CS234 Azure Step-by-Step Setup

Adapted from the setup instructions for Chris Manning's 2017 offering of CS224n

Key-Points

- This guide will walk you through running your code on GPUs in Azure.
- Before we start, it cannot be stressed enough: **do not leave the VM running when you are not using it.**
- Each person has initially been assigned $50 of credit
- **The expected time from start to finish is 1-2 hours. The most time consuming part will be downloading and installing NVIDIA drivers, CUDA and Tensorflow.**

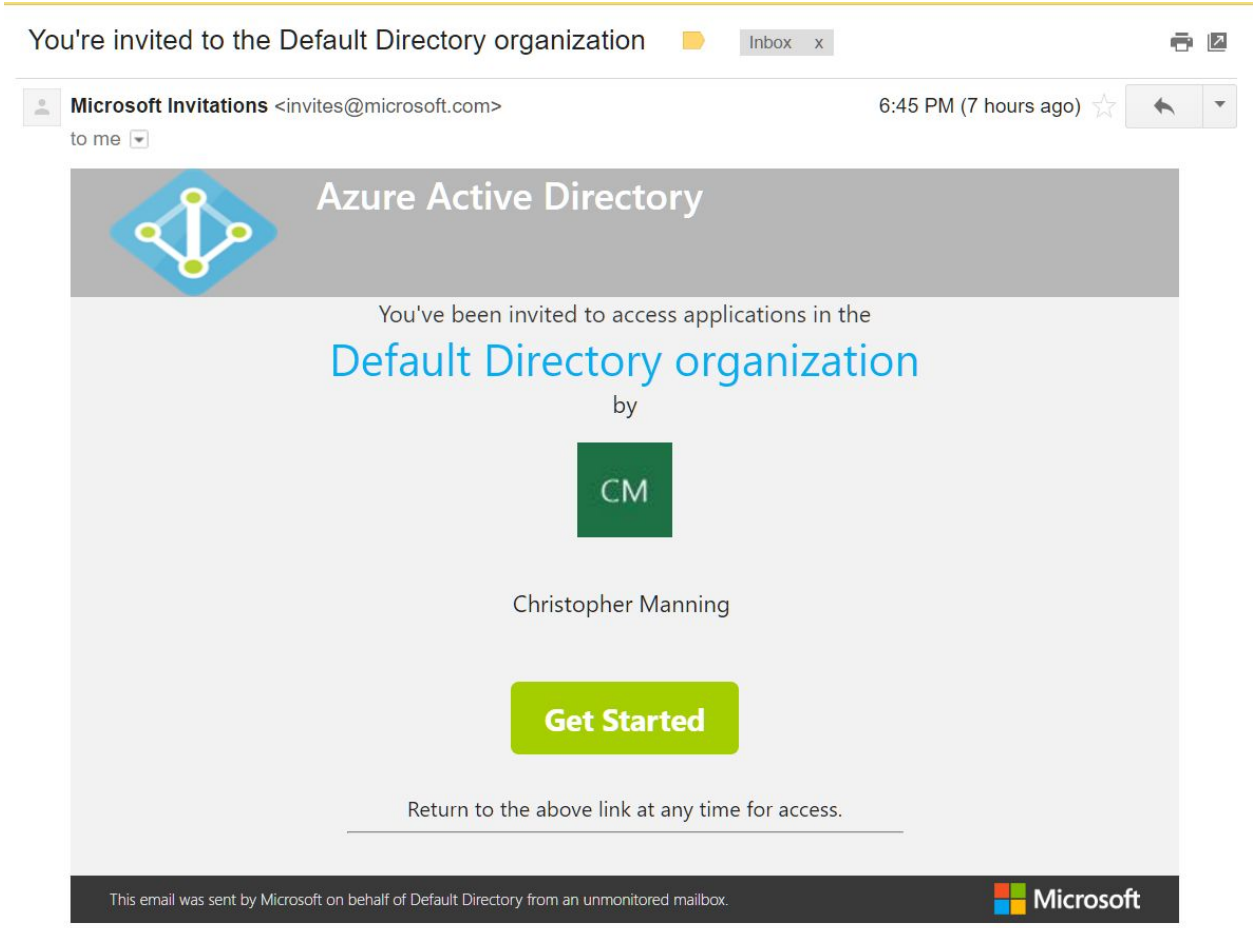
FAQ

- Do not install updates using: sudo apt-get install --upgrade
    - This might break the CUDA driver installation if the kernel is updated.
- Out of disk space error when unzipping or downloading your dataset.
    - Attach a larger disk to your VM. https://docs.microsoft.com/en-us/azure/virtual-machines/virtual-machines-linux-classic-attach-disk
    - Run **df -h** to see which disks have free space.
    - Store your data to the attached disk. There may be a temporary disk as well; do not store persistent data to it!
- Problems connecting (e.g., using SSH) to the VM
    - Try **ping <vm's ip address>**
    - Try ssh to myth/rice first and then try ssh'ing to the VM from there
    - Try restarting the VM and/or your local machine
        - If you restart the VM, remember to refresh your browser, as the IP address may change
    - If all of the previous steps fail, file an Azure support ticket
- Checking Azure credits
    - https://www.microsoftazuresponsorships.com/
        - When you log on click "check my balance" and then "manage" in the sidebar
        - Azure may say "this account does not have active sponsorship". This is because a "subscription" can mean multiple things within Azure, and this is referring to organization/class (e.g. the whole of cs234 wide) sponsorship.
    - **You subscription balance is only updated during working hours, so may not reflect your ACTUAL usage. For example, if you log on at 11pm on**

Sunday, azuresponorships will show your usage as of 5pm Friday, and not reflect ANY of your weekend usage.

Creating a Microsoft account

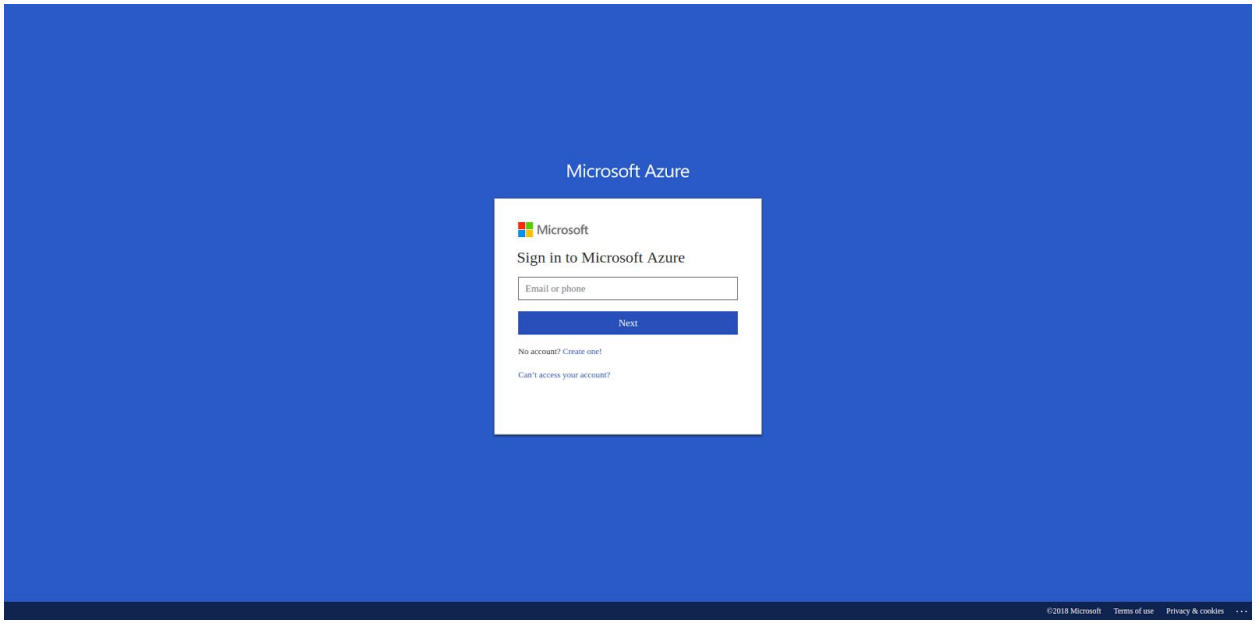
- You should have received an email to your inbox with an invitation to join the Azure subscription with credits.
- Please **follow the instructions** using the email address that received this invitation.



