

# How to install OpenFST on Google Cloud

This tutorial will cover the installation of OpenFST on Google Cloud. If you are not able to install OpenFST on your machine, we recommend using a Google Cloud Virtual Machine (VM). This will be a linux server you can SSH into. New Google Cloud accounts will receive \$300 in free credit, which will be more than what this assignment requires.

1. If you do not have a Google account, create a Google account. You will not be able to use your Andrew CMU account.
2. Go to the Google Cloud Console (<https://cloud.google.com/free/>)
3. Click on "Get started for free" and sign in with your Google account. Enter your information and your credit card. You will not be charged unless you use more than the \$300 limit.
4. After entering your information, click on "Start your free trial".
5. Click on the "Compute Engine" menu on the left side.

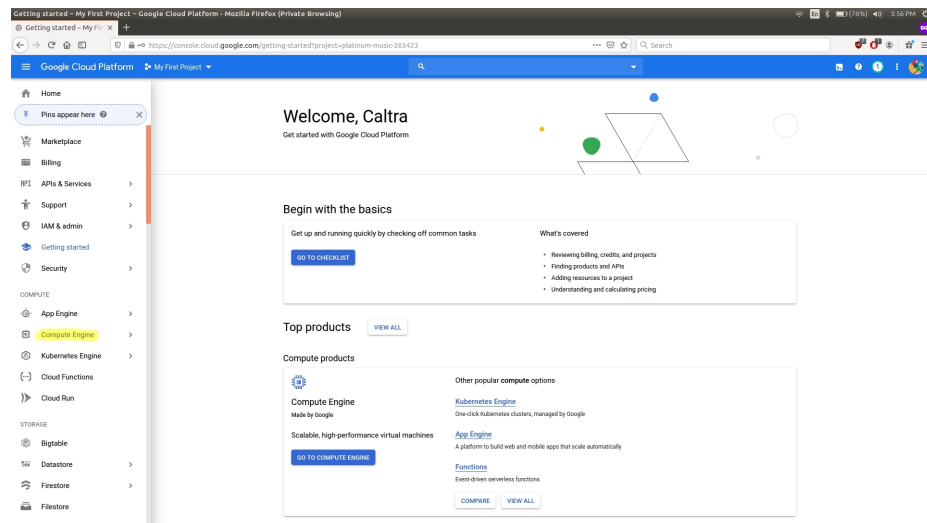


Figure 1: Google cloud main menu. Compute Engine is highlighted on the left.

6. The compute menu may take some time to load. Click on "Create".
7. When creating the VM, use the default machines but change the "Boot disk" to Ubuntu 18 and in the "Firewall section" allow HTTP and HTTPS access. Follow the settings below.

Machine family

General-purposeMemory-optimized

Machine types for common workloads, optimized for cost and flexibility


Series

N1

Powered by Intel Skylake CPU platform or one of its predecessors

Machine type


n1-standard-1 (1 vCPU, 3.75 GB memory)




vCPU  
1


Memory  
3.75 GB

⌵ CPU platform and GPU

Container 


☐ Deploy a container image to this VM instance. [Learn more](#)


Boot disk 




New 10 GB standard persistent disk  
Image  
Ubuntu 18.04 LTS

Change


Identity and API access 

Service account 

Compute Engine default service account

Access scopes 


☒ Allow default access  
☐ Allow full access to all Cloud APIs  
☐ Set access for each API

Firewall 

Add tags and firewall rules to allow specific network traffic from the Internet

☒ Allow HTTP traffic  
☒ Allow HTTPS traffic

⌵ Management, security, disks, networking, sole tenancy

Your free trial credit will be used for this VM instance. [GCP Free Tier](#) 

CreateCancel

Figure 2: Settings to create a VM

8. You should then be able to see the VM you have created. Click the SSH button on the right hand side to SSH into your server via your browser.

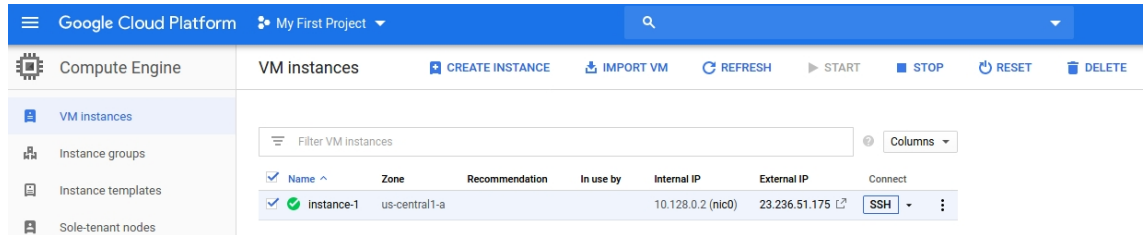


Figure 3: SSH into your VM

9. Once you SSH into the VM, click on the gear on the top right and click "Upload file". Upload the `ubuntu-install.sh` installation script from your assignment directory.

Warning: Do not run the install script on your local machine unless you understand what the script is doing. It will change some environmental variables.

