**Distributed Builds**

This section will guide you to:

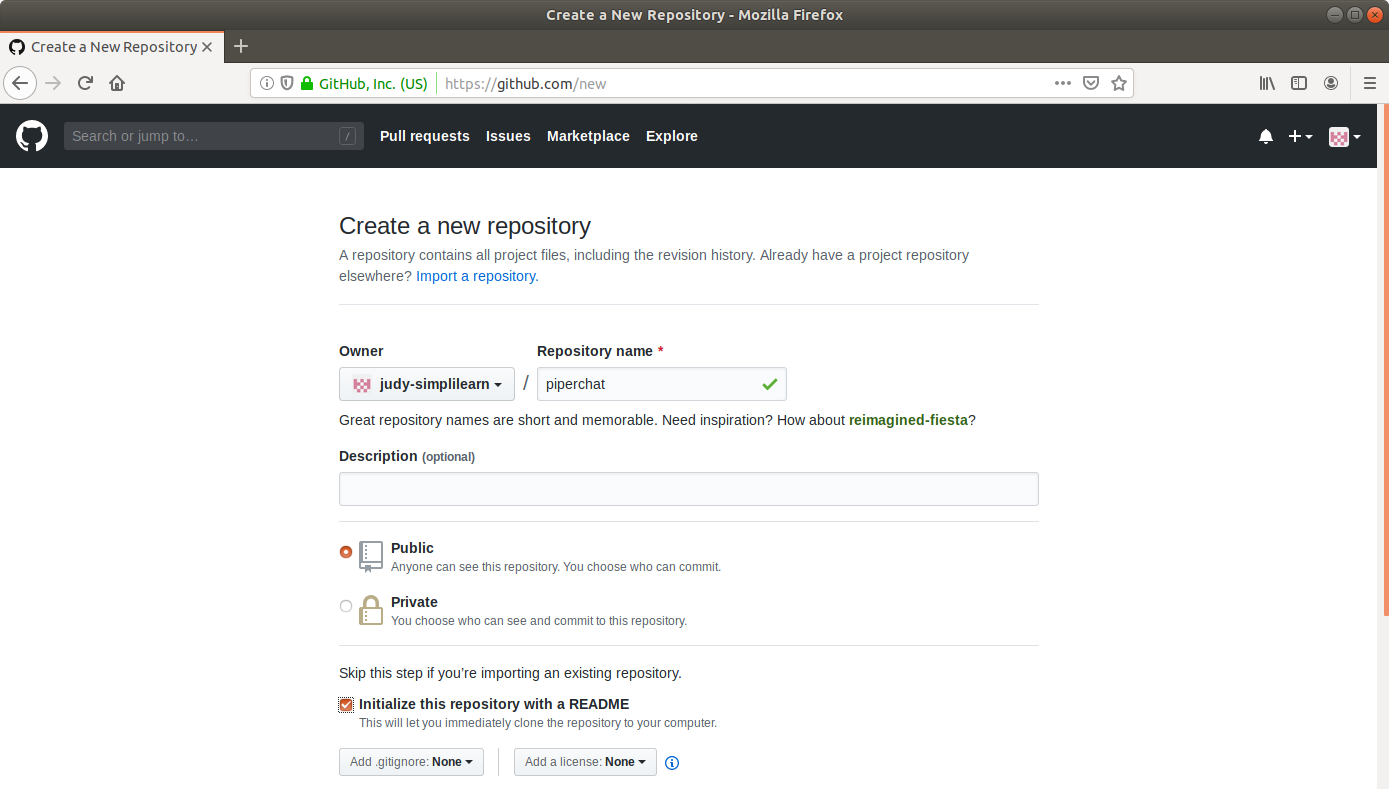
* Create an EC2 instance
* Create and run Jenkins on an EC2 VM
* Connect a Jenkins slave node to a master node
* Create a Maven web app
* Trigger a build job on a slave node from a master node

**Step 1:** Creating a Git repository for the web app

* Log in to your Github account.
* Click on the plus icon next to the profile picture and select *New repository* from the drop-down menu.



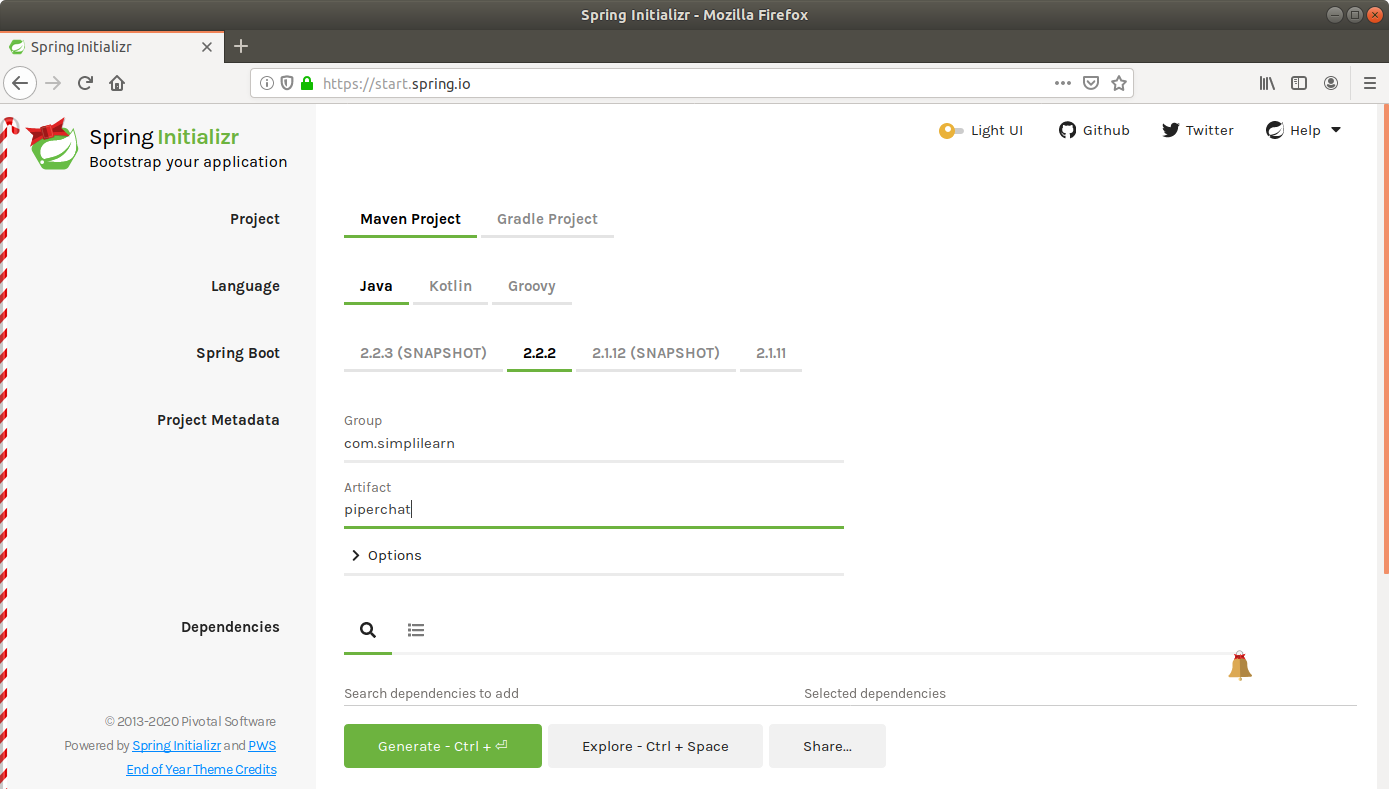
* Fill the required fields in the create repository form.



