



## **Networking: OCI Load Balancer**

### **Lab 5-1 Practice**

# Get Started

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## Overview

In this practice, you will configure a Public Load Balancer, including a set of two back-end compute instances.

## Load Balancer

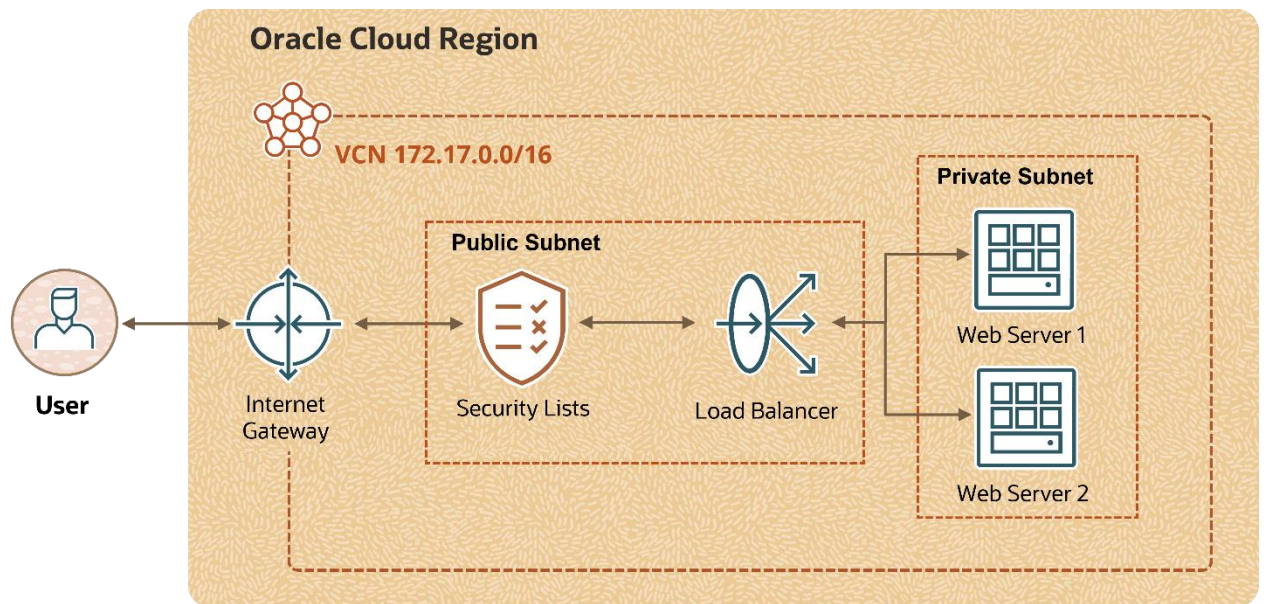
The OCI Load Balancer provides automated traffic distribution from one entry point to multiple back-end servers in your VCN. It operates at the connection level and balances incoming client connections to healthy back-end servers. The service offers a load balancer with your choice of a regional public or private IP address and provisioned bandwidth.

## Summary of Components for OCI Load Balancer Used in This Lab

- **Listener:** A logical entity that checks for incoming traffic on the load balancer's IP address
- **Back-end server:** An application server responsible for generating content in reply to the incoming traffic
- **Back-end set:** A logical entity defined by a list of backend servers
- **Load balancing policy:** A load-balancing policy tells the load balancer how to distribute incoming traffic to the back-end servers
- **Health check:** A test to confirm the availability of back-end servers
- **Shape:** The Bandwidth capacity of the load balancer

## In this lab, you will:

- a. Create a Virtual Cloud Network
- b. Create two compute instances
- c. Create a load balancer



# Create a Virtual Cloud Network

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In this practice, you will create a VCN and associated resources using the VCN Wizard.

## Tasks

1. In the console ribbon at the top of the screen, click the **Regions icon** to expand the menu. Ensure that you are in the correct region, **Germany Central (Frankfurt)**.
2. From the **Main Menu**, select **Networking**, and then click **Virtual Cloud Networks**.
3. Click **Start VCN Wizard**.
4. Select the **Create VCN with Internet Connectivity** option, and then click **Start VCN Wizard**.
5. Enter the following values:
  - **Name:** FRA-AA-LAB05-VCN-01
  - **Compartment:** Select your assigned *<compartment name>*.
  - **VCN CIDR Block:** 172.17.0.0/16
  - **Public Subnet CIDR Block:** 172.17.0.0/24
  - **Private Subnet CIDR Block:** 172.17.1.0/24
6. Leave the default values for the remaining fields. Click **Next**.
7. Review and understand the list of resources that the OCI VCN Wizard will create. Notice that the wizard will configure CIDR block ranges for VCN IP addresses, and for the public and private subnets. It will also set up security list rules and route table rules to enable basic access to the VCN.
8. Click **Create**.
9. When complete, click **View Virtual Cloud Network**.
10. In the left navigation pane, under **Resources**, click **Security Lists**.
11. Select **Default Security List for FRA-AA-LAB05-VCN-01**.
12. Click **Add Ingress Rule**.
  - a. For **Source CIDR**, enter 0.0.0.0/0.
  - b. For **Destination Port Range**, enter 80.
  - c. Click **Add Ingress Rules**.

