gateways (0)
Dynamic Routing Gateways (0)
Security Lists (1)
DHCP Options (1)
Local Peering Gateways (0)
NAT Gateways (0)
Service Gateways (0)

Subnets *in* Compartimento-Trial Compartment

[Create Subnet](#)

Sort by: Created Date (Desc)

There are no Subnets in Compartimento-Trial that match the filter criteria.

[Create Subnet](#)

Fill the fields with the information below :

SUBNET AD1

Name: Subrede-1

Availability Domain (AD): US-ASHBURN-AD1

CIDR Block: 100.0.0.0/24

Route Table: Default Route Table for VCN-Trial

- PUBLIC SUBNET

DHCP Options: Default DHCP Options for VCN-Trial

Security List: Default Security List for VCN-Trial

SUBNET AD2

Name: Subrede-2

Availability Domain (AD): US-ASHBURN-AD2

CIDR Block: 100.0.1.0/24

Route Table: Default Route Table for VCN-Trial

- PUBLIC SUBNET

DHCP Options: Default DHCP Options for VCN-Trial

Security List: Default Security List for VCN-Trial

SUBNET AD3

Name: Subrede-3

Availability Domain (AD): US-ASHBURN-AD3

CIDR Block: 100.0.2.0/24

Route Table: Default Route Table for VCN-Trial

- PUBLIC SUBNET

DHCP Options: Default DHCP Options for VCN-Trial

Security List: Default Security List for VCN-Trial

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Create Subnet

If the Route Table, DHCP Options, or Security Lists are in a different Compartment than the Subnet, enable Compartment selection for those resources: [Click here](#)

NAME OPTIONAL

AVAILABILITY DOMAIN

CIDR BLOCK

Specified IP addresses: 100.0.0.0-100.0.0.255 (256 IP addresses)

ROUTE TABLE

SUBNET ACCESS

PRIVATE SUBNET
Prohibit public IP addresses for Instances in this Subnet

PUBLIC SUBNET
Allow public IP addresses for Instances in this Subnet

DNS RESOLUTION

USE DNS HOSTNAMES IN THIS SUBNET ?

Allows assignment of DNS hostname when launching an instance

DNS LABEL

Only letters and numbers, starting with a letter. 15 characters max.

DNS DOMAIN NAME (READ-ONLY)

DHCP OPTIONS

Security Lists

X Default Security List for VCN-Trial

+

Resources

Subnets (3)

	Subnet Name	CIDR Block	Availability Domain	Route Table	DHCP Options
S AVAILABLE	Subrede-3	100.0.2.0/24	tmyY:US-ASHBURN-AD-3	Default Route Table for VCN-Trial	Default DHCP Options for VCN-Trial
S AVAILABLE	Subrede-2	100.0.1.0/24	tmyY:US-ASHBURN-AD-2	Default Route Table for VCN-Trial	Default DHCP Options for VCN-Trial
S AVAILABLE	Subrede-1	100.0.0.0/24	tmyY:US-ASHBURN-AD-1	Default Route Table for VCN-Trial	Default DHCP Options for VCN-Trial

Displaying 3 Subnets < Page 1 >

Internet Gateway Creation

You can think of an internet gateway as a router connecting the edge of the cloud network with the internet. Traffic that originates in your VCN and is destined for a public IP address outside the VCN goes through the internet gateway.

In the VCN, left menu, hit “Internet Gateways”, then “Create Internet Gateway”

Create in Compartment: Compartimento-Trial

Name: IG1

The screenshot shows the OCI Cloud Infrastructure console interface. At the top, there's a navigation bar with 'OCI Fast Track – Hands On Guide'. Below it, the main content area has a title 'Subnets in Compartimento-Trial Compartment' and a table listing two subnets: 'Subrede-3' and 'Subrede-2'. A red box highlights the 'Internet Gateways (0)' link in the left sidebar. The next section, 'Internet Gateways in Compartimento-Trial Compartment', shows a message 'No Internet Gateways'. A red box highlights the 'Create Internet Gateway' button. The final section is 'Create Internet Gateway', where the 'NAME OPTIONAL' field is filled with 'IG1'. A red box highlights the 'Create Internet Gateway' button at the bottom.

Resources

Subnets (3)

Route Tables (1)

Internet Gateways (0)

Dynamic Routing Gateways (0)

Security Lists (1)

DHCP Options (1)

Local Peering Gateways (0)

NAT Gateways (0)

Service Gateways (0)

Subnets in Compartimento-Trial Compartment

Create Subnet

Sort by: Created Date (Desc) ⚠

Displaying 3 Subnets < Page 1 >

Subnet	CIDR Block	Availability Domain	Route Table	DHCP Options
Subrede-3 AVAILABLE	100.0.2.0/24 CIDR Block: 100.0.2.0/24 OCID: tmyYUS-ASHBURN-AD-3 Virtual Router MAC Address: 00:00:17:AA:B5:A2	tmyYUS-ASHBURN-AD-3 DNS Domain Name: subrede3... Subnet Access: Public	Default Route Table for VCN-Trial Security Lists: Default Security List for VCN-Trial	Default DHCP Options for VCN-Trial
Subrede-2 AVAILABLE	100.0.1.0/24 CIDR Block: 100.0.1.0/24 OCID: tmyYUS-ASHBURN-AD-2 Virtual Router MAC Address: 00:00:17:AA:B5:A2	tmyYUS-ASHBURN-AD-2 DNS Domain Name: subrede2... Subnet Access: Public	Default Route Table for VCN-Trial Security Lists: Default Security List for VCN-Trial	Default DHCP Options for VCN-Trial

Internet Gateways in Compartimento-Trial Compartment

No Internet Gateways

Create Internet Gateway

There are no Internet Gateways in this Virtual Cloud Network.

Create Internet Gateway

help cancel

CREATE IN COMPARTMENT

Compartimento-Trial

testtrial (root)/Compartimento-Trial

NAME OPTIONAL

IG1

TAGS

Tagging is a metadata system that allows you to organize and track resources within your tenancy. Tags are composed of keys and values that can be attached to resources.

[Learn more about tagging](#)

TAG NAMESPACE

None (apply a free-form tag) ⚠

TAG KEY

VALUE

+ Additional Tag

Create Internet Gateway

Route Configuration for the Internet Gateway

Every VCN need it's route table, that will direct Public IP's traffic.

On the left menu, hit Route Tables, then, hit the name of the default route table, called “Default Route Table for VCN-Trial”

The screenshot shows the OCI Console interface. At the top, there is a breadcrumb navigation: Networking > Virtual Cloud Networks > Virtual Cloud Network Details > Route Tables. The main title is "VCN-Trial". Below the title, there are two buttons: "Terminate" and "Apply Tag(s)". A "Tags" tab is selected. The "VCN Information" section displays the following details:

- CIDR Block: 100.0.0.0/16
- Compartment: testetrial (root)/Compartimento-Trial
- Created: Wed, 09 Jan 2019 16:15:00 GMT
- OCID: ...mno4za
- Default Route Table: Default Route Table for VCN-Trial
- DNS Domain Name: vcntrial...

The "Resources" sidebar on the left lists the following items:

- Subnets (3)
- Route Tables (1)** (highlighted with a red box)
- Internet Gateways (1)
- Dynamic Routing Gateways (0)
- Security Lists (1)
- DHCP Options (1)
- Local Peering Gateways (0)

The "Route Tables in Compartimento-Trial Compartment" section shows one route table:

- Create Route Table** button
- RT icon
- Default Route Table for VCN-Trial** (highlighted with a red box)
- OCID: ...gban6a
- Compartment: Compartimento-Trial
- Created: Wed, 09 Jan 2019 16:15:00 GMT
- 0 RULES

At the bottom right of the route table list, it says "Displaying 1 Route Tables".

Target Type: Internet Gateway
Destination CIDR Block: 0.0.0.0/0
Compartment: Compartimento-Trial
Target Selection: IG1

The screenshot shows the "Default Route Table for VCN-Trial" page. The title is "Default Route Table for VCN-Trial". There is a "Route Table Information" section with the following details:

- OCID: ...gban6a
- Compartment: testetrial (root)/Compartimento-Trial
- Created: Wed, 09 Jan 2019 16:15:00 GMT

The "Resources" sidebar on the left shows "Route Rules (0)".

The "Route Rules" section has the following content:

- "Edit Route Rules" button
- A message: "There are no Route Rules for this Route Table."
- "Edit Route Rules" button (highlighted with a red box)

At the top right of the route rules section, it says "No Route Rules".

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Edit Route Rules [help](#) [cancel](#)

Important: For a route rule that targets a Private IP, you must first enable "Skip Source/Destination Check" on the VNIC that the Private IP is assigned to.

+ Another Route Rule

Save

Edit Route Rules [help](#) [cancel](#)

Important: For a route rule that targets a Private IP, you must first enable "Skip Source/Destination Check" on the VNIC that the Private IP is assigned to.

TARGET TYPE	DESTINATION CIDR BLOCK
Internet Gateway	0.0.0.0/0 ×

COMPARTMENT	TARGET INTERNET GATEWAY
Compartimento-Trial	IG1 ▼

testetrial (root)/Compartimento-Trial

+ Another Route Rule

Save

After this configuration you'll be ready to access the internet.

Lab 4.

Creating Windows Server 2016

Virtual Machine

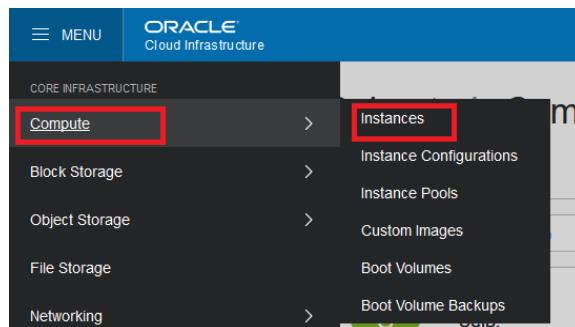


Lab 4. Creating Windows Server 2016 Virtual Machine

Objectives

- Quickly create a Virtual Machine
- Identify main information needed for a OCI Compute Instance Creation

To access main screen, Hit Menu > Compute > Instances.



Begin Creation

Hit “Create Instance”.

A screenshot of the OCI Instances page. The left sidebar shows 'Compute' selected, with 'Instances' highlighted. A 'Create Instance' button is visible at the top right of the main content area. The main content area displays a message: 'There are no Instances in Compartimento-Trial that match the filter criteria.' Below this message is another 'Create Instance' button, which is also highlighted with a red box.

Name you instance: VM-Windows2016

Availability Domain: AD 1

Operating System: Windows Server 2016 Standard

Instance Type: Virtual Machine

Instance Shape: VM.Standard2.1

Custom boot volume: 300 GB

Virtual Cloud Network Compartment: Compartimento-Trial

Virtual Cloud Network: VCN-Trial

Subnet Compartment: Compartimento-Trial

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Subnet: Subrede-1

☰ MENU ORACLE Cloud Infrastructure

Create Compute Instance

Oracle Cloud Infrastructure Compute lets you provision and manage compute hosts, known as instances. You can launch instances as needed to meet your compute and application requirements.

Name your instance
VM-Windows2016

Select an availability domain for your instance
AD 1 tmyY.US-ASHBURN-AD-1 AD 2 tmyY.US-ASHBURN-AD-2 AD 3 tmyY.US-ASHBURN-AD-3

Choose an operating system or image source
 Windows Server 2016 Standard
Image Build: Gen2-2018.12.12-0
Windows Server 2016 supports running production Windows workloads on Oracle Cloud Infrastructure.