* Click on the **Create Repository** button.
* Click on the **Clone or download** button and copy the URL.

**Step 2:** Generating a spring boot project

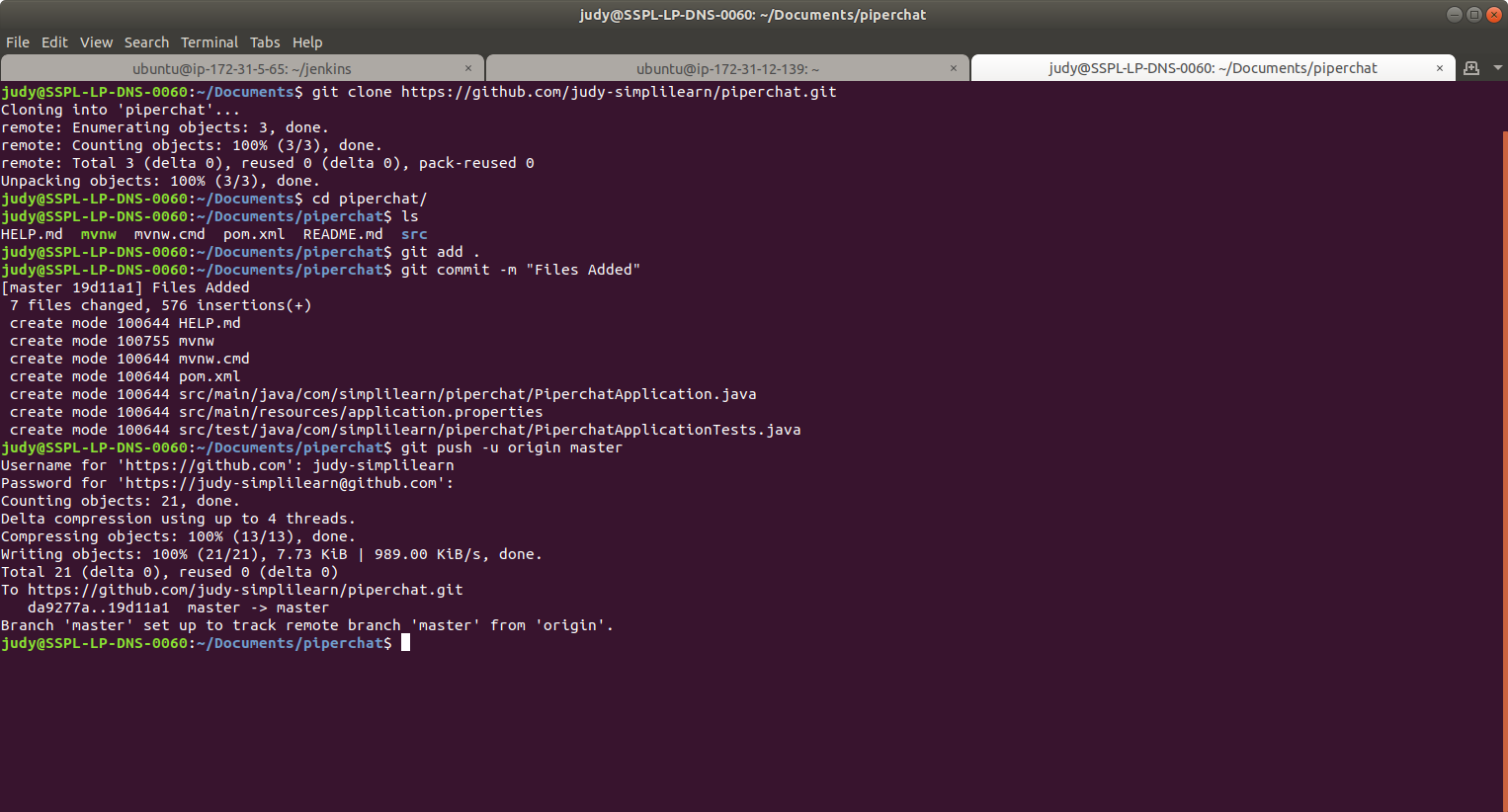
* Go to ​start.​spring.​io/​



* Select Maven as the project type.
* Fill Group and Artifact with appropriate values. For example, *com.simplilearn* and *freshmart-pos.*
* Click on **Generate Project.**
* The generated skeleton project should be downloaded as a zip file.

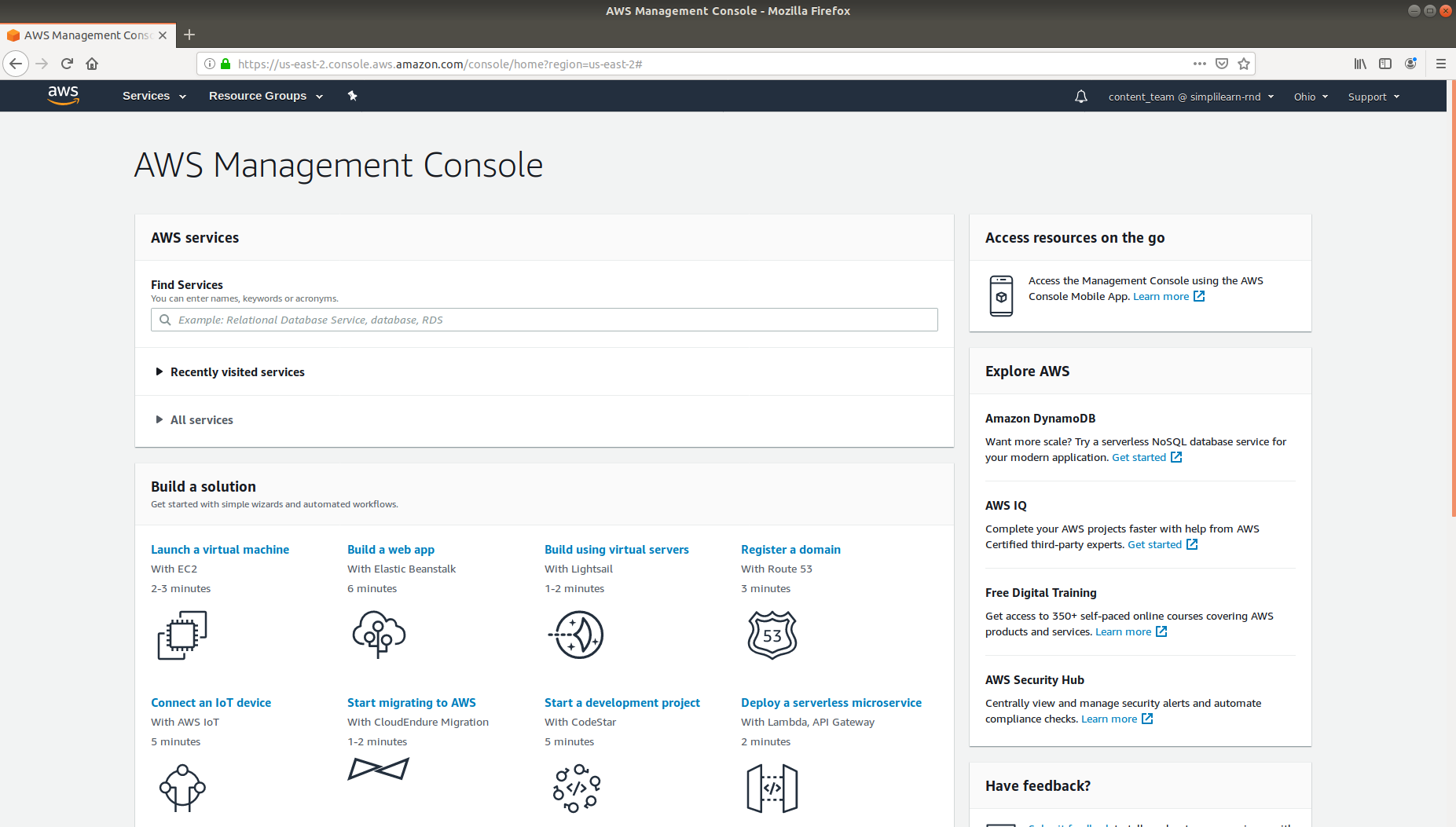
**Step 3:** Committing the project skeleton to the repository