# Create Two Compute Instances (Back-End Servers)

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In this lab, you will create two compute instances and configure them to provide web services. They will serve as the back-end servers, and will reside in a private subnet.

## Tasks

### Build the First Compute Instance

1. In the console ribbon at the top of the screen, click the **Regions icon** to expand the menu. Ensure that you are in the correct region, **Germany Central (Frankfurt)**.
2. From the **Main Menu**, select **Compute**, and then click **Instances**.
3. In the left navigation pane, under **List Scope**, select your assigned *<compartment name>*.
4. Click **Create Instance** and enter the following values:
  - **Name:** FRA-AA-LAB05-VM-01
  - **Compartment:** Your assigned *<compartment name>*.
  - **Placement:** AD-1
  - **Image:** Oracle Linux
  - **Shape:** Click **Change Shape**
    - **Instance Type:** Virtual Machine
    - **Shape Series:** Ampere
    - **Shape Name:** VM.Standard.A1.Flex (1 OCPU, 6 GB Memory)
  - Click **Select Shape**.
  - **Networking:**
    - **Primary network:** Select existing virtual cloud network.
    - **Virtual Cloud Network in *<assigned compartment>*:** FRA-AA-LAB05-VCN-01
    - **Subnet in *<assigned compartment>*:** Private Subnet-FRA-AA-LAB05-VCN-01 (regional)
  - **Add SSH Key:** No SSH Keys
  - Click **Show advanced options**
  - On the Management tab, click **Paste cloud-init script** under **Initialization script**.

- Copy and paste the following into the **Cloud-init script** field (**Tip:** Copy the below script in a notepad and ensure that the last 2 lines of the script are copied in a single line as a single command):

```
#!/bin/bash -x
iptables -A INPUT -p tcp -m multiport --dports 80,443 -j ACCEPT
yum -y install httpd
systemctl enable httpd.service
systemctl start httpd.service
firewall-offline-cmd --add-service=http
firewall-offline-cmd --add-service=https
systemctl enable firewalld
systemctl restart firewalld
echo Hello World! My name is FRA-AA-LAB05-WS-01>
/var/www/html/index.html
```

**Note:** This script configures and enables the compute instance's firewall and httpd processes.

5. Click **Create**.

**Note:** The process will take approximately two minutes.

## Build the Second Compute Instance

1. In the console ribbon at the top of the screen, click the **Regions icon** to expand the menu. Ensure that you are in the correct region, **Germany Central (Frankfurt)**.
2. From the **Main Menu**, select **Compute**, and then click **Instances**.
3. In the left navigation pane, under **List Scope**, select your assigned *<compartment name>*.
4. Click **Create Instance** and enter the following values:
  - **Name:** FRA-AA-LAB05-VM-02
  - **Compartment:** Your assigned *<compartment name>*
  - **Placement:** AD-2
  - **Image:** Oracle Linux
  - **Shape:** Click **Change Shape**
    - **Instance Type:** Virtual Machine
    - **Shape Series:** Ampere

- **Shape Name:** VM.Standard.A1.Flex (1 OCPU, 6 GB Memory)
- Click **Select Shape**
- **Networking:**
  - **Primary network:** Select existing virtual cloud network.
  - **Virtual Cloud Network in <assigned compartment>:** FRA-AA-LAB05-VCN-01
  - **Subnet in <assigned compartment>:** Private Subnet-FRA-AA-LAB05-VCN-01 (regional)
- **Add SSH Key:** No SSH Keys
- Click **Show advanced options**
- On the Management tab, click **Paste cloud-init script** under **Initialization script**.
- Copy and paste the following into the **Cloud-init script** field (**Tip:** Copy the below script in a notepad and ensure that the last 2 lines of the script are copied in a single line as a single command):

```
#!/bin/bash -x
iptables -A INPUT -p tcp -m multiport --dports 80,443 -j ACCEPT
yum -y install httpd
systemctl enable httpd.service
systemctl start httpd.service
firewall-offline-cmd --add-service=http
firewall-offline-cmd --add-service=https
systemctl enable firewalld
systemctl restart firewalld
echo Hello World! My name is FRA-AA-LAB05-WS-02>
/var/www/html/index.html
```

**Note:** This script configures and enables the compute instance's firewall and httpd processes.

5. Click **Create**.

**Note:** The process will take approximately two minutes.



# Create a Load Balancer

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In this lab, you will create a Load Balancer, and configure the listener, the health check, and back-end set. You will then add a security rule to the security list of the private subnet.