Choose instance type
Virtual Machine
A virtual machine is an independent computing environment that runs on top of physical bare metal hardware.
Bare Metal Machine
A bare metal compute instance gives you dedicated physical server access for highest performance and strong isolation.

Choose instance shape
VM.Standard2.1
1 Core OCPU, 15 GB Memory

Configure boot volume
Default boot volume size: 256.0 GB
 Custom boot volume size (in GB)
300

Volume performance varies with volume size. Size must be an integer between 50 GB and 32,768 GB (32 TB), and cannot be smaller than the selected image's default boot volume size. ([Learn more](#))
 Choose a key from Key Management to encrypt this volume

Login Credentials
Upon creating this instance, both a user name and an initial password will be generated for you. They will be available on the details screen for the newly launched instance. You must create a new password upon logging into the instance for the first time.

Configure networking
Virtual cloud network compartment
Compartimento-Trial
testetrial (root)/Compartimento-Trial
Virtual cloud network
VCN-Trial
Subnet compartment
Compartimento-Trial
testetrial (root)/Compartimento-Trial
Subnet
Subrede-1

[Show Advanced Options](#)

LAD Knowledge Team

IaaS and Monitoring Brazil Team

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After instance creation, you'll see:

The screenshot shows a list of instances. One instance is highlighted with a red box around its name "VM-Windows2016". The instance details are as follows:

Shape:	VM.Standard2.1
Region:	iad
Availability Domain:	tmyUS-ASHBURN-AD-1
Fault Domain:	FAULT-DOMAIN-2
Created:	Thu, 10 Jan 2019 16:33:49 GMT
Maintenance Reboot:	-

Buttons at the bottom include "Displaying 1 Instances < Page 1 >" and "Displaying 1 Instances < Page 1 >".

Before step foward, find the VM's public IP, and copy it :

The screenshot shows the "Instance Information" tab for the VM-Windows2016 instance. The Public IP Address is highlighted with a red box and is listed as 132.145.151.160.

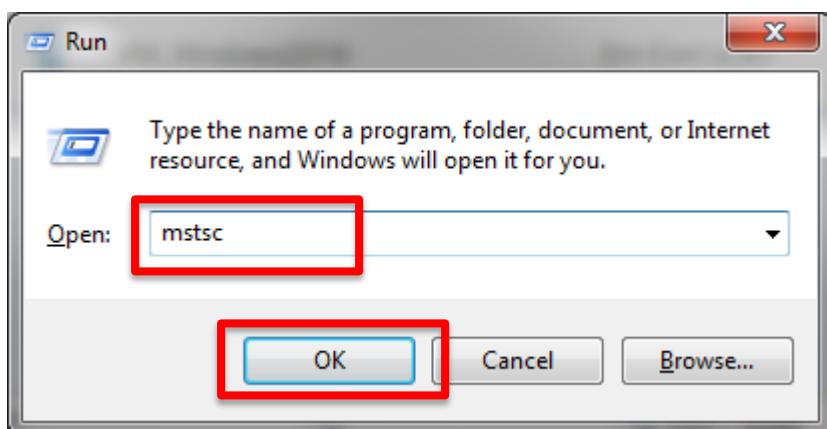
Instance Information

Availability Domain:	tmyUS-ASHBURN-AD-1
Fault Domain:	FAULT-DOMAIN-2
Region:	iad
Shape:	VM.Standard2.1
Username:	opn
Initial Password:	...h
Maintenance Reboot:	-
Image:	Windows-Server-2016-Standard-Edition-VM-Gen2-2018.12.12-0
OCID:	...wyaq3a
Launched:	Thu, 10 Jan 2019 16:33:49 GMT
Compartment:	testtrial (root)/Compartimento-Trial
Virtual Cloud Network:	VCN-Trial
Launch Mode:	NATIVE

Primary VNIC Information

Private IP Address:	100.0.0.2
Public IP Address:	132.145.151.160
Internal FQDN:	vm-windows2016...
Subnet:	Subrede-1

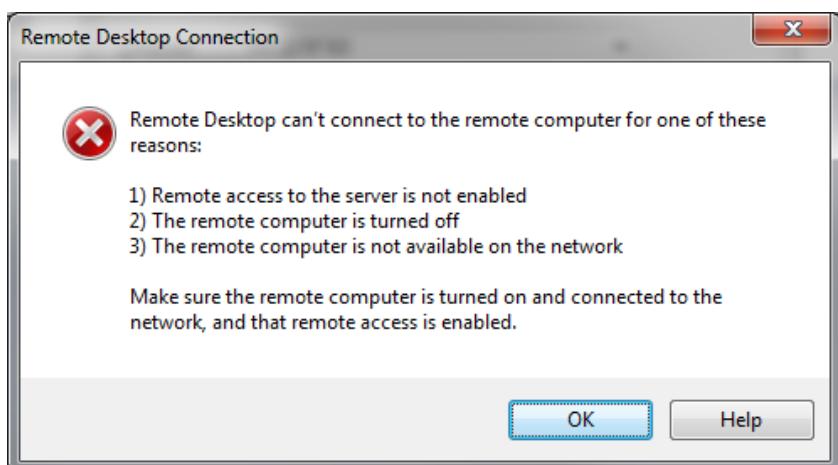
Now try to access it, using “Remote Desktop Connection”.



Use instance's Public IP address, and hit “Connect”.



You'll get the following error when trying to connect ...



Don't worry, that's the expected behavior. In order to access a compute instance on Oracle Public Cloud, you need to configure firewall "Access Rules" first. On the next session, we'll configure other resources, that can be created before the VM, and provide access permissions as well

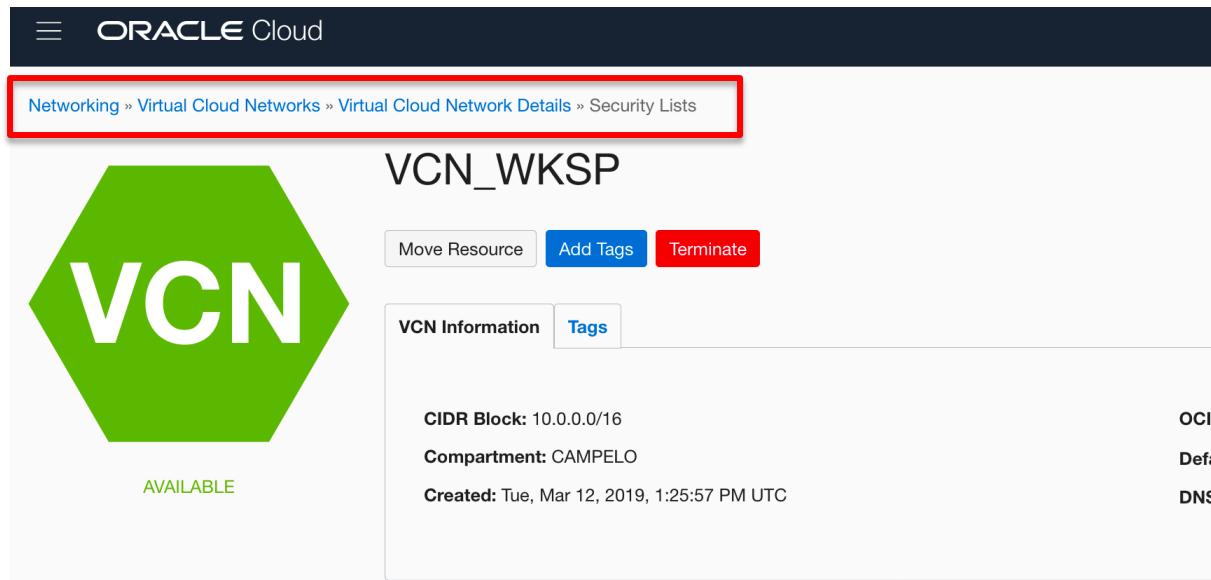
Security Rules

You probably noticed that Linux VM could be accessed by SSH key right after it's creation, but Windows instance could not be accessed through RDP.

To access Windows Compute, we'll need to configure some firewall rules.

Firewall rules are set inside in an object called “**Security List**”, that can be accessed within a subnet.

Security Rules, are inside the Security List, from there, we can setup which ports and protocols are allowed traffic inside a subnet.



The screenshot shows the OCI console interface. At the top, there is a navigation bar with the Oracle Cloud logo. Below it, a breadcrumb trail is shown: Networking > Virtual Cloud Networks > Virtual Cloud Network Details > Security Lists. A red box highlights the first three items in the breadcrumb trail. The main content area is titled "VCN_WKSP". On the left, there is a large green hexagonal icon with the letters "VCN" in white. Below the icon, the word "AVAILABLE" is displayed. To the right of the icon, there are three buttons: "Move Resource", "Add Tags" (which is highlighted in blue), and "Terminate". Below these buttons, there are two tabs: "VCN Information" and "Tags", with "Tags" being the active tab. Under the "Tags" tab, several details are listed: "CIDR Block: 10.0.0.0/16", "Compartment: CAMPELO", and "Created: Tue, Mar 12, 2019, 1:25:57 PM UTC".

Resources

- Subnets (2)
- Route Tables (1)
- Internet Gateways (1)
- Dynamic Routing Gateways (0)
- Network Security Groups (0)
- Security Lists (2)** (highlighted with a red box)
- DHCP Options (1)
- Local Peering Gateways (0)

Create Security List

Name	State
public	Available
Default Security List for VCN_WKSP	Available

OCI Fast Track – Hands On Guide

To access the VCN’s firewall rules, choose the Security List you want to configure. In our example, you’ll find the “public” security list already created on our VCN. Click on the “public” security list and the access rules console will come up.

The screenshot shows two pages from the OCI Console. The top page is titled "VCN_WKSP" and displays basic information about a VCN, including its CIDR Block (10.0.0.0/16), Compartment (CAMPELO), and creation date (Tue, Mar 12, 2019, 1:25:57 PM UTC). The bottom page is titled "Security Lists in CAMPELO Compartment" and lists existing security lists. One entry, "public", is highlighted with a red box. The left sidebar shows other resources like Subnets, Route Tables, and Internet Gateways.

Now you can add/edit Access Rules to the VCN ... Hit “Add Ingress Rules” to add more access conditions.

The screenshot shows two pages from the OCI Console. The top page is titled "public" and displays basic information about a security list, including its OCID, Compartment (CAMPELO), and creation date. The bottom page is titled "Ingress Rules" and lists existing ingress rules. A red box highlights the "Add Ingress Rules" button. The left sidebar shows other resources like Ingress Rules and Egress Rules.

RDP Setting permissions

Inside Security List, hit “Add Ingress Rules” option.

The screenshot shows the OCI Console interface for managing security lists. At the top, there's a green hexagonal icon labeled 'SL' with the word 'AVAILABLE' below it. The main title is 'Default Security List for VCN_WKSP'. Below the title, it says 'Instance traffic is controlled by firewall rules on each Instance in addition to this Security List'. There are three buttons at the top: 'Move Resource', 'Add Tags', and 'Terminate'. Below these are tabs for 'Security List Information' and 'Tags', with 'Tags' being selected. Under 'Security List Information', the OCID is listed as ...32iloa with 'Show' and 'Copy' options, and the creation date is Tue, Mar 12, 2019, 1:25:57 PM UTC. The 'Resources' section contains two tabs: 'Ingress Rules (12)' (selected) and 'Egress Rules (1)'. The 'Ingress Rules' tab has a table with columns: Stateless (checkbox), Source (dropdown), IP Protocol (dropdown), and Source Port Range (dropdown). A single rule is listed: No, 0.0.0.0/0, TCP, All. The 'Add Ingress Rules' button is highlighted with a red box.