* Open the terminal and navigate to an appropriate location.
* Run **git clone [URL]** to clone the repository.
* Unzip the downloaded spring boot project to the cloned repository.
* Commit the changes to the remote SCM.
* Run **git add .**
* Run **git commit -m "Add project skeleton"**
* Run **git push -u origin master**

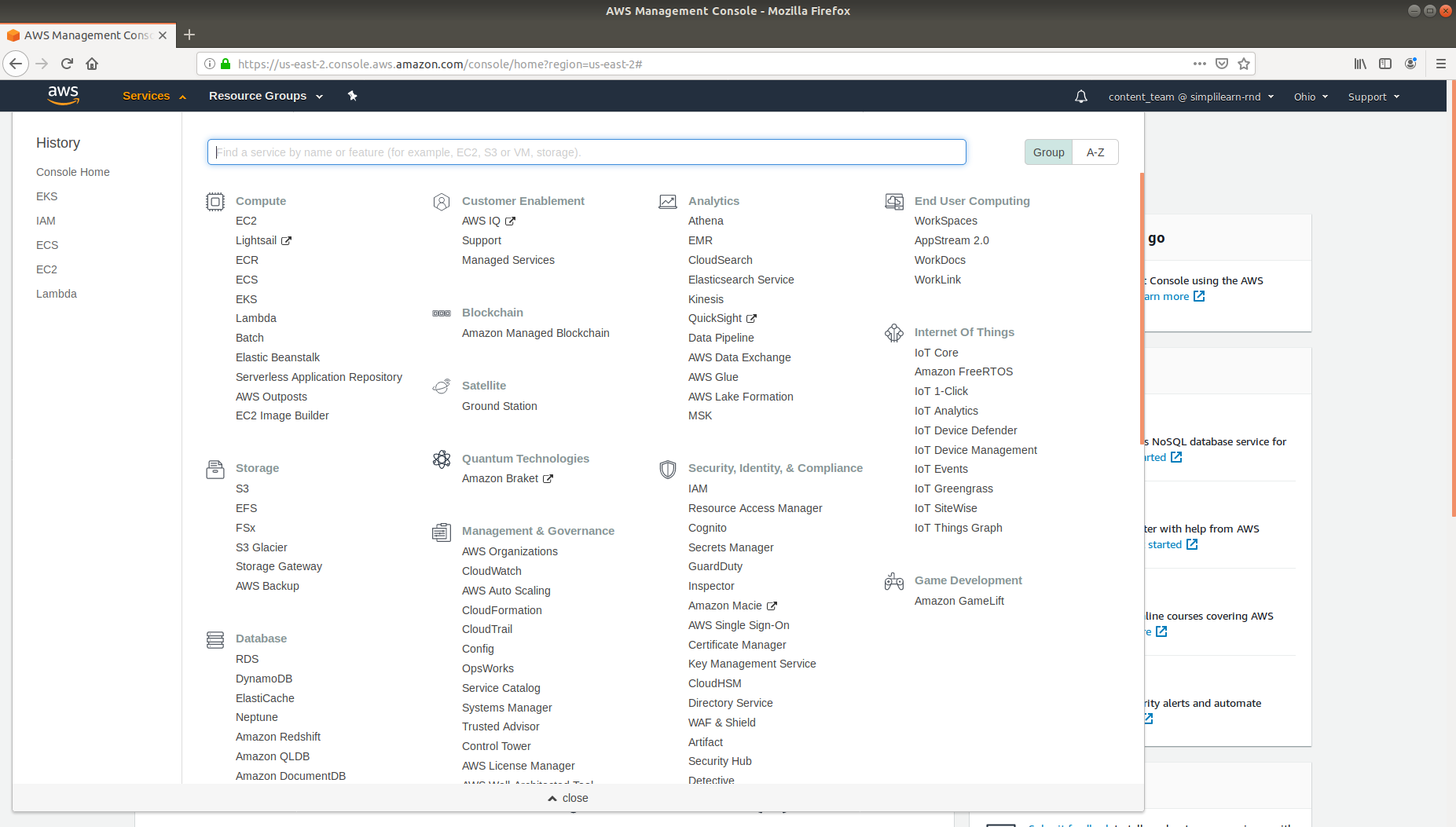


**Step 4:** Creating an EC2 instance

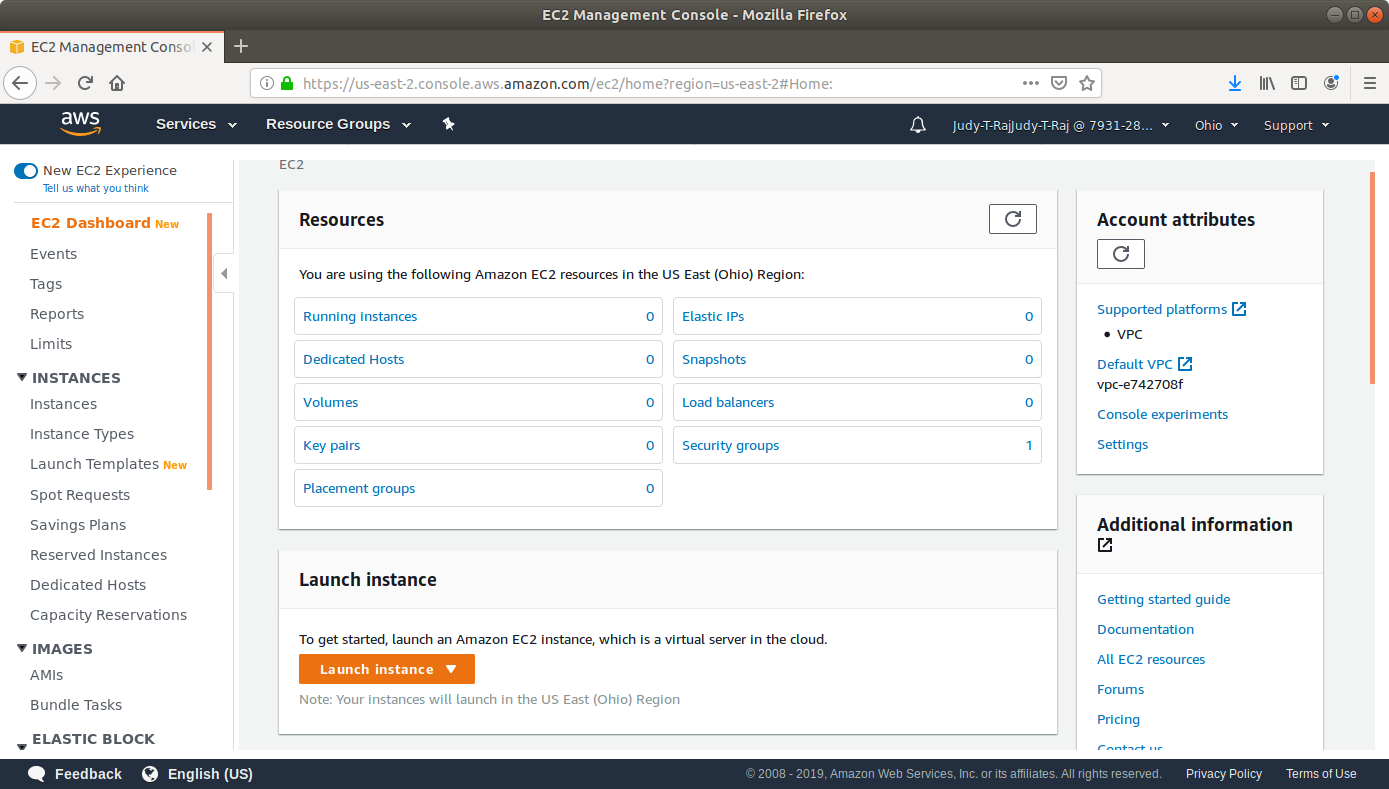
* Log in to the AWS lab account provided. You will be able to see the following screen:



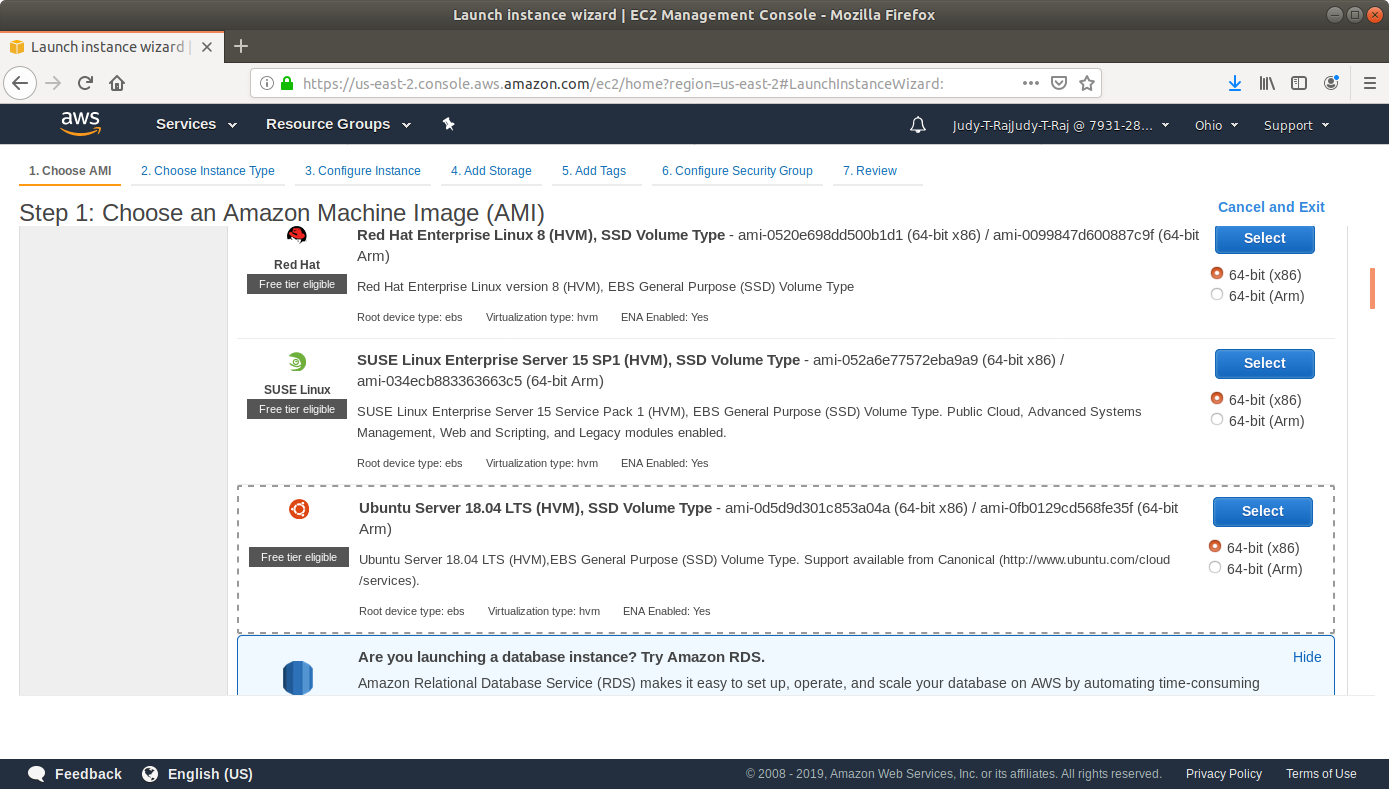
* Click on Services at the top left to view the drop-down list of resources.
* Click on EC2 under the Compute menu from the drop-down list.



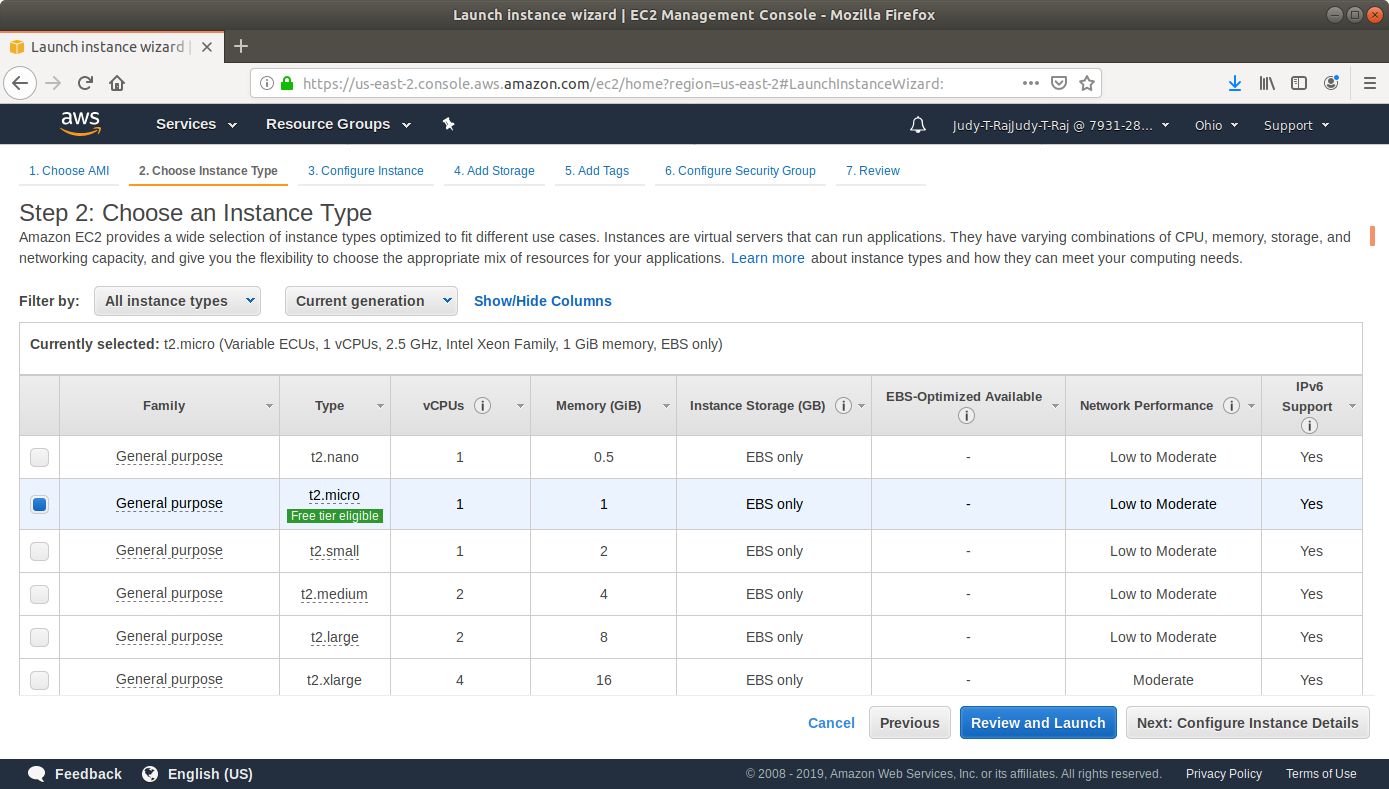
* Click on *Launch Instance* button and select Launch Instance from the menu.



