CSE 332: Data Structures and Parallelism

Google Compute Engine

This handout will help you set up Google Compute Engine for the Chess project.

(1) Setting up Terminal

This project, you will use Google Compute Engine to access more computing power than normal. As such, you will need to `ssh` to a remote instance. Google Compute Engine lets you do this by clicking a button in the browser, but you may `ssh` however you like.
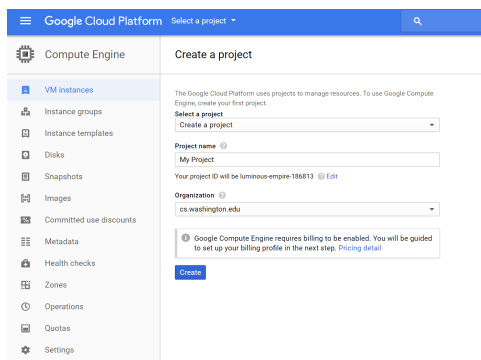
(2) Setting up Google Compute Engine

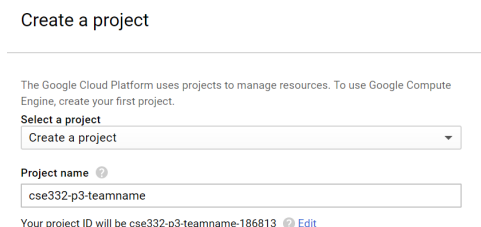Additionally, you will need to create a **project** and **VM Instances** using Google Compute Engine.

You should begin by going to:

https://console.cloud.google.com/compute

Make sure you are in the Create a Project section.

You should use `cse332-p3-<your team name>` as the project name.

Create your project. If you are prompted for a free trial, don't worry about it for now. Next, you will need to get a "coupon code". Google has provided us with one coupon code per student. This should be more than enough credits to complete the project, but if you end up needing more, send an e-mail to Ruth (rea@cs.washington.edu).

To get a coupon code, follow these steps:

(1) Check Piazza for a link to the coupon sign-up (link is also in your email from Ruth) and fill in your name and e-mail address.

(2) You should get a confirmation e-mail with a link. Click on the link.

(3) You should get another e-mail with a link and a coupon code. Either click on the link in the e-mail, or go to https://console.cloud.google.com/education and fill in the coupon code. WHEN YOU CLICK ON "REDEEM LINK" THE FORM DEFAULTS TO YOUR PERSONAL EMAIL. IN ORDER FOR GCE TO BE USED CORRECTLY, **YOU MUST CHANGE THE PROFILE TO YOUR CSE EMAIL** IN THE UPPER RIGHT CORNER BEFORE ACCEPTING AND CONTINUING THE COUPON.

(4) Chose "yes" or "no", and then click "Accept and Continue" on the webpage that comes up.

(3) Enabling Billing

Now that you have a "billing account" filled with your coupon code, you need to *apply* it to your GCE project.

(1) Go to https://console.cloud.google.com/compute

(2) Click the "enable billing" button:
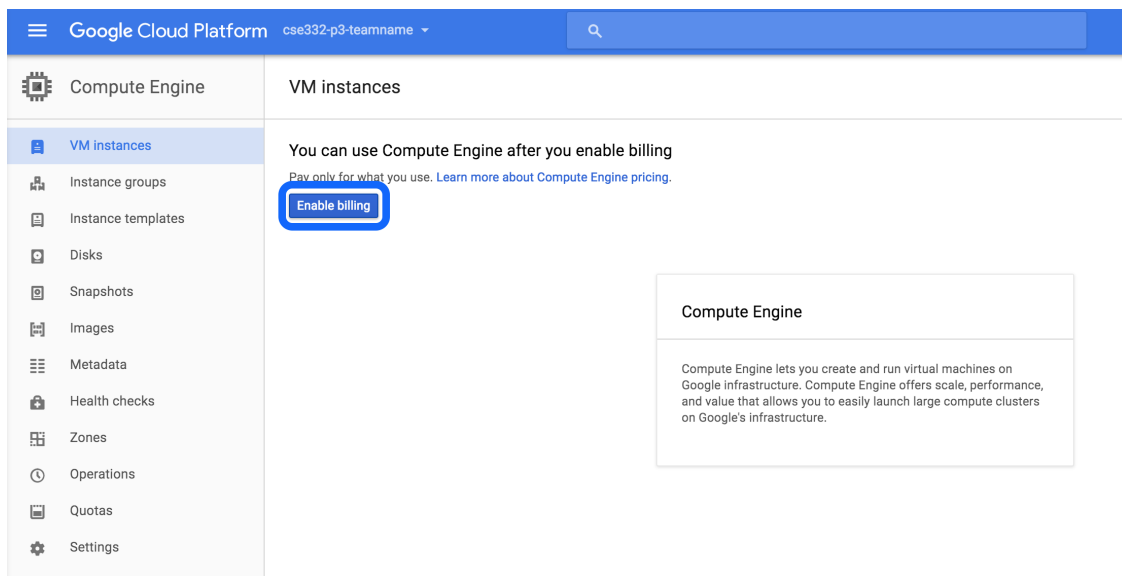
(3) Choose "CSE 332" in the pop-up dialog, and click "Set Account".