Getting started

Logging into Azure portal

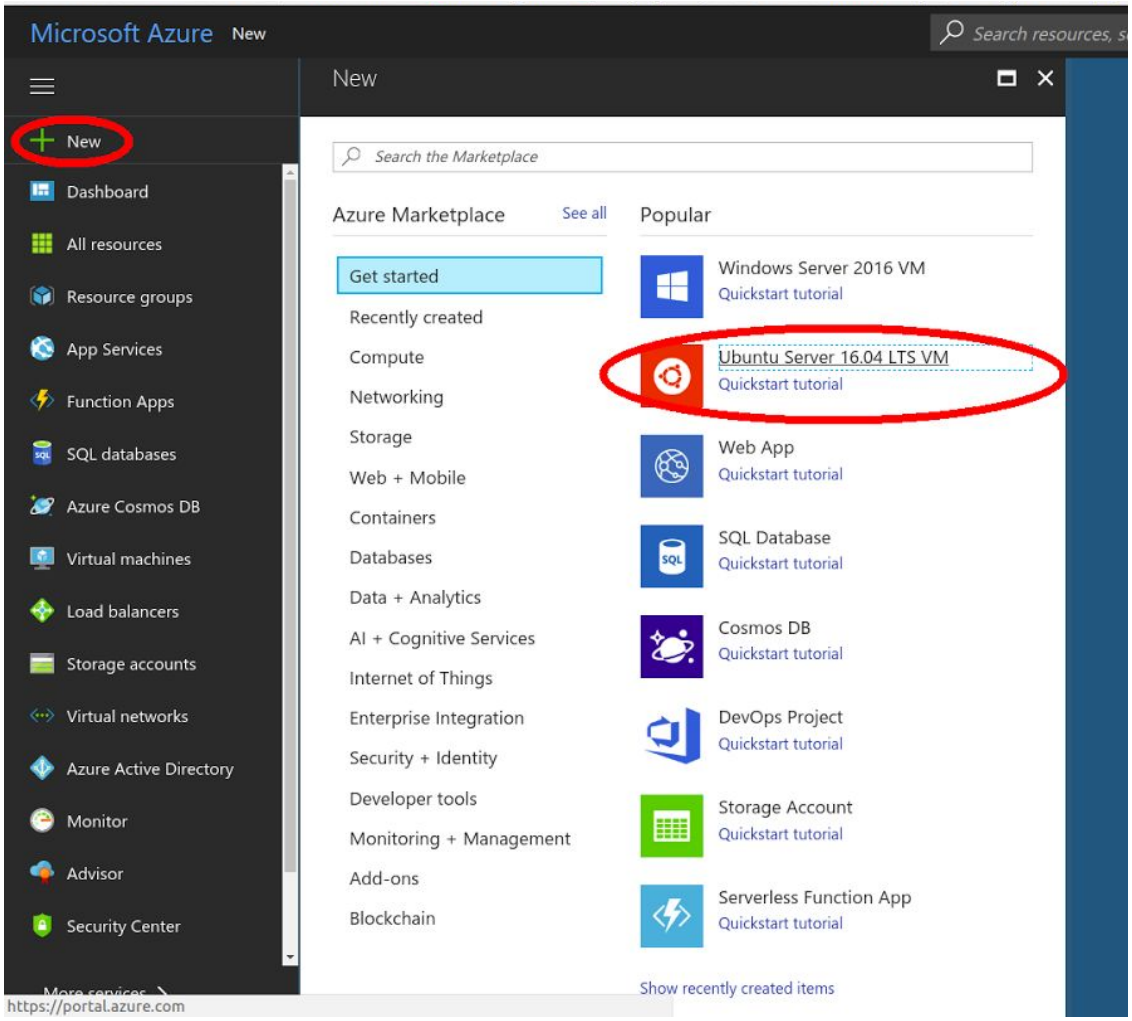
- Once you have created your account, log in to Azure at: portal.azure.com



- After logging in, you should reach the dashboard page.
- If you have multiple subscriptions (e.g., you previously signed up for a free one), then you must select CS234STANFORD by clicking in the top right quarter. If no such option appears see Piazza.

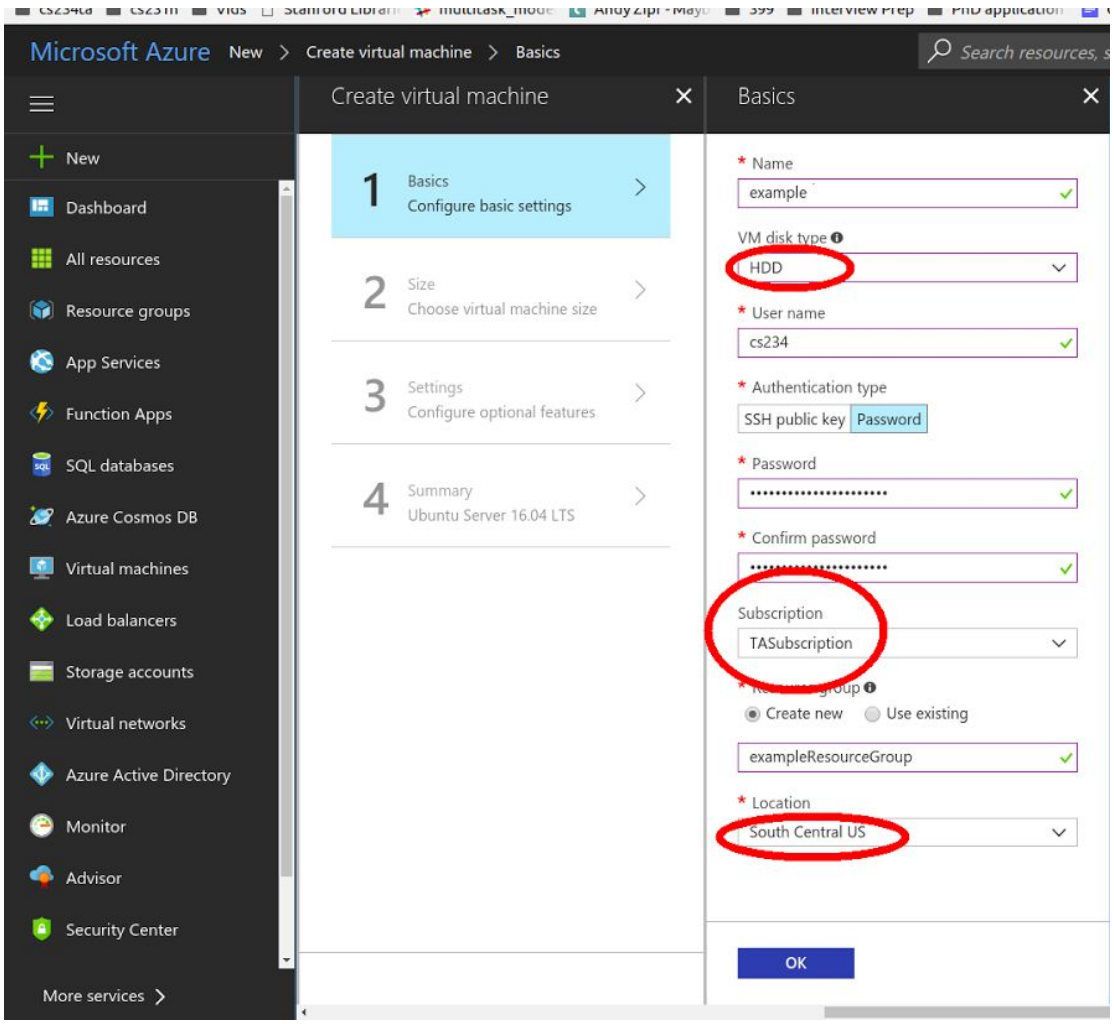
Create a VM

Once you are logged in, click on the + on the left. Select **Ubuntu Server 16.04 LTS**.

