Launch in the cloud: AWS

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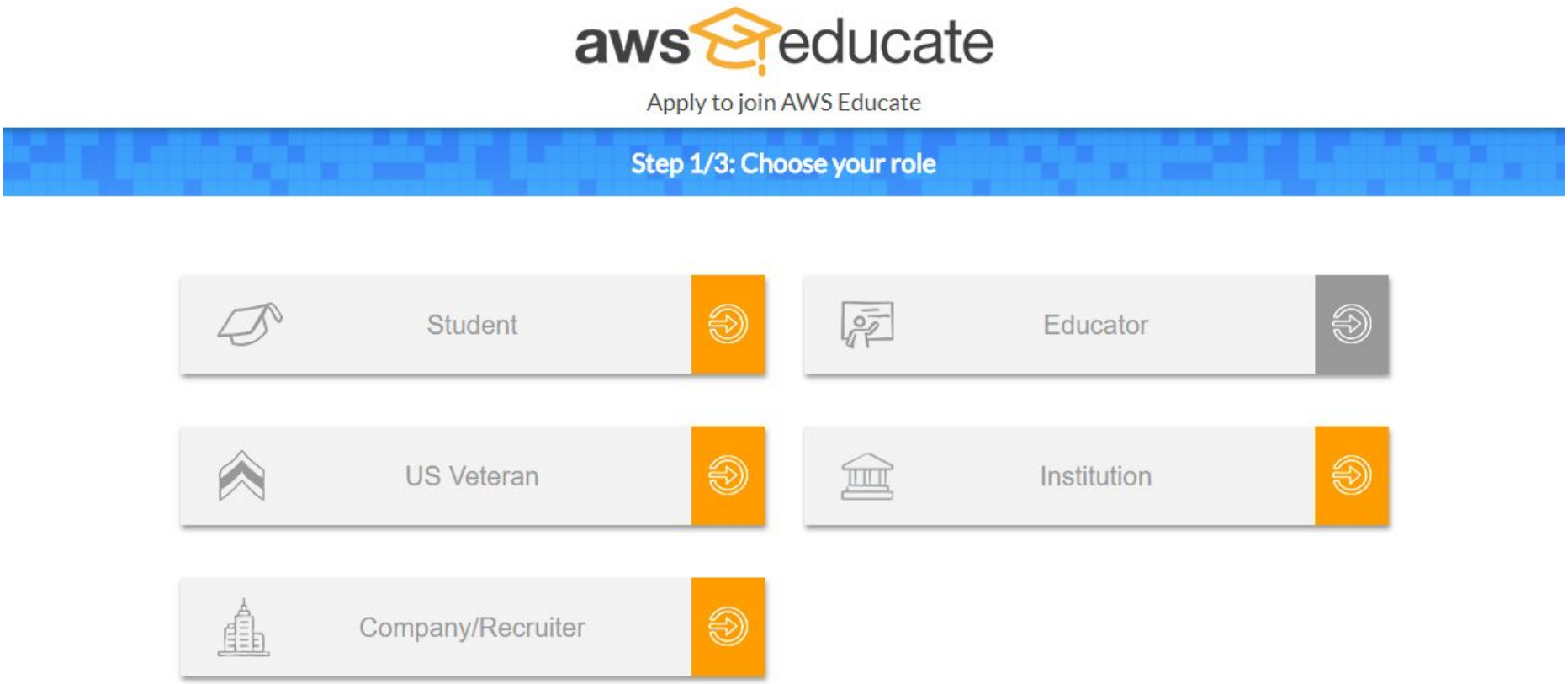
Sign-up for AWS

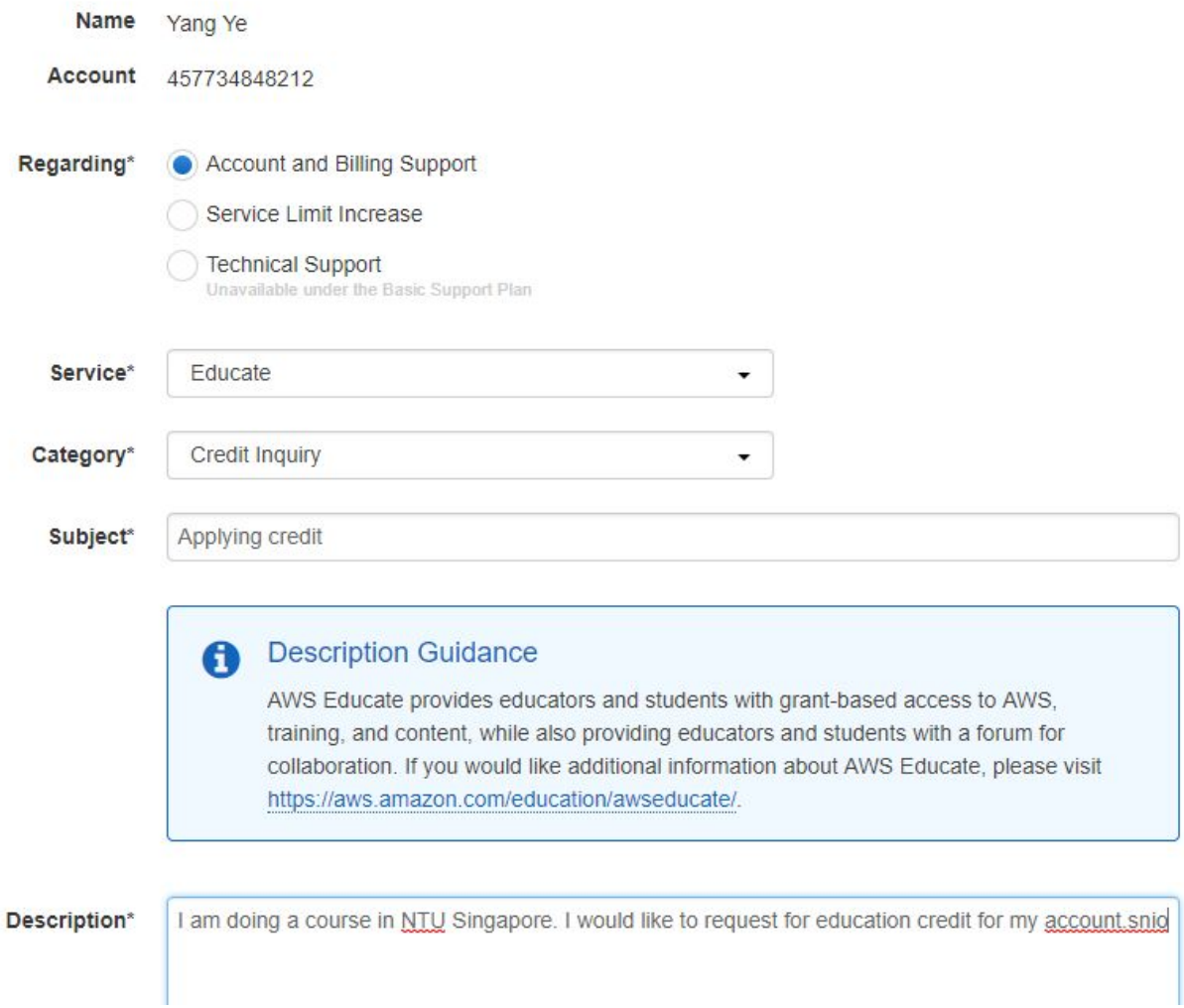
1. Sign-up with an AWS account at https://aws.amazon.com
- Students will need to either create a new AWS account or use one that they've already created. Their AWS account needs to be fully activated by completing phone verification steps and adding a valid credit card.
2. Sign-up AWS Educate account at https://aws.amazon.com/education/awseducate/
- They will need to select the AWS Account option and enter their 12 digit AWS Account ID number when they apply to AWS Educate.
3. (Depends) Because NTU is not (yet) listed as a institutude, you may need to apply credit from AWS Educate separatedly https://aws.amazon.com/education/awseducate/contact-us/
4. Claim credit from AWS according to the instruction of AWS