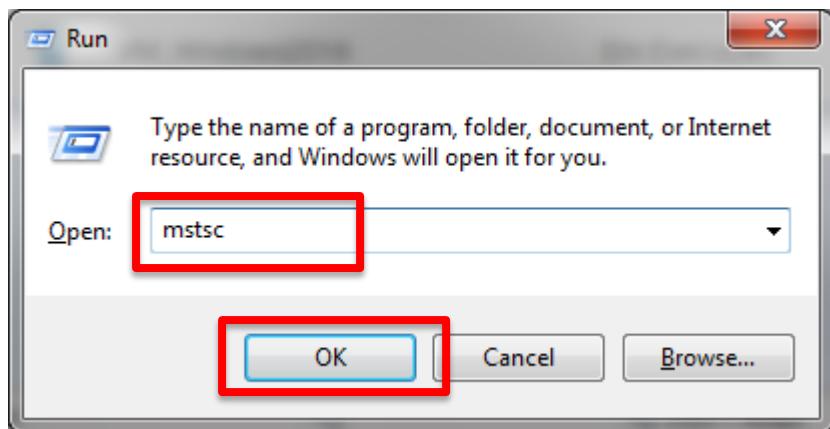
The screenshot shows the 'Add Ingress Rules' dialog box. It starts with a header 'Add Ingress Rules' and a 'cancel' link. The first section is 'Ingress Rule 1' with a note: 'Allows TCP traffic for ports: 3389'. It includes fields for 'STATELESS' (unchecked), 'SOURCE TYPE' (set to 'CIDR'), 'SOURCE CIDR' (set to '0.0.0.0/0'), 'IP PROTOCOL' (set to 'RDP (TCP/3389)'), 'SOURCE PORT RANGE' (set to 'All'), and 'DESTINATION PORT RANGE' (set to '3389'). Below these fields are examples: 'Examples: 80, 20-22 or All' and 'Examples: 80, 20-22 or All'. At the bottom are 'Add Ingress Rules' and 'Cancel' buttons, and a '+ Additional Ingress Rule' link.

Fill the blanks as follows :

Source Type: CIDR
Source CIDR: 0.0.0.0/0
IP Protocol: RDP (TCP/3389)
Source Port Range: All
Destination Port Range: 3389

Windows access through Remote Desktop

To access Windows VM, on Main Menu choose “Run”, type “mstsc”, then hit “OK”.



Input Instance's Public IP, then hit “Connect”



IF everything was properly configured, you'll be transported to Windows login page, where you will need to change OPC password on first access.

Lab 5.

Oracle Linux 7.6

Compute Instance Creation



Lab 5. Oracle Linux 7.6 Compute Instance Creation

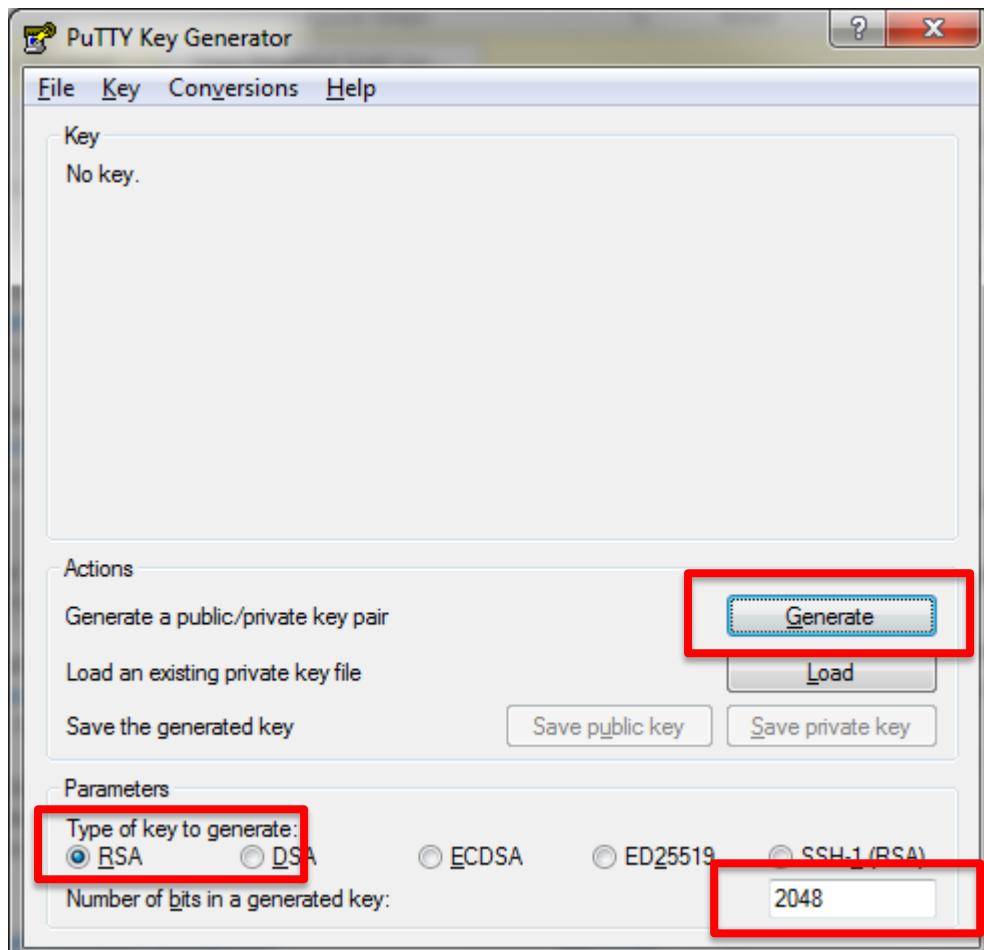
Objectives

- Create SSH key pair with PuTTY Gen
- Create Oracle Linux 7.6 virtual Machine
- Access compute instance using PuTTY

SSH Key pair creation

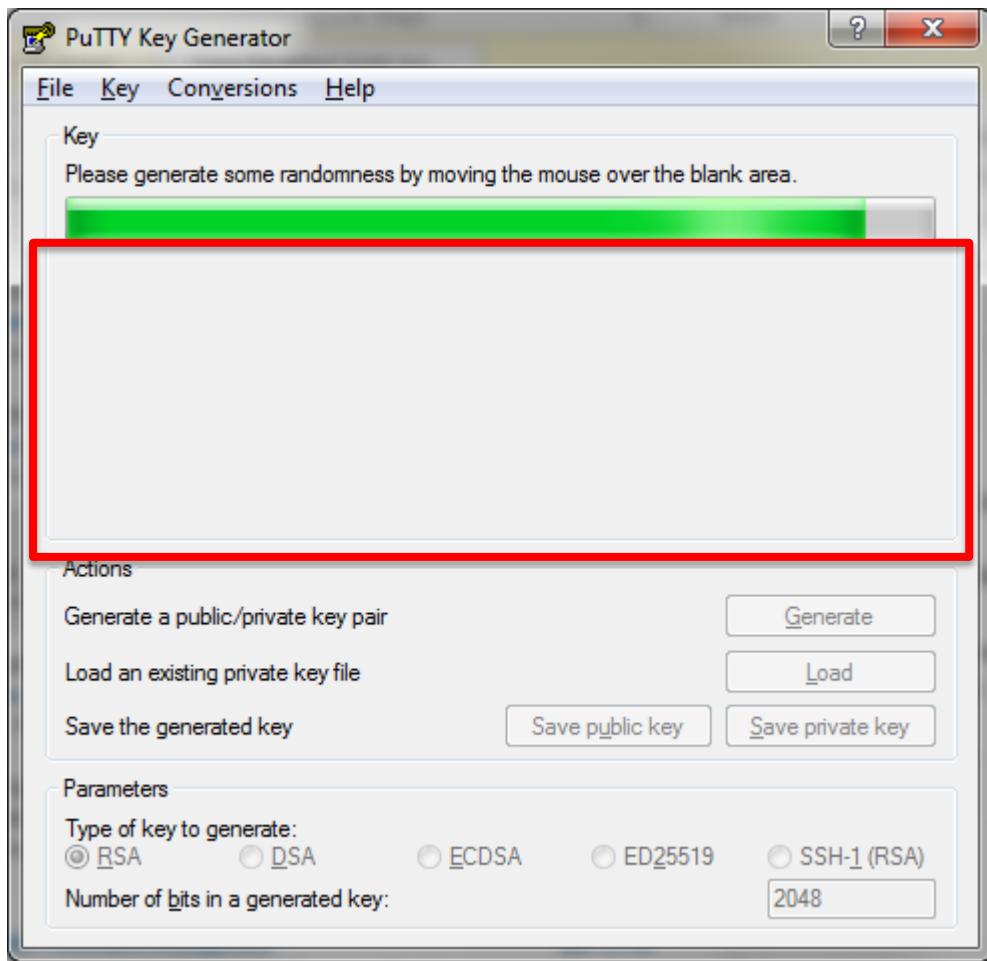
First step, before start VM Creation, is to create a SSH key pair. To do it, we'll use Putty Key Generator

Open the application, choose a RSA type key, and a 2048 bits key. Than hit “Generate”



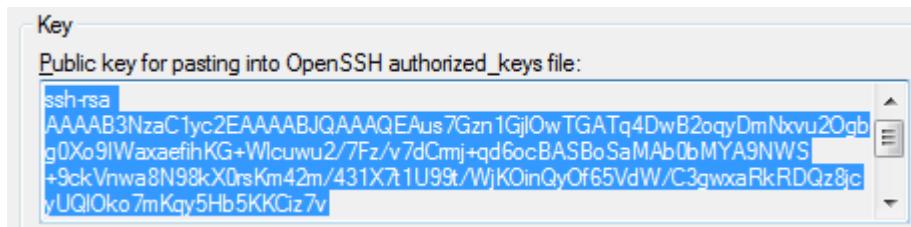
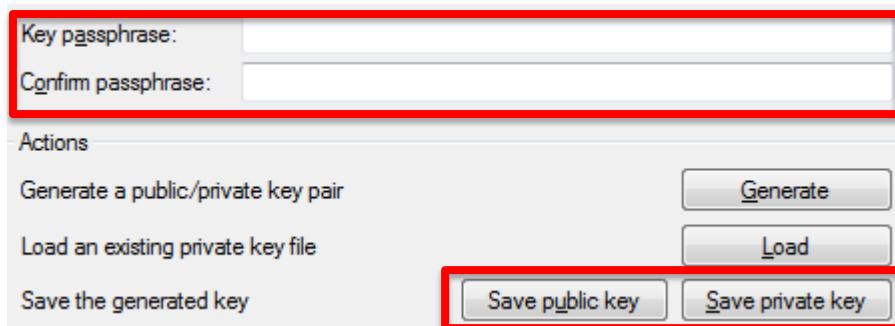
Move the mouse until the green bar stops moving

OCI Fast Track – Hands On Guide



Save private and public Keys in safe place.

“Key Passphrase” fields are optional



For VM creation, we'll use public key. Private key will only be used for connection.