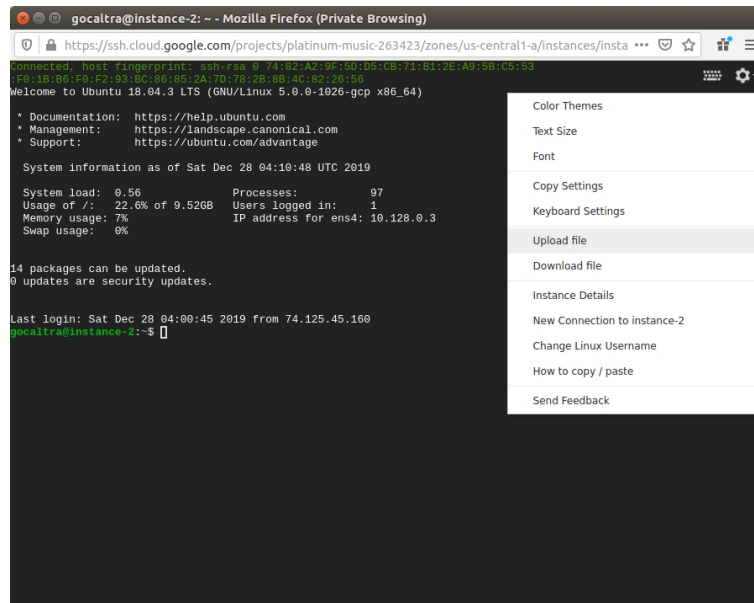


Figure 4: Upload the installation script

10. Run the installation script with the command:  
`sudo bash ubuntu-install.sh.`

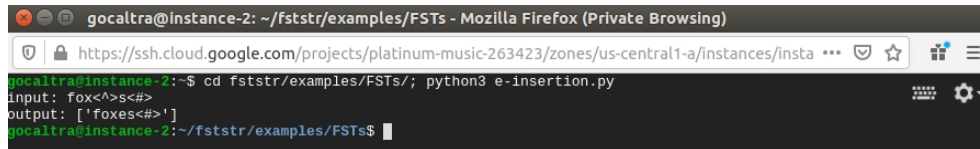
```
gocaltra@instance-2: ~ - Mozilla Firefox (Private Browsing)
https://ssh.cloud.google.com/projects/platinum-music-263423/zones/us-central1-a/instances/insta ...

creating build/lib
creating build/lib/fststr
copying fststr/fststr.py -> build/lib/fststr
copying fststr/_init_.py -> build/lib/fststr
/usr/lib/python3.6/distutils/dist.py:261: UserWarning: Unknown distribution option: 'long_description_content_type'
  warnings.warn(msg)
running install
running bdist_egg
running egg_info
creating fststr.egg-info
writing fststr.egg-info/PKG-INFO
writing dependency_links to fststr.egg-info/dependency_links.txt
writing top-level names to fststr.egg-info/top_level.txt
writing manifest file 'fststr.egg-info/SOURCES.txt'
reading manifest file 'fststr.egg-info/SOURCES.txt'
writing manifest file 'fststr.egg-info/SOURCES.txt'
installing library code to build/bdist.linux-x86_64/egg
running install_lib
running build_py
creating build/bdist.linux-x86_64
creating build/bdist.linux-x86_64/egg
creating build/bdist.linux-x86_64/egg/fststr
copying build/lib/fststr/fststr.py -> build/bdist.linux-x86_64/egg/fststr
copying build/lib/fststr/_init_.py -> build/bdist.linux-x86_64/egg/fststr
byte-compiling build/bdist.linux-x86_64/egg/fststr/fststr.py to fststr.cpython-36.pyc
byte-compiling build/bdist.linux-x86_64/egg/fststr/_init_.py to _init_.cpython-36.pyc
creating build/bdist.linux-x86_64/egg/EGG-INFO
copying fststr.egg-info/PKG-INFO -> build/bdist.linux-x86_64/egg/EGG-INFO
copying fststr.egg-info/SOURCES.txt -> build/bdist.linux-x86_64/egg/EGG-INFO
copying fststr.egg-info/dependency_links.txt -> build/bdist.linux-x86_64/egg/EGG-INFO
copying fststr.egg-info/top_level.txt -> build/bdist.linux-x86_64/egg/EGG-INFO
zip_safe flag not set; analyzing archive contents...
creating dist
creating 'dist/fststr-0.2-py3.6.egg' and adding 'build/bdist.linux-x86_64/egg' to it
removing 'build/bdist.linux-x86_64/egg' (and everything under it)
Processing fststr-0.2-py3.6.egg
Copying fststr-0.2-py3.6.egg to /usr/local/lib/python3.6/dist-packages
Adding fststr 0.2 to easy-install.pth file

Installed /usr/local/lib/python3.6/dist-packages/fststr-0.2-py3.6.egg
Processing dependencies for fststr==0.2
Finished processing dependencies for fststr==0.2
gocaltra@instance-2:~$
```

Figure 5: This is what it should stay with installation completed.

11. Test your OpenFST installation by running the sample e-insertion FST in fststr with the command:  
`cd fststr/examples/FSTs/; python3 e-insertion.py`

A screenshot of a terminal window titled 'gocaltra@instance-2: ~/fststr/examples/FSTs - Mozilla Firefox (Private Browsing)'. The terminal shows the command 'cd fststr/examples/FSTs/; python3 e-insertion.py' being executed. The output is 'input: fox<^>s<#>' followed by 'output: ['foxes<#>']'. The prompt 'gocaltra@instance-2:~/fststr/examples/FSTs\$' is visible at the bottom.

```
gocaltra@instance-2:~/fststr/examples/FSTs - Mozilla Firefox (Private Browsing)
https://ssh.cloud.google.com/projects/platinum-music-263423/zones/us-central1-a/instances/insta ...
gocaltra@instance-2:~$ cd fststr/examples/FSTs/; python3 e-insertion.py
input: fox<^>s<#>
output: ['foxes<#>']
gocaltra@instance-2:~/fststr/examples/FSTs$
```

Figure 6: This is the expected result of the FST.

12. Yay! You have installed OpenFST! Come to office hours if you need help with any of the steps.