Register for AWS Educate account



https://www.awseducate.com/registration

Apply AWS Educate Credit



https://aws.amazon.com/education/awseducate/contact-us/

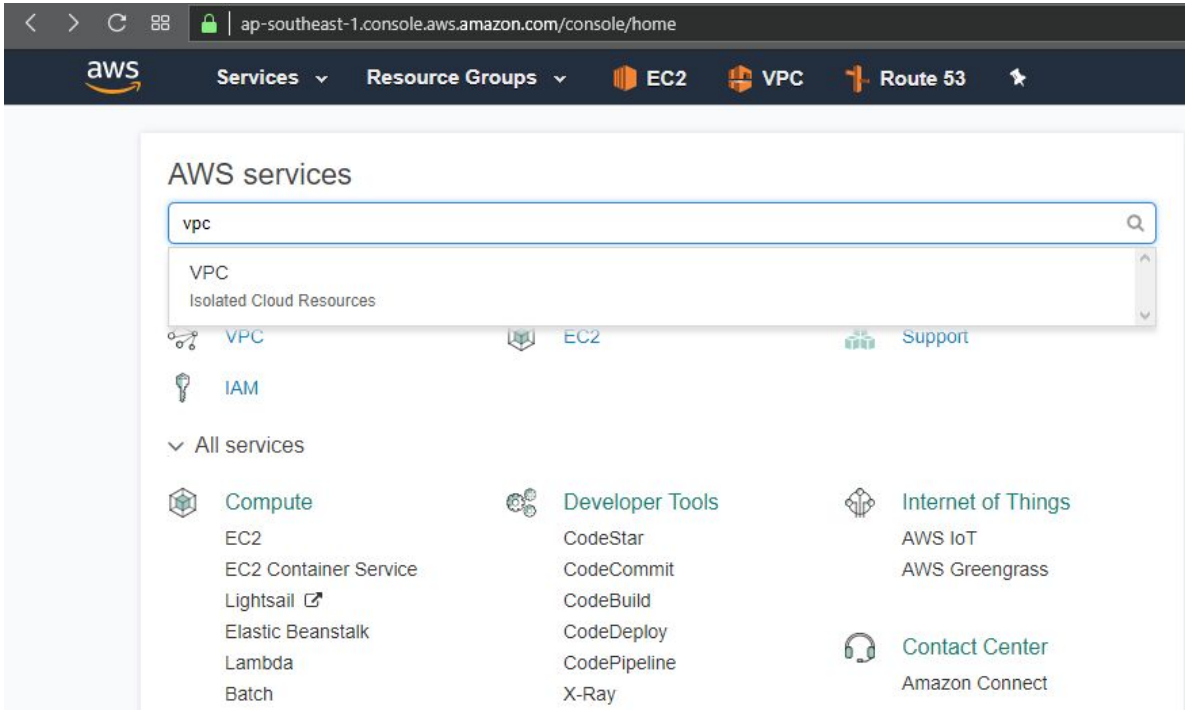
2. Setup AWS

After you login to AWS

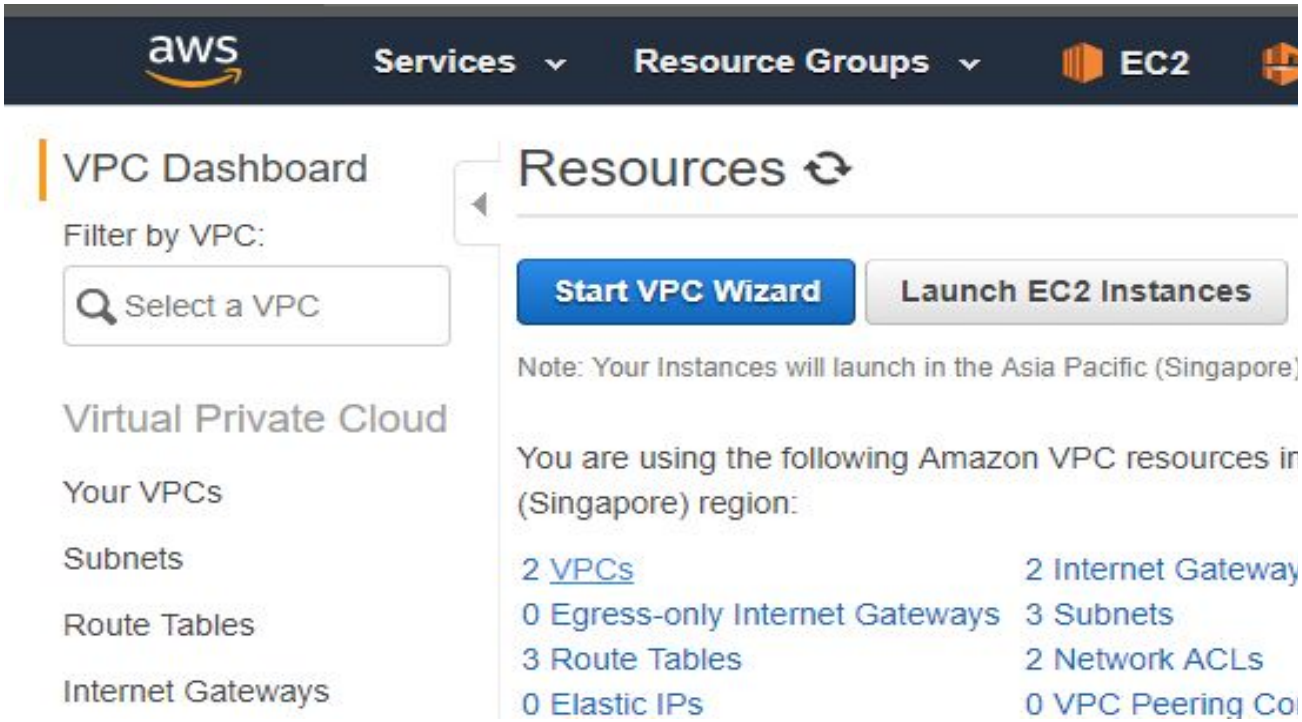
1. Change your region to Singapore.
2. Add shortcuts in the navigation bar
   a. EC2
   b. VPC

2. Create VPC Network

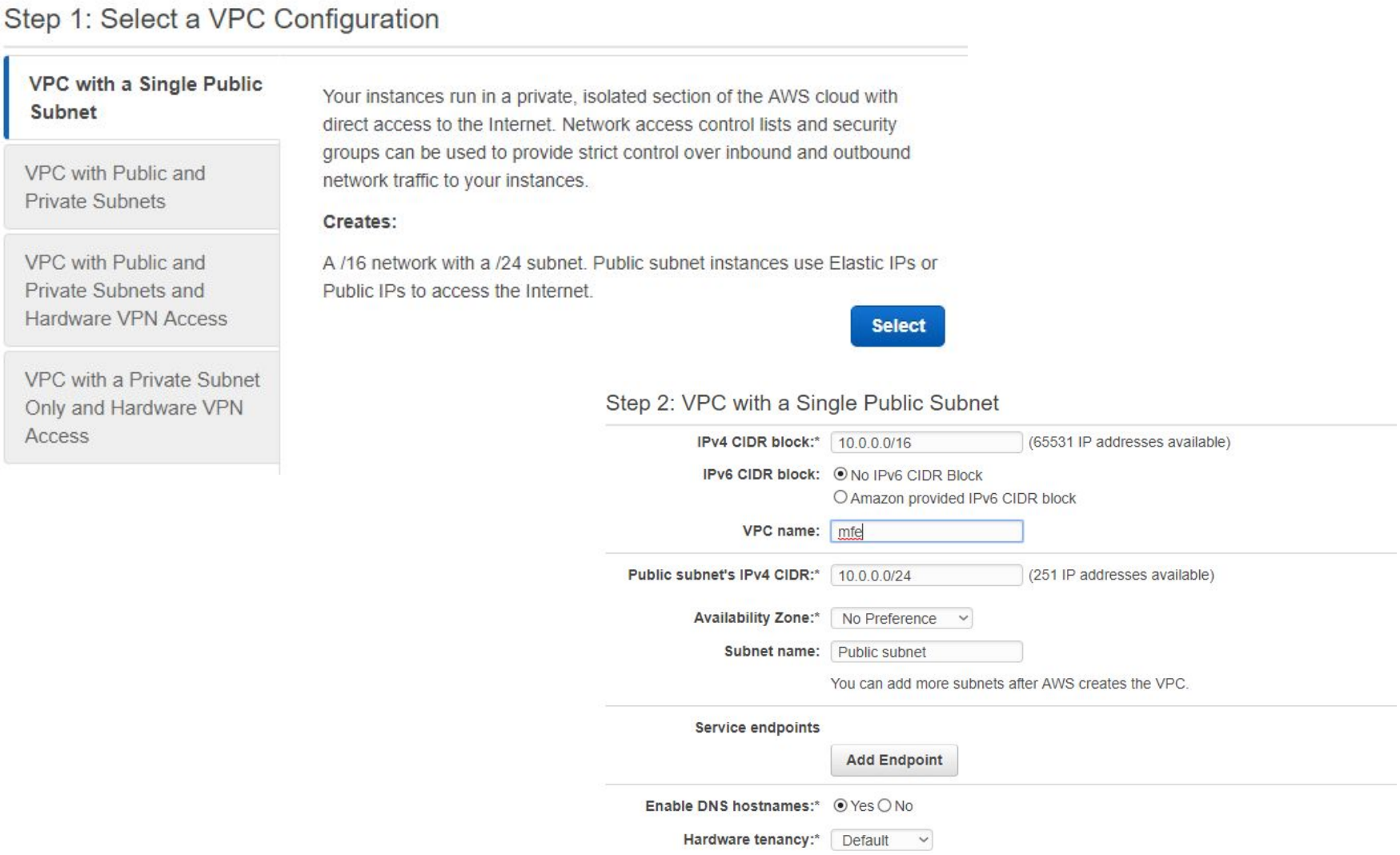
Search for VPC



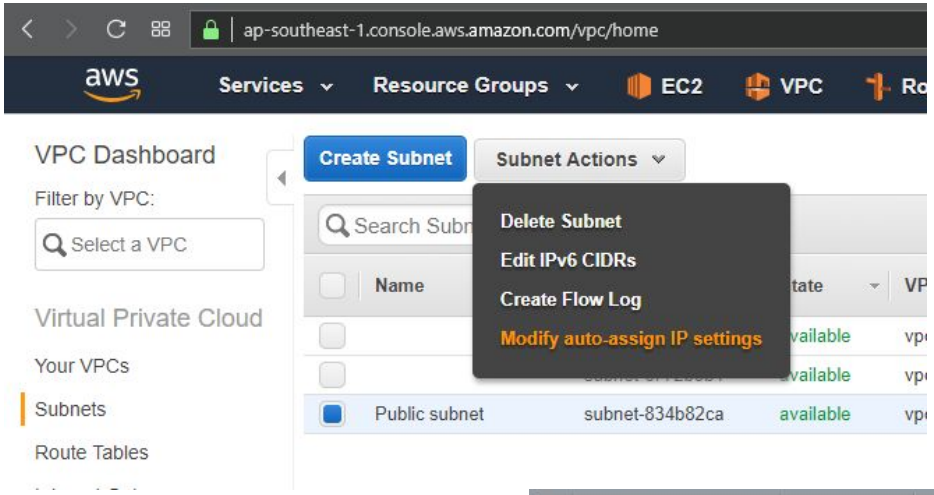
2.1 VPC: Click “Start VPC Wizard”