Creating Virtual Machine

In Main Menu, hit : Compute > Instances, than “Create Instance” :

- Name you instance:** VM-OracleLinux
- Availability Domain:** AD 2
- Operating System:** Oracle Linux 7.6
- Instance Type:** Virtual Machine
- Instance Shape:** VM.Standard2.1
- Custom boot volume:** 300 GB
 - **Choose SSH Key File:** Insert public key file (.pub)
- Virtual Cloud Network Compartment:** Compartimento-Trial
- Virtual Cloud Network:** VCN-Trial
- Subnet Compartment:** Compartimento-Trial
- Subnet:** Subrede-2

The screenshot shows the 'Create Compute Instance' wizard. At the top, there's a blue header bar with the 'MENU' button and the 'ORACLE Cloud Infrastructure' logo. Below the header, the title 'Create Compute Instance' is displayed. A descriptive message states: 'Oracle Cloud Infrastructure Compute lets you provision and manage compute hosts, known as instances. You can launch instances as needed to meet your compute and application requirements.' The first step is 'Name your instance', with the value 'VM-OracleLinux' entered. The second step is 'Select an availability domain for your instance', where 'AD 2' is selected (indicated by a blue border and a checkmark). The third step is 'Choose an operating system or image source', showing 'Oracle Linux 7.6' (Image Build: 2018.12.19-0) selected, with a 'Change Image Source' button available.

OCI Fast Track – Hands On Guide

Create Compute Instance

Choose instance type

Virtual Machine

A virtual machine is an independent computing environment that runs on top of physical bare metal hardware.

Bare Metal Machine

A bare metal compute instance gives you dedicated physical server access for highest performance and strong isolation.

Choose instance shape

VM.Standard2.1

1 Core OCPU, 15 GB Memory

[Change Shape](#)

Configure boot volume

Default boot volume size: 46.6 GB

Custom boot volume size (in GB)

Choose a key from Key Management to encrypt this volume

Add SSH key

Choose SSH key file Paste SSH keys

Choose SSH key file (.pub) from your computer

ssh_oracle_linux.pub

[Choose Files](#)

Configure networking

Virtual cloud network compartment

Compartimento-Trial

testetrial (root)/Compartimento-Trial

Virtual cloud network

VCN-Trial

Subnet compartment

Compartimento-Trial

testetrial (root)/Compartimento-Trial

Subnet

Subrede-2

Show Advanced Options

[Create](#)

Finshing this task, you'll see that we now have 2 compute instances, each on it's own AD.

Instances *in* Compartimento-Trial *Compartment*

Create Instance			
Sort by: Created Date (Desc)			
	VM-OracleLinux OCID: ...nh2k6a Show Copy	Shape: VM.Standard2.1	Region: iad Availability Domain: tmyY:US-ASHBURN-AD-2 Fault Domain: FAULT-DOMAIN-2
	VM-Windows2016 OCID: ...wyaq3a Show Copy	Shape: VM.Standard2.1	Region: iad Availability Domain: tmyY:US-ASHBURN-AD-1 Fault Domain: FAULT-DOMAIN-2

Accessing Linux Compute Instance with PuTTY

First step : Get instance's Public IP

Instances *in* Compartimento-Trial *Compartment*

[Create Instance](#)

Sort by: **Created Date (Desc)** ▾

 I	VM-OracleLinux OCID: ...nh2k6a Show Copy	Shape: VM.Standard2.1	Region: iad Availability Domain: tmyY:US-ASHBURN-AD-2 Fault Domain: FAULT-DOMAIN-2
 I	VM-Windows2016 OCID: ...wyaq3a Show Copy	Shape: VM.Standard2.1	Region: iad Availability Domain: tmyY:US-ASHBURN-AD-1 Fault Domain: FAULT-DOMAIN-2

VM-OracleLinux

[Create Custom Image](#) [Start](#) [Stop](#) [Reboot](#) [Terminate](#) [Apply Tags](#) [Create Instance Configuration](#)

[Instance Information](#) [Tags](#)

Instance Information

Availability Domain: tmyY:US-ASHBURN-AD-2
Fault Domain: FAULT-DOMAIN-2
Region: iad
Shape: VM.Standard2.1
Virtual Cloud Network: [VCN-Trial](#)
Maintenance Reboot: -

Image: [Oracle-Linux-7.6-2018.12-19-0](#)
OCID: ...amoucq [Show](#) [Copy](#)
Launched: Tue, 15 Jan 2019 19:57:01 GMT
Compartment: testtrial (root)/Compartimento-Tri
Launch Mode: NATIVE

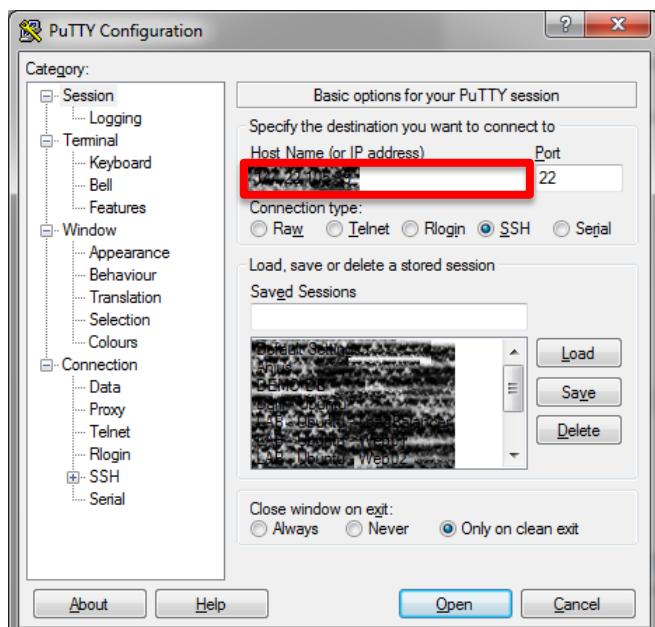
Primary VNIC Information

Private IP Address: 100.0.1.3
Public IP Address: 129.213.59.80

Internal FQDN: vm-oraclelinux... [Show](#) [Copy](#)
Subnet: [Subnet-2](#)

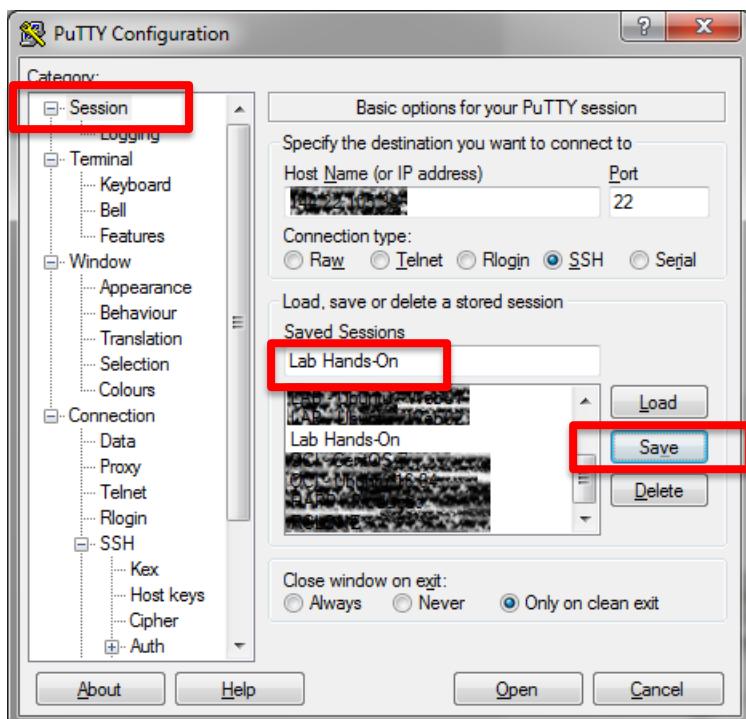
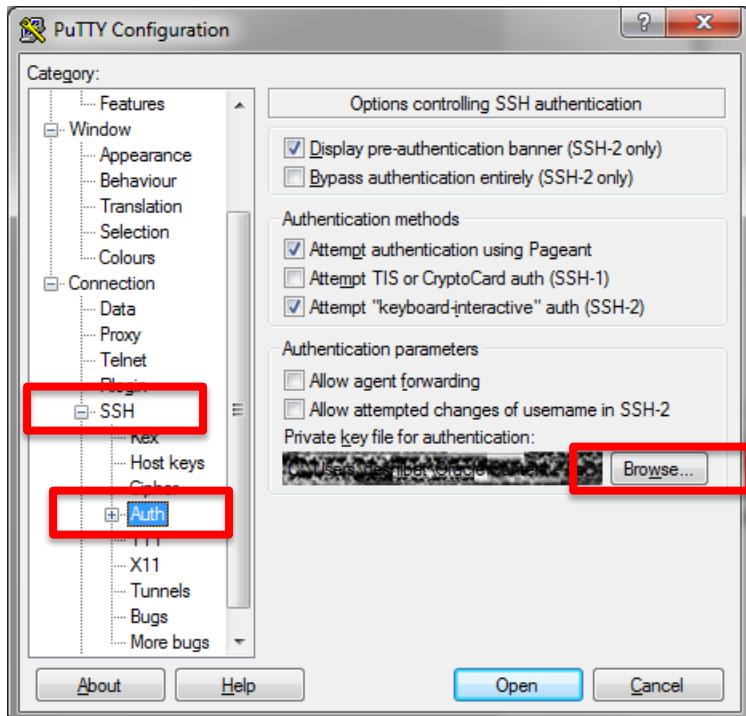
This instance's traffic is controlled by its firewall rules in addition to the associated [Subnet's](#) Security Lists.

Open PuTTY. Fill “Host Name (or IP Address)” with the public IP address

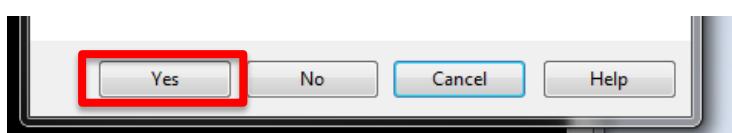


OCI Fast Track – Hands On Guide

Expand “SSH” option on the left, then hit “Auth”. Use the “Browse...” button, to search for the private key file generated previously.

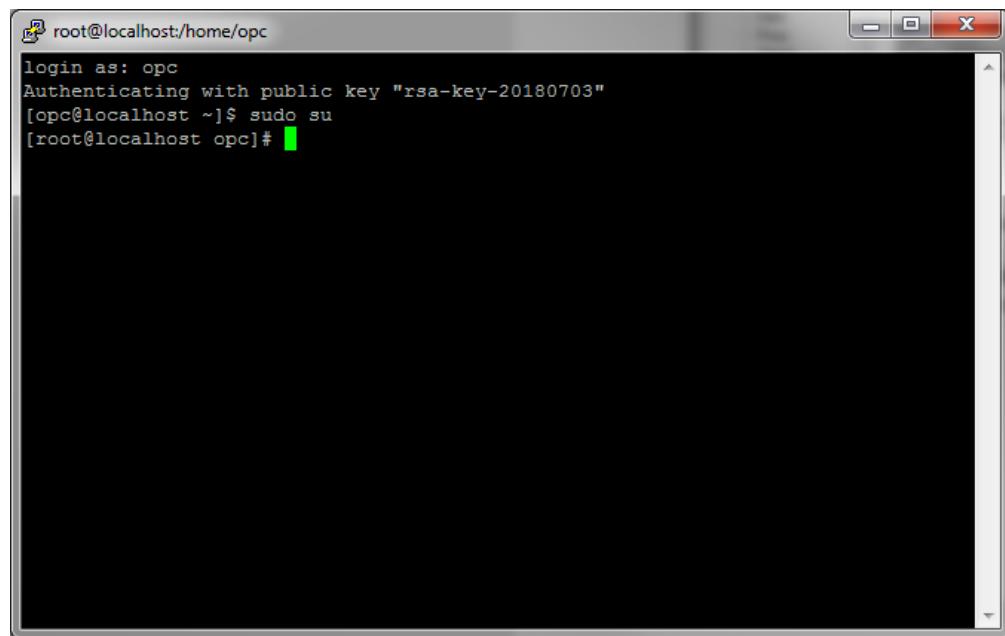


After saving the configuration, Hit Open, and you'll establish connection to the VM



User to connect: opc (When connecting to Oracle Cloud Compute instances, always use the user opc)

```
login as: opc
```



A screenshot of a terminal window titled "root@localhost:/home/opc". The window shows the command "login as: opc" being typed, followed by a message "Authenticating with public key "rsa-key-20180703"". Then, the command "[opc@localhost ~]\$ sudo su" is run, and finally, the root prompt "[root@localhost opc]#" is shown.

```
root@localhost:/home/opc
login as: opc
Authenticating with public key "rsa-key-20180703"
[opc@localhost ~]$ sudo su
[root@localhost opc]#
```

Lab 7.

