

GCP Project

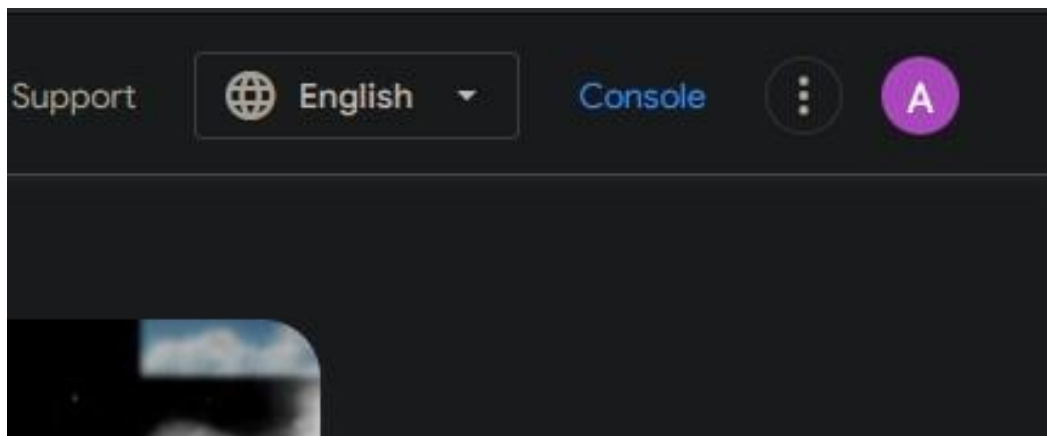
Apache web server on Google cloud

By Abdullah Aldrees.

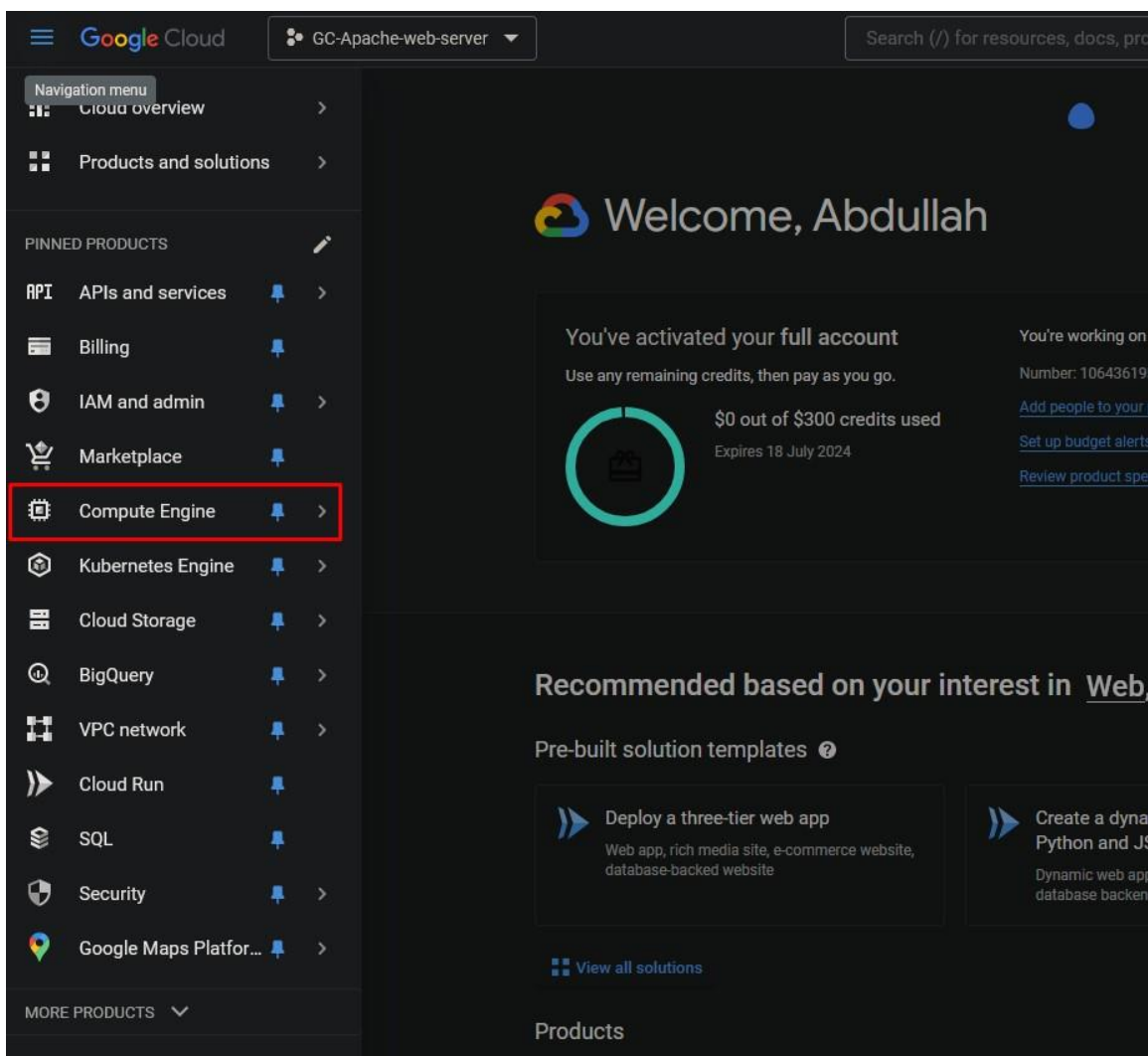
Guideline:

- **Make a Google cloud account, or sign in with your regular Google account.**
- **While signing in, you MUST enter any VISA card you have. Then, activate that card from the bar at the top of the page after signing in.**
- **Create your own project from top left of the page.**


First, after the activating, go to the Console button to create the VM:



Go to the navigation bar. Then, enter the compute engine option:




Enable the API:

 Google Cloud

GC-Apache-web-server ▾

← Product details



Compute Engine API

[Google Enterprise API](#)

Compute Engine API

ENABLE

TRY THIS API [↗](#)

OVERVIEW

DOCUMENTATION

SUPPORT

RELATED PRODUCTS

Overview

Creates and runs virtual machines on Google Cloud Platform.