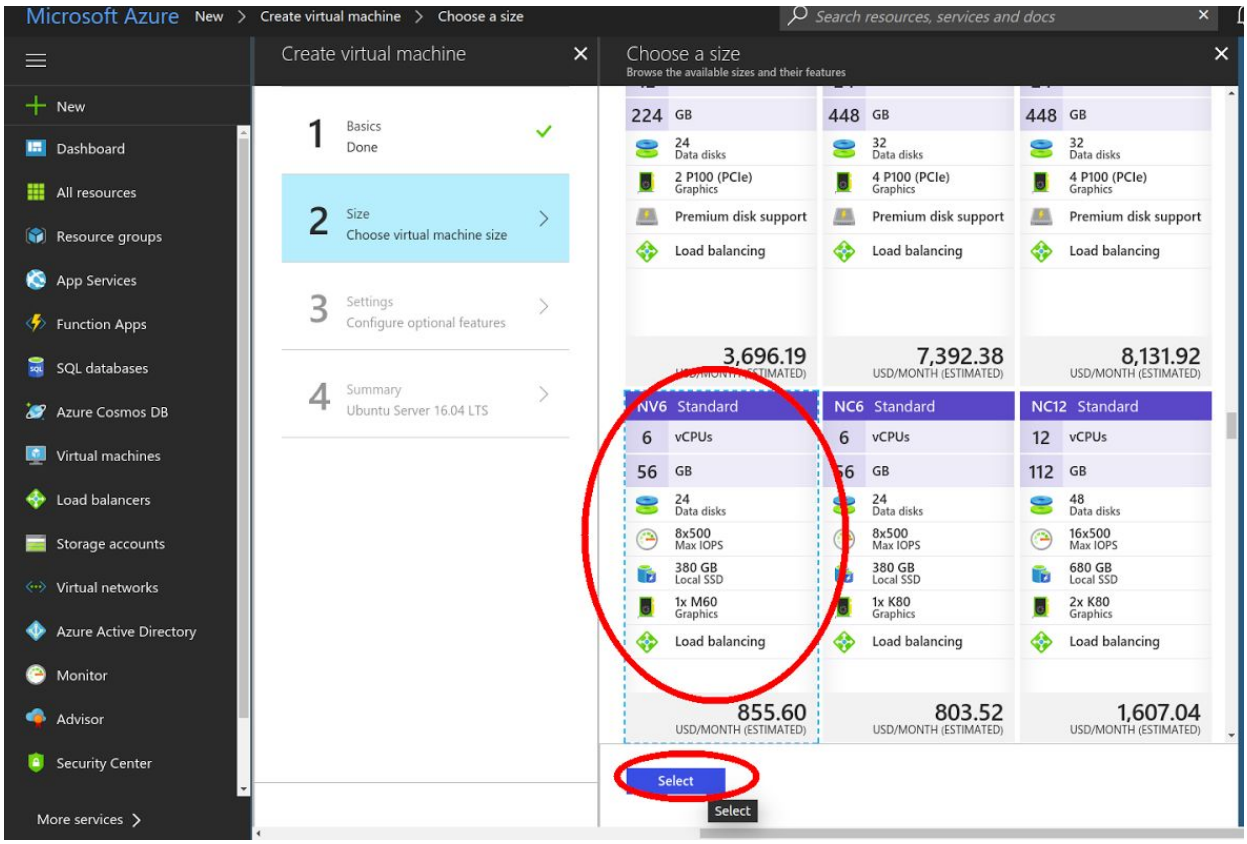


Fill in the name, user, etc for your VM. You must change the storage type from SSD to HDD. Choose “South Central US” for location. If there is a problem when using South Central US, you may use another location, but not GPUs are only available in certain locations.

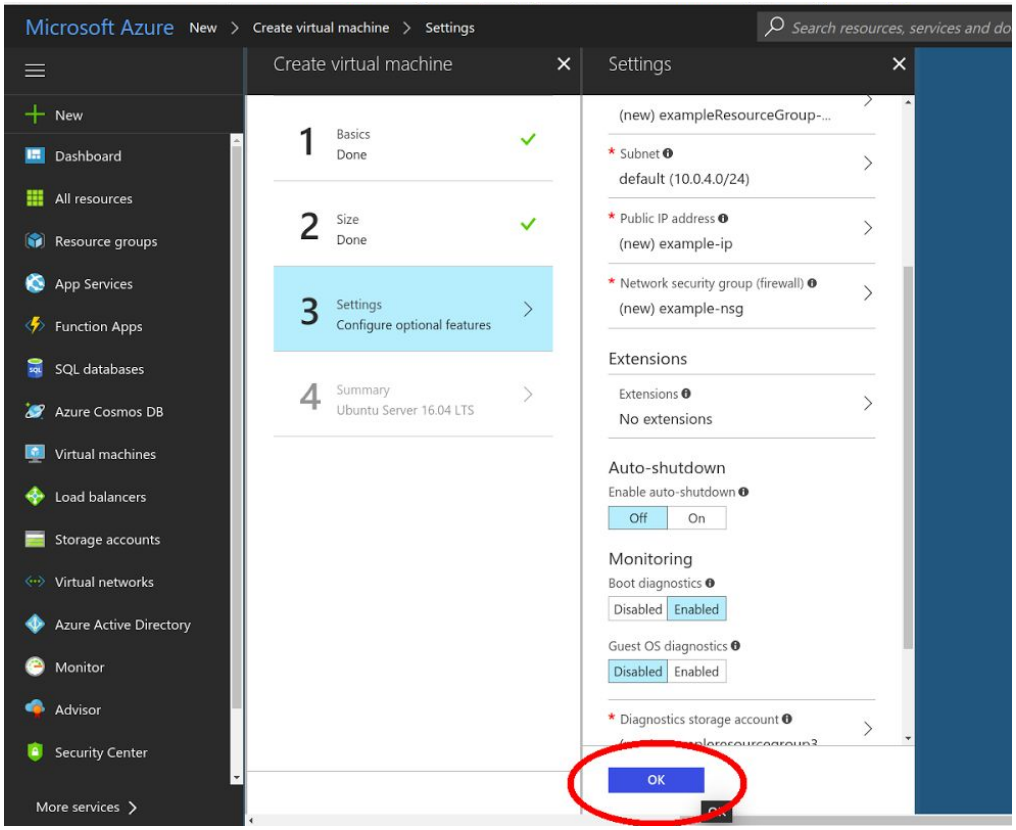
If you are in multiple classes using azure, you need to make sure that you select the correct subscription at this stage. **For cs234 your subscription name will be your SUNetID. (That is, you will see your SUNetID in place for “TASubscription”).**



