How to Setup a Web Server in VirtualBox and Ubuntu Server

Introduction

These are the instructions and basic summaries on all the essential components to create and host a simple site on a web server. Included in these components are the use of Virtualbox, Ubuntu, Apache, SSH, and Firewalls.

Basic terminology that the reader must know

Virtualbox

An open-source platform made by Oracle. It allows users to run multiple guest operating systems on a single host machine.

Ubuntu

A variant of the Ubuntu Linux distribution made for server environments. It offers a secure platform for hosting websites. It receives regular updates and has a large repository of software packages. It provides tools for system management, security, and virtualization. These features make it suitable for a wide range of server workloads.

Apache

An open-source web server that is used around the world. It is a very flexible application which allows for efficient handling of connections at the same time. It has support for SSL/TLS encryption which ensures a secure communication.

SSH

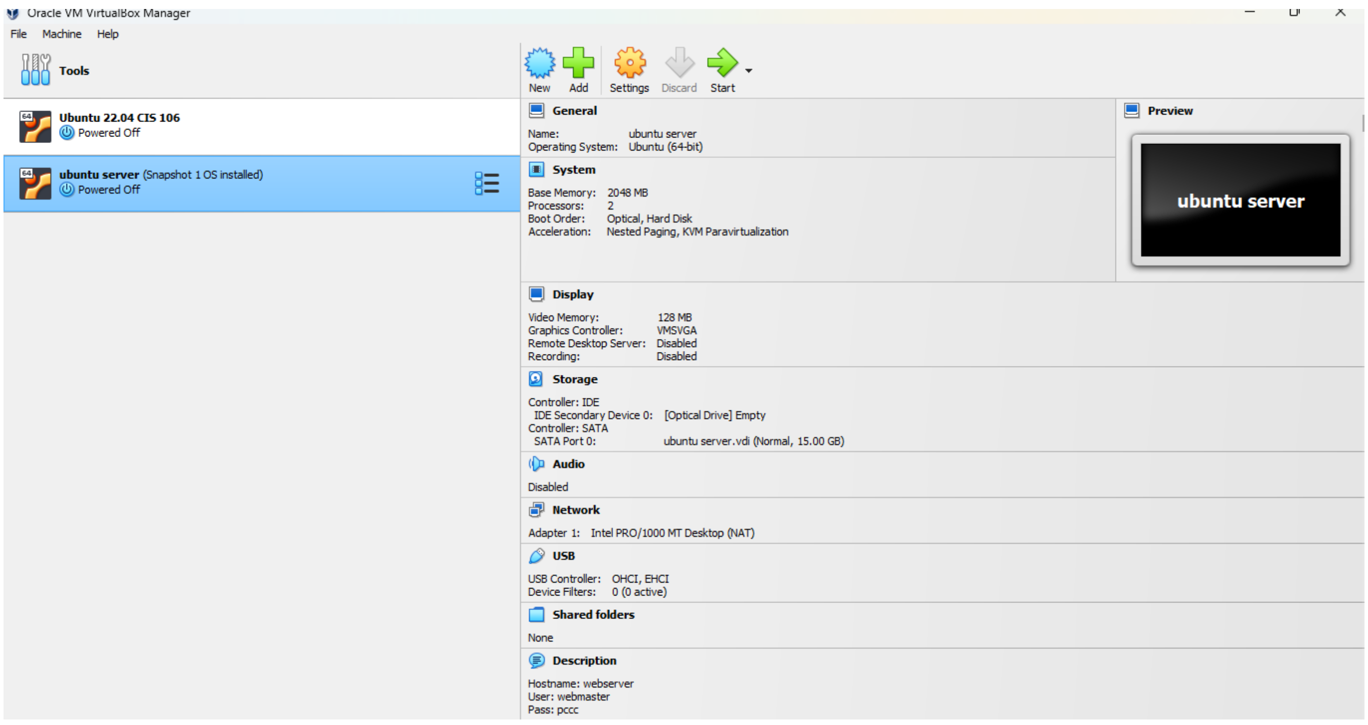
Stands for Secure Shell. It is a cryptographic network protocol that allows for secure communication between two computers over an unsecured network. It provides encrypted connections for secure remote login. SSH authentication usually involves passwords. SSH is an essential tool for secure remote access and administration.