Additional details

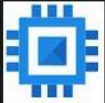
Type: [SaaS & APIs](#)

Last product update: 24/03/2023

Category: [Compute](#), [Networking](#), [Google Enterprise APIs](#)

Service name: compute.googleapis.com

← Product details



Compute Engine API

[Google Enterprise API](#)

Compute Engine API

MANAGE

TRY THIS API [↗](#)

✓ API Enabled

OVERVIEW

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SUPPORT

RELATED PRODUCTS

Overview

Creates and runs virtual machines on Google Cloud Platform.

Additional details

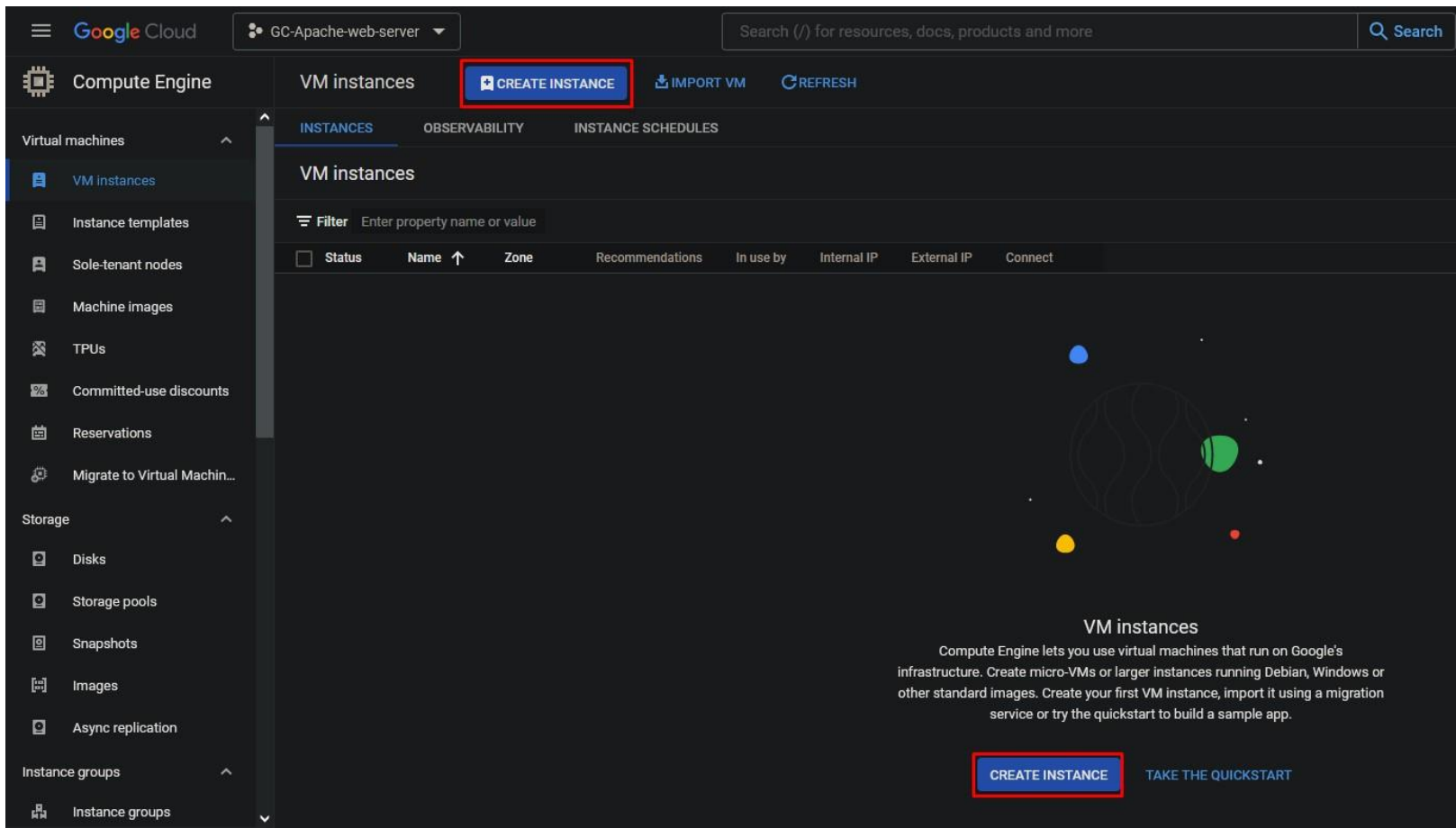
Type: [SaaS & APIs](#)

Last product update: 24/03/2023

Category: [Compute](#), [Networking](#), [Google Enterprise APIs](#)

Service name: compute.googleapis.com

Create first VM by create an instance:



The screenshot shows the Google Cloud Console interface for VM instances. The left sidebar contains navigation links for Virtual machines, Storage, and Instance groups. The main content area is titled 'VM instances' and features a 'CREATE INSTANCE' button highlighted with a red box. Below this, there are tabs for INSTANCES, OBSERVABILITY, and INSTANCE SCHEDULES. A table with columns for Status, Name, Zone, Recommendations, In use by, Internal IP, External IP, and Connect is visible. The bottom right of the page includes a 'CREATE INSTANCE' button (also highlighted with a red box) and a 'TAKE THE QUICKSTART' link.

Google Cloud

GC-Apache-web-server

Search (/) for resources, docs, products and more

Search

Compute Engine

VM instances

CREATE INSTANCE

IMPORT VM

REFRESH

INSTANCES

OBSERVABILITY

INSTANCE SCHEDULES

VM instances

Filter Enter property name or value

Status Name ↑ Zone Recommendations In use by Internal IP External IP Connect

Virtual machines

VM instances

Instance templates

Sole-tenant nodes

Machine images

TPUs

Committed-use discounts

Reservations

Migrate to Virtual Machin...

Storage

Disks

Storage pools

Snapshots

Images

Async replication

Instance groups

Instance groups

VM instances

Compute Engine lets you use virtual machines that run on Google's infrastructure. Create micro-VMs or larger instances running Debian, Windows or other standard images. Create your first VM instance, import it using a migration service or try the quickstart to build a sample app.

CREATE INSTANCE

TAKE THE QUICKSTART

Then choose the name of that instance. Let everything default, and scroll down into Firewall settings...