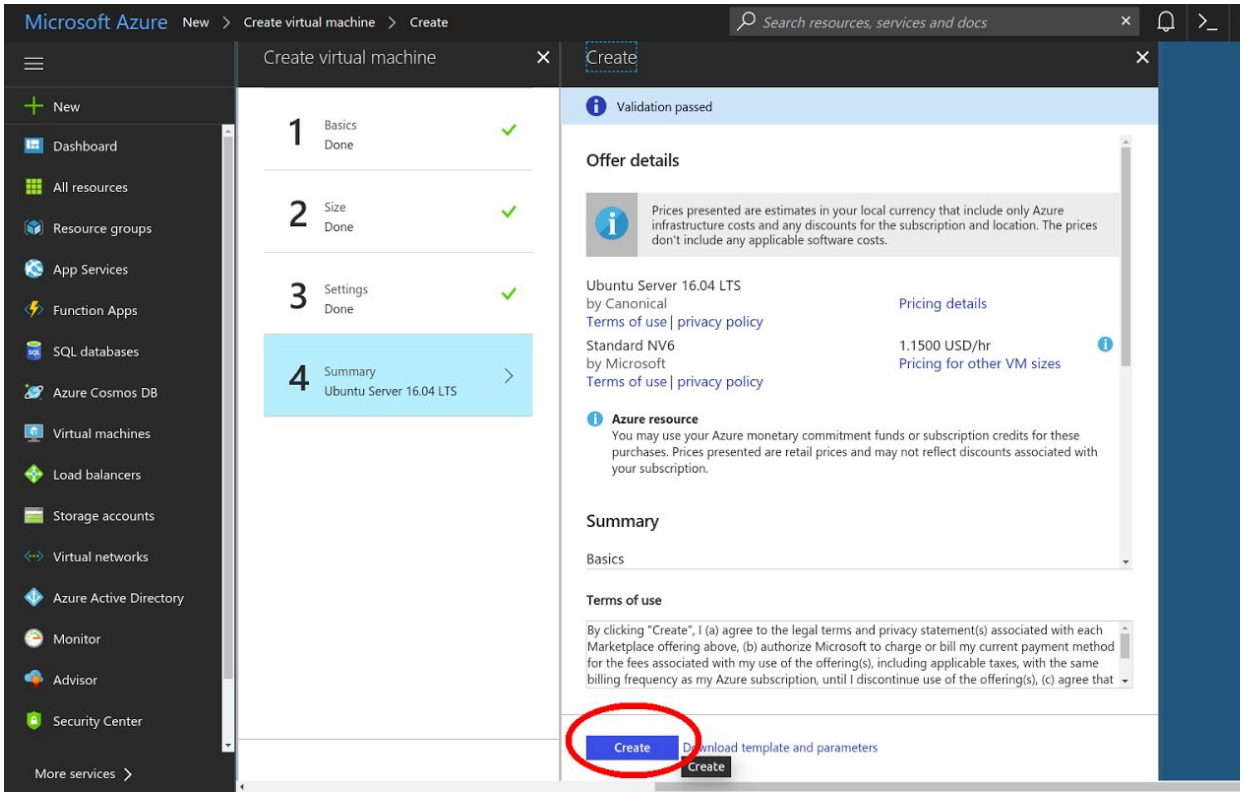
View all (click the button) of the options and **select NV6** by scrolling through the list, and then click select**. If NV6 does not show up, then you probably chose the wrong region or chose SSD in the previous page.** Also, if you do not select NV6 (or any of the NV/NC options), then you are not using a GPU instance and the setup scripts later will fail.



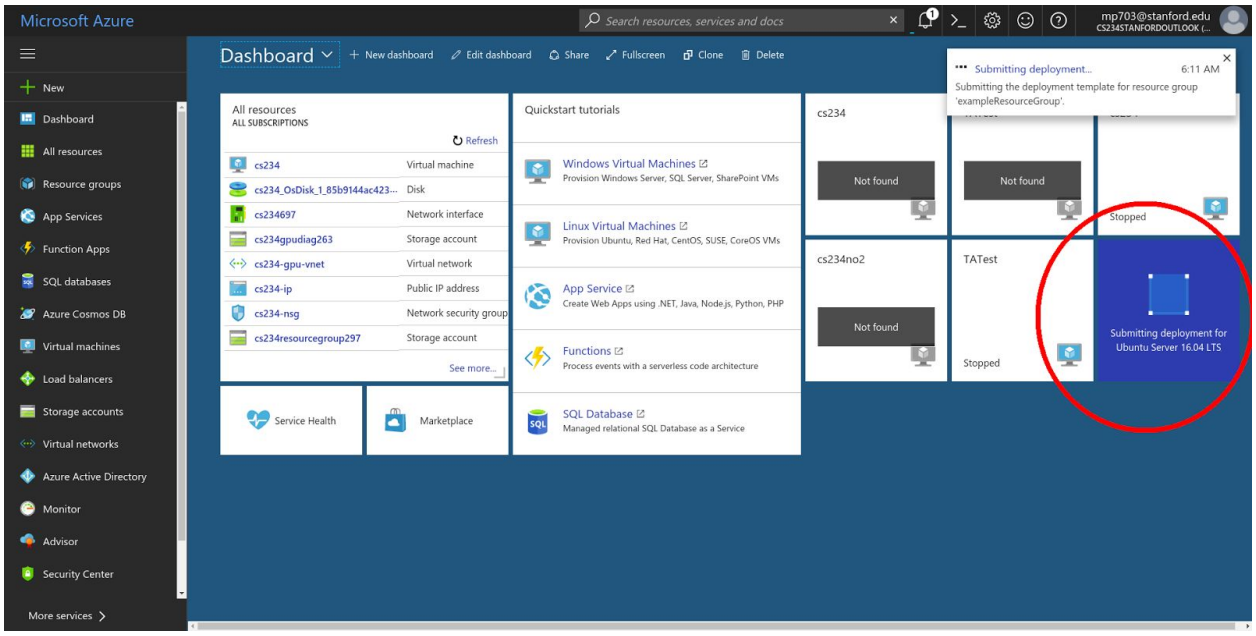
Click OK.


Microsoft Azure
New
Create virtual machine
Settings
Search resources, services and do
Create virtual machine
Settings
New
Dashboard
All resources
Resource groups
App Services
Function Apps
SQL databases
Azure Cosmos DB
Virtual machines
Load balancers
Storage accounts
Virtual networks
Azure Active Directory
Monitor
Advisor
Security Center
More services
1 Basics
Done
2 Size
Done
3 Settings
Configure optional features
4 Summary
Ubuntu Server 16.04 LTS
(new) exampleResourceGroup-...
* Subnet
default (10.0.4.0/24)
* Public IP address
(new) example-ip
* Network security group (firewall)
(new) example-nsg
Extensions
Extensions
No extensions
Auto-shutdown
Enable auto-shutdown
Off
On
Monitoring
Boot diagnostics
Disabled
Enabled
Guest OS diagnostics
Disabled
Enabled
* Diagnostics storage account
OK

Wait for the configuration to validate and then click CREATE.