Firewall

A network security device that monitors and controls incoming and outgoing network traffic based on predetermined rules. It is a barrier between a trusted internal network and an untrusted external network.

Step-by-step instructions

Part 1 Virtual Machine


Oracle VM VirtualBox Manager
File Machine Help
Tools
New Add Settings Discard Start
Ubuntu 22.04 CIS 106
Powered Off
ubuntu server (Snapshot 1 OS installed)
Powered Off
Preview
ubuntu server

General
Name: ubuntu server
Operating System: Ubuntu (64-bit)

System
Base Memory: 2048 MB
Processors: 2
Boot Order: Optical, Hard Disk
Acceleration: Nested Paging, KVM Paravirtualization

Display
Video Memory: 128 MB
Graphics Controller: VMSVGA
Remote Desktop Server: Disabled
Recording: Disabled

Storage
Controller: IDE
IDE Secondary Device 0: [Optical Drive] Empty
Controller: SATA
SATA Port 0: ubuntu server.vdi (Normal, 15.00 GB)

Audio
Disabled

Network
Adapter 1: Intel PRO/1000 MT Desktop (NAT)

USB
USB Controller: OHCI, EHCI
Device Filters: 0 (0 active)

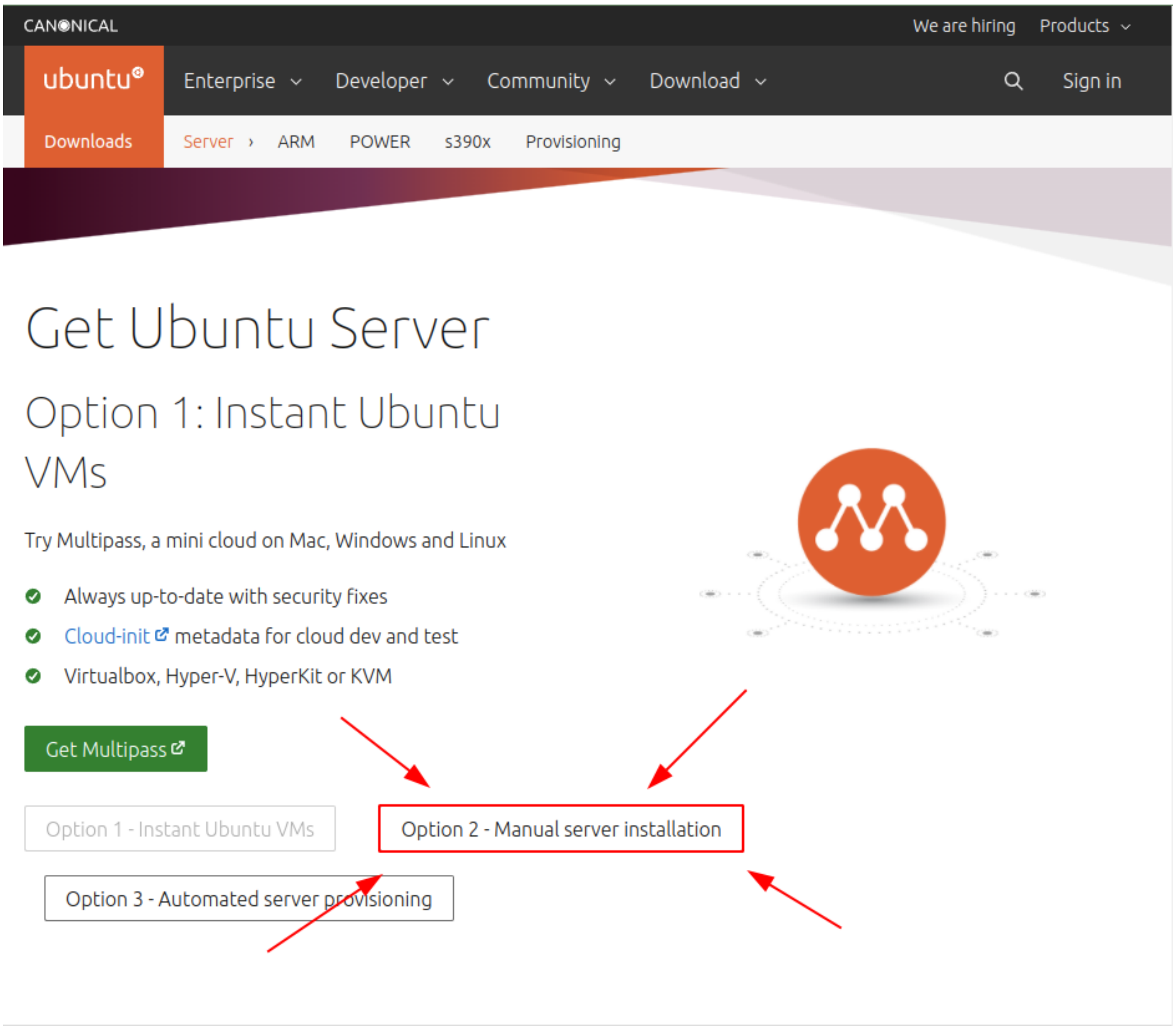
Shared folders
None

Description
Hostname: webserver
User: webmaster
Pass: pccc

Minimum requirements are 2 GBs of RAM and 5 GBs of Disk space

Part 2 Install Ubuntu Server

- Install Ubuntu server 20.04 file



Get Ubuntu Server

Option 1: Instant Ubuntu VMs

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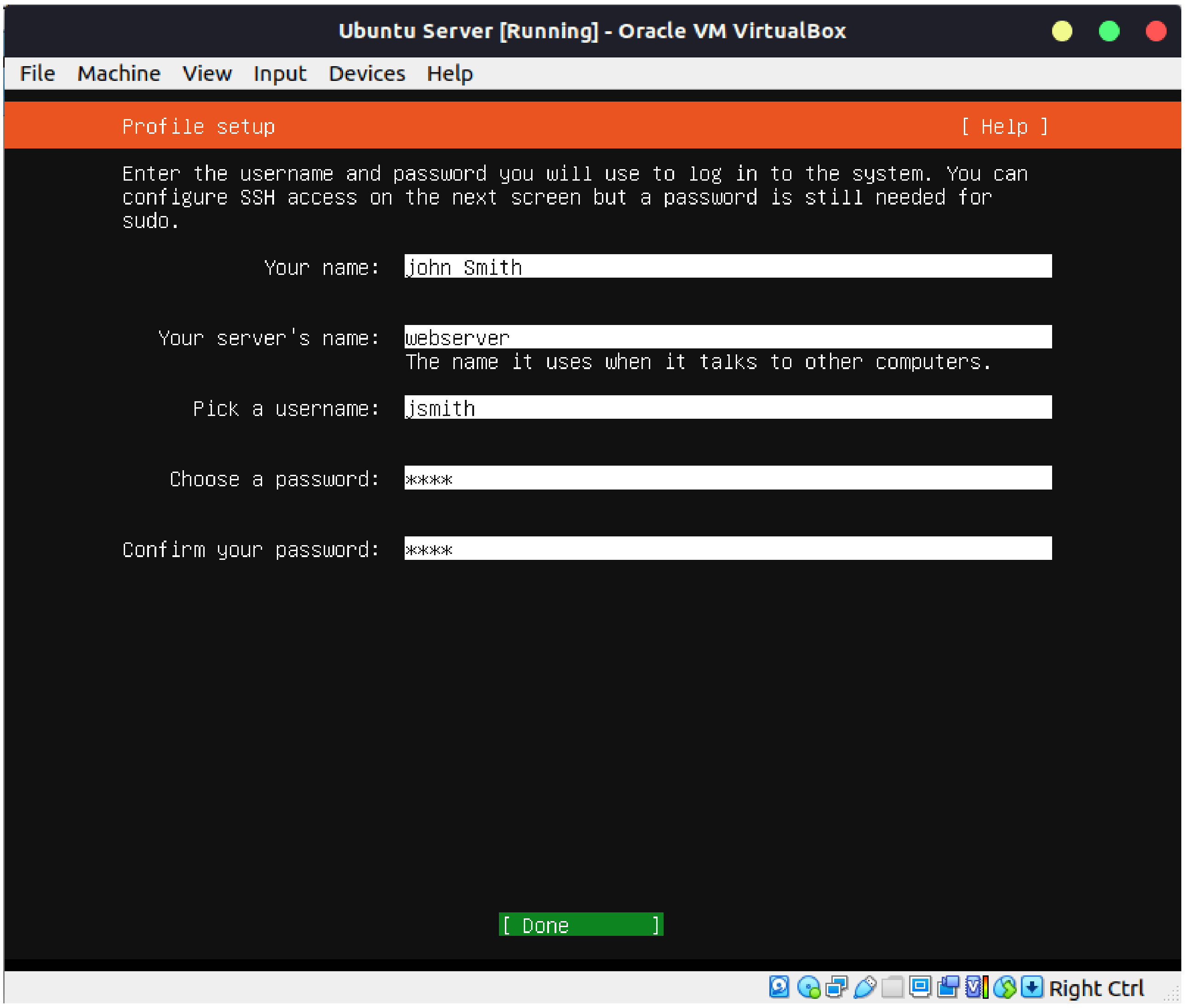
- Always up-to-date with security fixes
- Cloud-init metadata for cloud dev and test
- Virtualbox, Hyper-V, HyperKit or KVM