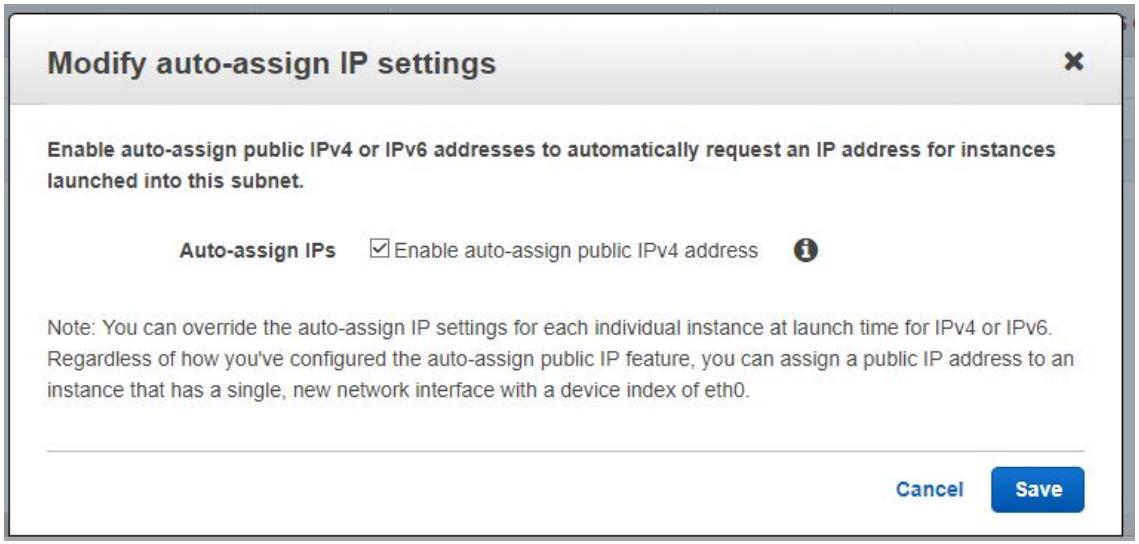


2.2 VPC two steps - follow defaults, add a name

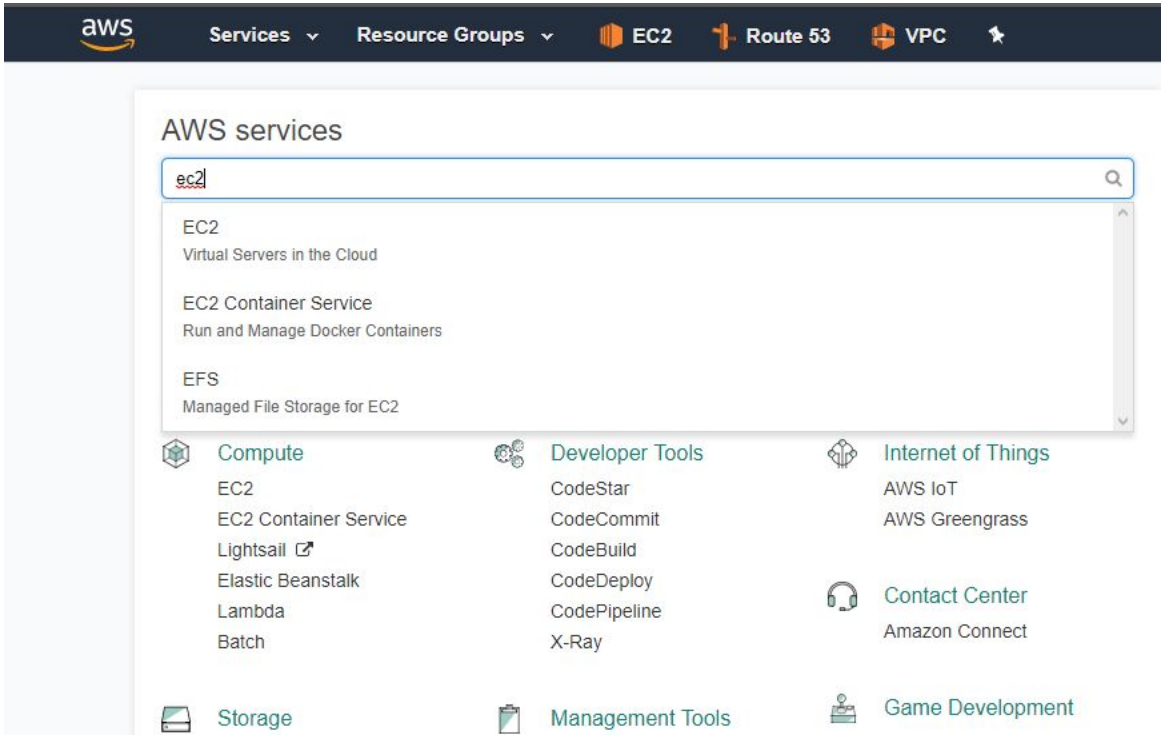


2.3 Subnet: Change settings. Tick auto-assign public IP4 address



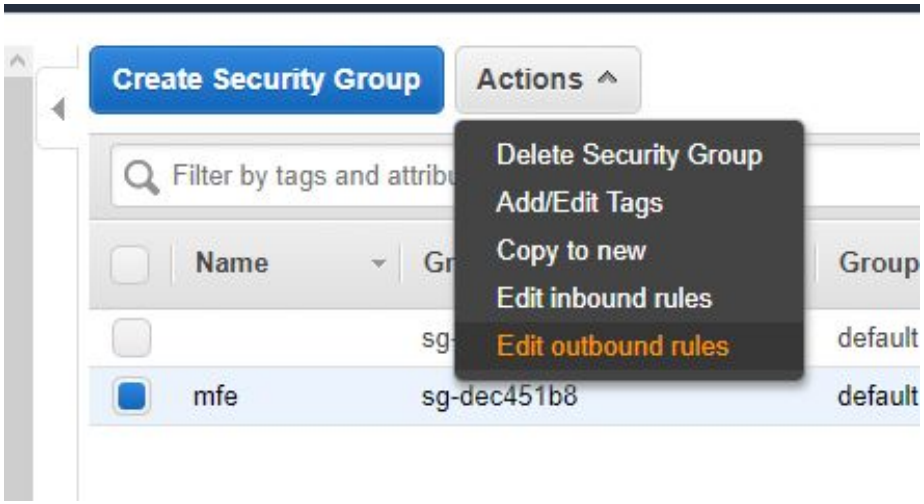


3. Go to EC2


aws
Services
Resource Groups
EC2
Route 53
VPC
AWS services
ec2
EC2
Virtual Servers in the Cloud
EC2 Container Service
Run and Manage Docker Containers
EFS
Managed File Storage for EC2
Compute
EC2
EC2 Container Service
Lightsail
Elastic Beanstalk
Lambda
Batch
Developer Tools
CodeStar
CodeCommit
CodeBuild
CodeDeploy
CodePipeline
X-Ray
Internet of Things
AWS IoT
AWS Greengrass
Contact Center
Amazon Connect
Storage
Management Tools
Game Development

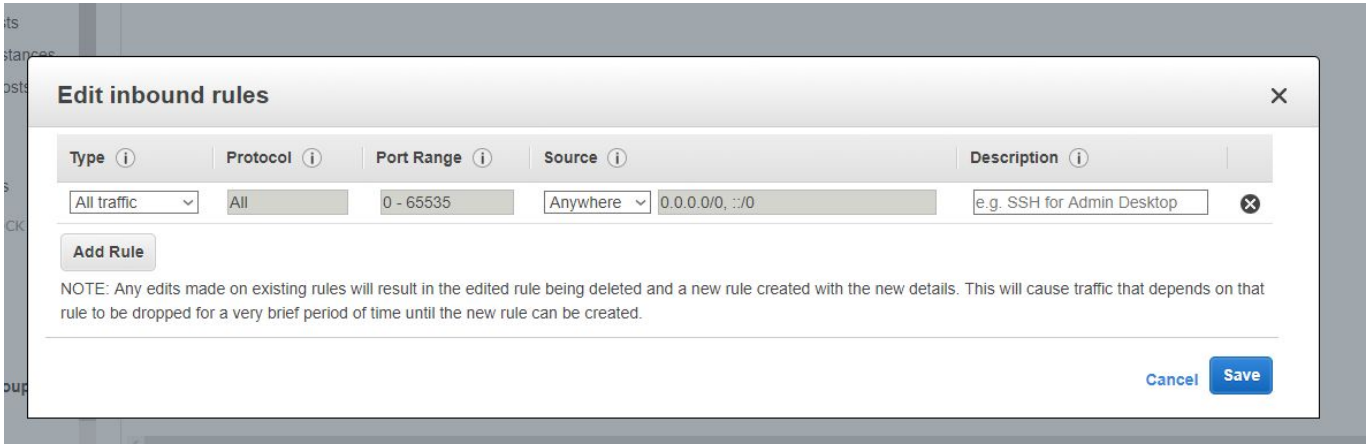
3.1 In VPC wizard, it created new security group.

