EXPERIMENT 1

Lab Exercise: Introduction to Vagrant and Vagrantfile

This exercise will guide them through setting up a virtual environment using Vagrant, configuring the environment via a Vagrantfile, and managing the virtual machines (VMs) with basic Vagrant commands.

Objective:

- Learn how to set up and configure virtual environments using Vagrant.
- Understand the structure and components of a Vagrantfile.
- Gain hands-on experience in managing virtual machines using Vagrant commands.

Prerequisites:

- Basic knowledge of virtualization concepts.
- Familiarity with command-line interfaces.
- Installation of Vagrant and VirtualBox (or any other supported provider) on your local machine.

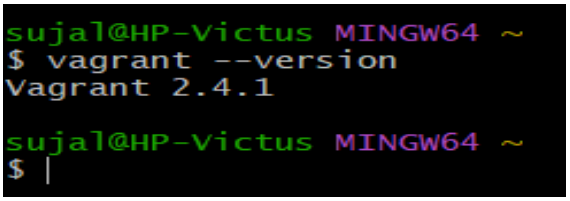
Step-by-Step Exercise:

1. Setting Up the Environment:

Install Vagrant:

- Download and install Vagrant from the official website.
- Ensure you have VirtualBox installed as it is a commonly used provider with Vagrant.
- Verify Installation:
- Open a terminal or command prompt.
- Run the following commands to verify the installation:

```
vagrant --version
```

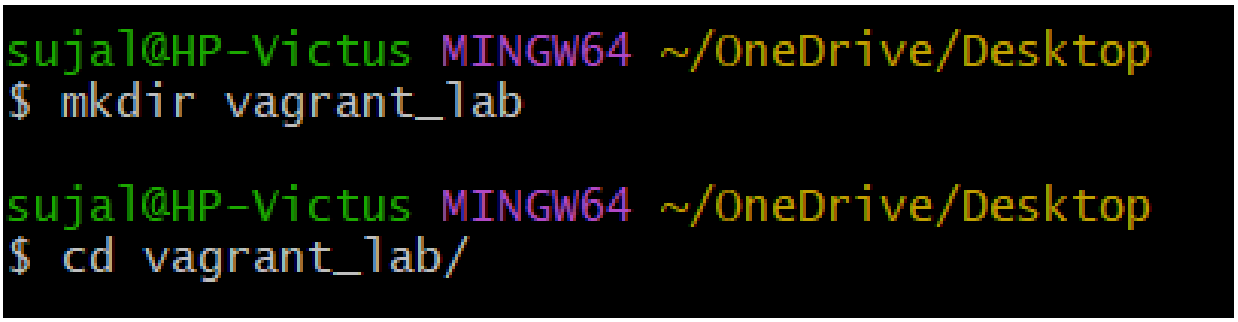


2. Creating a New Vagrant Project:

- Create a Project Directory:
- In your terminal, create a new directory for your Vagrant project and navigate into it:

```
mkdir vagrant_lab

cd vagrant_lab
```

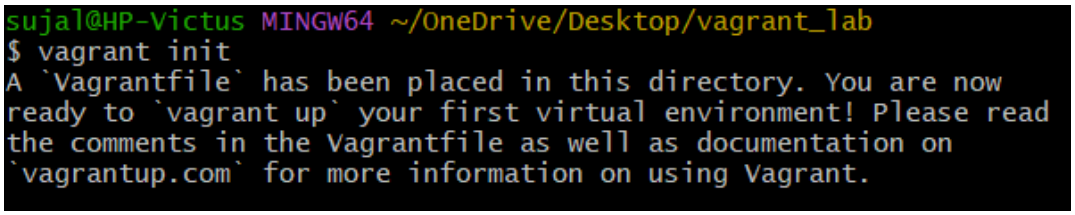


Initialize Vagrant:

- Run the following command to initialize a new Vagrantfile in your project directory:

```
vagrant init
```

This command will generate a Vagrantfile in the current directory.



3. Understanding the Vagrantfile:

- Open the Vagrantfile:
- Open the Vagrantfile in a text editor of your choice.
- The Vagrantfile is a Ruby-based configuration file used to define the virtual environment.
- Basic Vagrantfile Configuration:
- Modify the Vagrantfile to configure a basic virtual machine. For example:

```
Vagrant.configure("2") do |config|

  config.vm.box = "ubuntu/bionic64"  # Specifies the base box to use (Ubuntu 18.04)

  config.vm.network "private_network", type: "dhcp"  # Configures a private network

  config.vm.provider "virtualbox" do |vb|

    vb.memory = "1024"  # Allocates 1GB of RAM to the VM

  end

end
```

4. Launching and Managing the VM:

Start the VM:

In the terminal, start the VM using the following command:

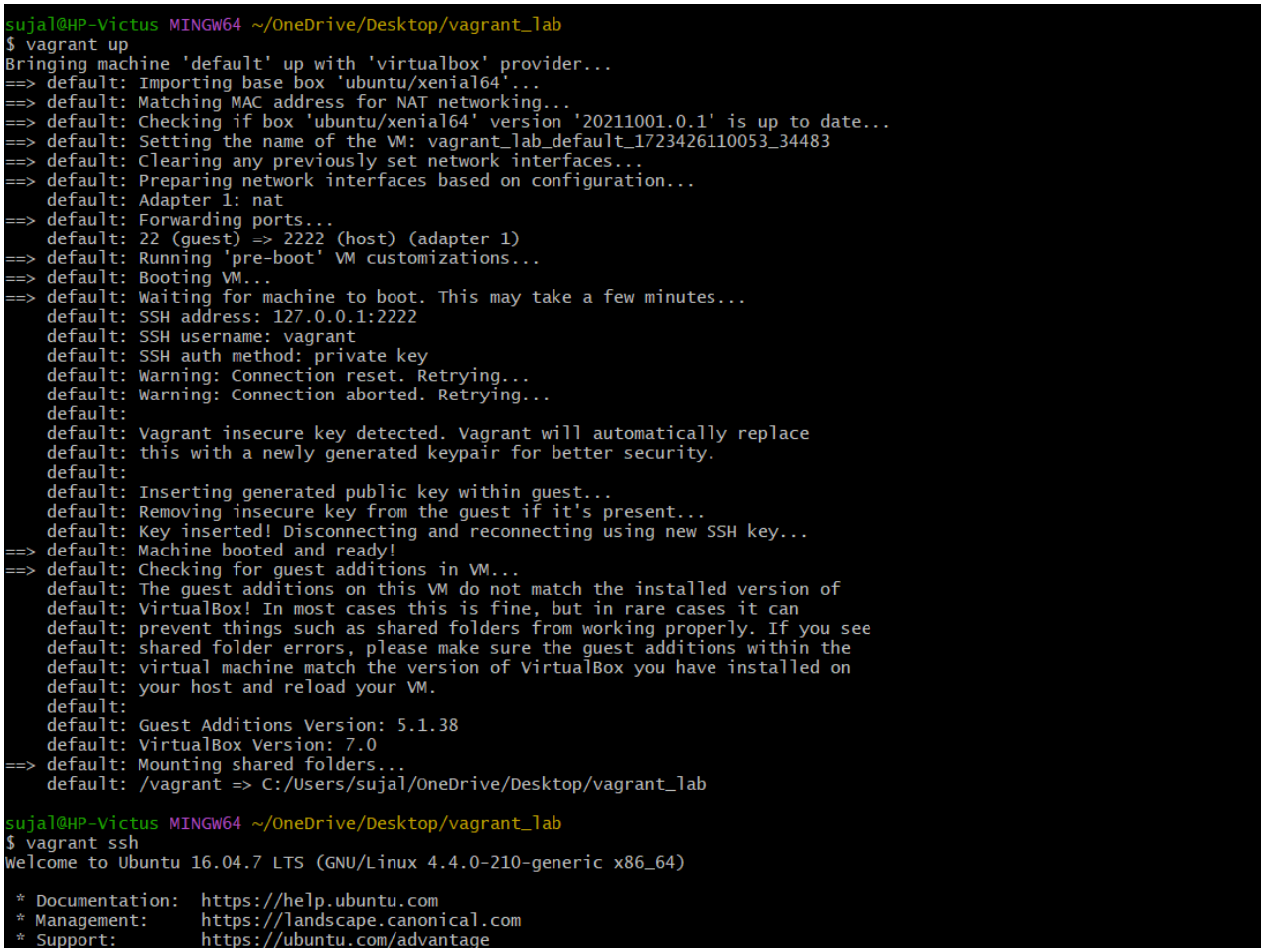
```
vagrant up
```

Vagrant will download the specified box (if not already downloaded) and launch the VM.

SSH into the VM:

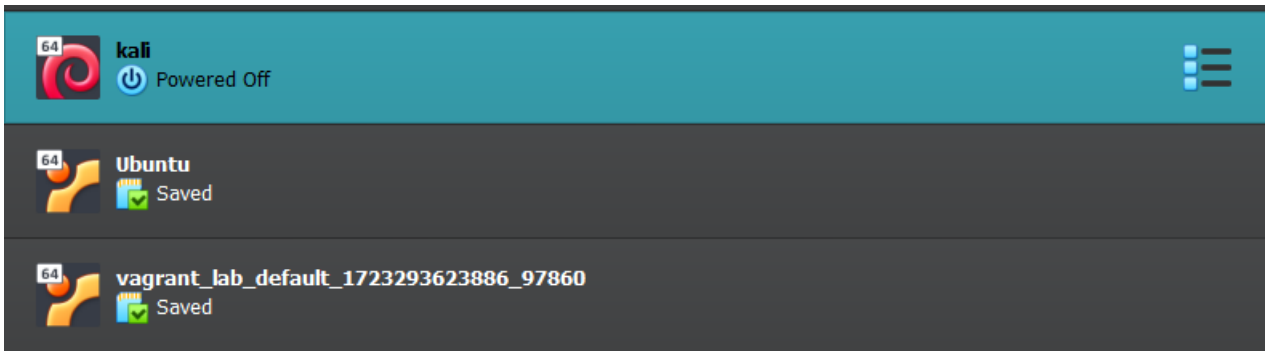
- Connect to the running VM using SSH:

```
vagrant ssh
```



- This command will log you into the VM's shell.
- Exploring the VM:
- Inside the VM, explore the filesystem, install packages, and run commands to understand the environment.
- Stop the VM:
- Exit the SSH session by typing exit.
- Stop the VM with the following command:

```
vagrant halt
```



Destroy the VM (optional):

To remove the VM completely, use the following command:

```
vagrant destroy
```

This will remove all traces of the VM, including any data stored on it.

Explore the benefits of using Vagrant for development and testing environments.

Submission:

- Submit a brief report including the Vagrantfile you configured, screenshots of the running VM, and the output of any commands run within the VM.
- Reflect on the learning experience and any challenges faced during the exercise.

This lab exercise provides a hands-on introduction to Vagrant, focusing on creating and managing virtual environments through a Vagrantfile. It offers both foundational learning and opportunities to explore more advanced features.