Lunatic Labs

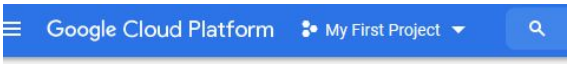
# Google Cloud Services

## Account Creation / Credit Redemption

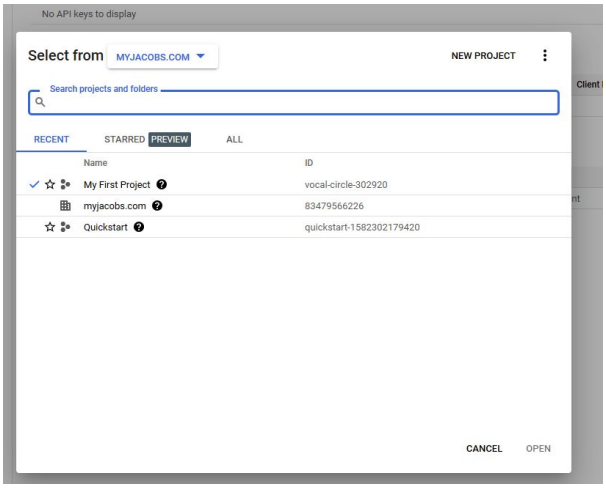
To utilize your free educational credits you will need two google accounts. Your school issued mail.lipscomb.edu account and a personal account to apply the credits to. If you do not have a personal google account create one via the instructions found here. Once you have successfully created your account navigate to our verified educational credit link and enter your school email to redeem your credits. First you will be asked to verify your school email, do so by navigating to your inbox and clicking the verify link sent to you by cloudedugrants@google.com. After verifying your email address google will send you a redemption code for 50$ worth of educational credits. Click the link to redeem the credits found in the email. Once you are routed to the GCP credit application fill out all fields copying and pasting your coupon code from the previous email. Ensure the “Account email” listed in the application is your ***PERSONAL*** account as the lipscomb domain is prohibited from using the Google Cloud Platform. You may change the targeted account by clicking the hyperlinked text “here” beneath the Account email field within the form. Press the accept and continue button and you will be routed to your google cloud dashboard where you should now have a billing method entitled, “Billing Account for Education” with a 50$ credit. Select this account when creating your needed cloud services in the steps below.

## Starting a Cloud Project

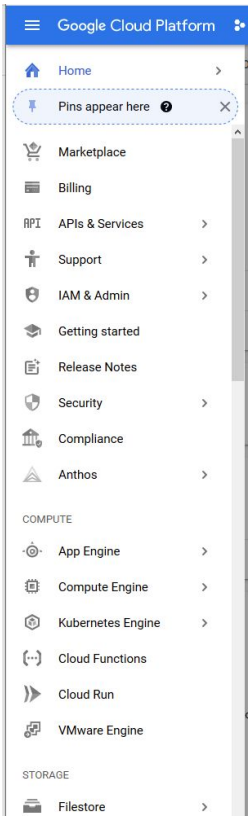
Google Cloud uses projects to neatly organize all of the resources that you will be using from Google Cloud. You will need to create a project to use any resources. This allows you to switch between different projects that have different resource needs and assign team members to their respective projects.




In order to create a new project go to the top bar and click the project button beside the Google logo at the top left of the website. A pop up will appear and in the top right you will see a New Project button. Name your project and click create. It will now appear in the list you saw earlier.