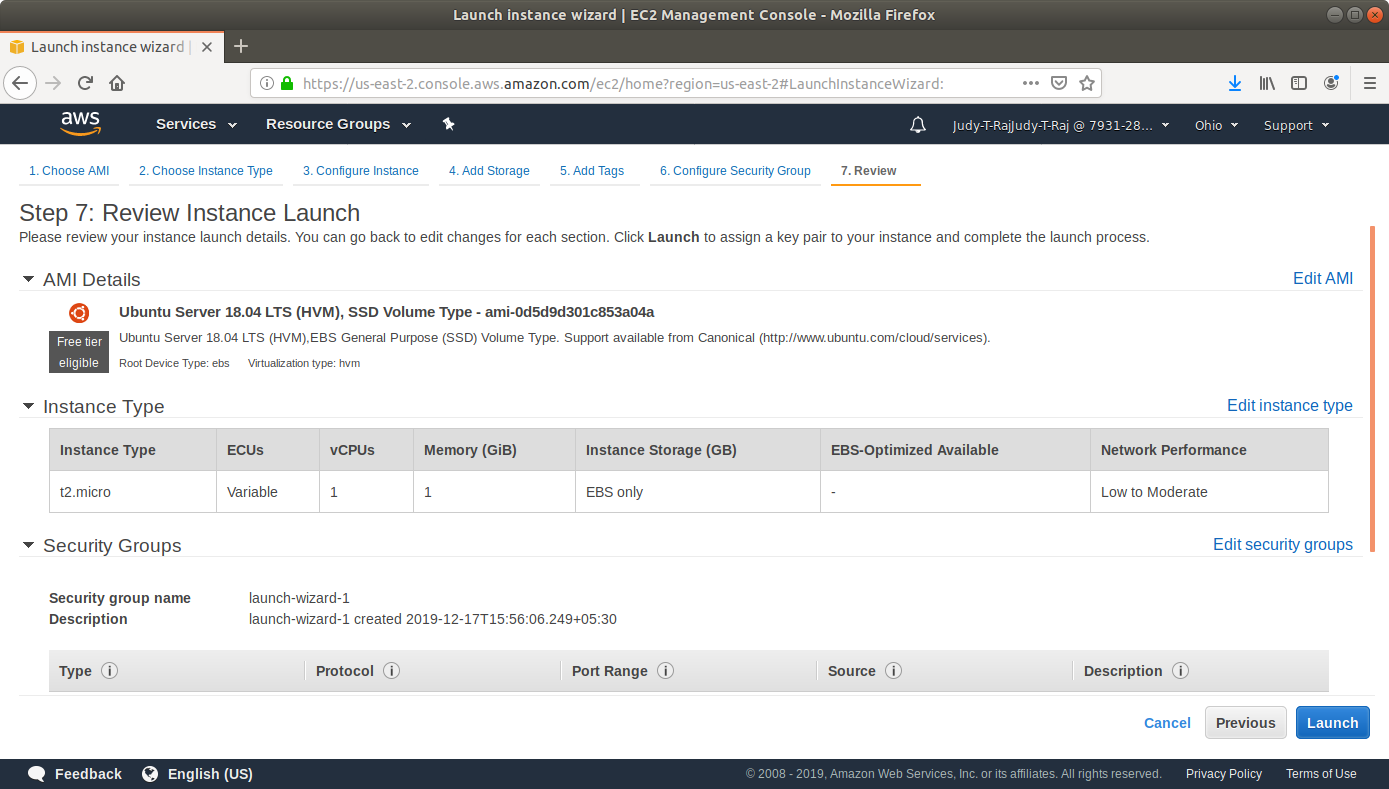
* Choose an Amazon Machine Image (AMI) from the list of AMIs and click on Select.



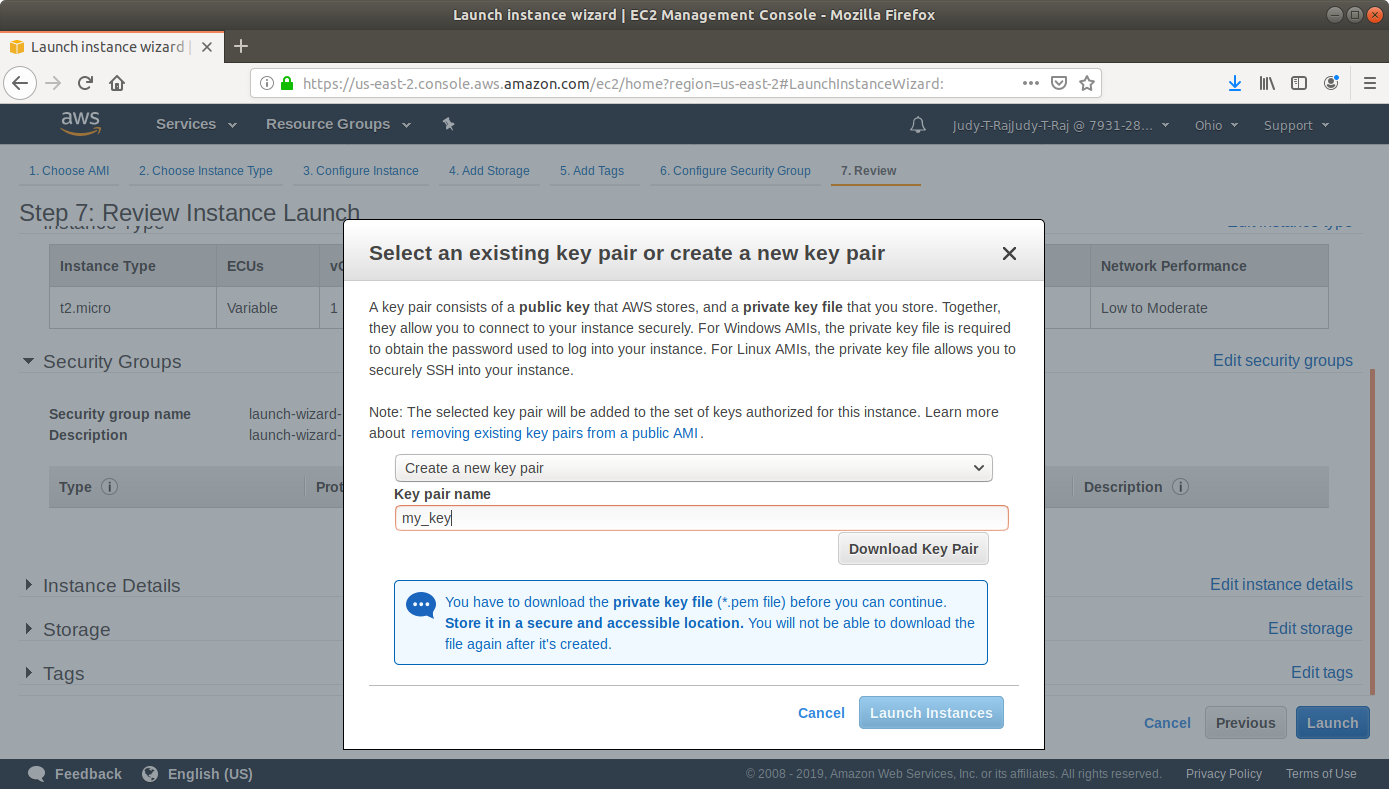
* Choose an Instance Type and click *Review and Launch*.



