

# Creating Virtual Machines

## Overview

In this lab, you will explore the Virtual Machine instance options and create several VMs with different characteristics.

## Objectives

In this lab, you explore the available options for VMs and see the differences between locations.

In this lab, you learn how to perform the following tasks:

- Create several standard VMs
- Create advanced VMs

## Task 1. Create a utility virtual machine

# Create a VM

1. In the Cloud Console, on the **Navigation menu** (☰), click **Compute Engine > VM instances**.
2. Click **Create Instance**.
3. For **Name**, type a name for your instance. Hover over the question mark icon for advice about what constitutes a properly formed name.
4. For **Region** and **Zone** select **us-central1** and **us-central1-c** respectively.
5. For **Machine configuration**, select **Series** as **N1**.
6. For **Machine type**, examine the options.

**Note:** Notice that the menu lists the number of vCPUs, the amount of memory, and a symbolic name such as *n1-standard-1*. The symbolic name is the parameter you would use to select the machine type if you were creating a VM using the `gcloud` command. Notice to the right of the zone and machine type that there is a per-month estimated cost.

7. Click **Details** to the right of the **Machine type** list to see the breakdown of estimated costs.
8. For **Machine type**, click **n1-standard-4 (4 vCPUs, 15 GB memory)**. How did the cost change?
9. For **Machine type**, click **n1-standard-1 (1 vCPUs, 3.75 GB memory)**.
10. For **Boot disk**, click **Change**.
11. Click **Version** and select **Debian GNU/Linux 10 (buster)**.
12. Click **Select**.
13. Click **Advanced options**.
14. Click **Networking**.
15. For **Network interfaces**, click the **dropdown** icon.
16. Select **None** for **External IPv4 address**.
17. Click **Done**.
18. Leave the remaining settings as their defaults, and click **Create**. Wait until the new VM is created.

**Note:** External IP addresses that don't fall under the Free Tier of the [Google Cloud Free Program](#) will incur a small cost. Learn more about the pricing in the [External IP address pricing section of the Virtual Private Cloud Guide](#).

## Explore the VM details

1. On the **VM instances** page, click on the name of your VM.
2. Locate **CPU platform** and note the value. Click **Edit**.

**Note:** Notice that you cannot change the machine type, the CPU platform, or the zone.

You can add network tags and allow specific network traffic from the internet through firewalls. Some properties of a VM are integral to the VM, are established when the VM is created, and cannot be changed. Other properties can be edited.

You can add additional disks and you can also determine whether the boot disk is deleted when the instance is deleted.

Normally the boot disk defaults to being deleted automatically when the instance is deleted. But sometimes you will want to override this behavior. This feature is very important because you cannot create an image from a boot disk when it is attached to a running instance.

So you would need to disable **Delete boot disk when instance is deleted** to enable creating a system image from the boot disk.

3. Examine **Availability policies**.

**Note:** You cannot convert a non-preemptible instance into a preemptible one. This choice must be made at VM creation. A preemptible instance can be interrupted at any time and is available at a lower cost.

If a VM is stopped for any reason, (for example an outage or a hardware failure) the automatic restart feature will start it back up. Is this the behavior you want? Are your applications idempotent (written to handle a second startup properly)?

During host maintenance, the VM is set for live migration. However, you can have the VM terminated instead of migrated.

If you make changes, they can sometimes take several minutes to be implemented, especially if they involve networking changes like adding firewalls or changing the external IP.

4. Click **Cancel**.

## Explore the VM logs

1. On the **VM instance details** page for your VM, click **Cloud Logging**.

**Note:** Notice that you have now navigated to the Cloud Logging page. This is a structured log view. At the top you can filter by using the pull-down menus, and there is a search box for searching based on labels or text.

2. Click the **Expand this log entry** icon to the left of one of the lines to see the kind of information it contains.

## Task 2. Create a Windows virtual machine

## Create a VM

1. On the **Navigation menu** (☰), click **Compute Engine > VM instances**.
2. Click **Create instance**.
3. Specify the following, and leave the remaining settings as their defaults:

Property	Value (type value or select option as specified)
Name	Type a name for your VM
Region	europe-west1
Zone	europe-west1-c
Series	N1
Machine type	n1-standard-2(2 vCPUs, 7.5 GB memory)
Boot disk	Change
Public Images > Operating system	Windows Server
Version	Windows Server 2016 Datacenter Core
Boot disk type	SSD persistent disk

<b>Size (GB)</b>	<b>100</b>
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4. Click **Select**.
5. For **Firewall**, enable **Allow HTTP traffic** and **Allow HTTPS traffic**.
6. Click **Create**.

**Note:** When the VM is running, notice that the connection option in the far right column is RDP, not SSH. RDP is the Remote Desktop Protocol. You would need the RDP client installed on your local machine to connect to the Windows desktop.

**Note:** Installing an RDP client on your local machine is outside the scope of this lab and of the class. For this reason, you will not be connecting to the Windows VM during this lab. However, you will step through the usual procedures up to the point of requiring the RDP client. Instructions for connecting to Windows VMs are in the [Connecting to Windows VMs Guide](#).

## Set the password for the VM

1. Click on the name of your Windows VM to access the **VM instance details**.
2. You don't have a valid password for this Windows VM: you cannot log in to the Windows VM without a password. Click **Set Windows password**.
3. Click **Set**.
4. Copy the provided password, and click **CLOSE**.

**Note:** You will **not** connect to the Windows VM during this lab. However, the process would look something like the following (depending on the RDP client you installed). The RDP client shown can be installed for Chrome from the [Chrome webstore](#). On the **VM instances** page, you would click **RDP** for your Windows VM and connect with the password copied earlier.

# Task 3. Create a custom virtual machine

## Create a VM

1. On the **Navigation menu** (≡), click **Compute Engine > VM instances**.
2. Click **Create instance**.
3. Specify the following, and leave the remaining settings as their defaults and then click **Select**.

Property	Value (type value or select option as specified)
Name	Type a name for your VM
Region	us-central1
Zone	us-central1-a
Series	E2
Machine type	Custom
Cores	2 vCPU
Memory	4 GB

<b>Boot disk</b>	<b>Debian GNU/Linux 10 (buster)</b>
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4.

Click **Create**.

## Connect via SSH to your custom VM

1. For the custom VM you just created, click **SSH**.
2. To see information about unused and used memory and swap space on your custom VM, run the following command:

```
free
```

3. To see details about the RAM installed on your VM, run the following command:

```
sudo dmidecode -t 17
```

4. To verify the number of processors, run the following command:

```
nproc
```

5. To see details about the CPUs installed on your VM, run the following command:

```
lscpu
```

6. To exit the SSH terminal, run the following command:

```
exit
```