Your project should be set up to use the GCE coupon; you might need to wait a little bit for compute engine to get ready.

(4) Creating An Instance

Now you should be ready to go with GCE. To test this out, let's try spinning up an instance.

Go to https://console.cloud.google.com/compute, and click on the "create" button.

When creating an instance, you will have a choice of several options. You *can* choose anything you like, but we recommend the following choices. In particular, if you are creating a "test instance", we recommend you use `f1-micro`.

Suggested GCE Instance Choices

- Zone: `us-central1-b`

- Machine Type:

  - For a test instance: `f1-micro`

  - For a real instance: `n1-highcpu-32`

- Image: Debian GNU/Linux 9

If you insist on using a Windows Image, you're on your own.

Once your instance boots, you will be able to ssh into it by clicking the "ssh" button next to it in the list:

Don't forget to stop your instance when you are not using it!! This will keep you from running out of money and resources. You can do this by selecting the checkbox and clicking the stop button. You can resume later by clicking the start button.

(5) Connecting To An Instance

Now that you've created your instance, you are ready to `ssh` to it. To do this, click the button in the GCE interface labeled "ssh" in the row of the instance you just created.

You're now connected to your instance!

Once you connect to your instance, you should copy/paste the following command into the terminal:

`source <(curl -s https://courses.cs.washington.edu/courses/cse332/gce/setup-instance.sh)`

Make sure you read the instructions that the script prints out. You will need to copy another key to `gitlab`, and, when you do, if it errors, make sure your key does not have any spaces in it.

(6) Running A Bot On A GCE Instance

When you are running one of your bots on a GCE instance, you **should not** use EasyChess, because you do not want to access it with a GUI. Instead, you will use `CloudClient.java`.

In preparation for running your bot on the server, edit the configuration of `CloudClient.java` to be set to your Chess Server Login and the bot you want to run. Then, after you've run the command (above), you should run `CloudClient` on the VM. Finally, to see your bot play the game, you should do the following:
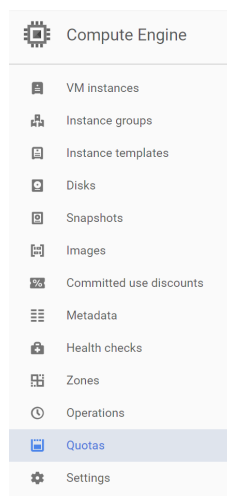
- Run EasyChess on your local machine

- Type "games" to see the list of currently running games

- Type "watch #<game number here>"

(7) GCE Won't Allow Me To Use More Cores!

If you have multiple instances running, the *total* you are allowed is 32 cores. Sometimes, for reasons that I haven't figured out, GCE doesn't let you use 32 cores like it should.

If this happens, follow these instructions and it should start working within a few hours:

- Go to the quotas page in your account.

- Select the checkbox for `CPUs` and type '32' into the form **for the us-central1 region** as shown:

- Check back periodically to see if the quota changes to 32. You should get an email from google when this happens.