## Lab 6-01: Creating a Load-Balanced Managed Instance Group on Google Cloud Platform

### Introduction

This lab will demonstrate how to create a load-balanced managed instance group. We will be performing three primary tasks in this lab.

* Initially, we will take two web servers, convert those into custom images, and then from version 1 custom image. We will create an instance template from which we will create a managed instance group. It will serve as a backend server for our load balancer.
* After that, we will create an HTTP load balancer to serve traffic to our backend instance group.
* Then, we will update our instance group from version 1 over to version 2 using a new instance template from which, without any downtime, we will slowly replace all of the version 1 instances of our website with version 2.

### Problem

Your company needs to create a new version of its web services and replace all instances with a new version with the lowest possible downtime. How will they do this?

### Solution

They can create a managed instance group in GCP. It will serve as a backend server for our load balancer. After that, create an HTTP load balancer, which will serve traffic to our backend instance group. Then they can update their instance group from version 1 over to version 2.

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| **Step 1: Create Custom Images**  We have created two compute engine instances with the names web-1 and web-2, which is a prerequisite for this lab.     1. Click on the **External address** of web-v1 to see your custom website.      1. The following interface will appear on the screen.   Text  Description automatically generated   1. Click on the **External address** of web-v2 to see your custom website.      1. The following interface will appear on the screen.   Graphical user interface, text, application  Description automatically generated   1. Stop already running instances by clicking on three buttons on the top menu and then on **Stop.**      1. Click **Stop** on the following pop-up menu.      1. Open Cloud Shell from the top right corner.      1. Run the following command in the cloud shell to create a custom image of web-1. The name of our image will be web-v1, which will be added to the web-server family. The source disk is the disk attached to the web 1 machine, the zone location for that disk, and then press Enter.   **gcloud compute images create web-v1 –family=webserver --source-disk=web-1 --source-disk-zone= us-central-1a**     1. After some time, the image will be created.      1. Run the following command in the Cloud Shell to create a custom image of web-2. The name of our image will be web-v2, which will be added to the web-server family. The source disk is a disk attached to the web 2 machine, and the zone location for that disk and then press **Enter.**   **gcloud compute images create web-v2 –family=webserver --source-disk=web-2 --source-disk-zone= us-central-1a**   1. After some time, the image will be created.   Text  Description automatically generated   1. To verify new images are created, navigate to **Images** under **Storage** under the section of **Compute Engine.**      1. You will see the two images running in the images section.     **Step 2: Create a Managed Instance Template**   1. Navigate to **Instance Groups** under **Compute Engine** page.      1. Click on **+ CREATE INSTANCE TEMPLATE.**      1. Enter the name of the template and set the machine type to e2-micro.      1. Under boot disk, click on C**hange.**      1. Click on C**ustom images** on the pop-up.      1. Choose the web-v1 image you created previously and click **Select**.      1. Select A**llow HTTP traffic** under the firewall and click **Create.**     **Step 3: Create a Managed Instance Group**   1. Navigate to **Instance groups** from the **Compute Engine** menu.      1. Click on **CREATE INSTANCE GROUP**.      1. Enter the name and location of your instance group.      1. Under instance template, choose instance-template-1, which you created previously.      1. Set the Minimum number of instances to 3 and the maximum to 5.      1. Select **Create a health check** under **Health Check**.      1. Give a name to your health check, make sure the protocol is set to TCP and port to 80, then click on **Save and Continue.**      1. Click on **Create.**      1. After some time, you will see a web-group running.   Graphical user interface, application, Word  Description automatically generated  **Step 4: Create a Load Balancer**   1. Navigate to **Load balancing** underthe **Networking services** page under **the Networking** section.      1. Click on **Create load balancer.**      1. Click **START CONFIGURATION** under HTTPS load balancing.      1. Click **Continue.**      1. Enter the name of your load balancer and click on **Backend configuration.**      1. Select **CREATE A BACKEND SERVICE** and then **OK.**      1. Enter the name of your backend, and under **Backend Type,** select “instance group”.      1. Under the **New backend** section, select **web-group** and set port numbersto **80**.      1. Under the **Health check** dropdown, select **health-check-1** and click **Create.**      1. On the **HTTP(S) load balancer** menu, select **Frontend Configuration.**      1. Enter the name of your frontend and set the protocol to **HTTP**.      1. Set the port number to **80** and click on **Done**.      1. Click on **Review and finalize** and then click on **Create.**      1. Go back to the load balancing page and click on **Frontend** from the top menu.      1. Copy the IP address of the frontend and paste it into the browser's address bar.      1. The website loads, and it displays VERSION 1.   Graphical user interface, application  Description automatically generated  **Step 5: Update the Instance Group to Version 2**   1. Navigate to the **Instance template** under **Compute Engine.**      1. Create a new instance template by clicking on **+ CREATE INSTANCE TEMPLATE.**      1. Enter the name of the template.      1. Set machine type to e2-micro.      1. Under boot disk, click on **Change.**      1. Click on **Custom images** on the pop-up.      1. Choose the web-v1 image you created previously and click **Select**.      1. Select A**llow HTTP traffic** under the firewall and click **Create.**      1. Navigate to **Instance groups** from the **Compute Engine** menu.      1. Click on **web-group**.      1. Click **UPDATE VMS** on the top menu.      1. Change template to **instance-template-2**.      1. Click on **UPDATE VMS.** |