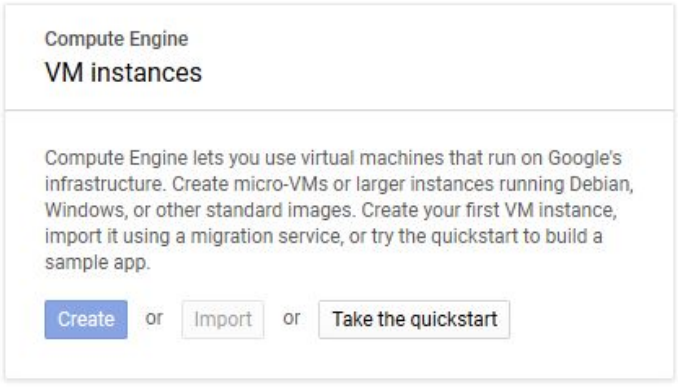

# Creating a Virtual Machine



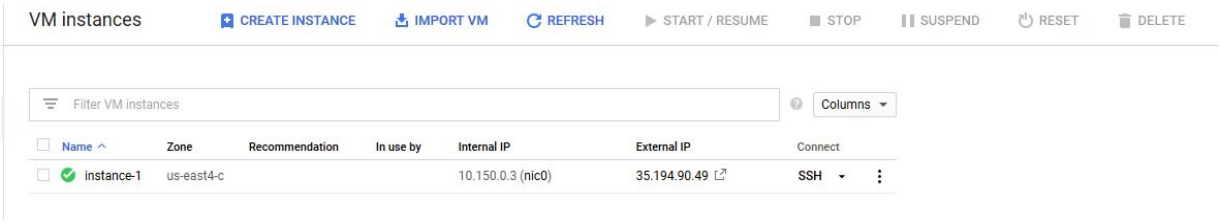

Virtual machines are instances of a virtual computer that you can use. They run off the operating system of your choice but the default is Linux. You can access your instance through Cloud shell or an ssh connection. Cloud shell is easy to use and makes connecting to your virtual machine very easy but a stand alone ssh client might be useful in some circumstances.

To create a virtual machine make sure you have a project selected and go to the navigation button on the top left of the website 


Once in the navigation window click on Compute Engine and if no VM instances exist you will see the below image:



If you already have a VM you will see the below image:




Click the create button, either  or  depending on if you already have a VM.





Next you will be prompted to decide the VM's name, region, and machine configuration.

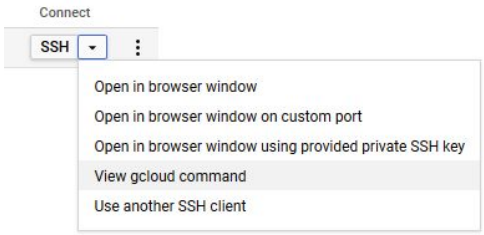
The name is permanent so make sure you know what you need it to be named. Region is based on where the machine is located. The zone is the collection of resources in the region.

For machine configuration you have several choices, general purpose is likely what you'll need the series and machine type will determine what type of machine you will have. For machine type we have been using micro to avoid using a lot of resources. If you are using this VM for http traffic make sure it is enabled in the firewall settings. Once everything is set up hit the create button.

Once your VM is running you will see a list of VMs.

To connect to it you will need to either set up


an SSH connection or connect using Cloud shell.



Click the drop down button under connect and select view gcloud command

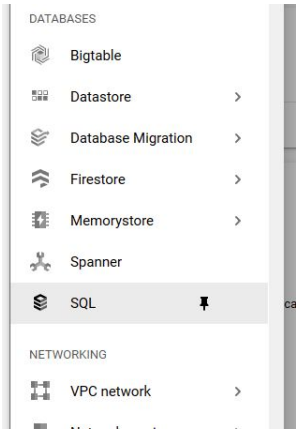

You can either copy and paste the command shown in the dialogue box into an already existing shell (as long as that shell isn't connected to anything yet) or you can click the 'RUN IN CLOUD SHELL' button which will pull up the cloud shell terminal at the bottom of the webpage.

You now have full access to the virtual machine. It functions exactly like a Linux terminal. You can use 'ls' to view the directory 'mkdir' to create folders 'cd' to navigate. In order to get your own code onto the machine it is best to use git, 'git clone *url_address*'.

The Google cloud platform provides a plethora of different Web App hosting services. Cloud Engine, that we've just used to create a VM, is a good customizable default solution but every project is different. If your project only needs a simple static website or you'd like to code in a language not typically used in web dev tech stacks check out the video "GCP Architecture: Web Application" in the Resources section of this document. It provides an overview of all the web hosting services and helps you decide which of them is the most appropriate for you.

# Database

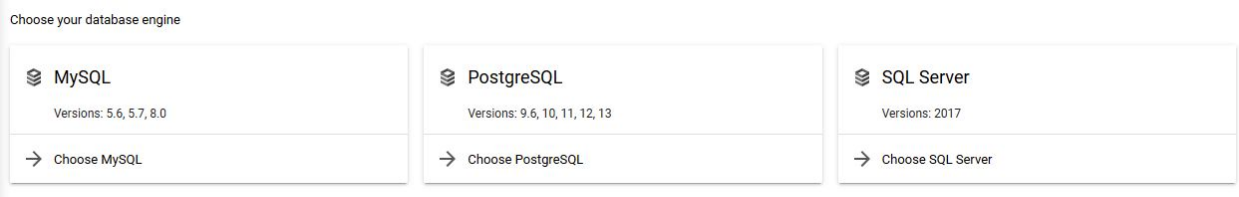
There are multiple databases that can be used with Google Cloud with options for both relational and NoSql. As the majority of students have some experience with SQL we will go over setting up a mySQL server in the cloud (for additional database options check out resource section). Go to the navigation panel by clicking on this button. 