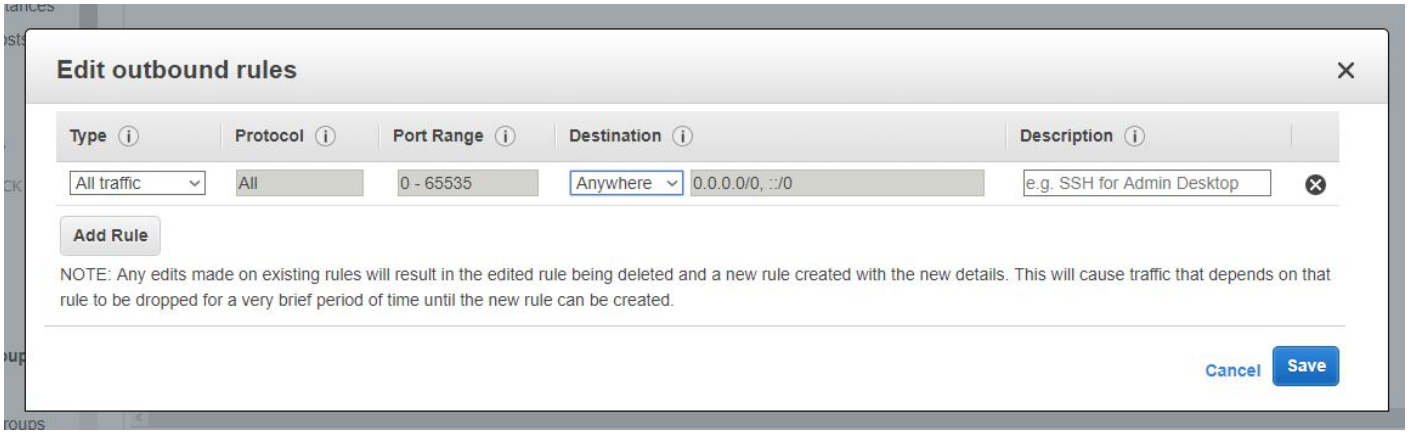
Selected the newly created security group.
Edit Inbound rules and edit outbound rules.



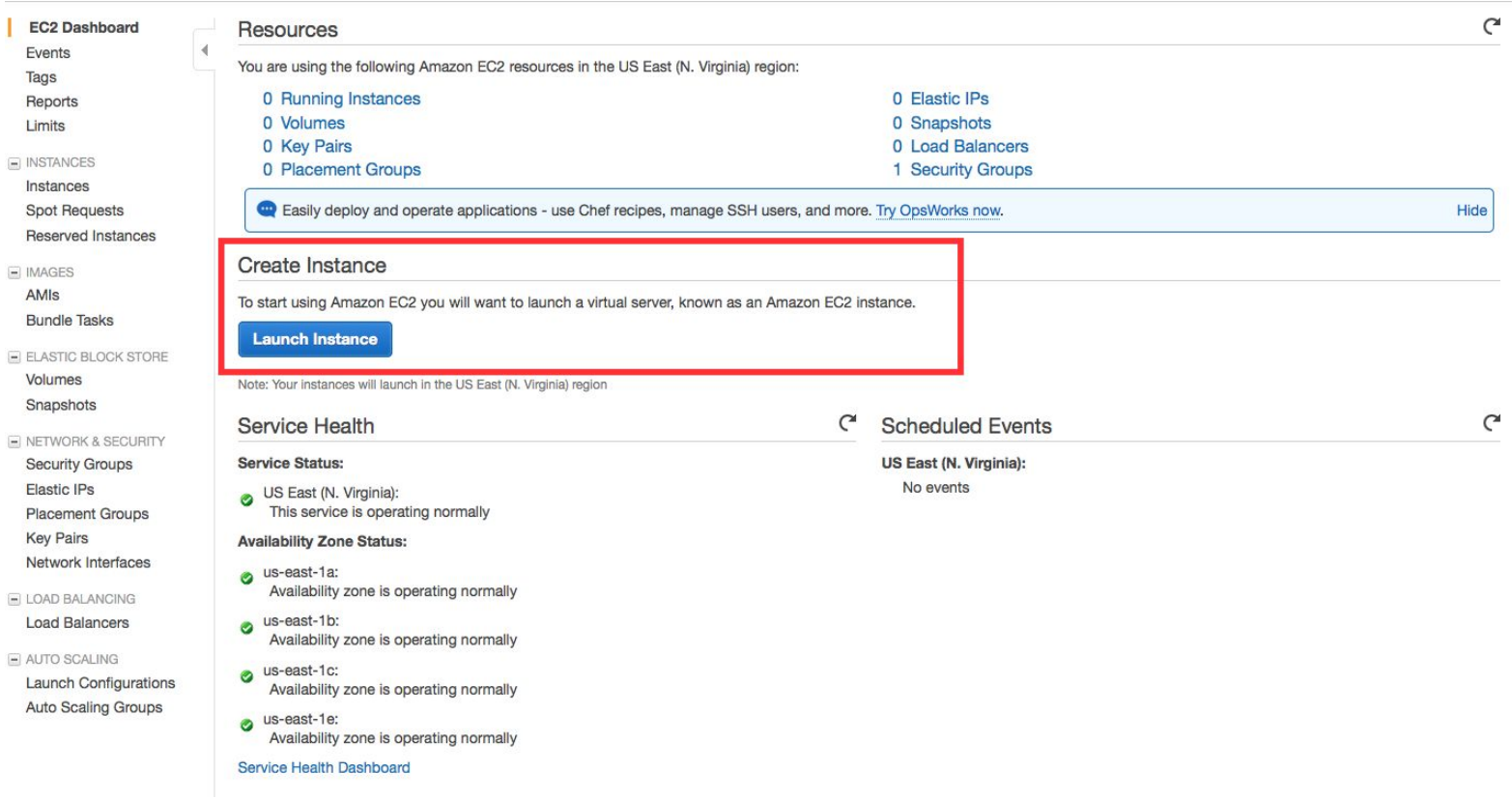
3.2 Inbound/Outbound: choose All traffic/Anywhere

An inbound firewall protects the network against incoming traffic from the internet or other network segments, namely disallowed connection from outside.
Outbound rules determines what application can connect to the outside.



