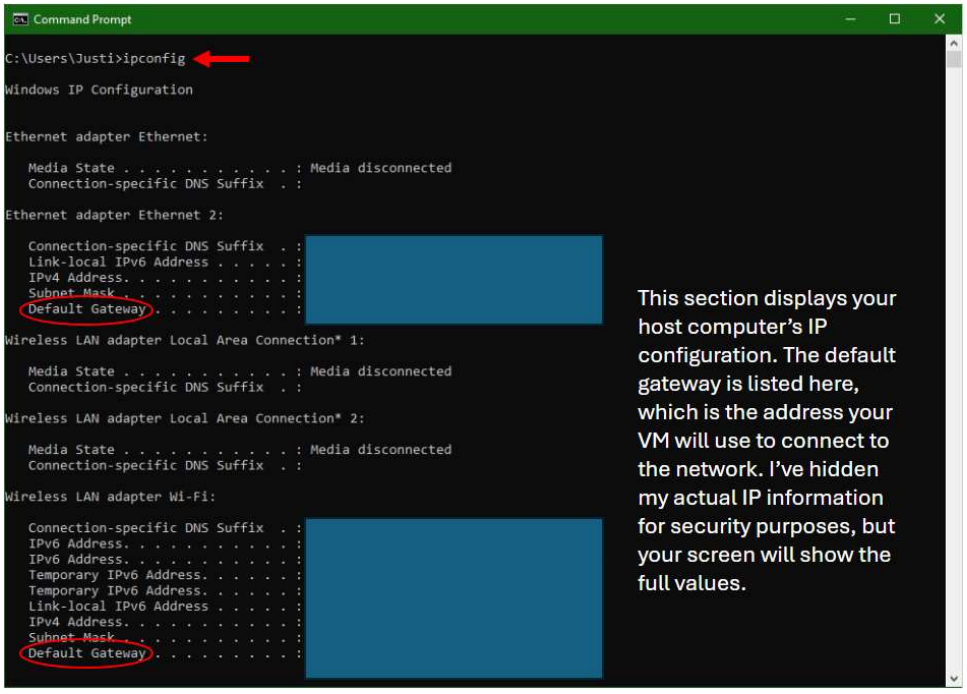
Configure Ubuntu Server (Linux Layer)

Ubuntu Server is already installed on your VM, but now we'll configure it to act as the stable base for the stack.

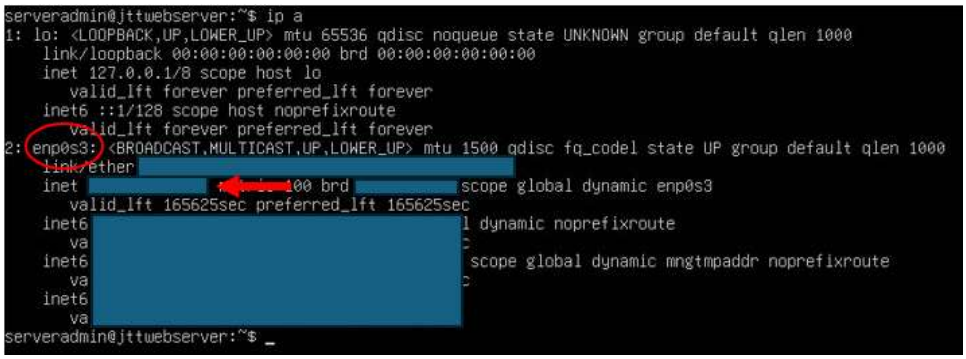
1. Start your VM in VirtualBox and login using the login credentials you created during install.

2. Set a static IP address to ensure consistent network configuration for web server reliability.

    a. Open command prompt on your host machine and type *ipconfig* on the command line to find the default gateway for your host machine. If you have a wired connection, it will be found under your ethernet adapter; if you have a wireless connection, it will be found under your wifi adapter.



b. In your Ubuntu Server VM, type *ip a* on the command line to display your VM's IP configuration and locate your ethernet adapter (it will start with en) and note the VM's dynamic IP address, on the line next to inet, to include it's CIDR notation (example: 192.168.0.125/24, the /24 being the CIDR notation).