Block Storage



Lab 7. Block Storage

Objectives

- Create and Assign Block Storage volumes to Compute Instances
- Configure Backup Options

Creating Block Storage Volumes

You can create block volumes through “Block Storage” interface. To access it: From main menu, you choose Block Storage, than “Block Volume”.

	Name	Attached Instance	Size	Encryption Key
BV	disk_restore	LNXSRV01	50.0 GB	None
BV	blkldsk02	LNXSRV01	50.0 GB	None

Block Volume creation process is a very straight forward process, you just need to hit “Create Block Volume”, and fill the requested information :

Compartment_id : Choose your own created compartment

Name : Name for this disk volume

Availability Domain : Choose the AD to store this disk volume

Size : Disk size, from 50 GB to 32 TB

Backup Policy : From none (No backup Policy) to Silver, Bronze and Gold (More on backup later)

OCI Fast Track – Hands On Guide

Create Block Volume

CREATE IN COMPARTMENT
CAMPELO
gse00014643 (root)/CAMPELO

NAME
disk_tst

AVAILABILITY DOMAIN
PqLC:US-ASHBURN-AD-1

SIZE (IN GB)
50

Size must be between 50 GB and 32,768 GB (32 TB). Volume performance varies with volume size.

BACKUP POLICY
Select a backup policy

TAGS

Tagging is a metadata system that allows you to organize and track resources within your tenancy. Tags are composed of keys and values that can be attached to resources.

[Learn more about tagging](#)

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

+ Additional Tag

ENCRYPT USING KEY MANAGEMENT

VIEW DETAIL PAGE AFTER THIS RESOURCE IS CREATED

Create Block Volume

After setup, OCI Will begin provisioning. Provision time depends on the volume size, on our example (50 GB), it will take no more than 30 seconds:

ORACLE Cloud

Storage » Block Volumes » Block Volume Details » Block Volume Backups

disk_tst

PROVISIONING...

Detach from Instance Resize Delete Block Volume Apply Tag(s)

Block Volume Information Tags

OCID: ...g2eecd Show Copy
Size: 50.0 GB ⓘ
Created: Mon, 04 Mar 2019 01:28:18 GMT
Backup Policy: None

Attached Instance: None in this compartment.
Availability Domain: PqLC:US-ASHBURN-AD-1
Hydrated: false
Encryption Key: None

Resources

Metrics
Backups (0)
Clones (0)

Backups

Create Backup

There are no Backups for this Block Volume.

Create Backup

Connecting Block Volumes to Compute Instance

To connect Block Volumes to compute instances, you need to access “Compute Instance” home screen, and from VM’s detail page, hit “Attach Block Volume”.

Inxsrv02

RUNNING

Instance Information

Primary VNIC Information

Attached Block Volumes

Attach Block Volume

ISCSI : disk must be detected manually (fdisk)
PARAVIRTUALIZED : disk is detected automatically.
But in both cases, disk must be mounted manually

disk_tst

Attach

Once disk is properly attached, we can mount it on Compute Instance

To ease disk attachment process, Oracle Cloud Infrastructure provides the necessary commands to detect the new disk from the VM. On the right side of the disk information, you'll find a three dot's menu.

Attached Block Volumes

The screenshot shows a list of attached block volumes. One volume named 'disk_tst' is selected. A context menu is open at the bottom right of the volume details. The menu items are: 'View Block Volume Details' (disabled), 'ISCSI Commands & Information' (highlighted with a red box), and 'Detach'.

If you choose the “iSCSI Commands & Information”, you’ll get the necessary commands to detect the disk :

iSCSI Commands & Information

[help](#) [close](#)

Use OS tools to edit your /etc/fstab volume to have the _netdev and nofail options from the OS. Failure to run commands will cause instance boot failure.

ATTACH COMMANDS

```
sudo iscscliadm -m node -o new -T iqn.2015-12.com.oracleiaas:3c3718e6-bb0d-4826-8c15-dd24d8a961a2 -p 169.254.2.2:3260
sudo iscscliadm -m node -o update -T iqn.2015-12.com.oracleiaas:3c3718e6-bb0d-4826-8c15-dd24d8a961a2 -n node.startup -v automatic
```

[Copy](#)

DETACH COMMANDS

```
sudo iscscliadm -m node -T iqn.2015-12.com.oracleiaas:3c3718e6-bb0d-4826-8c15-dd24d8a961a2 -p 169.254.2.2:3260 -u
sudo iscscliadm -m node -o delete -T iqn.2015-12.com.oracleiaas:3c3718e6-bb0d-4826-8c15-dd24d8a961a2 -p 169.254.2.2:3260
```

[Copy](#)

IP ADDRESS AND PORT

169.254.2.2:3260

[Copy](#)

VOLUME IQN

iqn.2015-12.com.oracleiaas:3c3718e6-bb0d-4826-8c15-dd24d8a961a2

[Copy](#)

Ally you need to do, is copy the commands, and execute it on the Linux server. After disk detection, you need to format and mount the new disk :

1st – Detect the new device with “fdisk -l” command, you’ll note the disk : /dev/sdb

2nd – Format the disk wih “mkfs /dev/sdb”

3rd – Mount he filesystem

OCI Fast Track – Hands On Guide

```
[opc@lnxsrv02 ~]$ sudo su
[opc@lnxsrv02 ~]# fdisk -l
1
Disk /dev/sda: 50.0 GB, 50010783744 bytes, 97677312 sectors
Units = sectors of 1 * 512 = 512 bytes
Sector size (logical/physical): 512 bytes / 4096 bytes
I/O size (minimum/optimal): 4096 bytes / 1048576 bytes
Disk label type: gpt
Disk identifier: 24B3008A-713C-4A61-9EF0-709312E028D4
          Start    End     Size  Type      Name
1        2048  411647   200M  EFI System  EFI System Partition
2       411648 17188863      8G  Linux swap
3     17188864  97675263  38.4G Microsoft basic
Disk /dev/sdb: 53.7 GB, 53687091200 bytes, 104857600 sectors
Units = sectors of 1 * 512 = 512 bytes
Sector size (logical/physical): 512 bytes / 4096 bytes
I/O size (minimum/optimal): 4096 bytes / 1048576 bytes
Junk
[root@lnxsrv02 ~]# mkfs /dev/sdb
2
mke2fs 1.42.9 (28-Dec-2015)
/dev/sdb is entire device, not just one partition!
Proceed anyway? (y,n) y
Filesystem label=
```

```
[root@lnxsrv02 ~]#
[root@lnxsrv02 ~]# mkdir /BKP
[root@lnxsrv02 ~]# mount /dev/sdb /BKP
[root@lnxsrv02 ~]# df -h
3
Filesystem      Size  Used Avail Use% Mounted on
devtmpfs        7.2G    0  7.2G  0% /dev
tmpfs          7.3G    0  7.3G  0% /dev/shm
tmpfs          7.3G  8.6M  7.3G  1% /run
tmpfs          7.3G    0  7.3G  0% /sys/fs/cgroup
/dev/sda3       39G  2.1G  37G  6% /
/dev/sda1      200M  9.7M 191M  5% /boot/efi
tmpfs          1.5G    0  1.5G  0% /run/user/1000
/dev/sdb        50G  52M  47G  1% /BKP
[root@lnxsrv02 ~]#
```

Testing Block Volume performance

According to our documentation, Block Volume's performance may vary from 3.000 IOPS to 25.000 IOPS according to disk size. In the next test, we're going to validate the true performance delivered by the provisioned Block Volume.

Step 1 Test the true performance of the already provisioned Block Volume (/dev/sdb):

1 – Install FIO utility on the recently created Linux Compute instance: (as ROOT user, issue the command : “`yum install fio`”

```
[root@wksp-001 ~]# yum install fio
Loaded plugins: langpacks, ulninfo
ol7_UEKR5                                         | 2.8 kB  00:00:00
ol7_addons                                         | 2.8 kB  00:00:00
ol7_developer                                     | 2.8 kB  00:00:00
ol7_developer_EPEL                                | 2.8 kB  00:00:00
ol7_ksplice                                         | 2.8 kB  00:00:00
ol7_latest                                         | 3.4 kB  00:00:00
ol7_optional_latest                               | 2.8 kB  00:00:00
ol7_software_collections                         | 2.8 kB  00:00:00
(1/17): ol7_UEKR5/x86_64/updateinfo              | 33 kB   00:00:00
(2/17): ol7_developer/x86_64/primary_db          | 414 kB  00:00:00
(3/17): ol7_developer_EPEL/x86_64/updateinfo     | 3.9 kB  00:00:00

Dependency Installed:
  boost-iostreams.x86_64 0:1.53.0-27.el7    boost-random.x86_64 0:1.53.0-27.el7    daxctl-libs.x86_64 0:65-1.0.1.el7    libibverbs.x86_64 0:17.2-3.el7
  libpmem.x86_64 0:1.4-3_0.3.el7      libpmemblk.x86_64 0:1.4-3_0.3.el7      librados2.x86_64 1:10.2.5-4.el7    librbd1.x86_64 1:10.2.5-4.el7
  librdmacm.x86_64 0:17.2-3.el7      ndctl-libs.x86_64 0:65-1.0.1.el7      rdma-core.x86_64 0:17.2-3.el7

Complete!
[root@wksp-001 ~]#
```