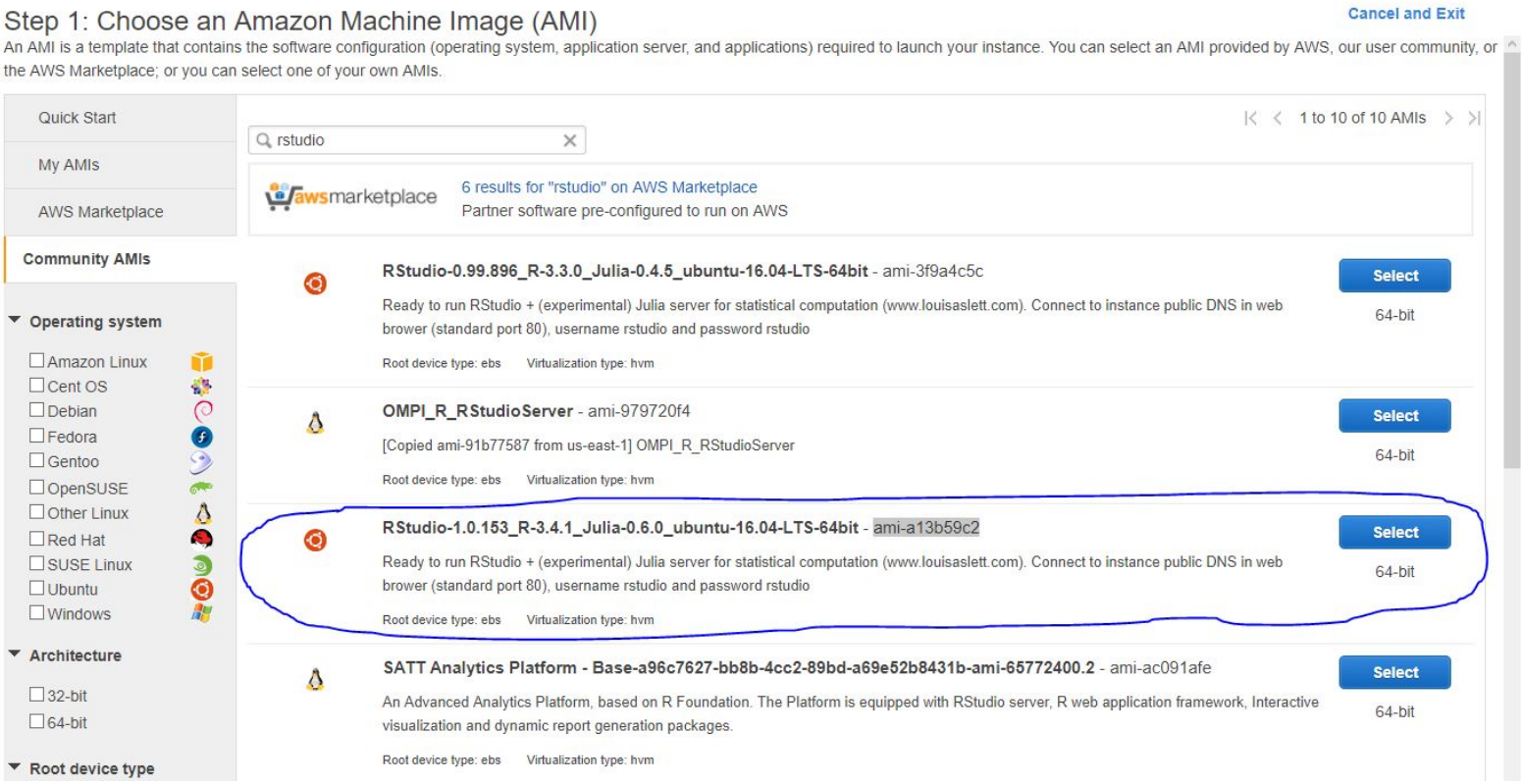


Ready to Launch



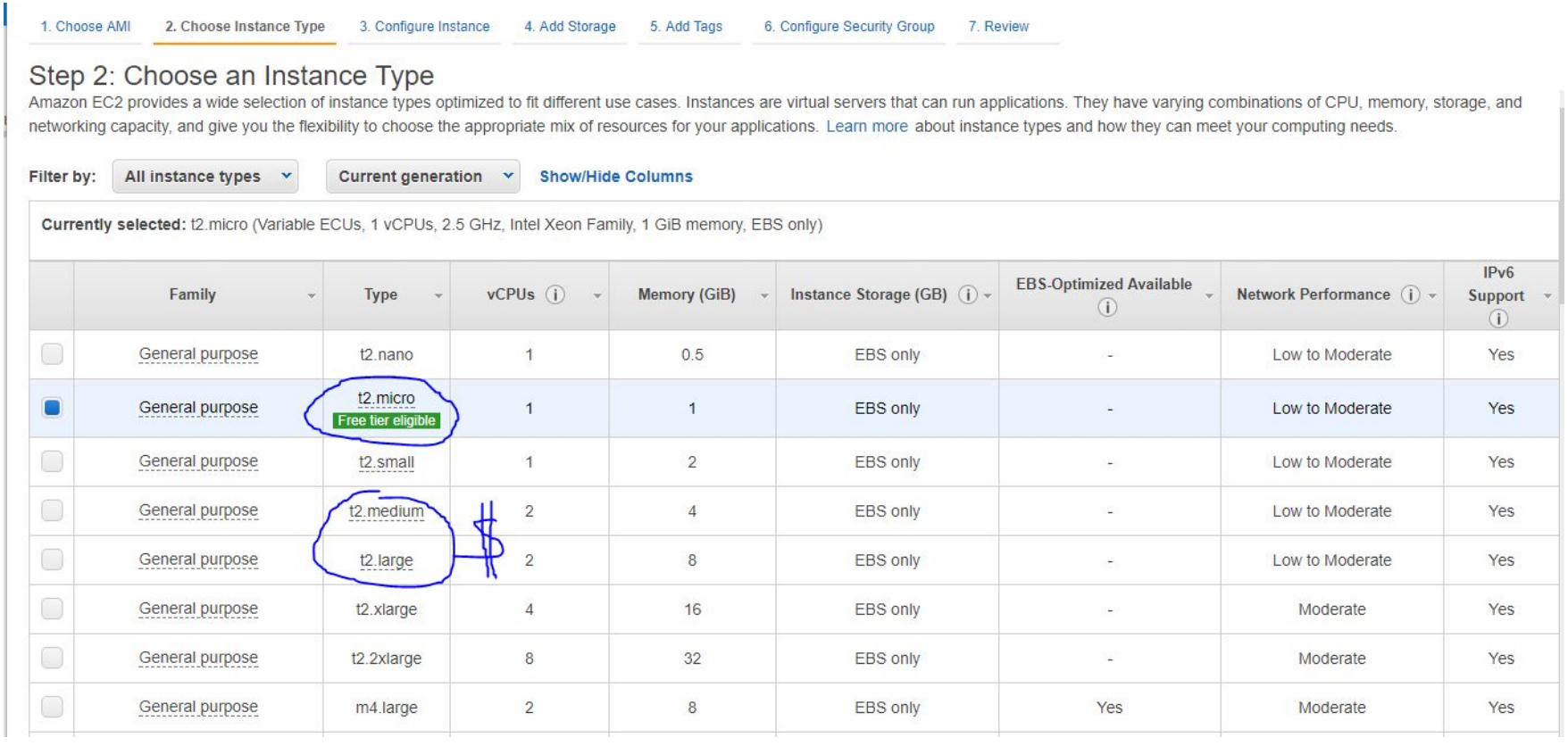
EC2 Step 1: Community AMI: search for “RStudio”

ami-a13b59c2
This is created by http://www.louisaslett.com/RStudio_AMI/



EC2 Step 2: Choose instance type. You can enjoy having one instance of t2.micro during 12-month free-tier.

- Upgrade to higher instance type when you have received your AWS educate credit.
- T2.medium/t2.large should be good enough. There are more expensive ones.



1. Choose AMI | 2. Choose Instance Type | 3. Configure Instance | 4. Add Storage | 5. Add Tags | 6. Configure Security Group | 7. Review

Step 2: Choose an Instance Type

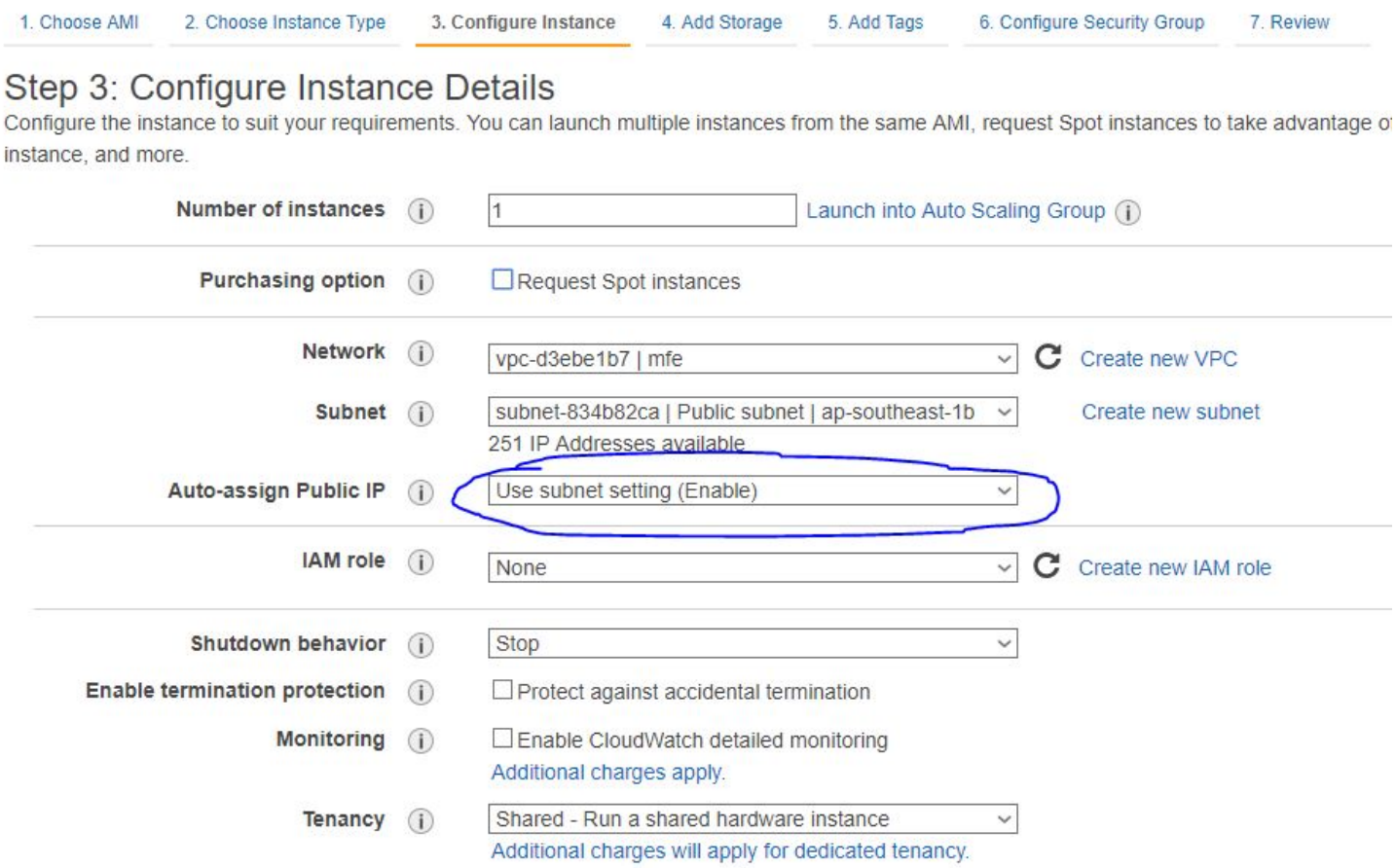
Amazon EC2 provides a wide selection of instance types optimized to fit different use cases. Instances are virtual servers that can run applications. They have varying combinations of CPU, memory, storage, and networking capacity, and give you the flexibility to choose the appropriate mix of resources for your applications. Learn more about instance types and how they can meet your computing needs.