Make sure the instance is on Linux OS, and change the Firewall settings, then create:

Google Cloud GC-Apache-web-server Search (/) for resources, docs, products and more

← Create an instance

New VM instance
Create a single VM instance from scratch

New VM instance from template
Create a single VM instance from an existing template

New VM instance from machine image
Create a single VM instance from an existing machine image

Marketplace
Deploy a ready-to-go solution onto a VM instance

Boot disk ?

Name	abdullah-vm
Type	New balanced persistent disk
Size	10 GB
Licence type ?	Free
Image	Debian GNU/Linux 12 (bookworm) Linux-OS VM

[CHANGE](#)

Identity and API access ?

Service accounts ?

Service account
Compute Engine default service account

Requires the Service Account User role (roles/iam.serviceAccountUser) to be set for users who want to access VMs with this service account. [Learn more](#)

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

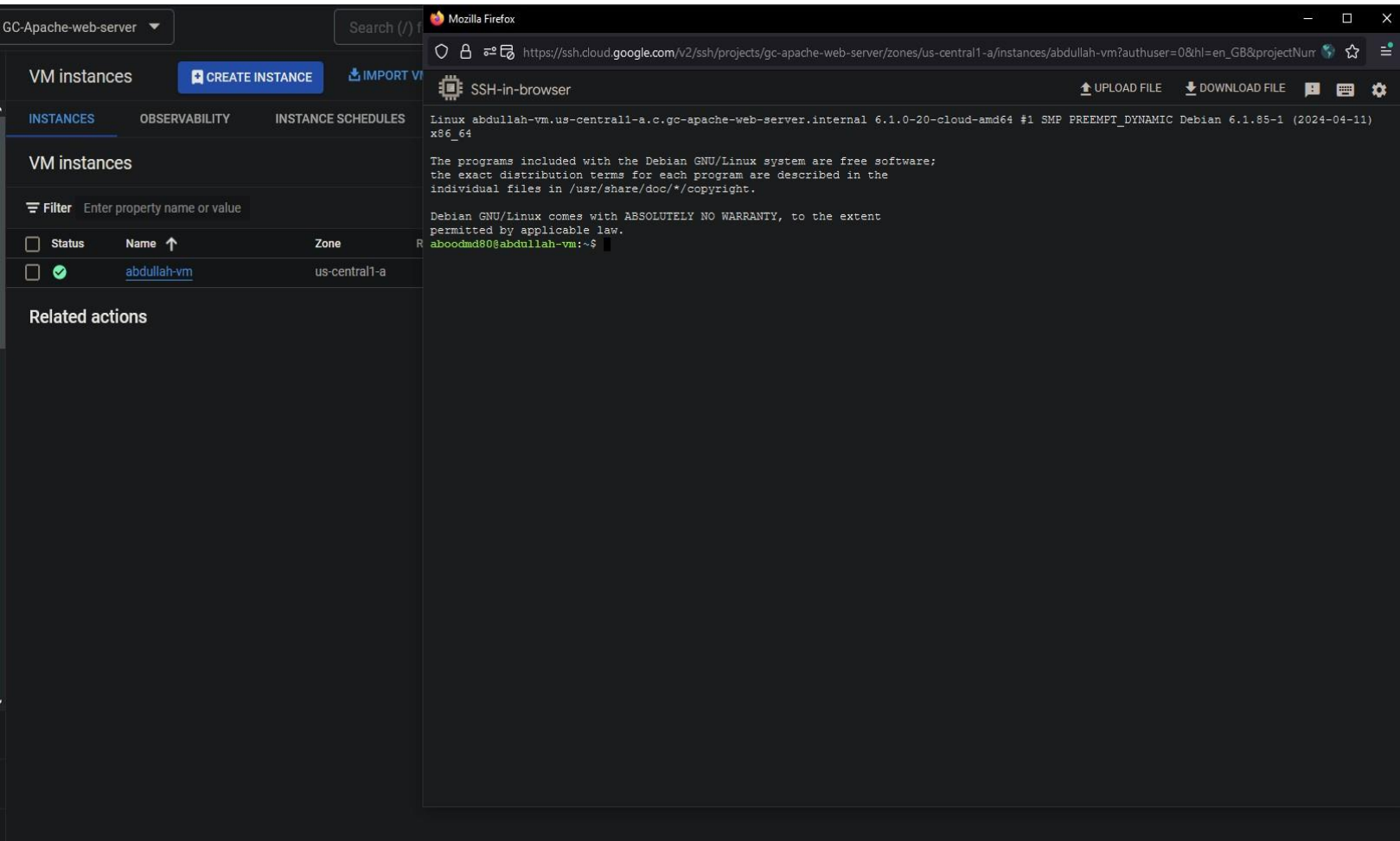
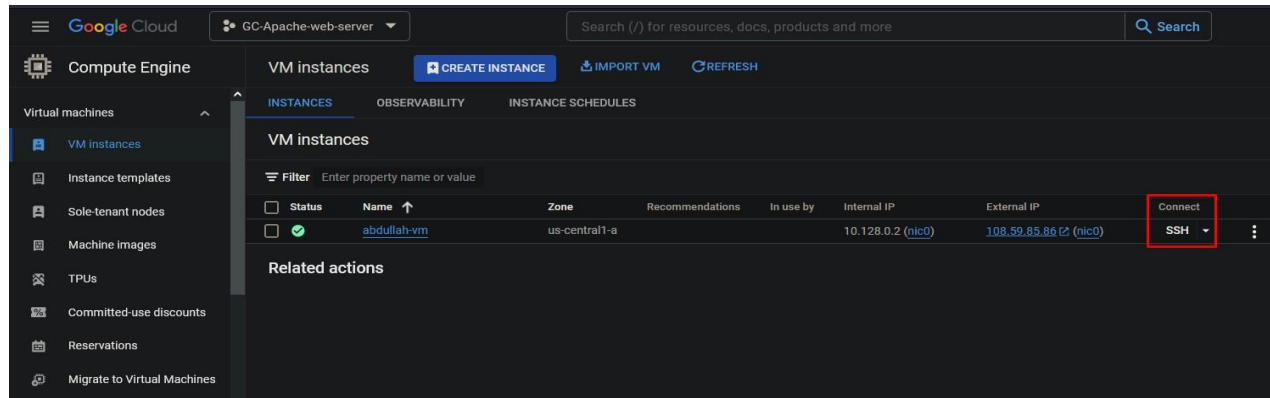
☐ Allow load balancer health checks

Observability – Ops Agent ?