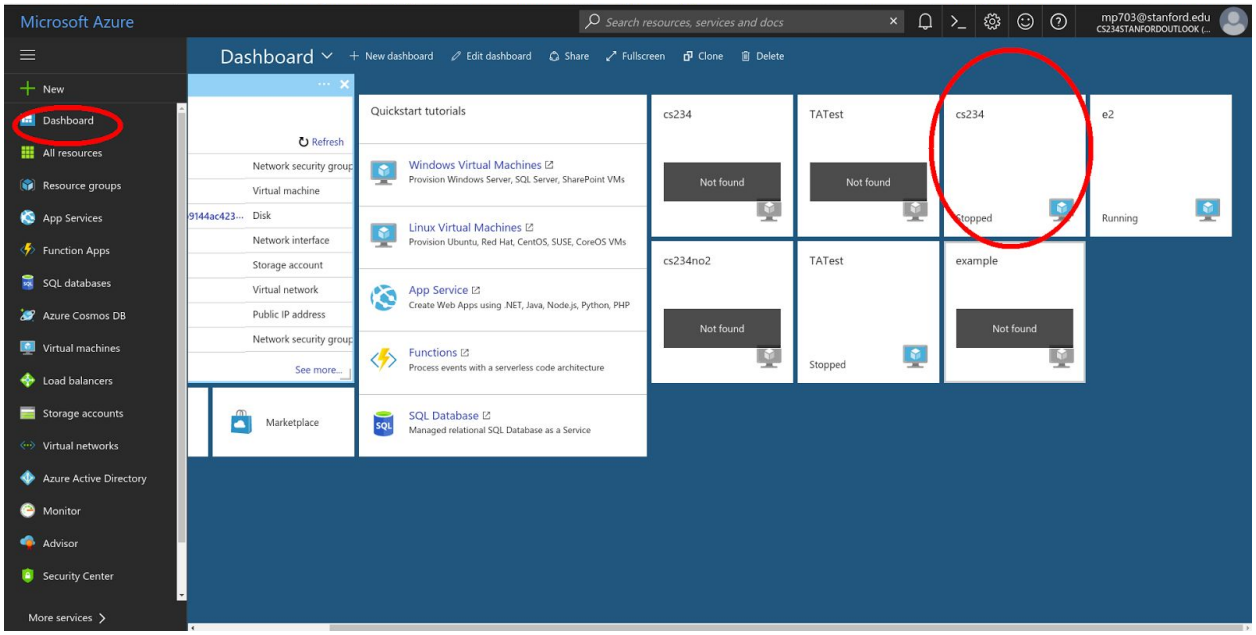
Note: it can take a while. And it will likely look like this for a long time



Using the VM

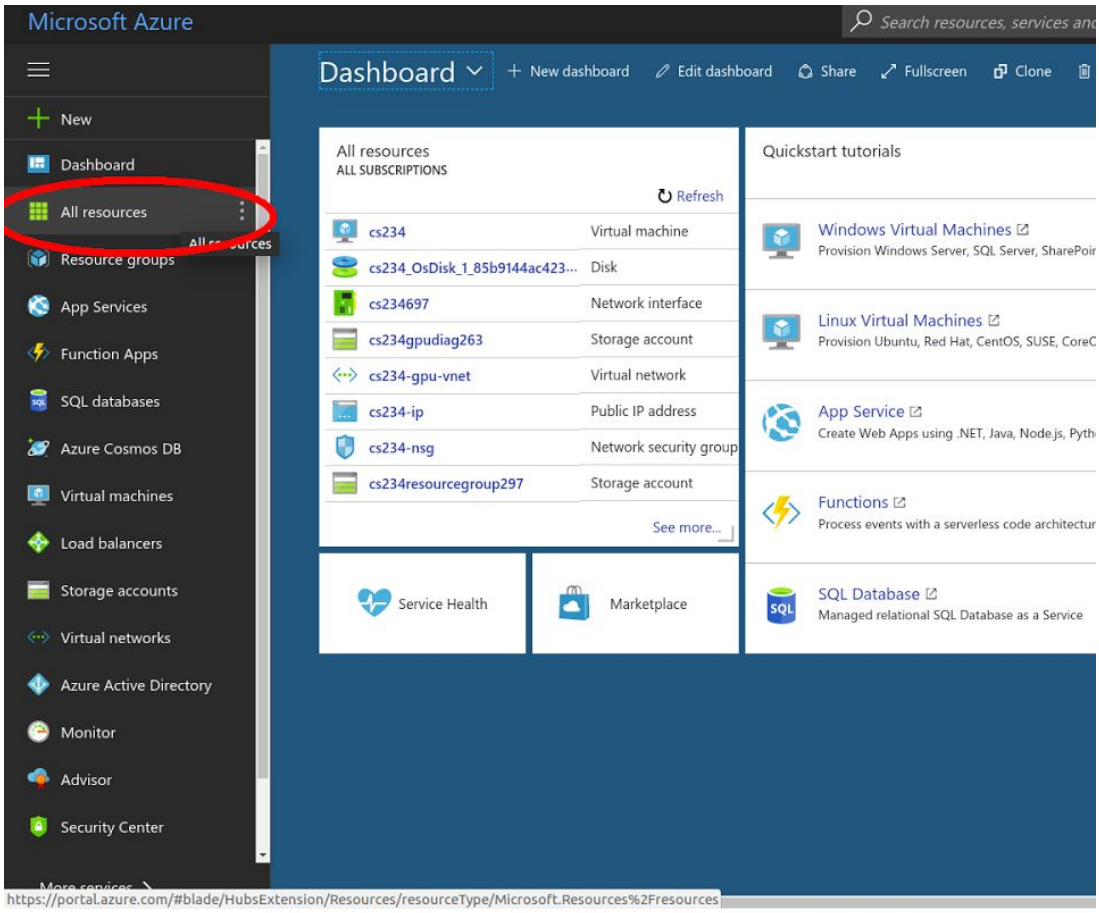
Finding your VM

Click on dashboard and then click on the machine that you have created.