Filter by: All instance types | Current generation | Show/Hide Columns

Currently selected: t2.micro (Variable ECUs, 1 vCPUs, 2.5 GHz, Intel Xeon Family, 1 GiB memory, EBS only)

	Family	Type	vCPUs	Memory (GiB)	Instance Storage (GB)	EBS-Optimized Available	Network Performance	IPv6 Support
☐	General purpose	t2.nano	1	0.5	EBS only	-	Low to Moderate	Yes
☑	General purpose	t2.micro Free tier eligible	1	1	EBS only	-	Low to Moderate	Yes
☐	General purpose	t2.small	1	2	EBS only	-	Low to Moderate	Yes
☐	General purpose	t2.medium	2	4	EBS only	-	Low to Moderate	Yes
☐	General purpose	t2.large	2	8	EBS only	-	Low to Moderate	Yes
☐	General purpose	t2.xlarge	4	16	EBS only	-	Moderate	Yes
☐	General purpose	t2.2xlarge	8	32	EBS only	-	Moderate	Yes
☐	General purpose	m4.large	2	8	EBS only	Yes	Moderate	Yes

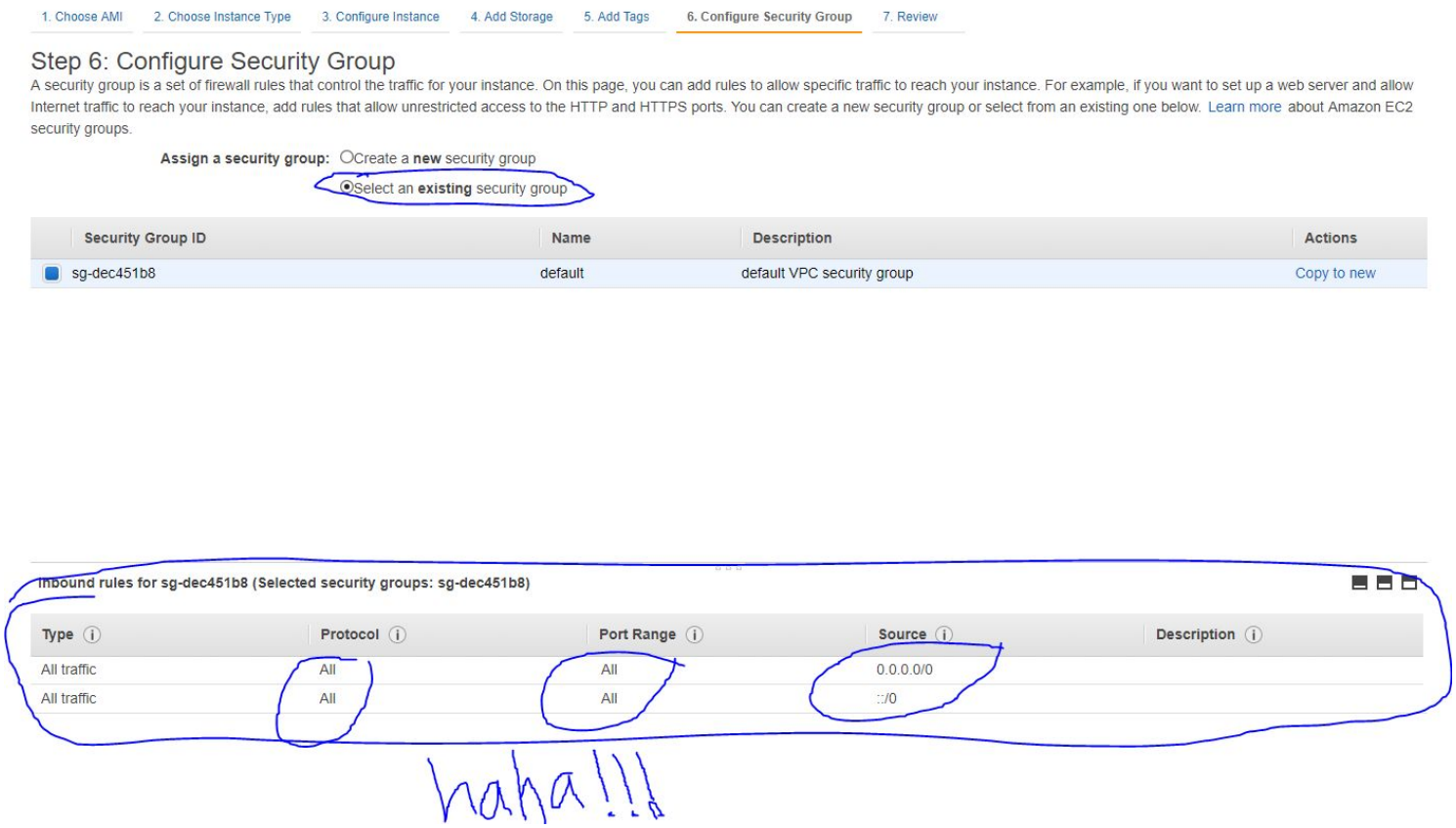
EC2 Step 3: Make sure Auto-assign Public IP is ticked. Click “Next”.



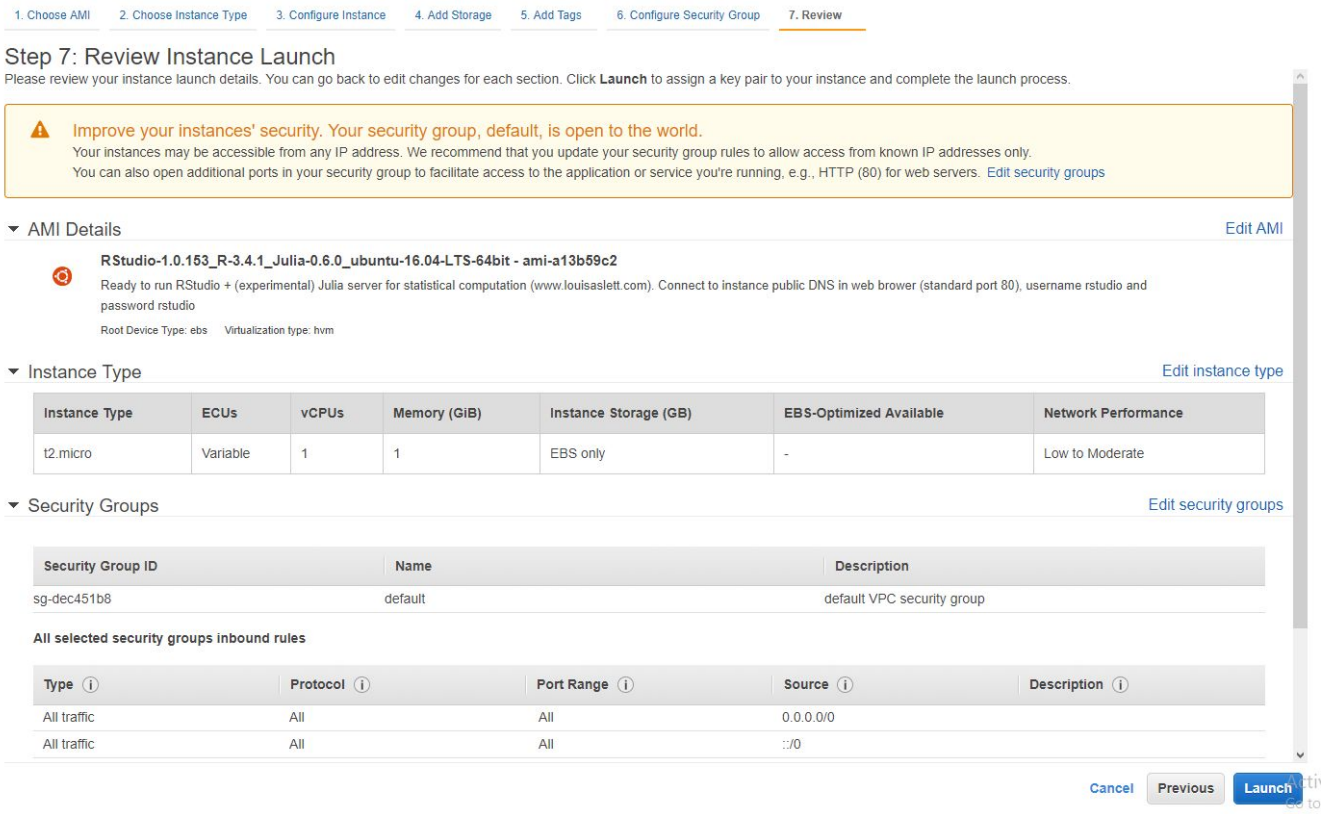
EC 2 Step 4: Add Storage, use the default setting.