Monitor your system through collection of logs and key metrics.

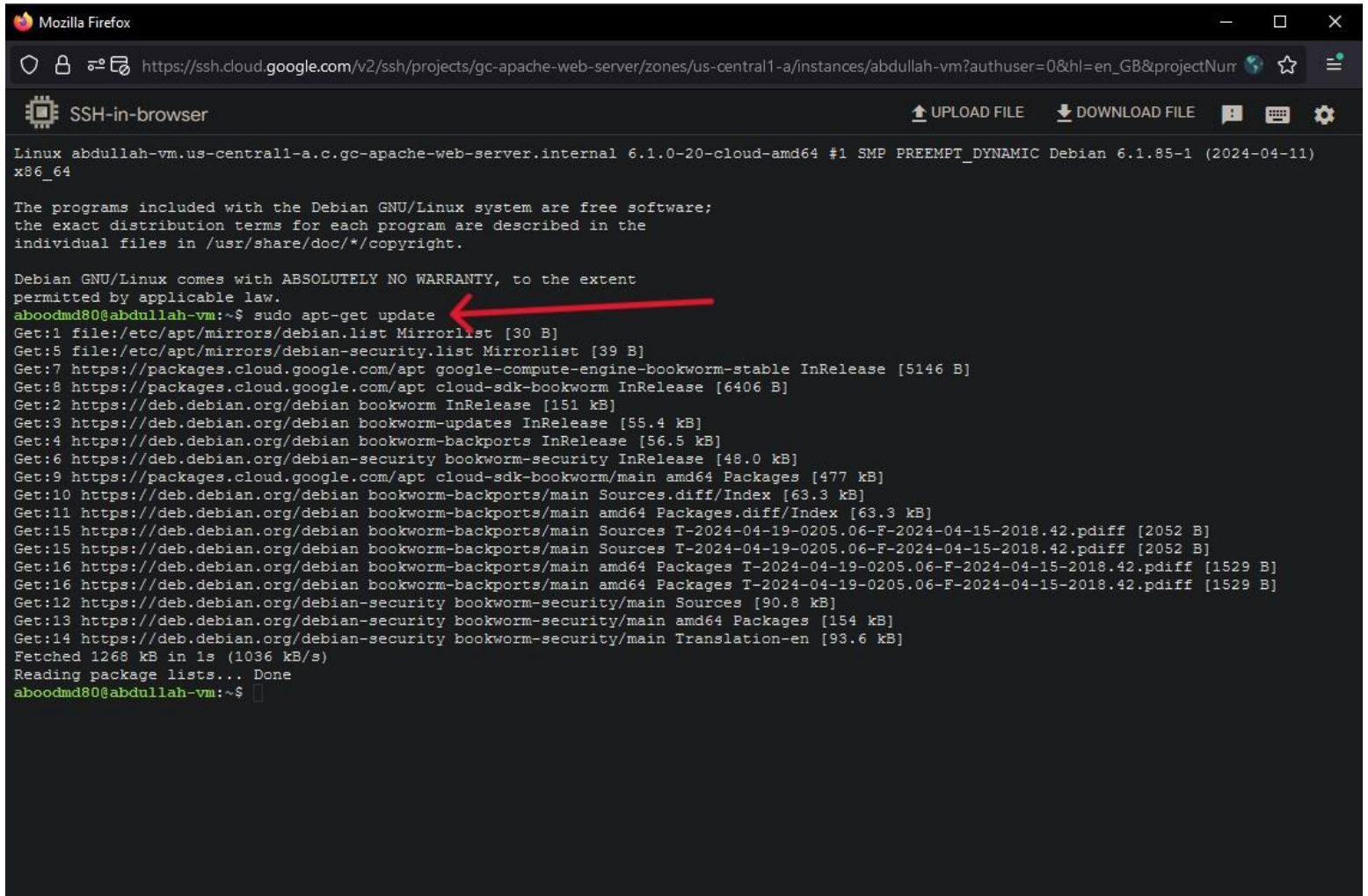
2 [CREATE](#) CANCEL [EQUIVALENT CODE](#)

After it has been successfully loaded. Click on the SSH button which takes you another pop-up window:



Here is the virtual CMD which you can run
your server through, type the command:

sudo apt-get update



The screenshot shows a terminal window titled "SSH-in-browser" within a Mozilla Firefox browser. The terminal output displays the system information: "Linux abdullah-vm.us-central1-a.c.gcp-apache-web-server.internal 6.1.0-20-cloud-amd64 #1 SMP PREEMPT_DYNAMIC Debian 6.1.85-1 (2024-04-11) x86_64". It then shows the Debian GNU/Linux system's free software notice. The command "sudo apt-get update" is entered and executed, with a red arrow pointing to it. The output shows the system fetching package lists from various mirrors and repositories, including the Google Cloud SDK and Debian bookworm repositories. The process completes with the message "Reading package lists... Done".

