

**Containers & Docker Security LAB**

SUBMITTED TO SUBMITTED BY

Dr. Hitesh Kumar Sharma Siddharth Agarwal

500107594

R2142220663

Btech CSE DevOps B1

**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.

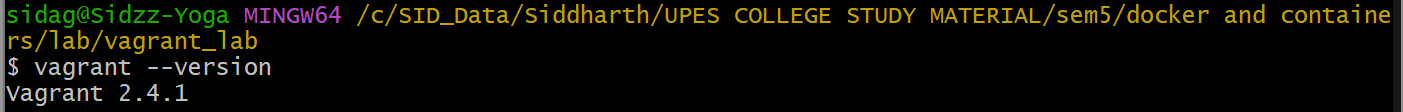
**Step-by-Step Exercise:**

1. **Setting Up the Environment:**

**Install Vagrant:**

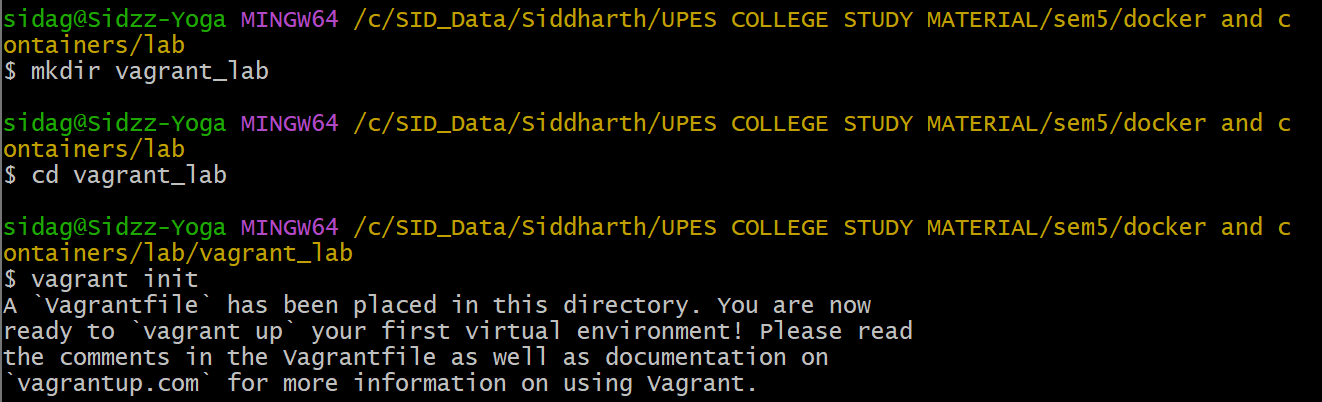
* + Download and install Vagrant from the official website.
  + Ensure you have VirtualBox installed as it is a commonly used provider with Vagrant.
  + Verify Installation:
  + Open a terminal or command prompt.
  + Run the following commands to verify the installation:

vagrant --version



1. **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

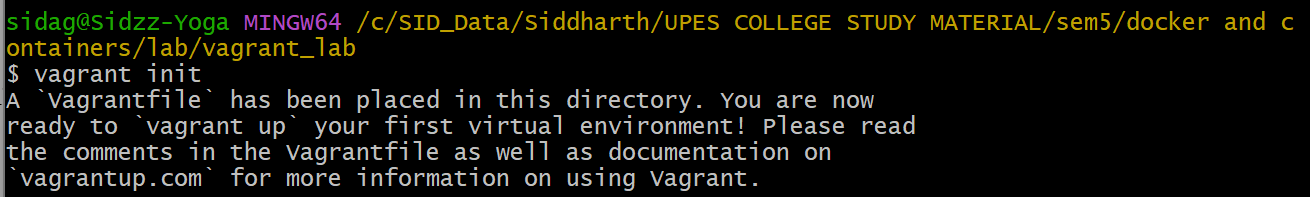
****

**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.



1. **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:

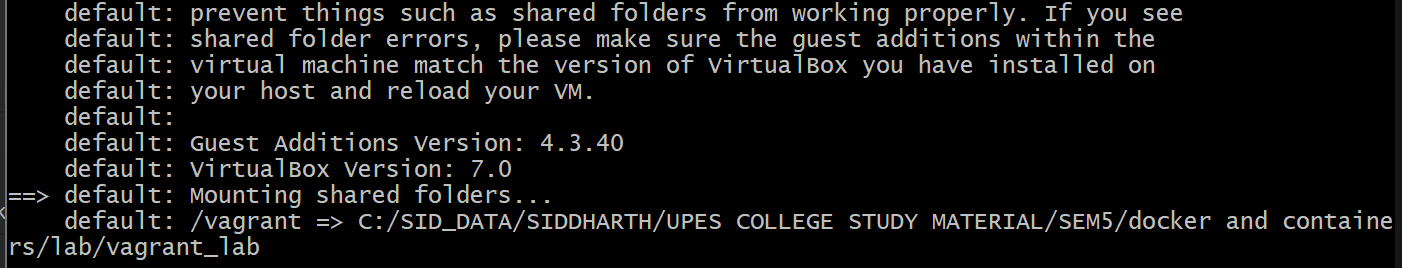
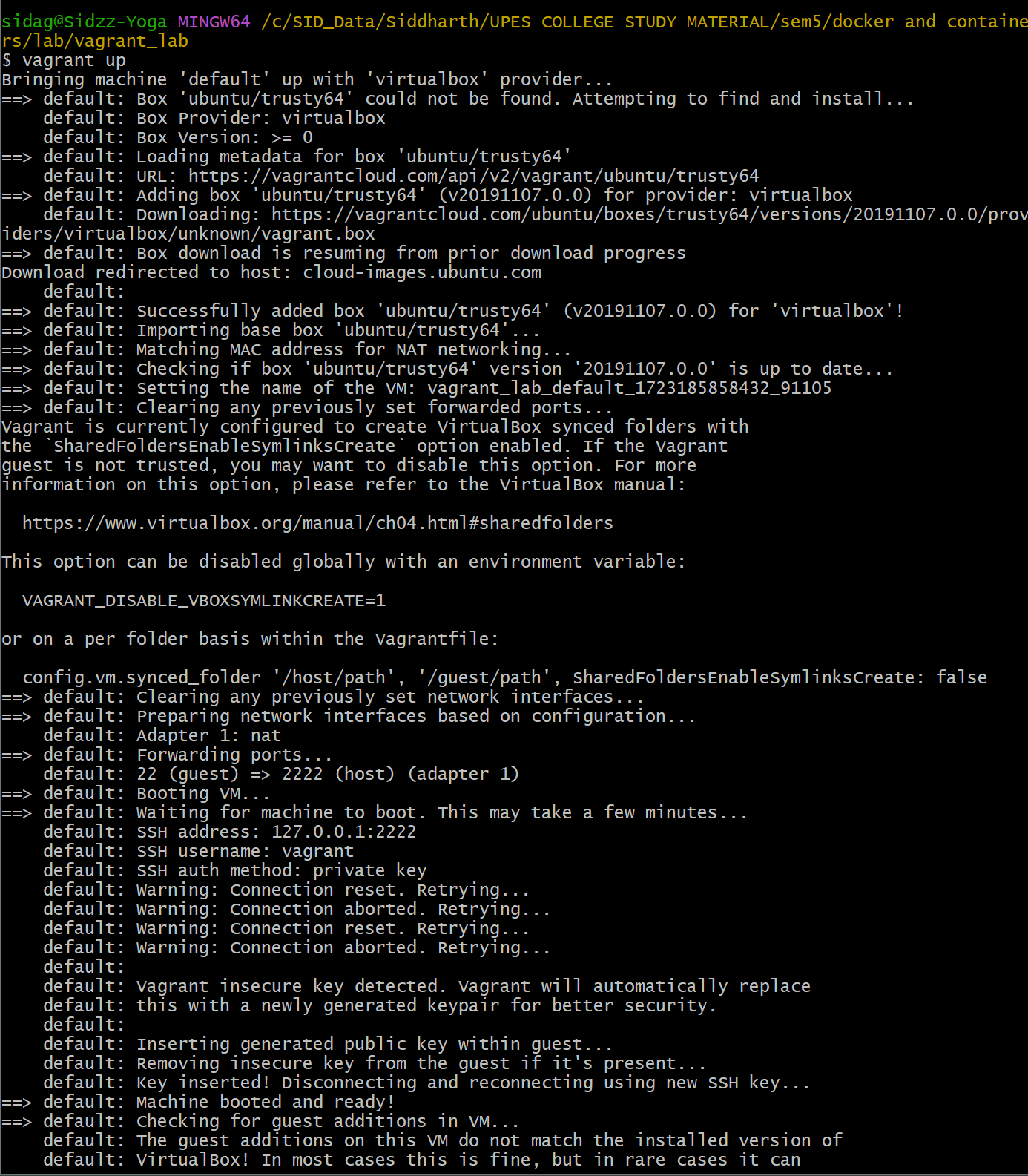
|  |
| --- |
| Vagrant.configure("2") do |config|  config.vm.box = "ubuntu/bionic64" # Specifies the base box to use (Ubuntu  18.04)  config.vm.network "private\_network", type: "dhcp" # Configures a private network  config.vm.provider "virtualbox" do |vb| vb.memory = "1024" # Allocates 1GB of RAM to the VM  end  end |