- One AMI image can be launched into many instances so its content is static.
- The author of AMI image configures a persistent storage so it saves any changes we did.
- Most importantly, we don’t need to do anything now.

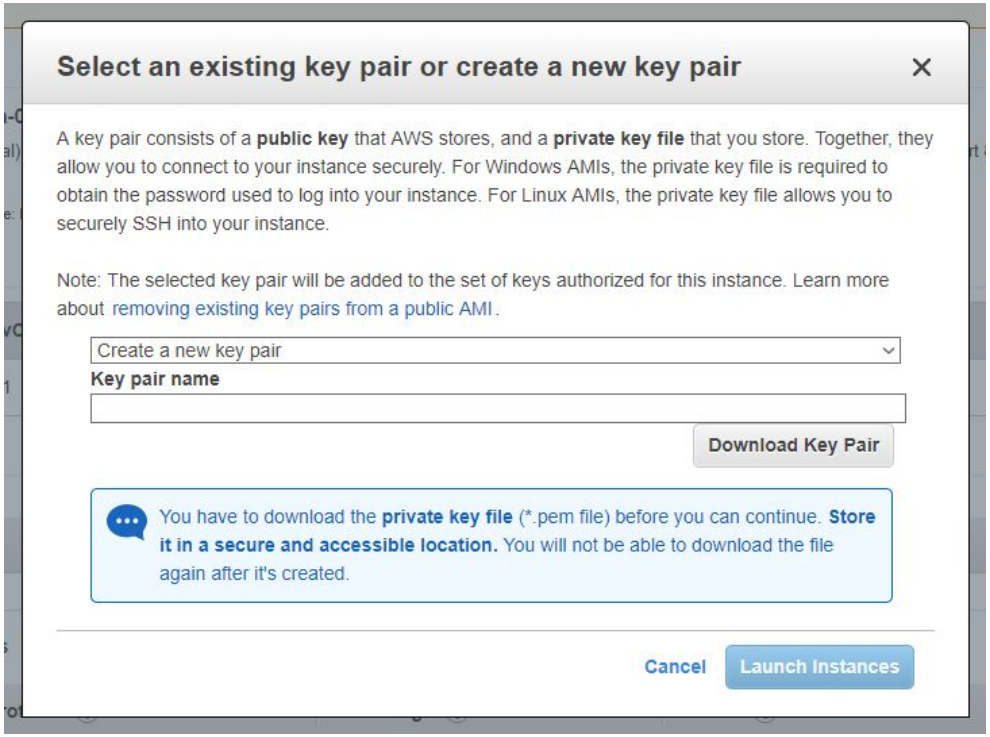
EC Step 6: Click “6. Configure Security Group” Select an existing security group. Your previous changes are loaded.



EC 2 Step 7: Review and Launch
Click the blue button.



One last thing: Key pair
Create if you didn't have an existing one or lost the previous download.



If you know SSH

You can connect to the server by

- Windows: Download Git for Windows from https://git-scm.com/download/.

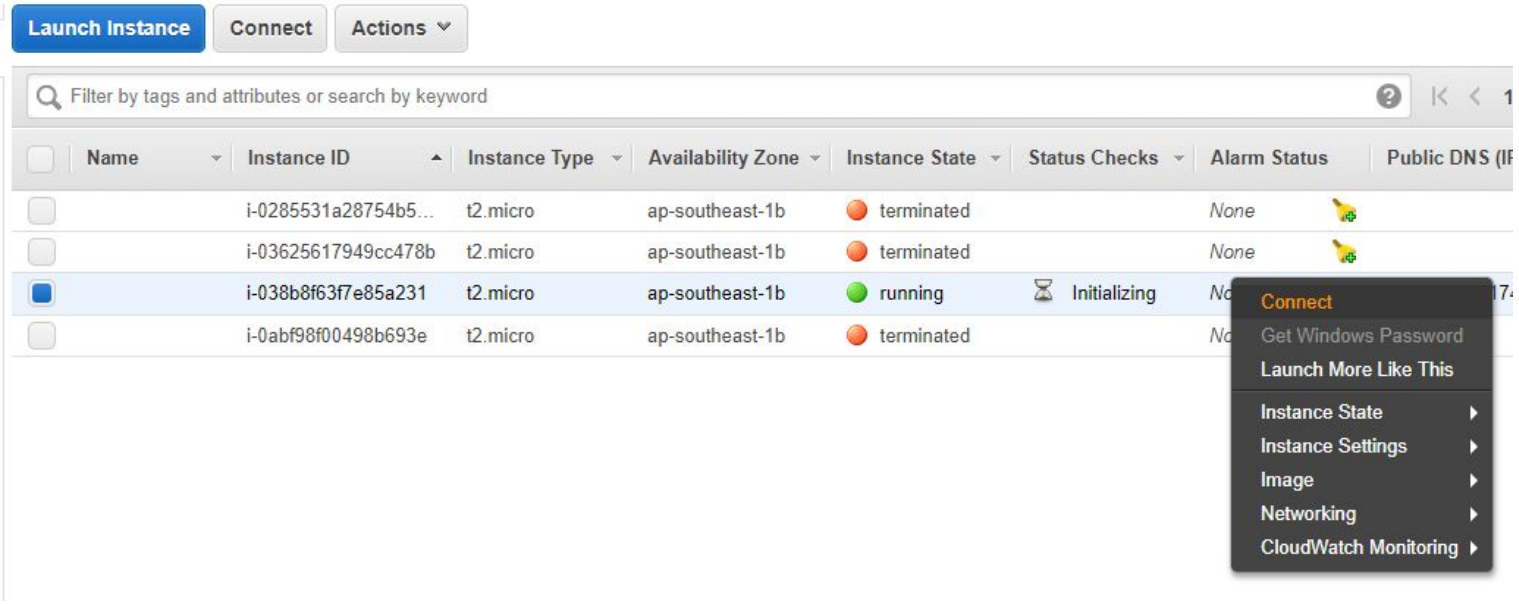
ssh -i 'c:\Users\yourusername\Downloads\MyKeyPair.pem' ubuntu@{IP_Address}

- Mac: skip download Git. Go straight

ssh -i ~/Downloads/MyKeyPair.pem ubuntu@{IP_Address}

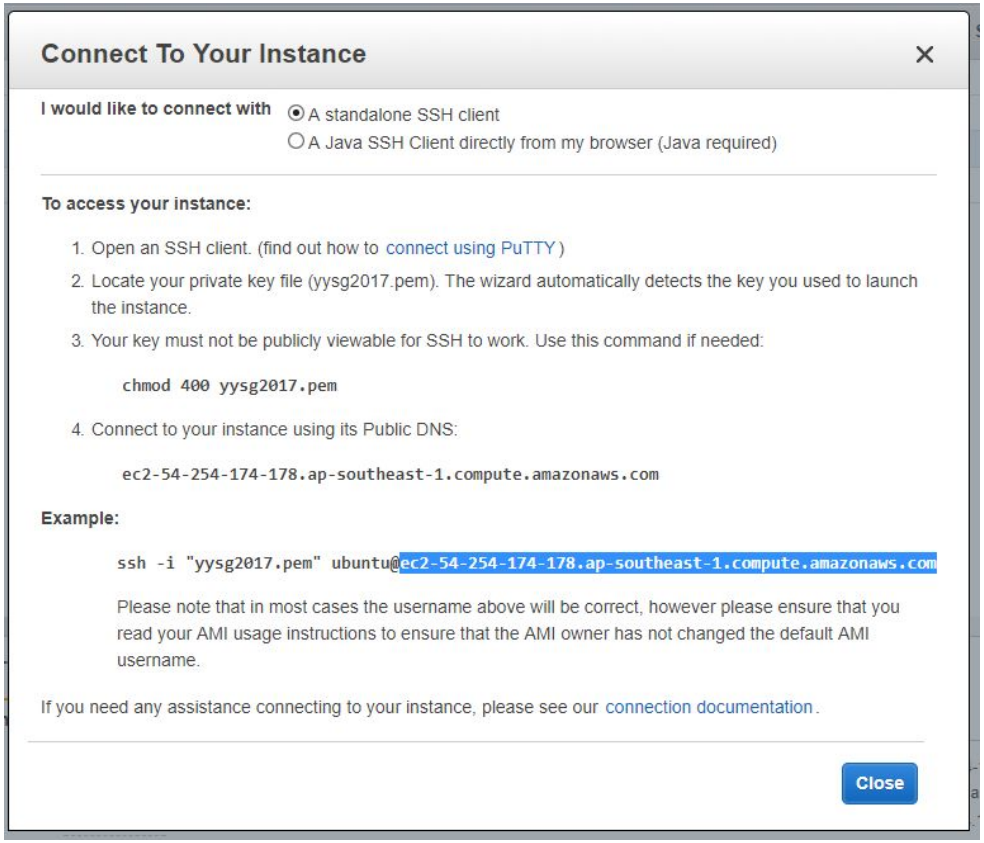
Control the instance.