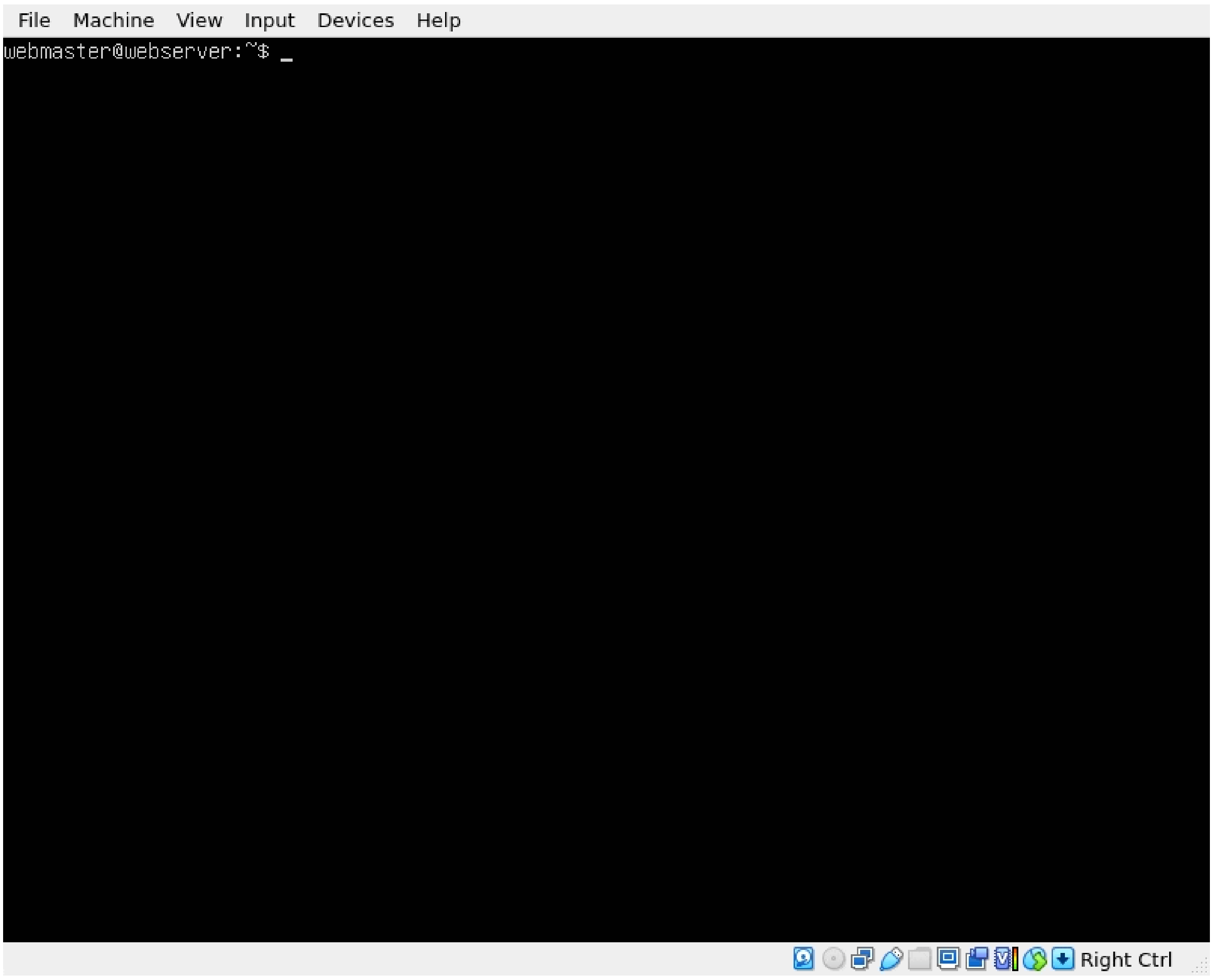
- Create a virtual machine that meets the minimum requirements
- Turn on the virtual machine
- Start the installer
- Choose a server name, username, and password