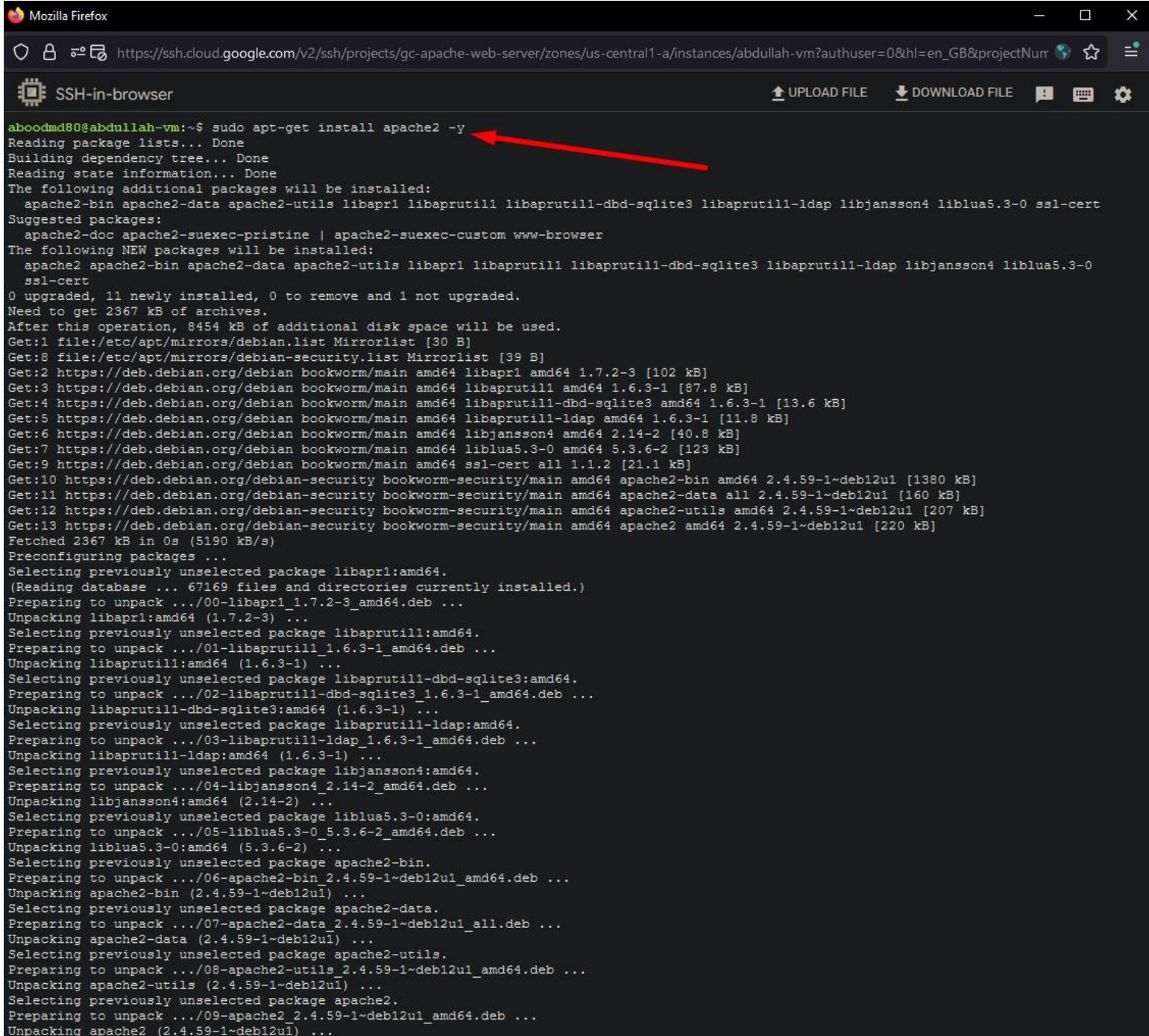
```
Linux abdullah-vm.us-central1-a.c.gcp-apache-web-server.internal 6.1.0-20-cloud-amd64 #1 SMP PREEMPT_DYNAMIC Debian 6.1.85-1 (2024-04-11) x86_64

The programs included with the Debian GNU/Linux system are free software;
the exact distribution terms for each program are described in the
individual files in /usr/share/doc/*/copyright.

Debian GNU/Linux comes with ABSOLUTELY NO WARRANTY, to the extent
permitted by applicable law.
aboodmd80@abdullah-vm:~$ sudo apt-get update
Get:1 file:/etc/apt/mirrors/debian.list Mirrorlist [30 B]
Get:5 file:/etc/apt/mirrors/debian-security.list Mirrorlist [39 B]
Get:7 https://packages.cloud.google.com/apt google-compute-engine-bookworm-stable InRelease [5146 B]
Get:8 https://packages.cloud.google.com/apt cloud-sdk-bookworm InRelease [6406 B]
Get:2 https://deb.debian.org/debian bookworm InRelease [151 kB]
Get:3 https://deb.debian.org/debian bookworm-updates InRelease [55.4 kB]
Get:4 https://deb.debian.org/debian bookworm-backports InRelease [56.5 kB]
Get:6 https://deb.debian.org/debian-security bookworm-security InRelease [48.0 kB]
Get:9 https://packages.cloud.google.com/apt cloud-sdk-bookworm/main amd64 Packages [477 kB]
Get:10 https://deb.debian.org/debian bookworm-backports/main Sources.diff/Index [63.3 kB]
Get:11 https://deb.debian.org/debian bookworm-backports/main amd64 Packages.diff/Index [63.3 kB]
Get:15 https://deb.debian.org/debian bookworm-backports/main Sources T-2024-04-19-0205.06-F-2024-04-15-2018.42.pdiff [2052 B]
Get:15 https://deb.debian.org/debian bookworm-backports/main Sources T-2024-04-19-0205.06-F-2024-04-15-2018.42.pdiff [2052 B]
Get:16 https://deb.debian.org/debian bookworm-backports/main amd64 Packages T-2024-04-19-0205.06-F-2024-04-15-2018.42.pdiff [1529 B]
Get:16 https://deb.debian.org/debian bookworm-backports/main amd64 Packages T-2024-04-19-0205.06-F-2024-04-15-2018.42.pdiff [1529 B]
Get:12 https://deb.debian.org/debian-security bookworm-security/main Sources [90.8 kB]
Get:13 https://deb.debian.org/debian-security bookworm-security/main amd64 Packages [154 kB]
Get:14 https://deb.debian.org/debian-security bookworm-security/main Translation-en [93.6 kB]
Fetched 1268 kB in 1s (1036 kB/s)
Reading package lists... Done
aboodmd80@abdullah-vm:~$
```