2 – Run FIO utility against the new disk:

```
sudo fio --filename=/dev/sdb --direct=1 --rw=randread --bs=4k \
--ioengine=libaio --iodepth=256 --runtime=30 --numjobs=4 --time_based \
--group_reporting --name=iops-test-job --eta-newline=1 --readonly
```

```
[root@vm-apache ~]# sudo fio --filename=/dev/sdb --direct=1 --rw=randread --bs=4k --  
sed --group_reporting --name=iops-test-job --eta newline=1 --readonly  
iops-test-job: (g=0): rw=randread, bs=(R) 4096B-4096B, (W) 4096B-4096B, (T) 4096B-4096B  
...  
fio-3.1  
Starting 4 processes  
Jobs: 4 (f=4): [r(4)][10.0%][r=23.9MiB/s,w=0KiB/s][r=6125,w=0 IOPS][eta 00m:27s]  
Jobs: 4 (f=4): [r(4)][16.7%][r=23.4MiB/s,w=0KiB/s][r=6003,w=0 IOPS][eta 00m:25s]  
Jobs: 4 (f=4): [r(4)][23.3%][r=22.5MiB/s,w=0KiB/s][r=5768,w=0 IOPS][eta 00m:23s]  
Jobs: 4 (f=4): [r(4)][30.0%][r=23.7MiB/s,w=0KiB/s][r=6063,w=0 IOPS][eta 00m:21s]  
Jobs: 4 (f=4): [r(4)][36.7%][r=23.2MiB/s,w=0KiB/s][r=5933,w=0 IOPS][eta 00m:19s]  
Jobs: 4 (f=4): [r(4)][43.3%][r=23.7MiB/s,w=0KiB/s][r=6055,w=0 IOPS][eta 00m:17s]  
Jobs: 4 (f=4): [r(4)][50.0%][r=23.2MiB/s,w=0KiB/s][r=5947,w=0 IOPS][eta 00m:15s]  
Jobs: 4 (f=4): [r(4)][56.7%][r=23.5MiB/s,w=0KiB/s][r=6020,w=0 IOPS][eta 00m:13s]  
Jobs: 4 (f=4): [r(4)][63.3%][r=23.8MiB/s,w=0KiB/s][r=6099,w=0 IOPS][eta 00m:11s]  
Jobs: 4 (f=4): [r(4)][70.0%][r=23.5MiB/s,w=0KiB/s][r=6004,w=0 IOPS][eta 00m:09s]  
Jobs: 4 (f=4): [r(4)][76.7%][r=23.0MiB/s,w=0KiB/s][r=5889,w=0 IOPS][eta 00m:07s]  
Jobs: 4 (f=4): [r(4)][83.3%][r=23.5MiB/s,w=0KiB/s][r=6013,w=0 IOPS][eta 00m:05s]  
Jobs: 4 (f=4): [r(4)][90.0%][r=23.6MiB/s,w=0KiB/s][r=6036,w=0 IOPS][eta 00m:03s]  
Jobs: 4 (f=4): [r(4)][96.7%][r=24.0MiB/s,w=0KiB/s][r=6152,w=0 IOPS][eta 00m:01s]  
Jobs: 4 (f=4): [r(4)][100.0%][r=23.3MiB/s,w=0KiB/s][r=5972,w=0 IOPS][eta 00m:00s]  
iops-test-job: (groupid=0, jobs=4): err= 0: pid=28122: Thu Jul 25 20:17:16 2019  
    read: IOPS=6266  BW=24.5MiB/s (25.7MB/s)(735MiB/30044msec)
```

Lab 8.

Block Storage Backup Policy



Lab 8. Setting Backup Policies for Block Storage

Objectives

- Set Backup Policies

On Oracle Cloud Infrastructure, Block Volume (including boot volumes), and compute nodes backups are independent. Backup policies can be set on the Block Storage home page (Main Menu > Block Storage > Block Volumes) :

Block Volumes in CAMPELO Compartment					
Create Block Volume		Sort by: Created Date (Desc)			
Displaying 6 Block Volumes < Page 1 >					
Block Storage Block Volumes <hr/> Block Volume Backups <hr/> List Scope COMPARTMENT CAMPELO <small>gsd00014643 (root)/CAMPELO</small> Don't see what you're looking for? ? <hr/> Filters STATE Any state <hr/> AVAILABILITY DOMAIN <input checked="" type="checkbox"/> PQLC:US-ASHBURN-AD-1	BV disk_tst OCID: ...g2eecc Show Copy AVAILABLE	Attached Instance: lnxsvr02 Date Attached: Mon, 04 Mar 2019 02:39:58 GMT Availability Domain: PQLC:US-ASHBURN-AD-1 Protocol: iSCSI Attachment Access: Read/Write	Size: 50.0 GB Encrypt Create GMT Back Sour View Block Volume Details Create Manual Backup Assign Backup Policy Create Clone Resize Assign-Master-Encryption-Key Apply Tag(s)	
	BV disk_restore OCID: ...ujpz7q Show Copy AVAILABLE	Attached Instance: LNXSRV01 Date Attached: Tue, 19 Feb 2019 20:22:47 GMT Availability Domain: PQLC:US-ASHBURN-AD-3 Protocol: iSCSI Attachment Access: Read-only	Size: 50.0 GB Encrypt Create GMT Back Sour View Block Volume Details Create Manual Backup Assign Backup Policy Create Clone Resize Assign-Master-Encryption-Key Apply Tag(s)	
	BV bklidk02 OCID: ... AVAILABLE	Attached Instance: LNXSRV01 Date Attached: Wed, 13 Feb 2019 02:20:30 Availability Domain: PQLC:US-ASHBURN-AD-1	Size: 50.0 GB Encrypt Create GMT Back Sour View Block Volume Details Create Manual Backup Assign Backup Policy Create Clone Resize Assign-Master-Encryption-Key Apply Tag(s)	

Backup options can be easily accessed from the “fast menu” (Three dots on the right), option “Assign Backup Policy”

Assign Backup Policy	
help cancel	
<input type="radio"/> BRONZE	Monthly incremental backups. At midnight on the 1st of the month. Retain 12 months. Yearly full backups. At midnight January 1. Retain 5 years.
<input type="radio"/> SILVER	Weekly incremental backups. At midnight Sunday. Retain 4 weeks. Monthly incremental backups. At midnight on the 1st of the month. Retain 12 months. Yearly full backups. At midnight January 1. Retain 5 years.
<input type="radio"/> GOLD	Daily incremental backups at midnight. Retain 7 days. Weekly incremental backups. At midnight Sunday. Retain 4 weeks. Monthly incremental backups. At midnight on the 1st of the month. Retain 12 months. Yearly full backups. At midnight January 1. Retain 5 years.
Assign Backup Policy	

Where you can choose the most appropriate backup policy for your data.

Lab 9.

File Storage Service



Lab 9. FileStorage Service

Oracle Cloud Infrastructure File Storage service provides a durable, scalable, secure, enterprise-grade network file system. You can connect to a File Storage service file system from any bare metal, virtual machine, or container instance in your Virtual Cloud Network (VCN). You can also access a file system from outside the VCN using Oracle Cloud Infrastructure FastConnect and Internet Protocol security (IPSec) virtual private network (VPN)

Using the File Storage service requires an understanding of the following concepts, including some that pertain to Oracle Cloud Infrastructure Networking:

- **Mount Target**

An NFS endpoint that lives in a subnet of your choice and is highly available. The mount target provides the IP address or DNS name that is used in the mount command when connecting NFS clients to a file system. A single mount target can export many file systems

- **Export**

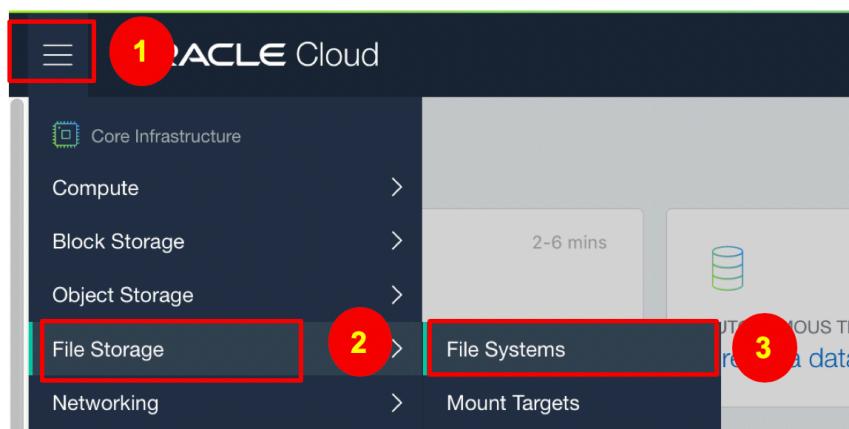
Exports control how NFS clients access file systems when they connect to a mount target. File systems are exported (made available) through mount targets. Each mount target maintains an export set which contains one or many exports.

Objective

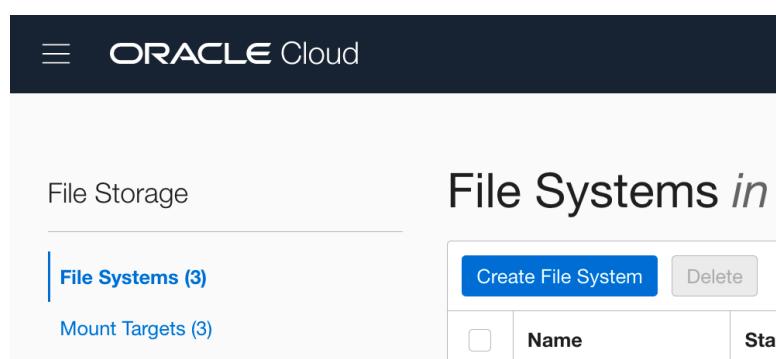
- Create a FileStorage Service filesystem, and access it through a Linux Compute Instance

Creating File Storage Service FileSystem

1 – Access FileStorage Service main screen through OCI Main page on Action Menu



Hit Create File system Button on the right



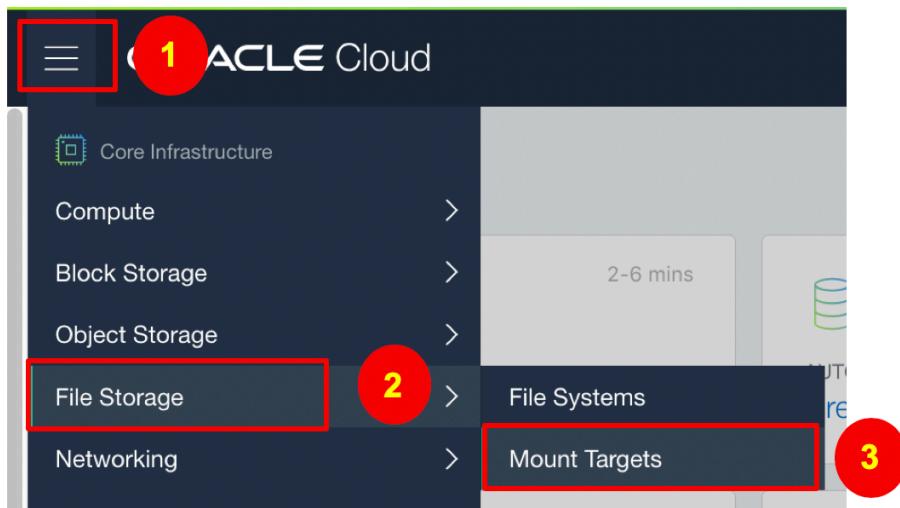
You'll see a pop-up screen requesting the main information to identify FileStorage Service. You will note, that the main fields are already filled with default information. Use the "Edit" button on the right, to customize the filesystem info with your data.

The screenshot shows the 'Create File System' dialog box. It has three main sections: 'File System Information', 'Export Information', and 'Mount Target Information'. Each section has an 'Edit Details' button in the top right corner, which is highlighted with a red box and a red arrow pointing to it. In the 'File System Information' section, the 'Name' field is set to 'FileSystem-20190325-1902' and the 'Availability Domain' is 'PqLC:US-ASHBURN-AD-1'. In the 'Export Information' section, the 'Export Path' is '/FileSystem-20190325-1902' and 'Use Secure Export Options' is set to 'Disabled'. In the 'Mount Target Information' section, the 'Mount Target Name' is 'MountTarget-20190320-1525' and the 'Compartment' is 'gse00014643 (root)/CAMPELO'. At the bottom left are 'Create' and 'Cancel' buttons.

You will have to provide :

- FileSystem Name
- Availability Domain
- Export Path Name
- Mount Target Name
- Compartment

Creating Mount Targets



Hit Create Mount target button:

The screenshot shows the 'Mount Targets' list page. On the left, there's a sidebar with 'File Storage' and two buttons: 'File Systems (-)' and 'Mount Targets (3)'. The 'Mount Targets (3)' button is highlighted with a blue border. On the right, the main area has a title 'Mount Targets in' followed by a table. The table has columns for 'Name' and 'Sta'. At the top of the table area, there are two buttons: 'Create Mount Target' (highlighted with a blue border) and 'Delete'.