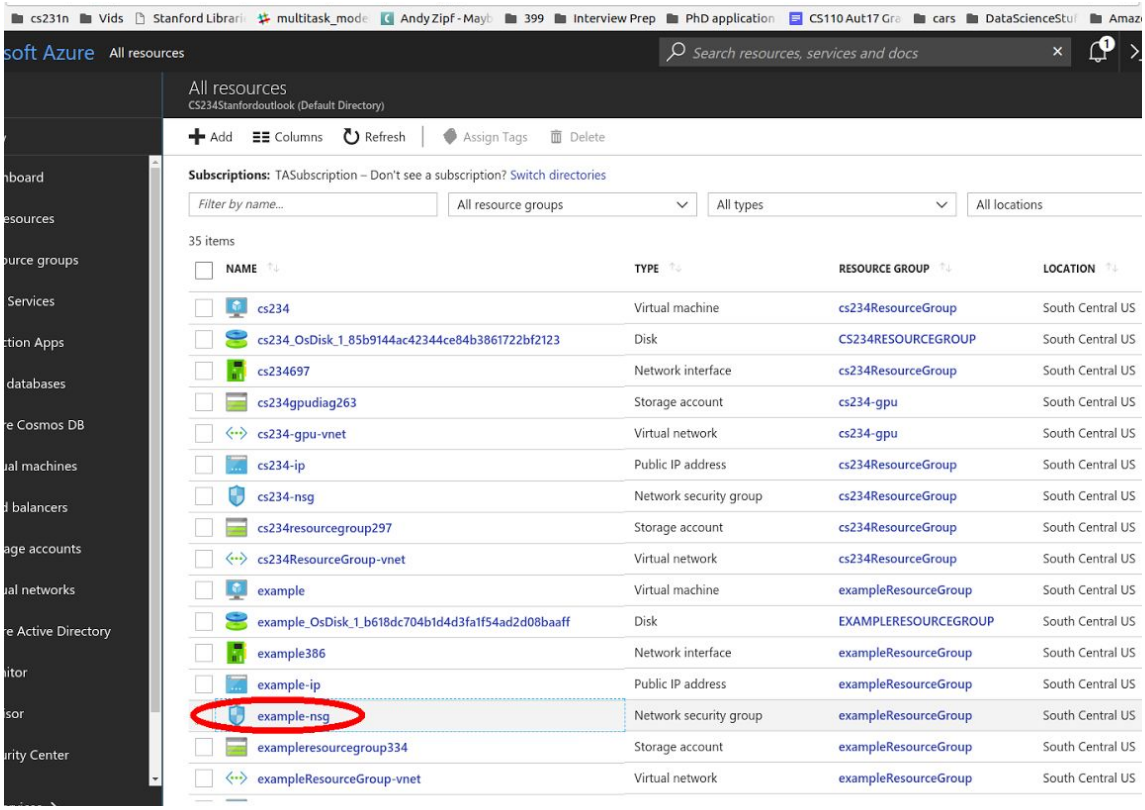


Setup port

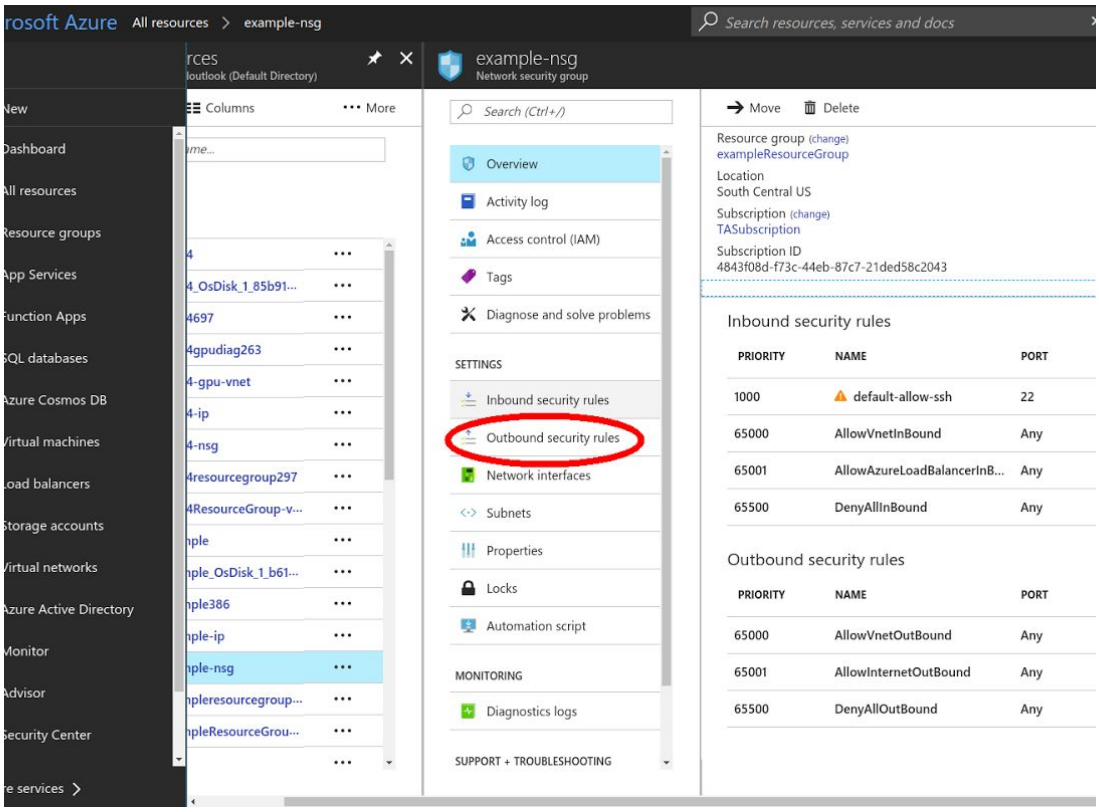
1. Go to all resources



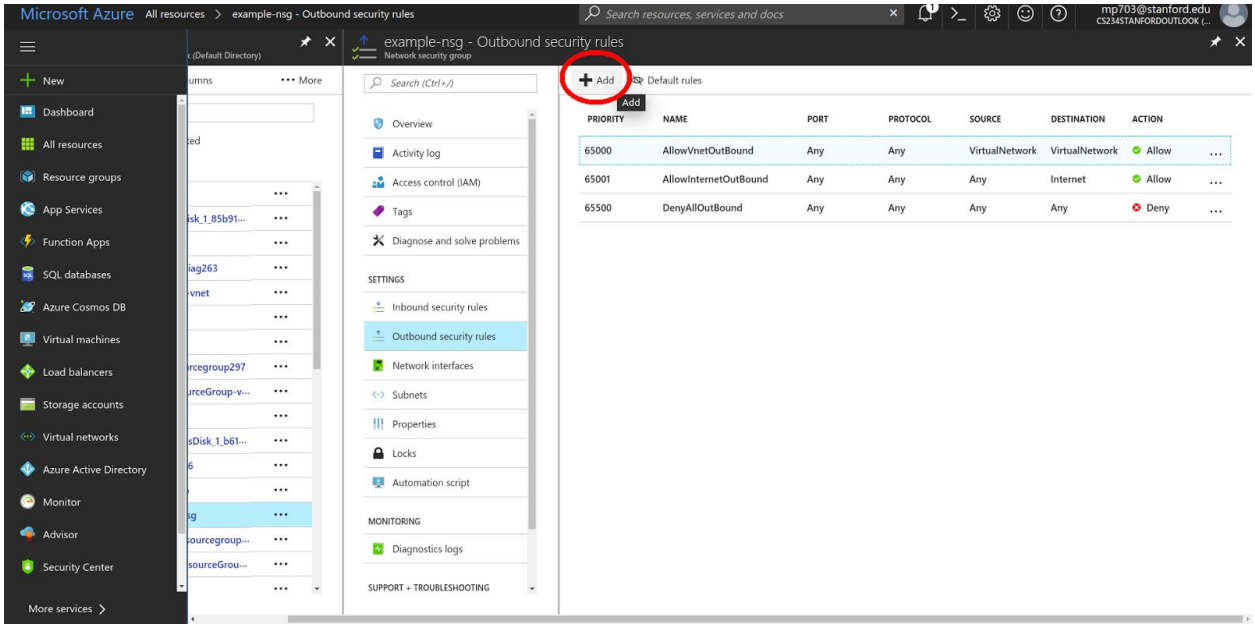
2. Click the network security group that you are in



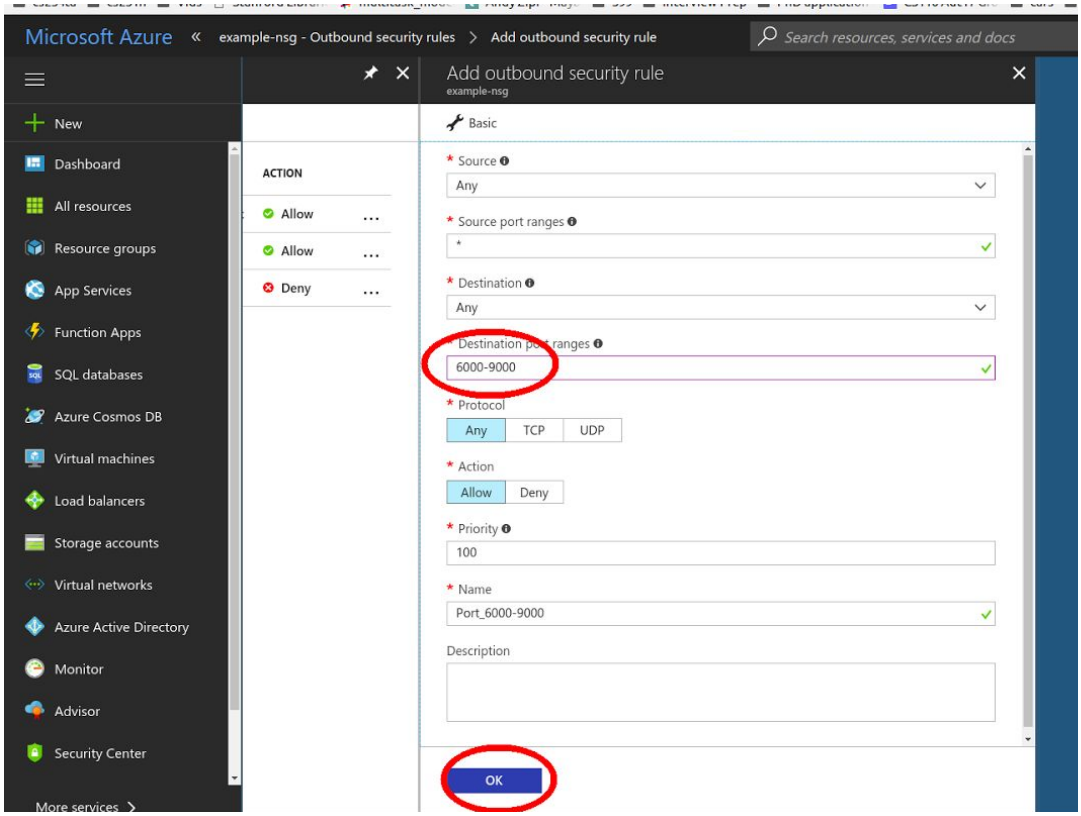
3. Go to outbound/inbound security rules,



4. click add.