You will need to identify an available IP address within the available range on your network to use as your static IP address. If your dynamic IP address is 192.168.0.125/24, the available range would be 192.168.0.126 to 192.168.0.254.

c. Next, we lets locate the network configuration file in the Ubuntu Server VM which will be in the netplan directory. On the command line, type the following commands (press enter after each command):

```
cd /etc/netplan
ls
```

This changed the current directory to the netplan directory which is located in the etc folder and then displayed a list of contents in the netplan directory. You should see a file called 50-cloud-init.yaml. Now let's display the contents of that file by typing the following command and pressing enter:

```
sudo cat 50-cloud-init.yaml
```

Be sure to use sudo or you will get a "permission denied" message because the netplan directory is in the root folder. If you are prompted for a password, enter your root password. The ethernet adapter under ethernets should match the ethernet adapter we located earlier.

d. Before we make changes to the network configuration file, lets make a backup of the current file, in case we ever need to revert to the original settings, by typing the following commands (press enter after each line):

```
sudo cp /etc/netplan/50-cloud-init.yaml /etc/netplan/50-cloud-init.yaml.backup
```

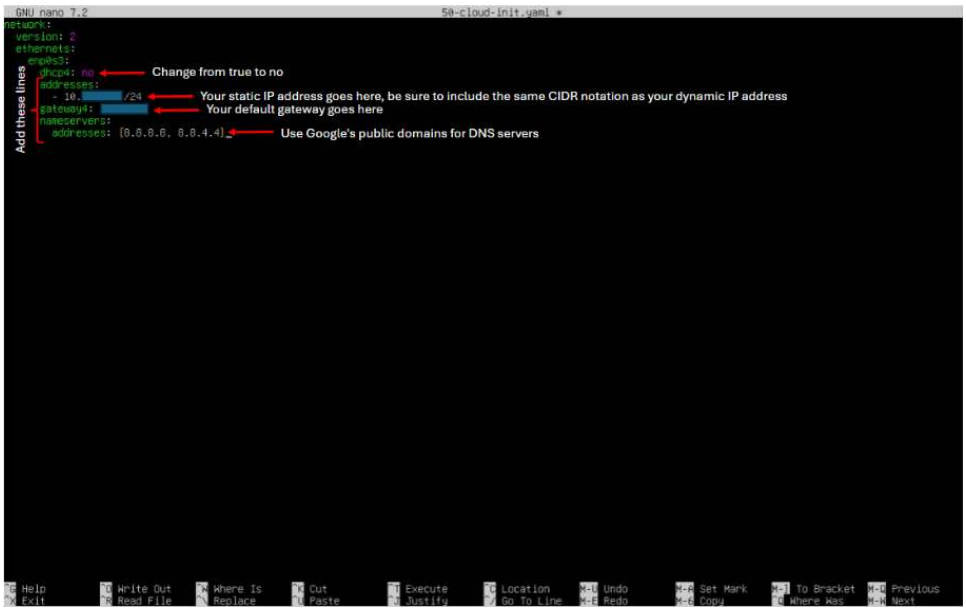
If prompted to enter a password, again use your root password. Type *ls* on the command line and press enter. You should now see 2 files in the directory, the original file and the backup file you just created.

e. Now we are ready to edit the network configuration file using the following commands:

```
sudo nano 50-cloud-init.yaml
```

In the nano editor change the dhcp4 field from true to no and add the following code directly below the dhcp4 line replacing <your-ip-address> with your chosen static ip address and <your-default-gateway> with your host machine's default gateway:

```
addresses:
  - <your-ip-address>
gateway4: <your-default-gateway>
nameservers:
  addresses: [8.8.8.8, 8.8.4.4]
```



To exit the nano editor, press CTRL+X, type y and press enter, confirm the file path and press enter.

f. Type the following commands pressing enter after each line to apply and verify the static ip configuration (enter your root password if prompted):

```
sudo netplan apply
hostname -I
```

You should now see your static ip address displayed on the screen.

g. Test the static ip address to ensure you have a solid connection:

```
ping -c 4 8.8.8.8
```

You should get a successful test. Now open command prompt on the host machine and try to ssh into your VM using the following command and pressing enter replacing <your-username> with your VM username and <your-ip-address> with your VM's IP address:

```
ssh <your-username>@<your-ip-address>
```

The first time using ssh, you will get a fingerprint message, just type yes to continue and you will be prompted to enter your password, be sure to use the password you use to login into your VM. You will now be able to access your server from the host machine's command prompt or powershell.

3. Update the system
    a. Before installing any new software, it is important to update the system. Updating ensures that all existing packages are current, security patches are applied, and dependencies are aligned. To do this type the following command:

```
sudo apt update && sudo apt upgrade -y
```

sudo apt update refreshes the package index, ensuring the system knows about the latest versions available. sudo apt upgrade -y installs the latest versions of the system packages (the -y flag automatically confirms the upgrade). Once the system is complete installing the updates, we are ready to move on to the next step of installing and configuring Apache.