## Tasks

1. From the **Main Menu**, select **Networking**, and then click **Load Balancers**.
2. In the left navigation pane, under **List Scope**, select your assigned *<compartment name>*.
3. Click **Create Load Balancer**.
4. Select **Load Balancer**, click **Create Load Balancer** and enter the following values:
  - **Load Balancer Name:** FRA-AA-LAB05-LB-01
  - **Choose visibility type:** Public
  - **Assign a public IP address:** Ephemeral IP Address
  - In the **Bandwidth** section, under **Shapes**, select **Flexible Shapes (Specify Minimum Bandwidth as 10 Mbps and Maximum Bandwidth as 20 Mbps)**.
  - Under **Choose Networking**, for the **Virtual Cloud Network in <compartment name>**, select FRA-AA-LAB05-VCN-01 and for the **Subnet in <compartment name>**, select **Public** Subnet-FRA-AA-LAB05\_VCN-01.
  - Click **Next**.
  - Under **Choose Backends** select **Weighted Round Robin**.
  - Click **Add Backends**.
  - Select both **FRA-AA-LAB05-VM-01** and **FRA-AA-LAB05-VM-02**.
  - Click **Add Selected Backends**.
  - Leave all values at defaults in the **Specify Health Check Policy** section.
  - Click **Next**.
  - On the **Configure Listener** page, enter the following values:
    - **Listener Name:** FRA-AA-LAB05-Listener-01
    - **Specify the type of traffic you listener handles:** HTTP

**Note:** The **Specify the port your listener monitors for ingress traffic** value will become 80.
  - Click **Next**.
  - On the **Manage Logging** page, set **Error Logs** to **Not Enabled**.
5. Click **Submit** and wait for the status to become **Active**.



**Note:** The process will take approximately three minutes.

6. Verify that the **Backend Set Health** status is **OK**.
7. Locate and copy the Load Balancer's **IP Address**.
8. Paste the copied value into your browser's address bar to visit the site.
9. A webpage stating **Hello World! My name is FRA-AA-LAB05-WS-01** will appear.
10. Reload the page to see the other back-end server has provided the message, **Hello World! My name is FRA-AA-LAB05-WS-02**.

# Purge Instructions

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## Purge Load Balancer

1. In the console ribbon at the top of the screen, click the **Regions icon** to expand the menu. Ensure that you are in the correct region, **Germany Central (Frankfurt)**.
2. From the navigation menu, select **Networking**, and then click **Load Balancers**.
3. In the left navigation pane, under **List Scope**, select your assigned *<compartment name>*.
4. Click **FRA-AA-LAB05-LB-01**.
5. Click **Terminate**.
6. Click **Terminate** when prompted.

## Purge the First Oracle Linux Compute Instance

1. In the console ribbon at the top of the screen, click the **Regions icon** to expand the menu. Ensure that you are in the correct region, **Germany Central (Frankfurt)**.
2. From the navigation menu, select **Compute**, and click **Instances**.
3. In the left navigation pane, under **List Scope**, select your assigned *<compartment name>*.
4. Click **FRA-AA-LAB05-VM-01**.
5. Click **Terminate**.
6. Check **Permanently delete the attached boot volume** when prompted.
7. Click **Terminate instance**.

**Note:** The status for the compute instance will show **Terminating**.

8. Eventually you will see the status of the compute instance will show **Terminated** and all buttons for administrative tasks for this Linux Machine will be disabled.

## Purge the Second Oracle Linux Compute Instance

1. In the console ribbon at the top of the screen, click the **Regions icon** to expand the menu. Ensure that you are in the correct region, **Germany Central (Frankfurt)**.
2. From the navigation menu, select **Compute**, and click **Instances**.
3. In the left navigation pane, under **List Scope**, select your assigned <compartment name>.
4. Click **FRA-AA-LAB05-VM-02**.
5. Click **Terminate**.
6. Check **Permanently delete the attached boot volume** when prompted.
7. Click **Terminate instance**.

**Note:** The status for the compute instance will show **Terminating**.

8. Eventually you will see the status of the compute instance will show **Terminated** and all buttons for administrative tasks for this Linux machine will be disabled.

## Purge VCN

1. Click the navigation menu, click **Networking**, and then click **Virtual Cloud Networks**.
2. In the left navigation pane, under **List Scope**, select your assigned compartment from the **Compartment** drop-down menu.
3. In the list of VCNs, click the three dots on the right of **FRA-AA-LAB05-1-VCN-01** to open the Actions menu. Select **Delete**.
4. Make sure that the **Search compartments for resources associated with this VCN** check box is selected.
5. In the white box that starts with **Select which compartments to search for associated resources**, select the **Specific compartments** option and select your assigned compartment from the drop-down menu.
6. Click **Scan**.

7. After the scan is completed, click **Delete All**.

**Note:** This process can take up to 2 minutes.