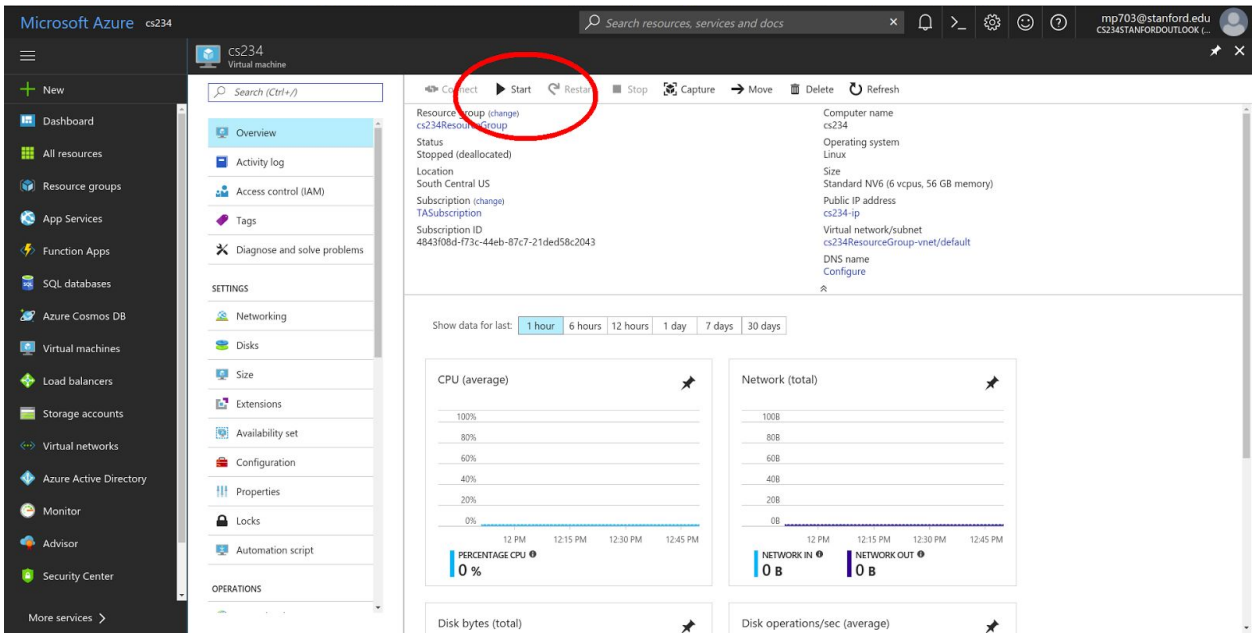
5. File port ranges, let source port ranges remain “*”, and change the destination port ranges to “6000-9000”, then click ok.



6. Now, you can access the vm by using ssh tunneling, such as:
   ssh vmname@ipaddress -l port:localhost:port
7. This will allow you to use TensorBoard, following this stack overflow post.

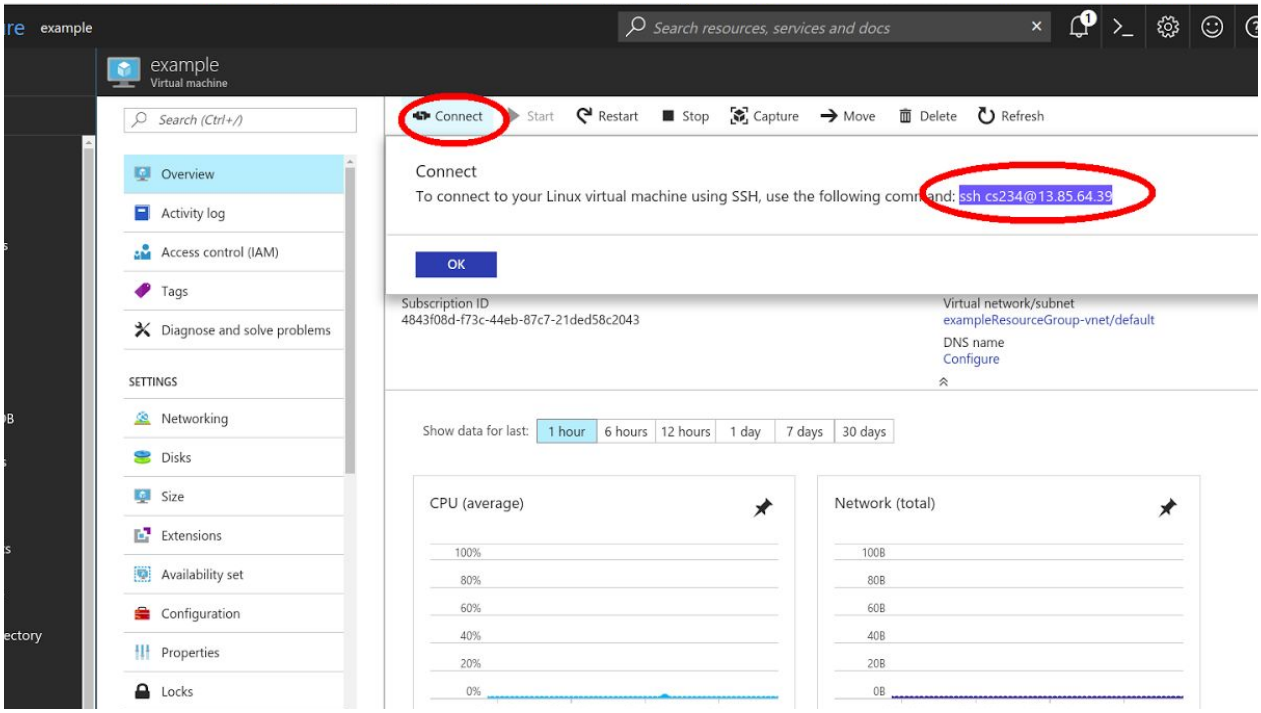
Spinning up your VM

If you just completed the previous part and the VM has finished deploying, then your VM should be running already.