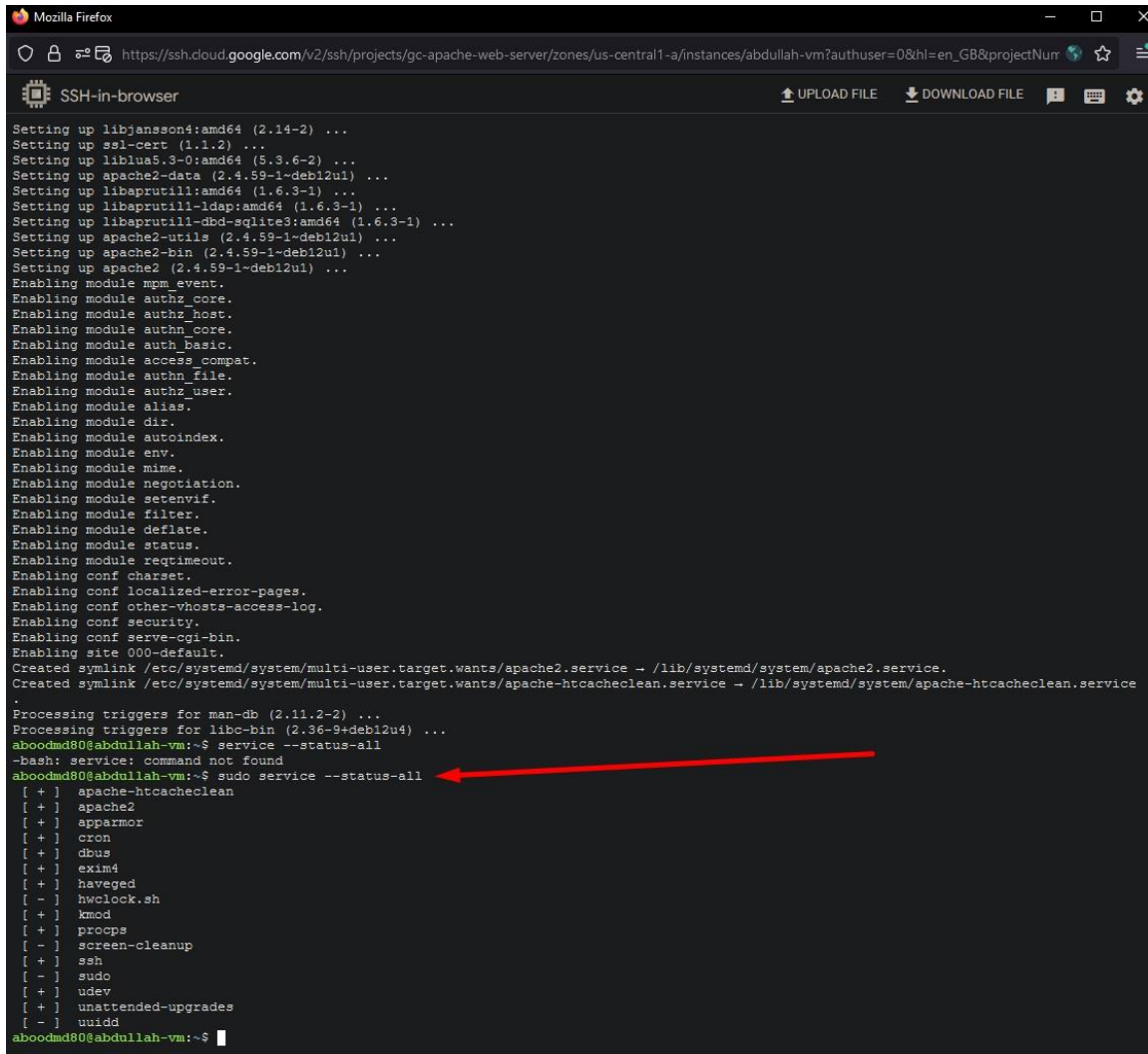
What this command do is update the local
package index which is a pre-downloaded
packages from a specific database that the OS
contacts.

Now we are ready to install apache HTTP server:



```
aboodmd80@abdullah-vm:~$ sudo apt-get install apache2 -y
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
The following additional packages will be installed:
  apache2-bin apache2-data apache2-utils libapr1 libaprutil1 libaprutil1-dbd-sqlite3 libaprutil1-ldap libjansson4 liblua5.3-0 ssl-cert
Suggested packages:
  apache2-doc apache2-suexec-pristine | apache2-suexec-custom www-browser
The following NEW packages will be installed:
  apache2 apache2-bin apache2-data apache2-utils libapr1 libaprutil1 libaprutil1-dbd-sqlite3 libaprutil1-ldap libjansson4 liblua5.3-0
  ssl-cert
0 upgraded, 11 newly installed, 0 to remove and 1 not upgraded.
Need to get 2367 kB of archives.
After this operation, 8454 kB of additional disk space will be used.
Get:1 file:///etc/apt/mirrors/debian.list Mirrorlist [30 B]
Get:8 file:///etc/apt/mirrors/debian-security.list Mirrorlist [39 B]
Get:2 https://deb.debian.org/debian bookworm/main amd64 libapr1 amd64 1.7.2-3 [102 kB]
Get:3 https://deb.debian.org/debian bookworm/main amd64 libaprutil1 amd64 1.6.3-1 [87.8 kB]
Get:4 https://deb.debian.org/debian bookworm/main amd64 libaprutil1-dbd-sqlite3 amd64 1.6.3-1 [13.6 kB]
Get:5 https://deb.debian.org/debian bookworm/main amd64 libaprutil1-ldap amd64 1.6.3-1 [11.8 kB]
Get:6 https://deb.debian.org/debian bookworm/main amd64 libjansson4 amd64 2.14-2 [40.8 kB]
Get:7 https://deb.debian.org/debian bookworm/main amd64 liblua5.3-0 amd64 5.3.6-2 [123 kB]
Get:9 https://deb.debian.org/debian bookworm/main amd64 ssl-cert all 1.1.2 [21.1 kB]
Get:10 https://deb.debian.org/debian-security bookworm-security/main amd64 apache2-bin amd64 2.4.59-1~deb12u1 [1380 kB]
Get:11 https://deb.debian.org/debian-security bookworm-security/main amd64 apache2-data all 2.4.59-1~deb12u1 [160 kB]
Get:12 https://deb.debian.org/debian-security bookworm-security/main amd64 apache2-utils amd64 2.4.59-1~deb12u1 [207 kB]
Get:13 https://deb.debian.org/debian-security bookworm-security/main amd64 apache2 amd64 2.4.59-1~deb12u1 [220 kB]
Fetched 2367 kB in 0s (5190 kB/s)
Preconfiguring packages ...
Selecting previously unselected package libapr1:amd64.
(Reading database ... 67169 files and directories currently installed.)
Preparing to unpack .../00-libapr1_1.7.2-3_amd64.deb ...
Unpacking libapr1:amd64 (1.7.2-3) ...
Selecting previously unselected package libaprutil1:amd64.
Preparing to unpack .../01-libaprutil1_1.6.3-1_amd64.deb ...
Unpacking libaprutil1:amd64 (1.6.3-1) ...
Selecting previously unselected package libaprutil1-dbd-sqlite3:amd64.
Preparing to unpack .../02-libaprutil1-dbd-sqlite3_1.6.3-1_amd64.deb ...
Unpacking libaprutil1-dbd-sqlite3:amd64 (1.6.3-1) ...
Selecting previously unselected package libaprutil1-ldap:amd64.
Preparing to unpack .../03-libaprutil1-ldap_1.6.3-1_amd64.deb ...
Unpacking libaprutil1-ldap:amd64 (1.6.3-1) ...
Selecting previously unselected package libjansson4:amd64.
Preparing to unpack .../04-libjansson4_2.14-2_amd64.deb ...
Unpacking libjansson4:amd64 (2.14-2) ...
Selecting previously unselected package liblua5.3-0:amd64.
Preparing to unpack .../05-liblua5.3-0_5.3.6-2_amd64.deb ...
Unpacking liblua5.3-0:amd64 (5.3.6-2) ...
Selecting previously unselected package apache2-bin.
Preparing to unpack .../06-apache2-bin_2.4.59-1~deb12u1_amd64.deb ...
Unpacking apache2-bin (2.4.59-1~deb12u1) ...
Selecting previously unselected package apache2-data.
Preparing to unpack .../07-apache2-data_2.4.59-1~deb12u1_all.deb ...
Unpacking apache2-data (2.4.59-1~deb12u1) ...
Selecting previously unselected package apache2-utils.
Preparing to unpack .../08-apache2-utils_2.4.59-1~deb12u1_amd64.deb ...
Unpacking apache2-utils (2.4.59-1~deb12u1) ...
Selecting previously unselected package apache2.
Preparing to unpack .../09-apache2_2.4.59-1~deb12u1_amd64.deb ...
Unpacking apache2 (2.4.59-1~deb12u1) ...
```