1. **Launching and Managing the VM:**

Start the VM:

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

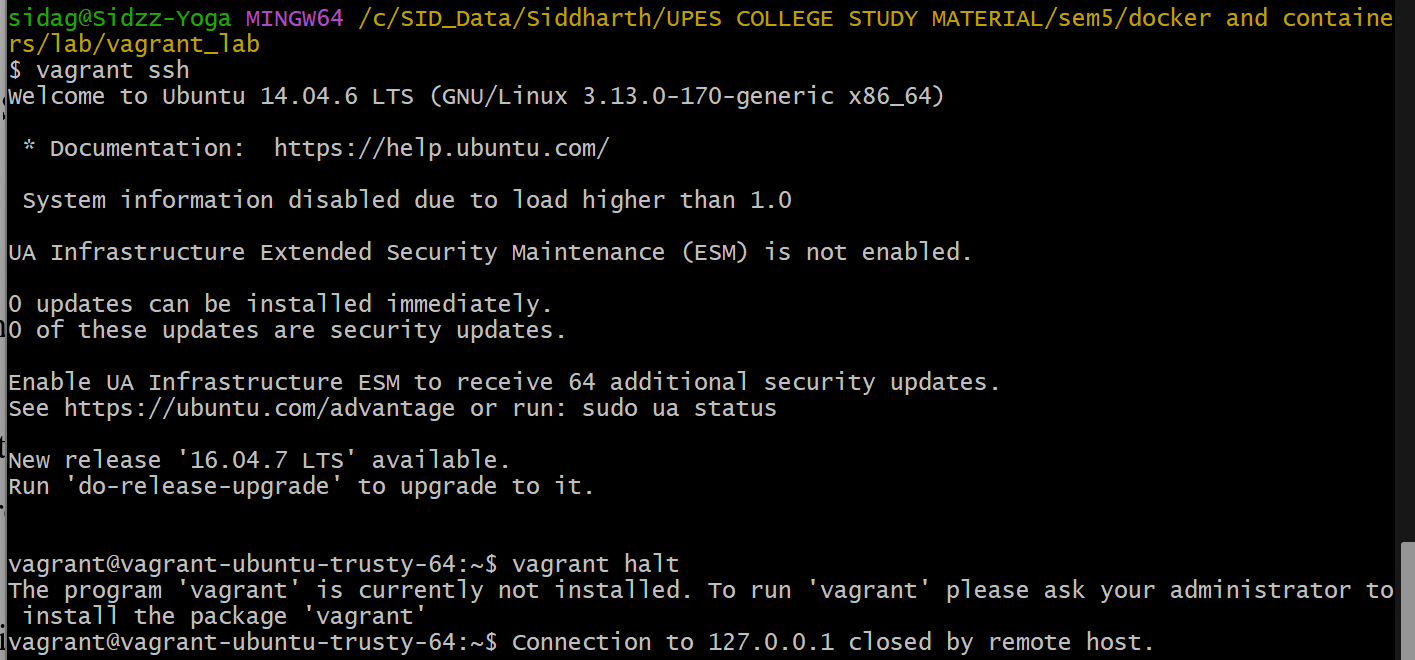
vagrant up



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

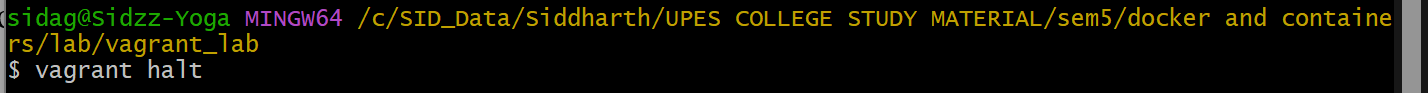
* + SSH into the VM:
  + Connect to the running VM using SSH:

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.