Now navigate to the Databases section and click on the SQL.

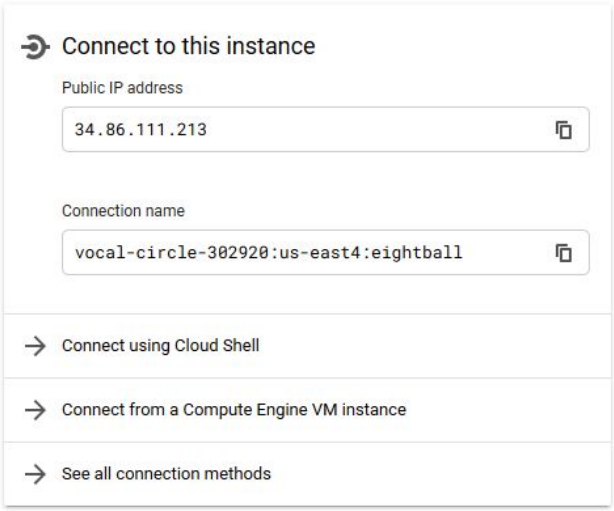
Click on the create instance button. If you already have a database, it will be at the top bar, if you don't it will be in a box.

Now you must choose what type of SQL you want to use. For now we will use MySQL.




Create the instance ID and root password. The instance ID is permanent so choose wisely. You can have no password, but it is not recommended. Whatever password you choose, make sure you write it down somewhere. Choose a region near you and any zone in that region. Note: you may want to put it in the same region/zone that your VM is in if you are using one. Next choose the Database version, mysql has LTS support for 8.0 but the decision is yours.

To connect to your database click on the name of your instance in the instance list. You will see various things such as a public IP address and connection name that can be used to connect to the database. To connect using the cloud shell click on the 'Connect using Cloud shell' button below the connection name.




You will be required to enable the gcloud API. When you try to connect it will give you a web address in the terminal with instructions on how to enable it. It's just a simple click of a button and you should be able to connect. For connecting to your database manually or from your VM you can do so via the command line. If on the linux operating system the command looks like this:

sudo mysql -h [your database IP] -u root -p

Connecting your database to your project is largely determined by the database type and the tech stack you are working with. You can either connect directly via public or private IP, or you can use a proxy to connect to your database (for clarification on these options check out Connection Summary in Resources). For example, if using the LAMP stack you can connect your database to your website/application with a mysqli connection using a static IP in PHP. For this to be done, the mysqli extension must first be enabled in the php.ini file. Here's what it might look like.


This information should get you started on your GCP journey. Check out the resources section below for more information, or contact the operations team with any questions.

# Resources

Getting started with Google Cloud Platform:

https://cloud.google.com/gcp/getting-started

GCP Architecture: Web Application:
https://www.youtube.com/watch?v=pxp7uYUjH_M&t=146s

GCP Databases:
https://cloud.google.com/products/databases

Getting started with PHP on Compute Engine:

https://cloud.google.com/php/getting-started/getting-started-on-compute-engine

How to set up a LAMP (Linux, Apache, MySQL, PHP) stack on a Compute Engine virtual machine instance:

https://cloud.google.com/community/tutorials/setting-up-lamp

Quickstart for Cloud SQL for MySQL:

https://cloud.google.com/sql/docs/mysql/quickstart

Summary of options for connecting to your Cloud SQL instance:

https://cloud.google.com/sql/docs/mysql/connect-overview#appaccessIP

How to connect MySQL Database with PHP file:

https://www.cloudways.com/blog/connect-mysql-with-php/

Insert Data Into MySQL Using MySQLi and PDO:

https://www.w3schools.com/php/php_mysql_insert.asp

Create a Web Server and save form data into MySQL database using PHP (Beginners Guide):

https://dev.to/alwaysup/create-a-web-server-and-save-form-data-into-mysql-database-using-php-beginners-guide-fah