After successfully installed. We could run a command that checks the server's functionality:



```
Setting up libjansson4:amd64 (2.14-2) ...
Setting up ssl-cert (1.1.2) ...
Setting up liblua5.3-0:amd64 (5.3.6-2) ...
Setting up apache2-data (2.4.59-1-deb12u1) ...
Setting up libaprutil1:amd64 (1.6.3-1) ...
Setting up libaprutil1-ldap:amd64 (1.6.3-1) ...
Setting up libaprutil1-dbd-sqlite3:amd64 (1.6.3-1) ...
Setting up apache2-utils (2.4.59-1-deb12u1) ...
Setting up apache2-bin (2.4.59-1-deb12u1) ...
Setting up apache2 (2.4.59-1-deb12u1) ...
Enabling module mpm_event.
Enabling module authz_core.
Enabling module authz_host.
Enabling module authn_core.
Enabling module auth_basic.
Enabling module access_compat.
Enabling module authn_file.
Enabling module authz_user.
Enabling module alias.
Enabling module dir.
Enabling module autoindex.
Enabling module env.
Enabling module mime.
Enabling module negotiation.
Enabling module setenvif.
Enabling module filter.
Enabling module deflate.
Enabling module status.
Enabling module reqtimeout.
Enabling conf charset.
Enabling conf localized-error-pages.
Enabling conf other-vhosts-access-log.
Enabling conf security.
Enabling conf serve-cgi-bin.
Enabling site 000-default.
Created symlink /etc/systemd/system/multi-user.target.wants/apache2.service - /lib/systemd/system/apache2.service.
Created symlink /etc/systemd/system/multi-user.target.wants/apache-htcacheclean.service - /lib/systemd/system/apache-htcacheclean.service.
Processing triggers for man-db (2.11.2-2) ...
Processing triggers for libc-bin (2.36-9+deb12u4) ...
aboodmd80@abdullah-vm:~$ service --status-all
-bash: service: command not found
aboodmd80@abdullah-vm:~$ sudo service --status-all
[ + ] apache-htcacheclean
[ + ] apache2
[ + ] apparmor
[ + ] cron
[ + ] dbus
[ + ] exim4
[ + ] haveged
[ - ] hwclock.sh
[ + ] kmod
[ + ] procps
[ - ] screen-cleanup
[ + ] ssh
[ - ] sudo
[ + ] udev
[ + ] unattended-upgrades
[ - ] uuidd
aboodmd80@abdullah-vm:~$
```

Now exit the CMD and locate the external IP of that machine then press it, now we havean HTTP web page that is public on internet and accessible from any device:

GC-Apache-web-server

Search (/) for resources, docs, products and more

Search

VM instances

CREATE INSTANCE

IMPORT VM

REFRESH

INSTANCES

OBSERVABILITY

INSTANCE SCHEDULES

VM instances

Filter Enter property name or value

Status	Name ↑	Zone	Recommendations	In use by	Internal IP	External IP	Connect
<input checked="" type="checkbox"/>	abdullah-vm	us-central1-a			10.128.0.2 (nic0)	108.59.85.86 (nic0)	SSH

Related actions

108.59.85.86

Apache2 Debian Default Page

It works!

This is the default welcome page used to test the correct operation of the Apache2 server after installation on Debian systems. If you can read this page, it means that the Apache HTTP server installed at this site is working properly. You should **replace this file** (located at `/var/www/html/index.html`) before continuing to operate your HTTP server.

If you are a normal user of this web site and don't know what this page is about, this probably means that the site is currently unavailable due to maintenance. If the problem persists, please contact the site's administrator.