You'll see a pop-up screen requesting the main information to identify the Mount Target :

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Mount Target Information

If you want your mount target, virtual cloud network, or subnet in different compartments than your file system, [click here](#) to enable compartment selection for those resources.

NEW MOUNT TARGET NAME OPTIONAL

MountTarget-20190325-1921

AVAILABILITY DOMAIN

PqLC:US-ASHBURN-AD-1

VIRTUAL CLOUD NETWORK

VCN_FSTST

SUBNET

Public Subnet PqLC:US-ASHBURN-AD-1

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 KEY VALUE OPTIONAL

No namespace (Free-Form tag)

Show Advanced Options

You will have to provide :

- Mount Target Name
- Availability Domain
- VCN that will be used
- Subnet

After Mount Target creation, you'll the “Mount Targets” main screen :

Mount Targets in CAMPELO Compartment						
		Name	State	Availability Domain	Virtual Cloud Network	Subnet
<input type="checkbox"/>	MountTarget-20190320-1525	● Active	PqLC:US-ASHBURN-AD-1	VCN_FSTST	Public Subnet PqLC:US-ASHBURN-AD-1	10.0.0.9
<input type="checkbox"/>	FS_WKSP	● Active	PqLC:US-ASHBURN-AD-2	VCN_WKSP	Public Subnet PqLC:US-ASHBURN-AD-2	10.0.1.5
<input type="checkbox"/>	FSBKP	● Active	PqLC:US-ASHBURN-AD-1	VCN_LAB	Public Subnet PqLC:US-ASHBURN-AD-1	10.0.0.17

Now that you have FileSystem, and Mount Target properly created, you can now mount the new file system on Linux Compute Instance.

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Select the created Mount Target to get it's details, than, on the “Export’s” action menu, on the right, select “Mount Commands”, and you'll get a screen with connectivity information regarding the MountTarget.

The screenshot shows the Oracle Cloud interface for File Storage - Mount Targets. A specific mount target named 'FS_WKSHP' is selected. In the top right corner of the main panel, there is a context menu with several options: 'View Export Details', 'Copy OCID', 'Mount Commands', and 'Delete'. The 'Mount Commands' option is highlighted with a red box. Below the main panel, there is a section titled 'Exports' which lists one export entry: '/FSWKSHP'.

Here Oracle Cloud follows the same behavior as in the other wizards. Ally you need to do, is “copy” and “Paste” the Linux commands on SSH prompt.

This screenshot shows the 'Mount Commands' wizard. It provides step-by-step instructions for mounting a file system:

- IMAGE:** Oracle Linux
- COMMAND TO INSTALL NFS CLIENT:**

```
sudo yum install nfs-utils
```

A 'Copy' button is available below this command.
- COMMAND TO CREATE THE MOUNT POINT DIRECTORY:**

```
sudo mkdir -p /mnt/FSWKSHP
```

A 'Copy' button is available below this command.
- COMMAND TO MOUNT THE FILE SYSTEM:**

```
sudo mount 10.0.1.5:/FSWKSHP /mnt/FSWKSHP
```

A 'Copy' button is available below this command.

At the bottom left is a 'Close' button.

Connectivity Issues

FileStorage is a network service, and as such, its usage, is subordinated to firewall rules. In order to mount the created mount target, we're gonna need to create an Ingress Security Rule, to allow FileStorage Service IP traffic.

The screenshot shows the OCI Ingress Rule configuration interface. At the top, it says "Ingress Rule 5". Below that, it says "Allows TCP traffic for ports: all". There is a checkbox for "STATELESS" which is unchecked. Under "SOURCE TYPE", there is a dropdown menu set to "CIDR" and a text input field containing "10.0.1.0/24" which is also highlighted with a red box. Under "IP PROTOCOL", there is a dropdown menu set to "TCP" and a link "(more information)". Below the source section, there is a "SOURCE PORT RANGE (OPTIONAL)" field containing "All" and a link "(more information)". Below the destination section, there is a "DESTINATION PORT RANGE (OPTIONAL)" field containing "All" and a link "(more information)".

SOURCE CIDR is the IP address attached to the Mount Target. You can get this information on the “Mount Target” screen.

DESTINATION PORT, File Storage requires some ports do be opened (2048 – 2050, 111, 2048 and 111). In our example, we don't need to specify any port, so all traffic from File Storage's IP will be allowed.

Lab 10.

Load Balancer



Lab 10. Load Balancer

The Oracle Cloud Infrastructure Load Balancing service provides automated traffic distribution from one entry point to multiple servers reachable from your virtual cloud network (VCN). The service offers a load balancer with your choice of a public or private IP address, and provisioned bandwidth.

The Load Balancing service enables you to create a public or private load balancer within your VCN. A public load balancer has a public IP address that is accessible from the internet. A private load balancer has an IP address from the hosting subnet, which is visible only within your VCN. You can configure multiple IP addresses to load balance transport Layer 4 and Layer 7 (TCP and HTTP) traffic. Both public and private load balancers can route data traffic to any backend server that is reachable from the VCN.

Your load balancer has a backend set to route incoming traffic to your Compute instances. The backend set is a logical entity that includes:

- A list of backend servers.
- A load balancing policy.
- A health check policy.
- Optional SSL handling.
- Optional session persistence configuration.

Load Balancing Concepts

backend server

An application server responsible for generating content in reply to the incoming TCP or HTTP traffic. You typically identify application servers with a unique combination of overlay (private) IPv4 address and port, for example, 10.10.10.1:8080 and 10.10.10.2:8080.

backend set

A logical entity defined by a list of backend servers, a load balancing policy, and a health check policy. SSL configuration is optional. The backend set determines how the load balancer directs traffic to the collection of backend servers.

certificates

If you use HTTPS or SSL for your listener, you must associate an SSL server certificate (X.509) with your load balancer. A certificate enables the load balancer to terminate the connection and decrypt incoming requests before passing them to the backend servers.

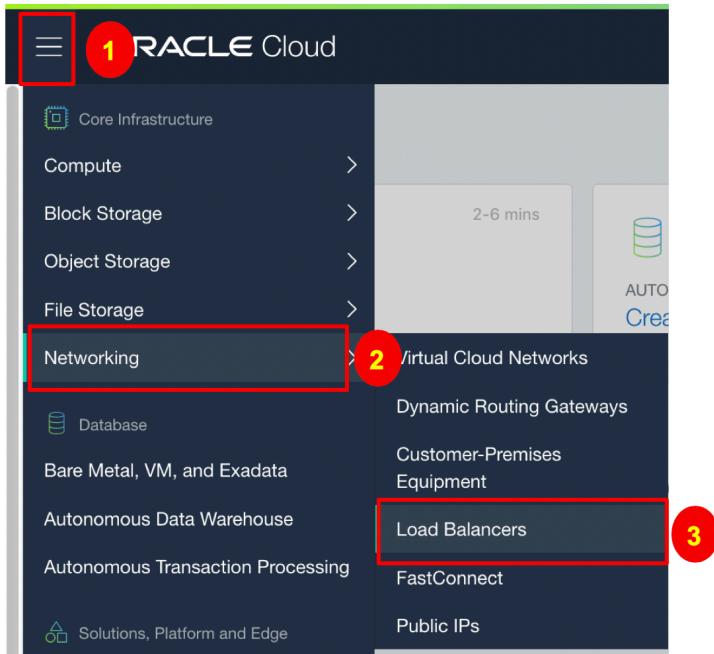
health check

A test to confirm the availability of backend servers. A health check can be a request or a connection attempt. Based on a time interval you specify, the load balancer applies the health check policy to continuously monitor backend servers. If a server fails the health check, the load balancer takes the server temporarily out of rotation. If the server subsequently passes the health check, the load balancer returns it to the rotation.

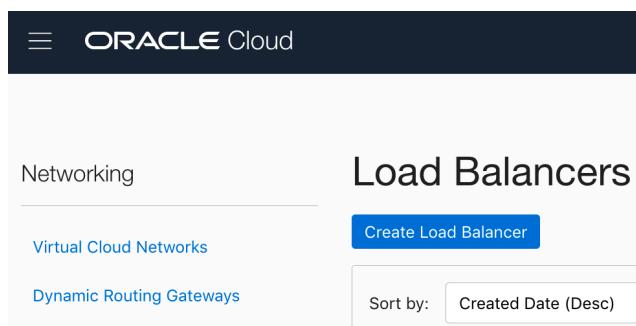
Objective

Create a Public Load Balancer Service, with 2 backends.

To access Load Balancer interface, again, we're gonna start from the “Action Menu”



Then Hit the Create Load Balancer button :



Creating Load Balancer

The Load Balancer creation screen is a Wizard Based model, where you'll be guided on the process by the interface. In the main screen, you'll provide the information below :

- Name
- Visibility: Public or Private

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- Supported Bandwidth (Small - 100, Medium - 400, or Large - 8 GB/s)
- VCN and subnets (choose 2 subnets, same subnets where your compute instances were created)

Create Load Balancer

1 Add Details 2 Choose Backends 3 Configure Listener

A load balancer provides automated traffic distribution from one entry point to multiple servers in a backend set. The load balancer ensures that your services remain available by directing traffic only to healthy servers in the backend set.

LOAD BALANCER NAME: lb_2019-0626-1113

CHOOSE VISIBILITY TYPE:

Public
You can use the assigned public IP address as a front end for incoming traffic.

Private
You can use the assigned private IP address as a front end for internal incoming VCN traffic.

CHOOSE THE MAXIMUM TOTAL BANDWIDTH (i)

Small
100Mbps

Medium
400Mbps

Large
8000Mbps

CHOOSE NETWORKING

VIRTUAL CLOUD NETWORK in CAMPELO ([Change Compartment](#))
VCN_WKSP

To create a public load balancer, specify a single regional subnet (recommended), or two availability domain-specific subnets in different availability domains.

SUBNET (1 OF 2) in CAMPELO ([Change Compartment](#))
Public Subnet PqLC:US-ASHBURN-AD-1

SUBNET (2 OF 2) in CAMPELO ([Change Compartment](#))

Set the Load Balancer Policy

1 Add Details 2 Choose Backends 3 Configure Listener

A load balancer distributes traffic to backend servers within a backend set. A backend set is a logical entity defined by a load balancing policy, a health check policy, and a list of backend servers (Compute instances).

SPECIFY A LOAD BALANCING POLICY

Weighted Round Robin
This policy distributes incoming traffic sequentially to each server in a backend set list.

IP Hash
This policy ensures that requests from a particular client are always directed to the same backend server.

Least Connections
This policy routes incoming request traffic to the backend server with the fewest active connections.

SPECIFY BACKEND SERVERS (OPTIONAL)

Enter the Backend Set servers :

Add Backends

Specify the compute instances to include in your set of backend servers.