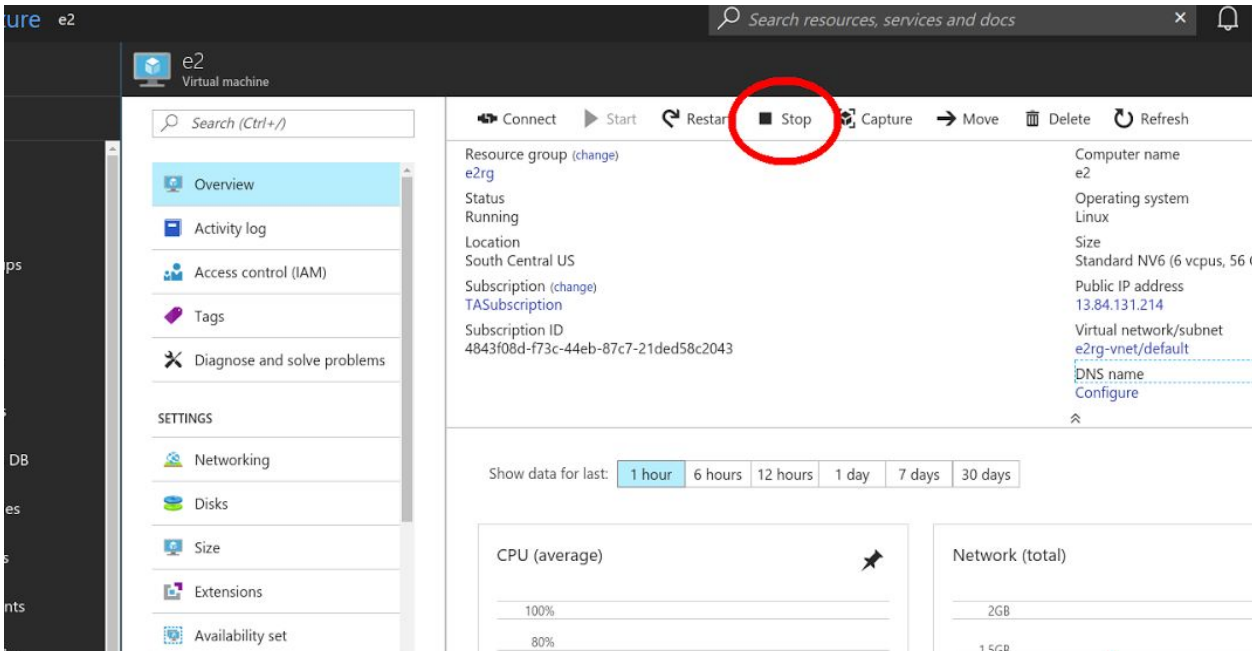
Connecting (SSH) to your VM

Once your VM is started (it may take a few minutes). Click connect and follow the instructions.

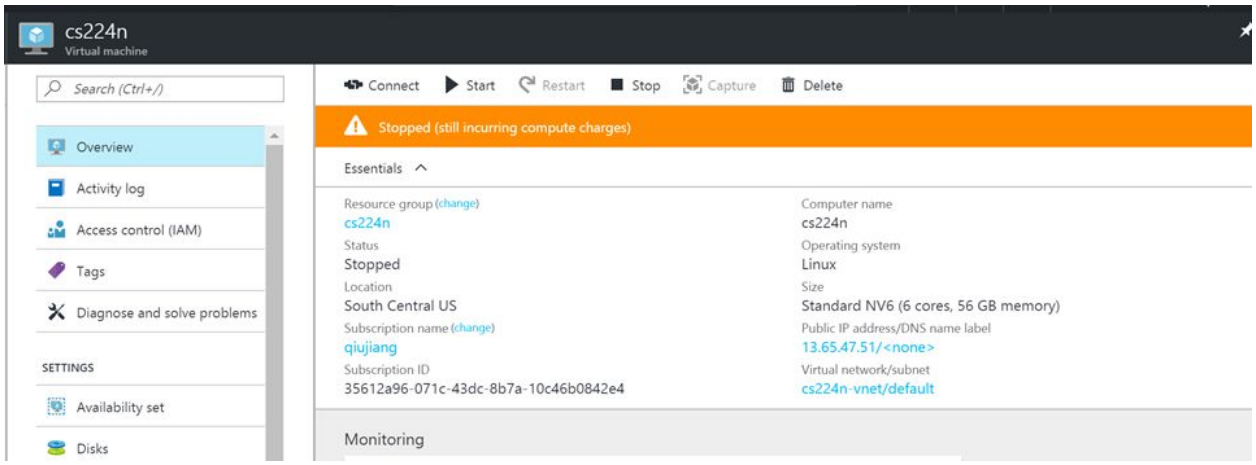


Stopping your VM

Once you are done working, stop your VM. You must do this or your credits will disappear at a rate of $1+ every hour the VM is on.



Make sure your VM is fully stopped. **If you see “stopped still incurring compute charges”, you must hit stop again.**



Completing CUDA/Tensorflow setup

Now we will finish installing CUDA and Tensorflow dependencies. There are two scripts that you will need to run and your VM will need reboot after running each of them.

Download the setup scripts in the zipped folder **Azure-GPU-Setup.zip** from the piazza post.

You will need to SSH into your VM. First, in your VM do:

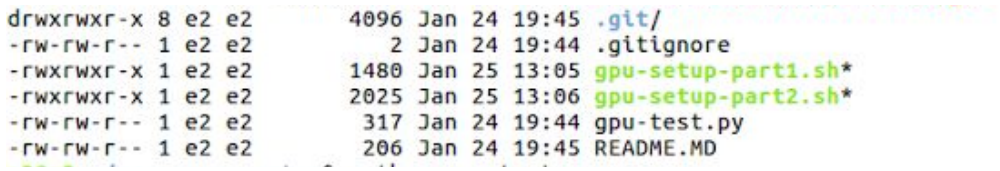
unzip Azure-GPU-Setup.zip
cd Azure-GPU-Setup

Alternatively to using the zip, you can download the scripts using git, and you would first do:

git clone https://github.com/MWPainter/Azure-GPU-Setup.git
cd Azure-GPU-Setup

However, you will need to manually download cuDNN (you need to make an account) from here, and place it in the Azure-GPU-Setup folder.

You should see the following if you use **ls -all**



Run gpu-setup-part1.sh using the following command:

./gpu-setup-part1.sh

This will install some libraries, fetch and install NVIDIA drivers, and trigger a reboot. (The command will take some time to run.)

If you chose to use the git repository to download the scripts, you will need to download cudnn-6.0 manually. This can be downloaded from Nvidia here, and you will need to create a NVIDIA Account to download it! You need to place the downloaded tgz into your Azure-GPU-Setup folder.

Once your VM has finished restarting. SSH into the VM again.

Now navigate to the setup directory and run the second script.

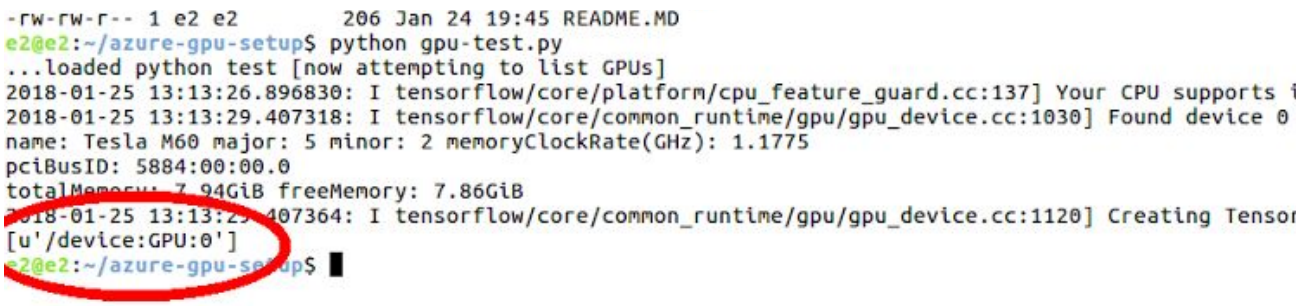
cd Azure-GPU-Setup/
./gpu-setup-part2.sh

This script installs the CUDA toolkit, CUDNN, and Tensorflow. Once the VM has finished restarting for the second time, SSH into the VM again.

Now, to test that Tensorflow and the GPU is properly configured, run the gpu test script by executing:

python gpu-test.py

You should see the following if all went well:



Yes!
Took about 45 minutes

Setting up OpenAI

Use the requirements.txt file and setup instructions from assignment 1 to install OpenAI gym.

Atari gym

Run the following commands to install the Atari environments:

sudo apt-get install cmake
sudo apt-get install zlib1g-dev
sudo pip install gym[atari]
sudo apt-get install ffmpeg