- Connect gives information.
- Stop but not to terminate, which deletes all data from EBS.
- A running instance charges.
- A stopped instance will charge a small fee for the storage. Our configured size is 10G, within the free-tier for new account within 12-month.
- Use AWS calculator



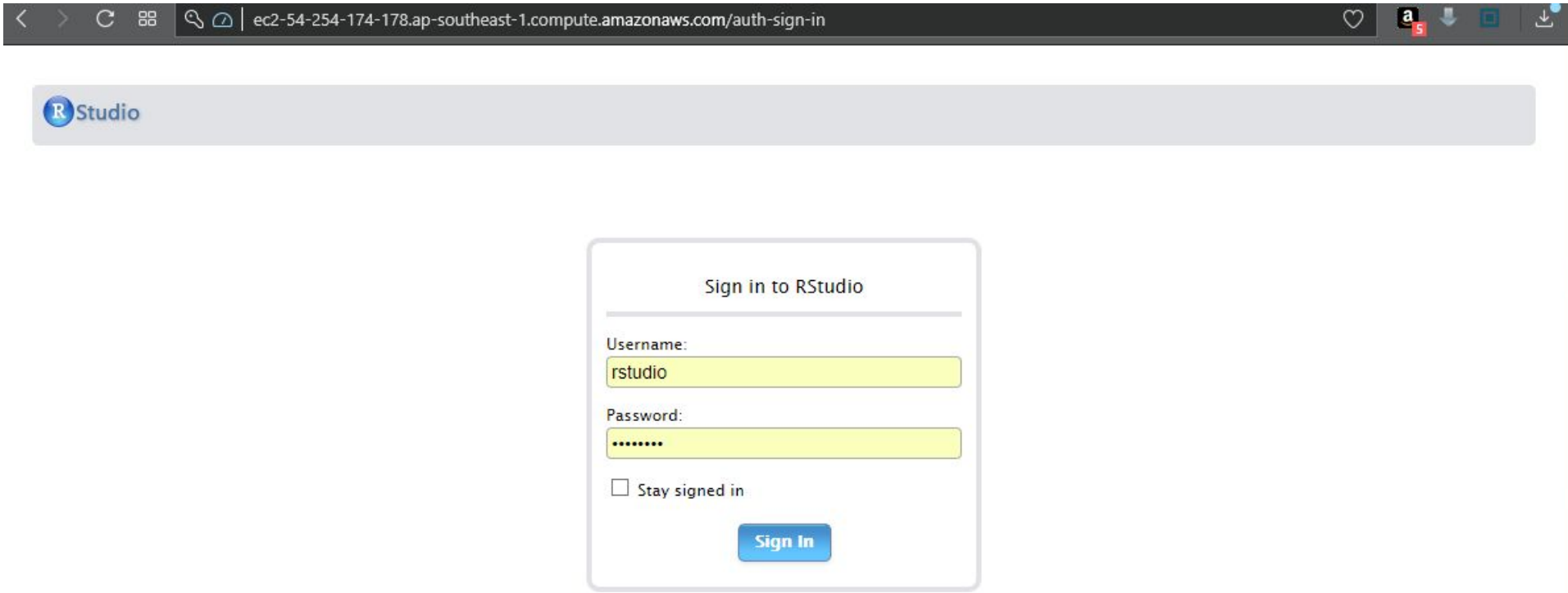
Access it

- Copy this address



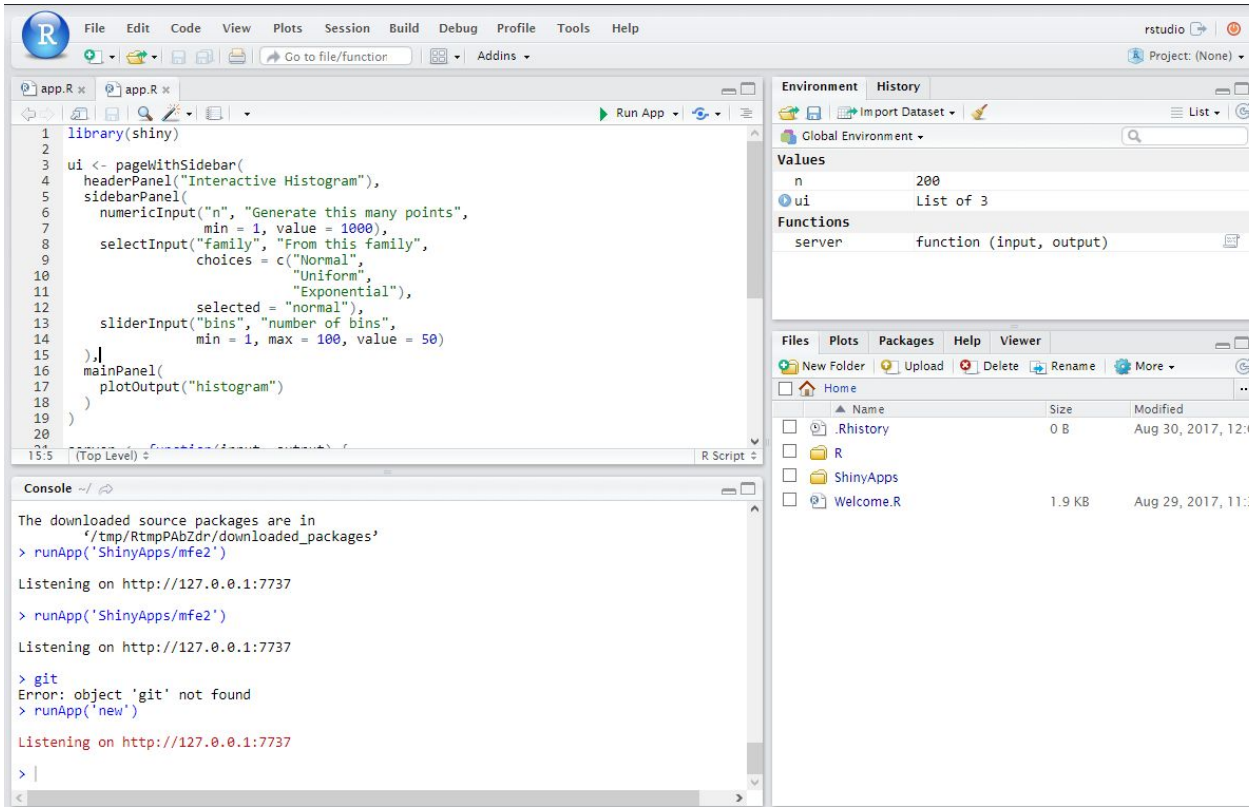
http://ec2-54-254-174-178.ap-southeast-1.compute.amazonaws.com/

Initial password: rstudio/rstudio.

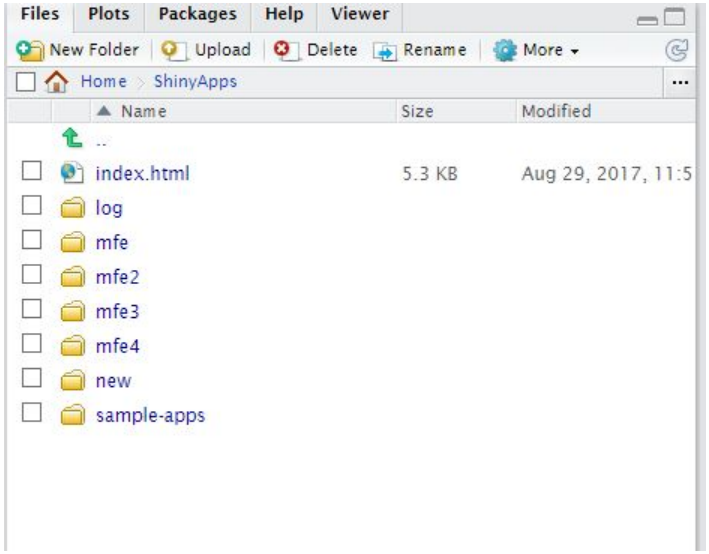


RStudio Setup

- Install packages
  - tidyverse
  - tidyquant
  - install.packages
- Tools -> Shell
  - passwd
- Shiny
  - Directory ShinyApps
  - Create sub-directories
- Files
  - Manage upload



Shiny Server



/home/**rstudio**/ShinyApps/**new**/

/ShinyApps/**new**/

http://ec2-54-254-174-178.ap-southeast-1.compute.amazonaws.com/shiny/**rstudio**/**new/**

AWS Recap

- AWS (Amazon Web Services) is an utility company for the internet like electricity/water.
- We can launch many computing/storage resources as we need.
  - We use Spot instance which is expensive.
  - AWS provides other pricing plan for long-term usage.
- Cool! We got something in the cloud.

Disclaimer:

1.
2. I am not working for Amazon and I don't get paid by this.
3. I am not owning Amazon shares directly and indirectly.
4. I don't plan to long AMZN during the course of this course.

For this course

- AWS setup is optional in this course.
- If you finishing working on it, leave the instance as Stopped. Be aware of how much you spend on AWS.

- It’s cool to have something running in the cloud. You can show people to impress.
- You can run R Studio and application on your laptop

- You can submit your assignment with me by Dropbox/Google drive.
- Please organize your assignments into different directories.