INSTANCES in CAMPELO ([Change Compartment](#))

<input type="checkbox"/>	Name	IP Address	OCID	Availability Domain
<input type="checkbox"/>	BMTESTE	10.0.0.3	...wnyfta	Show Copy PqLC:US-ASHBURN-AD-1
<input checked="" type="checkbox"/>	VM-LB01	10.0.0.7	...qyp4kq	Show Copy PqLC:US-ASHBURN-AD-1
<input type="checkbox"/>	VM-Petros	10.200.1.2	...quiv6a	Show Copy PqLC:US-ASHBURN-AD-1
<input checked="" type="checkbox"/>	VM-LB02	10.0.1.11	...fwewaa	Show Copy PqLC:US-ASHBURN-AD-2
<input type="checkbox"/>	WKSP_001	10.0.1.2	...mrizca	Show Copy PqLC:US-ASHBURN-AD-2

2 Selected Showing 5 Item(s) < Page 1 >

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As a last step, define the type of traffic that will be handled

Create Load Balancer

Add Details
 Choose Backends
3 Configure Listener

A listener is a logical entity that checks for incoming traffic on the load balancer's IP address. To handle TCP, HTTP and HTTPS traffic, you must configure at least one listener per traffic type. You can configure additional listeners after you create your load balancer.

SPECIFY THE TYPE OF TRAFFIC YOUR LISTENER HANDLES

HTTPS HTTP TCP

SPECIFY THE PORT YOUR LISTENER MONITORS FOR INGRESS TRAFFIC

80

Once the creation process is finished, you'll have the following information:

≡ ORACLE Cloud

Networking > Load Balancers > Load Balancer Details

LB-APACUE

LB ACTIVE

Load Balancer Information

OCID: ...27f1sa [Show](#) [Copy](#)
Created: Wed, 26 Jun 2019 13:43:13 GMT
Shape: 400Mbps
IP Address: 150.136.193.117 (Public)
Virtual Cloud Network: [VCN_WKSP](#)
Subnet (1 of 2): [Public Subnet P1.C1.US-ASHBURN-AD-1](#)
Subnet (2 of 2): [Public Subnet P1.C1.US-ASHBURN-AD-2](#)
Traffic between this load balancer and its backend servers is subject to the governing security lists.
[Learn more about load balancers and security lists.](#)

Overall Health

⚠ Warning

Backend Sets Health

0	Critical
1	Warning
0	Unknown
0	OK

Load Balancer Testing

In order to simulate an application environment, we need to start a web service on both Compute instances.

Following, you'll find the necessary commands to start a Apache Web Server :

1. sudo yum install httpd -y
2. sudo apachectl start
3. sudo systemctl enable httpd
4. sudo apachectl configtest

5. sudo firewall-cmd --permanent --zone=public --add-service=http
6. sudo firewall-cmd --reload

7. sudo su -
8. echo 'This is Oracle webserver <Put a name Here> running on OCI Workshop' > /var/www/html/index.html

To get different output's on load balancer calls, add different contents to Index.html file on each compute.

Lab 11.

Autonomous Database



Lab 11. Autonomous Database

Objectives

- Provisioning and usage of Autonomous database

Overview

Oracle Cloud Infrastructure's Autonomous Database is a fully managed, preconfigured database environment with two workload types available, Autonomous Transaction Processing and Autonomous Data Warehouse. You do not need to configure or manage any hardware, or install any software. After provisioning, you can scale the number of CPU cores or the storage capacity of the database at any time without impacting availability or performance. Autonomous Database handles creating the database, as well as the following maintenance tasks:

- Backing up the database
- Patching the database
- Upgrading the database
- Tuning the database

Available Workload Types

Autonomous Database offers two workload types:

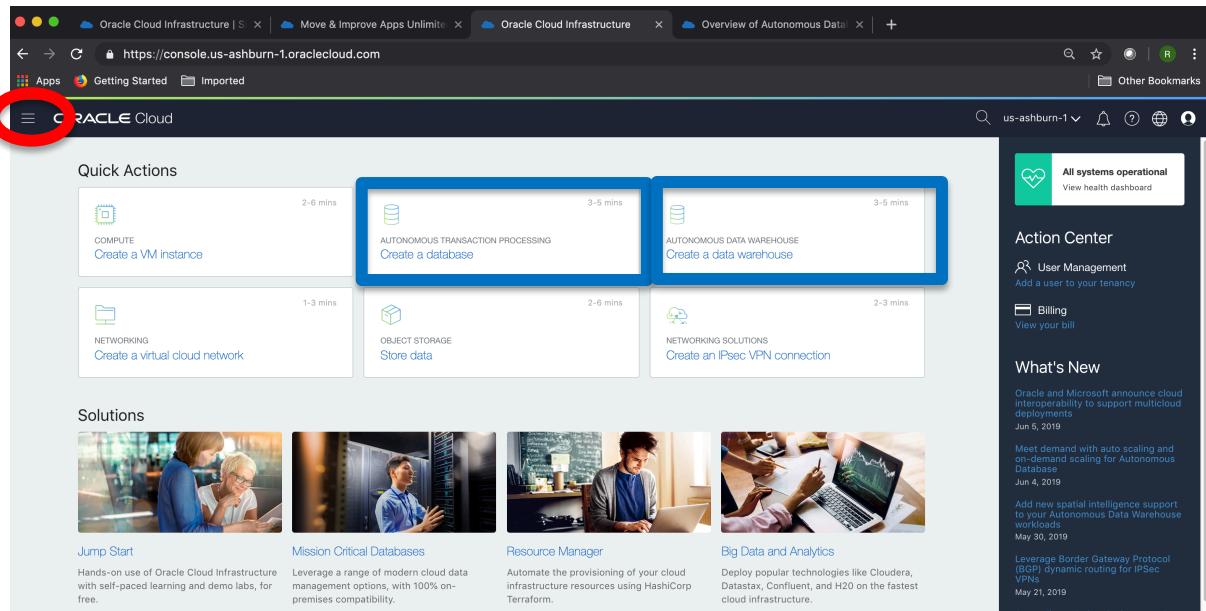
- The Autonomous Transaction Processing workload type configures the database for a transactional workload, with a bias towards high volumes of random data access.
- For a complete product overview of Autonomous Transaction Processing, see Autonomous Transaction Processing

The Autonomous Data Warehouse workload type configures the database for a decision support or data warehouse workload, with a bias towards large data scanning operations.

For a complete product overview of Autonomous Data Warehouse, see Autonomous Data Warehouse.

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Autonomous Database Provisioning



To start Autonomous Database creation process, you can choose between two different starting points:

1. Hit Action menu on the left side of the main screen, then choose “Autonomous Database”
2. Hit the desktop shortcut on the main screen (blue rectangle), and you’ll be redirected to Autonomous database creation.

Autonomous Database Creation

The screenshot shows the 'Autonomous Database' creation page. The 'Create Autonomous Database' button is highlighted with a red box. The 'COMPARTMENT' dropdown menu is also highlighted with a red box, showing 'wkrsp_oci' selected. A callout bubble points to the compartment dropdown with the text 'Don't forget to choose your compartment'.

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Create Autonomous Database

Provide basic information for the Autonomous Database

Choose a compartment
wkrsp_oci
oracleadr (root)/wkrsp_oci

Display name
DB_WRKSP

Database name
DBWRKSP
The name must contain only letters and numbers, starting with a letter. Maximum of 14 characters.

Choose a workload type

Data Warehouse
Configures the database for a decision support or data warehouse workload, with a bias towards large data scanning operations.

Transaction Processing
Configures the database for a transactional workload, with a bias towards high volumes of random data access.

Configure the database

CPU core count
1
The number of CPU cores to enable. Available cores are subject to your tenancy's service limits.

Storage (TB)
1
The amount of storage to allocate.

On the screen creation process, you'll need to answer only 5 questions :

1. Compartment
2. Service display name
3. Database name
4. Workload type (ADW / ATP) : For the Workshop, please **CHOOSE “Data Warehouse”**
5. Number of CPU's and Storage Volume. You can choose between 1 and 128 OCPU's and TB for storage

On the second half of the screen, you'll find :

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Auto scaling
Allows system to use up to three times the provisioned number of cores as the workload increases. [Learn more.](#)

Create administrator credentials ⓘ

Username READ-ONLY

Password

Confirm password

Choose a license type

Bring Your Own Licence
My organization already owns Oracle database software licenses. Bring my existing database software licenses to the database cloud service ([details](#)). 

License Included
Subscribe to new database software licenses at [Cloud Marketplace](#)

 [Show Advanced Options](#)

Create Autonomous Database

Then input :

1. Administrator password
2. Choose your license type model

After providing all this data, just hit “Create Autonomous Database” in the bottom of the screen, and provisioning process will start

Autonomous provisioning takes no more than 5 min. You’ll then get the screen :

≡ ORACLE Cloud

Autonomous Database » Autonomous Database Details

DB_WRKSP

DB Connection Service Console Scale Up/Down Stop Actions ▾

Autonomous Database Information Tags

General Information

Database Name: DBWRKSP
Workload Type: Data Warehouse
Compartment: oraclelead (root)/wkrsp_oci
OCID: ...bxyi2a [Show](#) [Copy](#)
Created: Thu, 04 Jul 2019 16:37:08 GMT
CPU Core Count: 1
Storage (TB): 1
License Type: Bring Your Own Licence
Database Version: 18c
Auto Scaling: Disabled ⓘ
Lifecycle State: Available

Infrastructure

Dedicated Infrastructure: No

Backup

Last Automatic Backup: No active backups exist for this database.

Most operations for Autonomous database can be done on the top 5 buttons of the screen :

Autonomous Database » Autonomous Database Details

DB_WRKSP

DB Connection Service Console Scale Up/Down Stop Actions ▾

Autonomous Database Information Tags

This new version of Autonomous, brings an already loaded version of SQL Developer, which can be reached from :

1. Hit the “**Service Console**” button
2. On the right side of the screen, hit “**Administration**”, and you’ll be redirected to the screen where you can choose several administrative option, from client download, to rest API Services and SQL console

Autonomous Data Warehouse

Overview

Activity

Administration

DATABASE DBWRKSP

2.

OCI Fast Track – Hands On Guide

3 Hit “SQL Developer Web” Button

Autonomous Data Warehouse

Overview

Activity

Administration

DATABASE DBWRKSP

Download Client Credentials (Wallet)

Connections to Autonomous Data Warehouse use a secure connection. Your existing tools and applications will need to use this wallet file to connect to your Autonomous Data Warehouse instance. If you are familiar with using an Oracle Database within your own data center, you may not have previously used these secure connections.

Set Administrator Password

Set or reset your database administrator user's (ADMIN) password and when locked unlock your administrator user account on Autonomous Data Warehouse.

REST Data Services

Oracle REST Data Services (ORDS) on your Autonomous Data Warehouse instance provides HTTPS access to your data.

APEX

SQL Developer Web

In the Worksheet tab, use the worksheet screen to right some SQL statements to query ADW database content :

Navigator Worksheets

[Worksheet]*

```
1 SELECT
2   PROD_ID,
3   CUST_ID,
4   TIME_ID,
5   CHANNEL_ID,
6   PROMO_ID,
7   QUANTITY_SOLD,
8   AMOUNT_SOLD
9  FROM
10 SH.SALES;
```

Query Result

	prod_id	cust_id	time_id	channel_id	promo_id	
1		13	524	01/20/98 12:00...	2	999
2		13	2128	04/05/98 12:00...	2	999
3		13	3212	04/05/98 12:00...	2	999
4		13	3375	04/05/98 12:00...	2	999
5		13	5204	04/05/98 12:00...	2	999
6		13	7082	04/05/98 12:00...	2	999

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The following commands can be used on the SQL Worksheet to test Autonomous database :

- Select count(*) from dba_tables, dba_source;
- select count(*) from (select * from dba_source, v\$sqltext)
- select a.cust_first_name, count(a.country_id), sum(b.amount_sold) from sh.sales b, sh.customers a, sh.products where a.cust_id = b.cust_id group by a.cust_first_name

While executing commands, you can change to **Activity** view on the Autonomous Database page, and follow-up the database activity.