Ubuntu Server [Running] - Oracle VM VirtualBox
File Machine View Input Devices Help
Right Ctrl

```
Profile setup                                                   [ Help ]

Enter the username and password you will use to log in to the system. You can
configure SSH access on the next screen but a password is still needed for
sudo.

            Your name: john Smith

     Your server's name: webserver
                        The name it uses when it talks to other computers.

       Pick a username: jsmith

     Choose a password: *****

  Confirm your password: *****

                              [ Done     ]
```

Part 3 Install Apache

`sudo apt update sudo apt install apache2 -y`

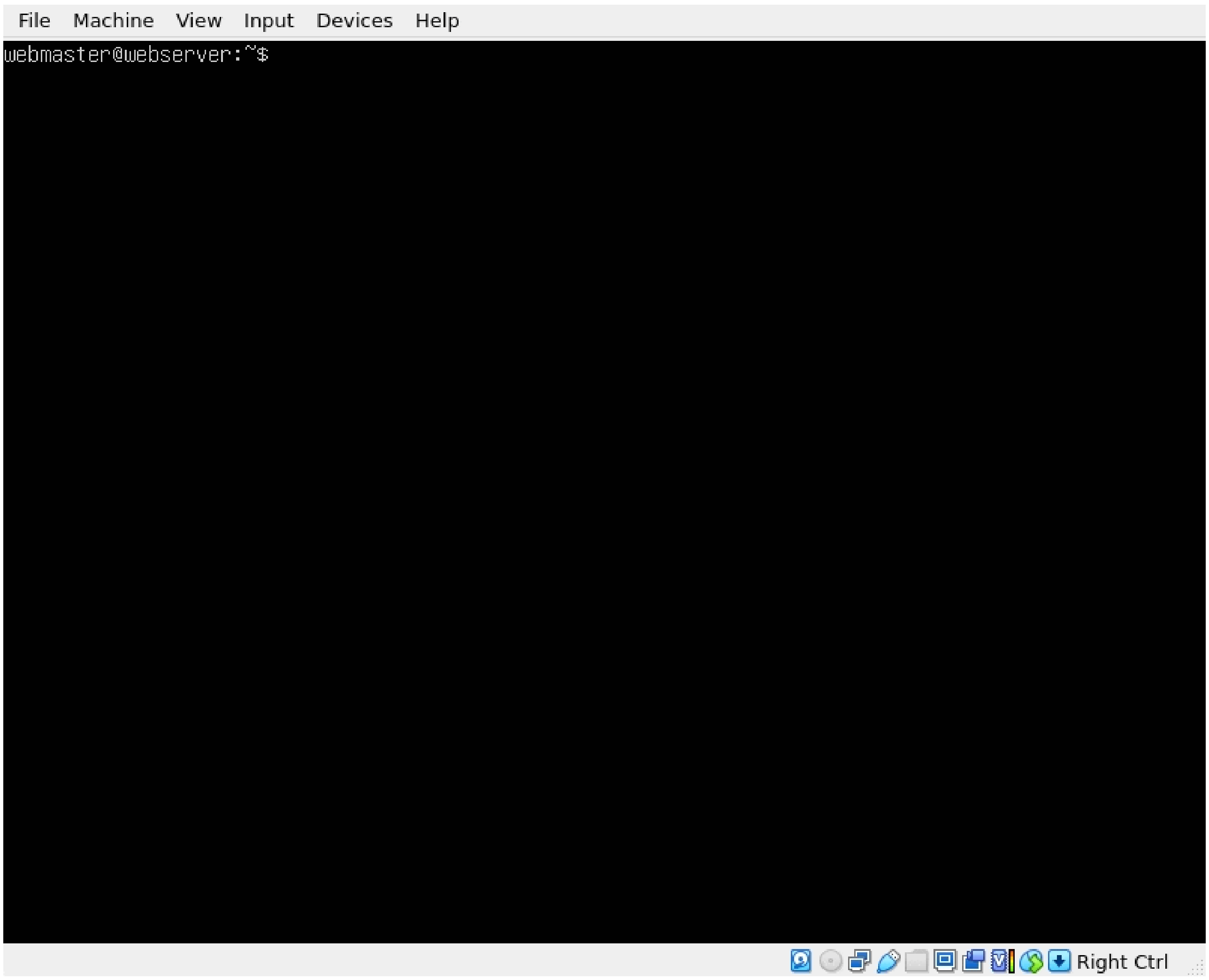


```
webmaster@webserver:~$ _
```

Part 4 Setup SSH

To enable the firewall

- `sudo ufw enable`
- `sudo ufw allow 'Apache`
- `sudo ufw allow 'OpenSSH'` To check the status of the firewall
- `sudo ufw status` To make sure if Apache and SSH are running
- `systemctl status apache2 --no-pager`
- `systemctl status ssh --no-pager` If the commands do not say "running" `sudo systemctl restart apache2 ssh`



```
webmaster@webserver:~$
```

Part 5 Setup virtual hosts

Create the directory for mywebsite as follows: `sudo mkdir /var/www/mywebsite`

Modify the ownership of mywebsite so that it is now owned by your user instead of root `sudo chown -R $USER:$USER /var/www/mywebsite`

Now let's change the file permission so that the owner can read, write, and execute the files while granting only read and execute permissions to groups and others: `sudo chmod -R 755 /var/www/mywebsite`

We can now create a simple html document to be served from our new virtual host. Create a document with the nano text editor called index.html in the `/var/www/mywebsite/` directory: `sudo nano /var/www/mywebsite/index.html.`

Once the new document opens, type the following text:

This is a sample document!

Save and close the file when you are finished.

We need to create a virtual host file so that this new content can be served. The default configuration is located in `/etc/apache2/sites-available/000-default.conf`

However, we do not need to touch this file, we can instead create a new one as it is best practice. To create a new config file, we are going to use nano again: `sudo nano /etc/apache2/sites-available/mywebsite.conf`

Add the following text to the domain config file:

<VirtualHost *:80> ServerAdmin webmaster@localhost ServerName mywebsite ServerAlias www.mywebsite DocumentRoot /var/www/mywebsite ErrorLog ${APACHE_LOG_DIR}/error.log CustomLog ${APACHE_LOG_DIR}/access.log combined

Save and close the file when you are finished.