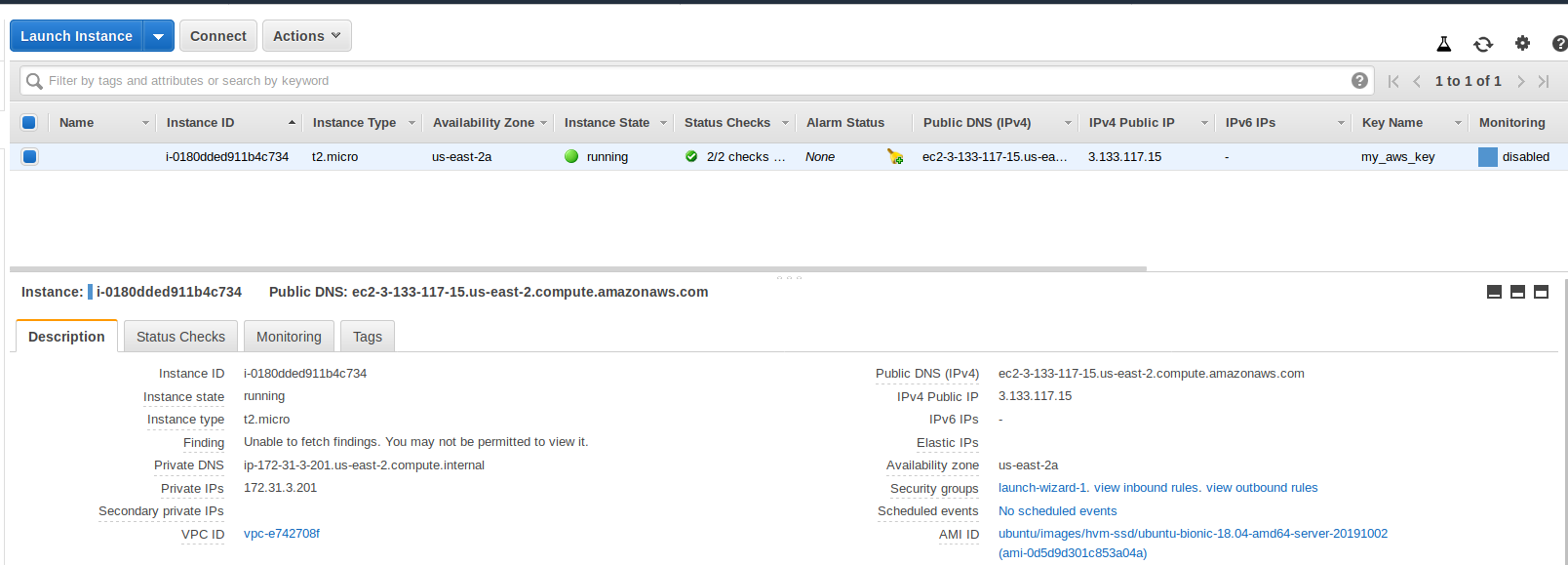
* Click on *Launch*.



* In the pop-up menu, select Create a new key-value pair.
* Click on *Download Key Pair*. You’ll need this key to SSH to the VM later.



* Click on *Launch*.
* Navigate to the security groups console.



* Add a rule to the security group to which the instance belongs to allow SSH with the following settings:

**Type:** SSH

**Protocol:** TCP

**Port Range:** 22

**Source:** Anywhere 0.0.0.0/0

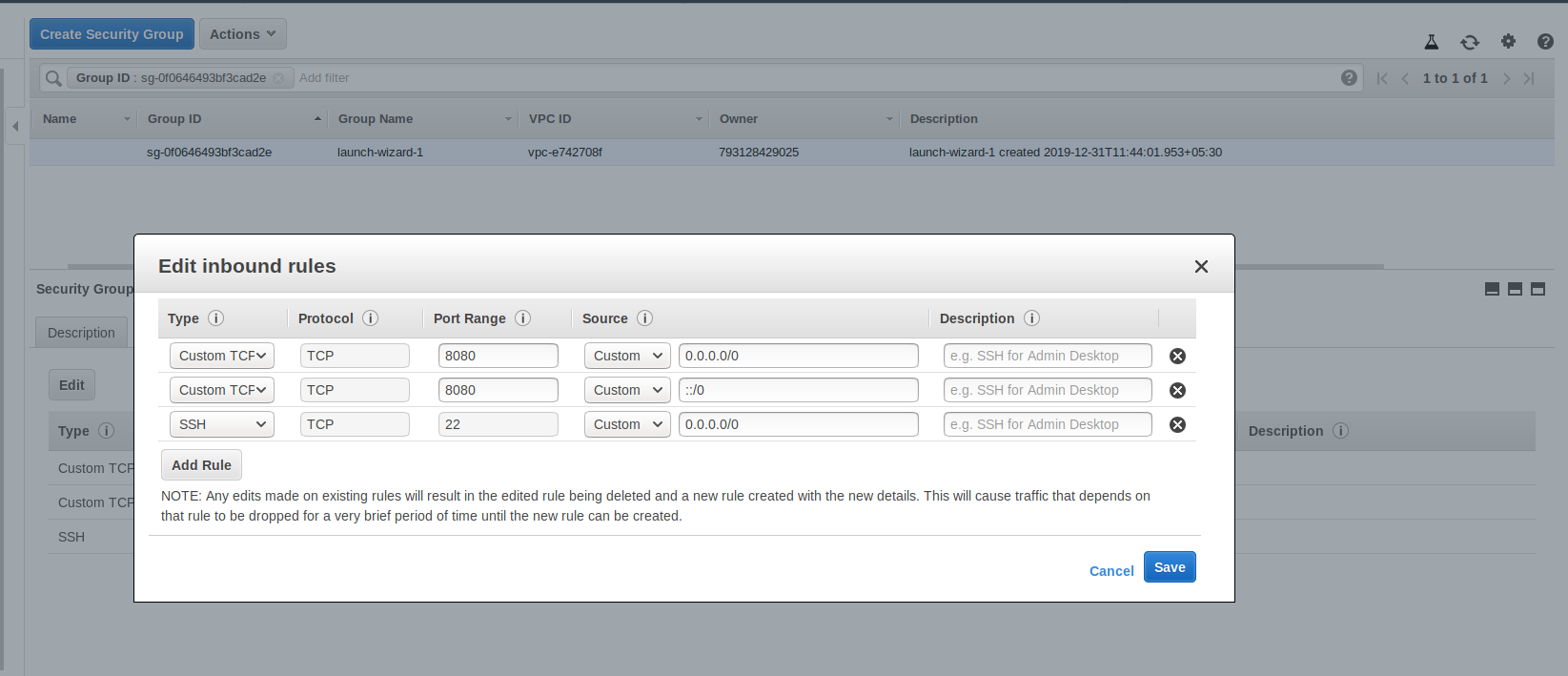
* Add a rule to the security group to which the instance belongs to allow HTTP traffic to port 8080 with the following settings:

**Type:** Custom TCP Rule

**Protocol:** TCP

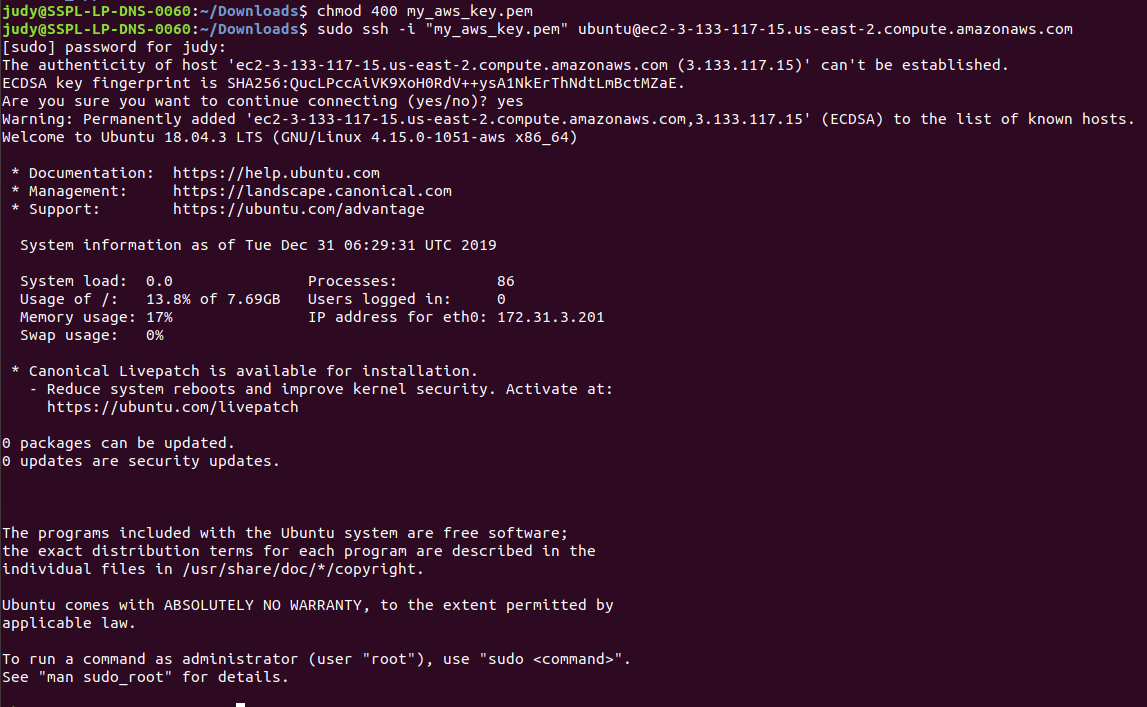
**Port Range:** 8080

**Source:** Anywhere 0.0.0.0/0



**Step 5:** Installing Jenkins on EC2

* Open the terminal.
* Navigate to the location where the AWS key is stored.
* Make the key file executable with the command **chmod 400 <key-name>.pem**
* SSH to the EC2 instance with the command **sudo ssh -i <key-name>.pem ubunutu@<public-dns>**



* Run the following commands to install Java and Jenkins

**sudo apt update**

**sudo apt install openjdk-8-jdk**

**wget -q -O - https://pkg.jenkins.io/debian/jenkins.io.key | sudo apt-key add -**

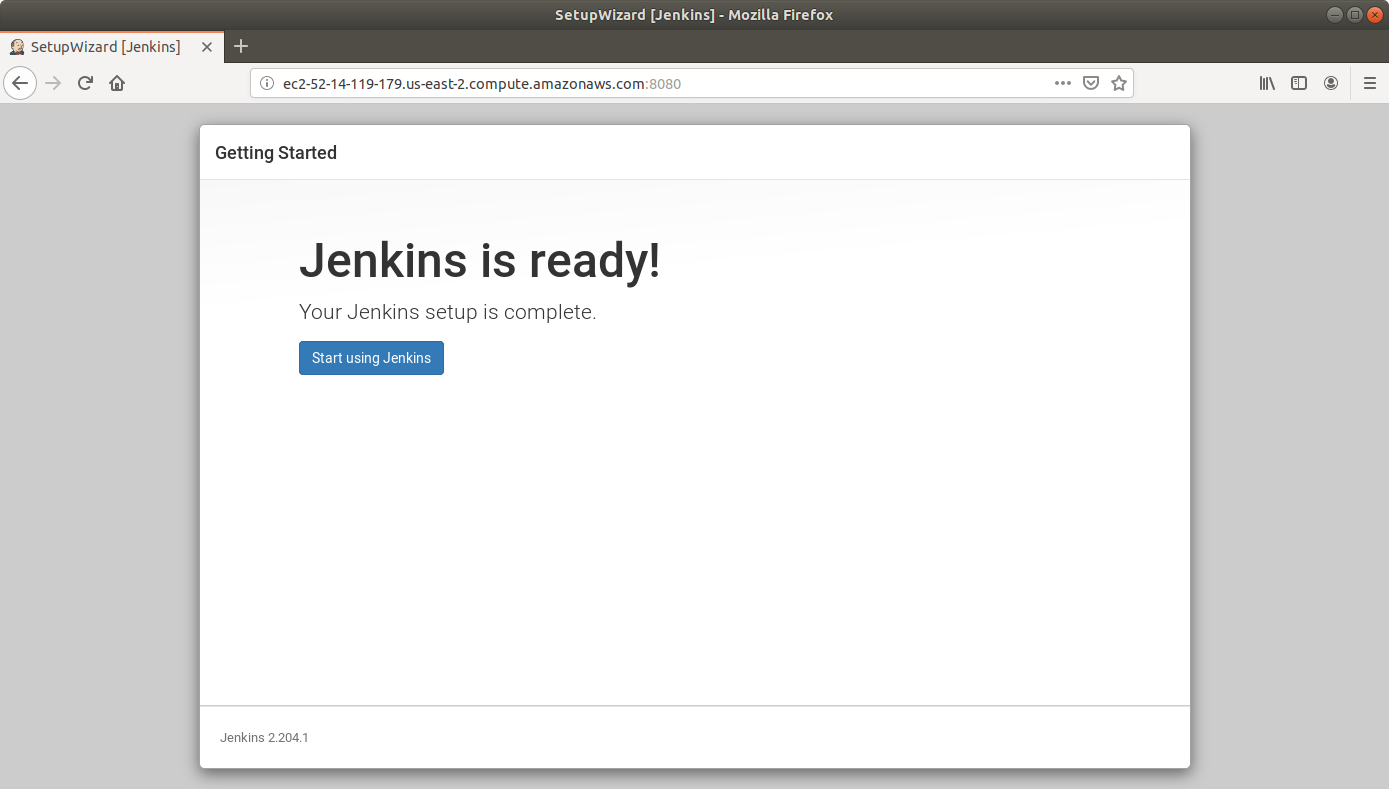
**sudo sh -c 'echo deb http://pkg.jenkins.io/debian-stable binary/ > /etc/apt/sources.list.d/jenkins.list'**