Configuration Overview

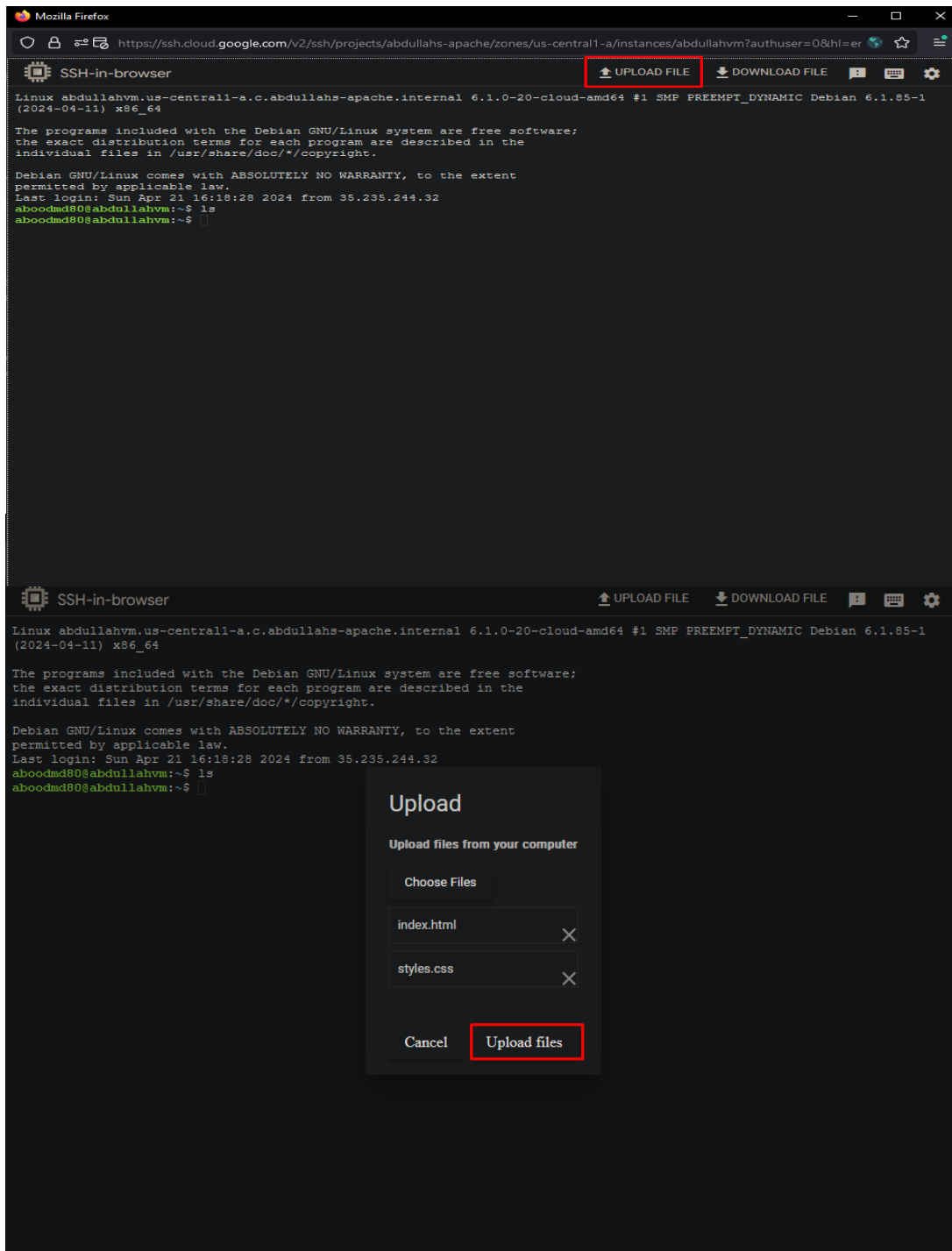
Debian's Apache2 default configuration is different from the upstream default configuration, and split into several files optimized for interaction with Debian tools. The configuration system is **fully documented in `/usr/share/doc/apache2/README.Debian.gz`**. Refer to this for the full documentation. Documentation for the web server itself can be found by accessing the **manual** if the `apache2-doc` package was installed on this server.

The configuration layout for an Apache2 web server installation on Debian systems is as follows:

```
/etc/apache2/
|-- apache2.conf
|   |-- ports.conf
|-- mods-enabled
|   |-- *.load
|   |-- *.conf
|-- conf-enabled
|   |-- *.conf
|-- sites-enabled
|   |-- *.conf
```

- `apache2.conf` is the main configuration file. It puts the pieces together by including all remaining configuration files when starting up the web server.
- `ports.conf` is always included from the main configuration file. It is used to determine the listening ports for incoming connections, and this file can be customized anytime.
- Configuration files in the `mods-enabled/`, `conf-enabled/` and `sites-enabled/` directories contain particular configuration snippets which manage modules, global configuration fragments, or virtual host configurations, respectively.
- They are activated by symlinking available configuration files from their respective `*-available/` counterparts. These should be managed by using our helpers `a2enmod`, `a2dismod`, `a2ensite`, `a2dissite`, and `a2enconf`, `a2disconf`. See their respective man pages for detailed information.
- The binary is called `apache2`. Due to the use of environment variables, in the default configuration, `apache2` needs to be started/stopped with `/etc/init.d/apache2` or `apache2ctl`. Calling `/usr/bin/apache2` directly will not work with the default configuration.

There is nothing remaining except uploading our HTML and CSS files, go back to the SSH button, then go to UPLOAD FILE and locate your files:

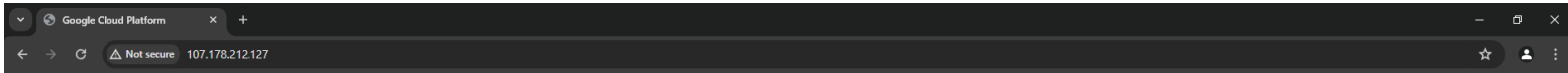


Then we are going to move these uploaded files into the location we are going to specify, the location is **/var/www/html**:



```
aboodmd80@abdullahvm:~$ sudo mv index.html /var/www/html
aboodmd80@abdullahvm:~$ sudo mv styles.css /var/www/html
aboodmd80@abdullahvm:~$ cd /var/www/html
aboodmd80@abdullahvm:/var/www/html$ ls
index.html  styles.css
aboodmd80@abdullahvm:/var/www/html$
```


Close the CMD window then go back to External IP link:



Welcome to Google Cloud Platform



What is Google Cloud Platform?

Google Cloud Platform (GCP) is a suite of cloud computing services offered by Google. It provides a range of on-demand services including:

- Compute: Create and manage virtual machines (VMs)
- Storage: Store your data securely and reliably
- Networking: Connect your applications and resources
- Big Data: Analyze large datasets
- Machine Learning: Build and train machine learning models
- And many more!

What are Virtual Machines (VMs)?

A virtual machine (VM) is a software computer that emulates a physical computer. It allows you to run an operating system and applications on a virtualized server. VMs offer several benefits including:

- Scalability: Easily scale your resources up or down as needed
- Cost-effectiveness: Pay only for the resources you use
- Flexibility: Deploy different types of VMs for different applications
- Isolation: Applications running on VMs are isolated from each other