Now you can enable the site with the following command: `sudo a2ensite mywebsite.conf`

Now lets disable the default domain: `sudo a2dissite 000-default.conf`

Before we can refresh the configuration, we need to add a configuration line to the `apache2.conf` file. Open the file in nano: `sudo nano /etc/apache2/apache2.conf`

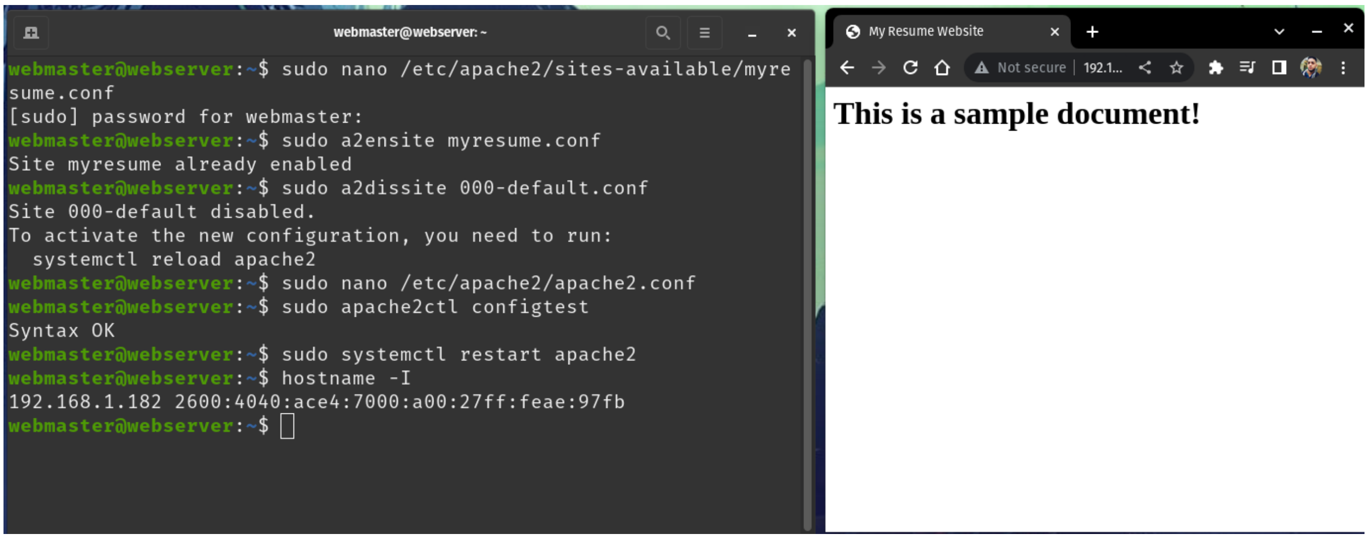
Add the following line at the end of the file: `ServerName 127.0.0.1`

Save and close the file when you are finished. Now you can test the configuration for errors: `sudo apache2ctl configtest`

The output of the command should look like this: `Syntax OK`

If there are no errors, restart Apache to apply the changes: `sudo systemctl restart apache2`

Now, if you open a web browser in your host computer and go the URL: `http://ip.address.of.your.server/` your `index.html` document should load.



```
webmaster@webserver:~$ sudo nano /etc/apache2/sites-available/myre
sume.conf
[sudo] password for webmaster:
webmaster@webserver:~$ sudo a2ensite myresume.conf
Site myresume already enabled
webmaster@webserver:~$ sudo a2dissite 000-default.conf
Site 000-default disabled.
To activate the new configuration, you need to run:
  systemctl reload apache2
webmaster@webserver:~$ sudo nano /etc/apache2/apache2.conf
webmaster@webserver:~$ sudo apache2ctl configtest
Syntax OK
webmaster@webserver:~$ sudo systemctl restart apache2
webmaster@webserver:~$ hostname -I
192.168.1.182 2600:4040:ace4:7000:a00:27ff:feae:97fb
webmaster@webserver:~$
```

This is a sample document!