**sudo apt update**

**sudo apt install jenkins**

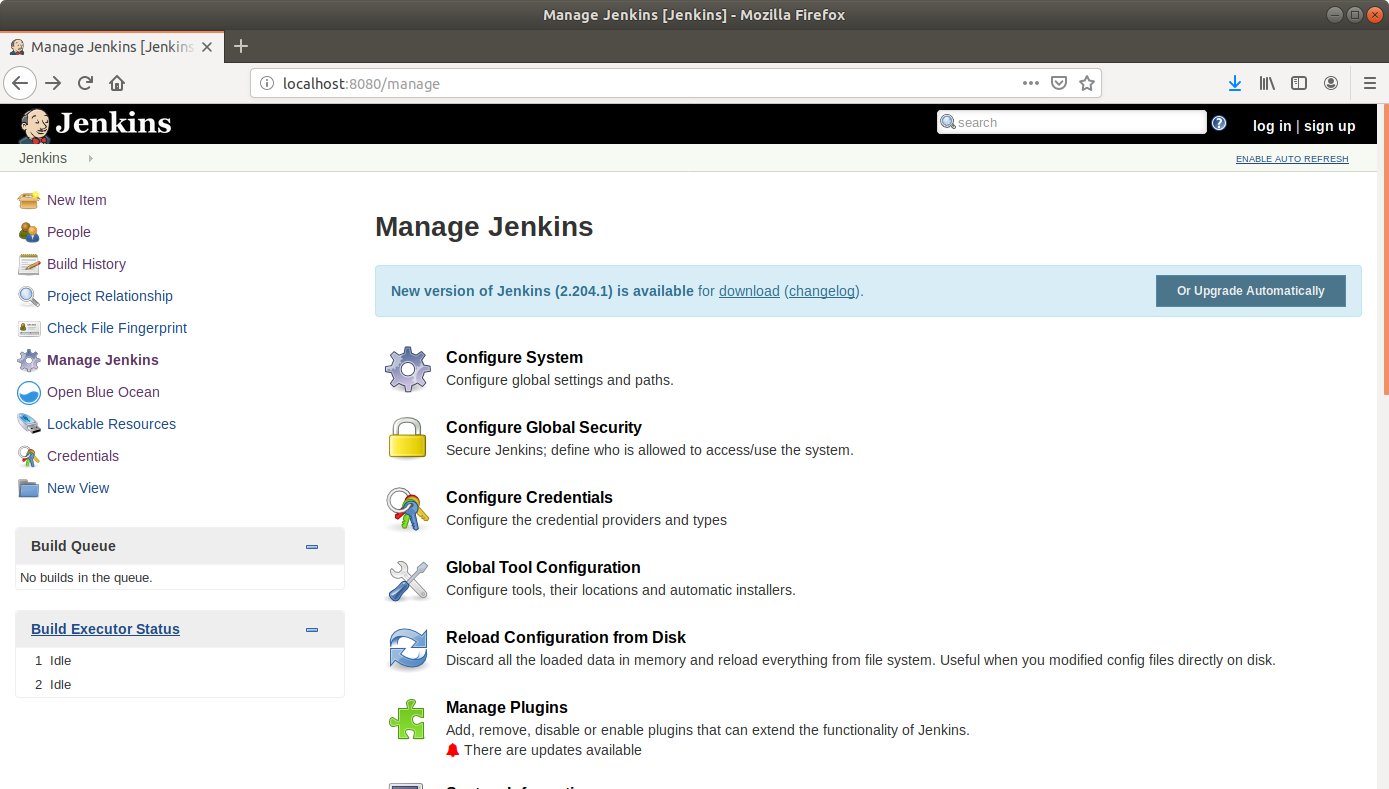
**sudo ufw allow 8080**

* Navigate to http://<Public DNS (IPv4)>:8080 to view the Jenkins server.
* Follow the instructions on screen to complete installation.

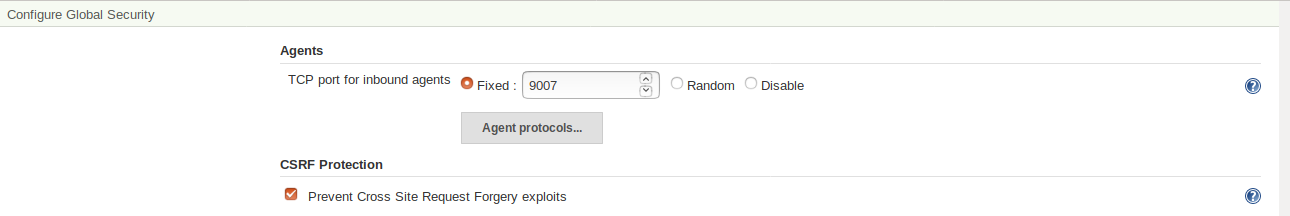
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**Step 6:** Connecting a slave node to Jenkins master

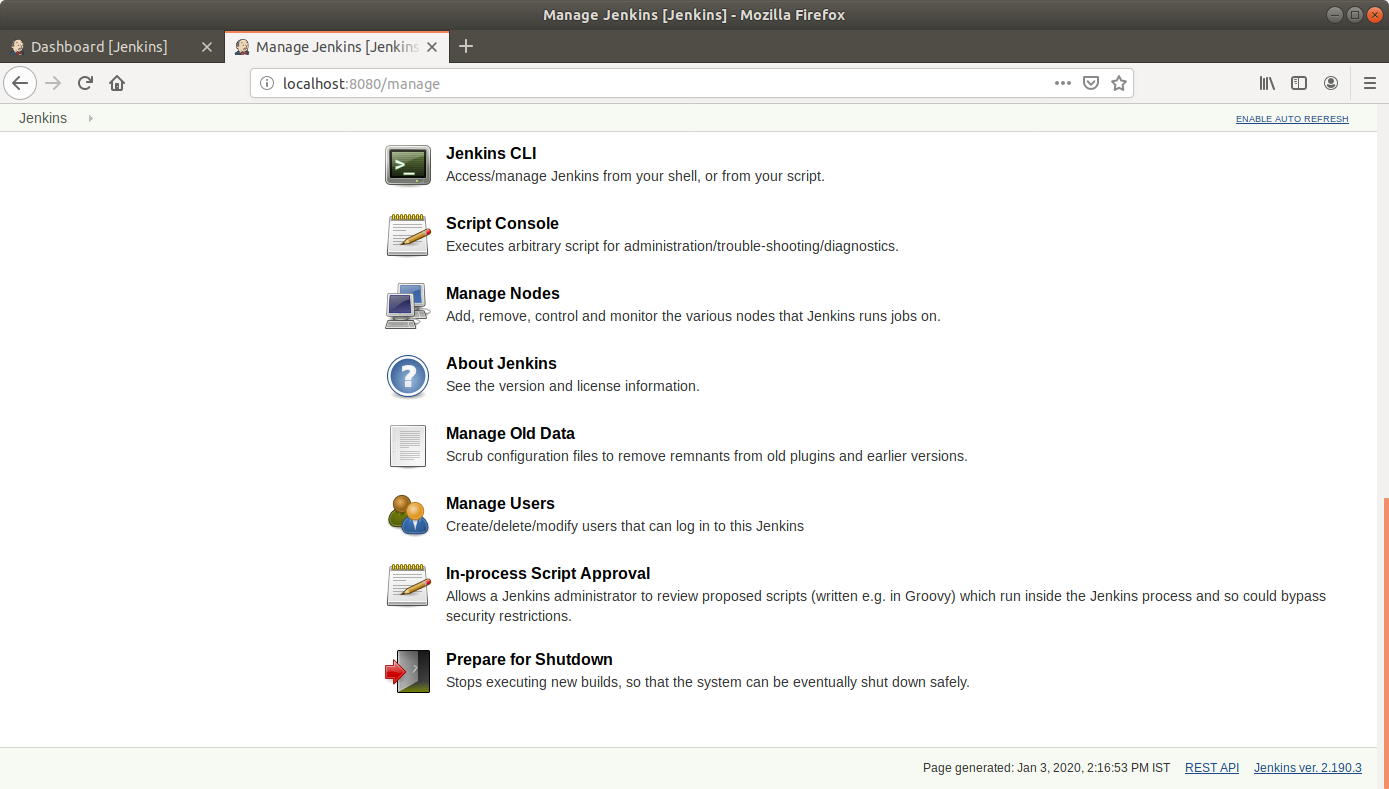
* Go to Jenkins dashboard.
* Click on *Manage Jenkins* and select *Manage Global Security.*

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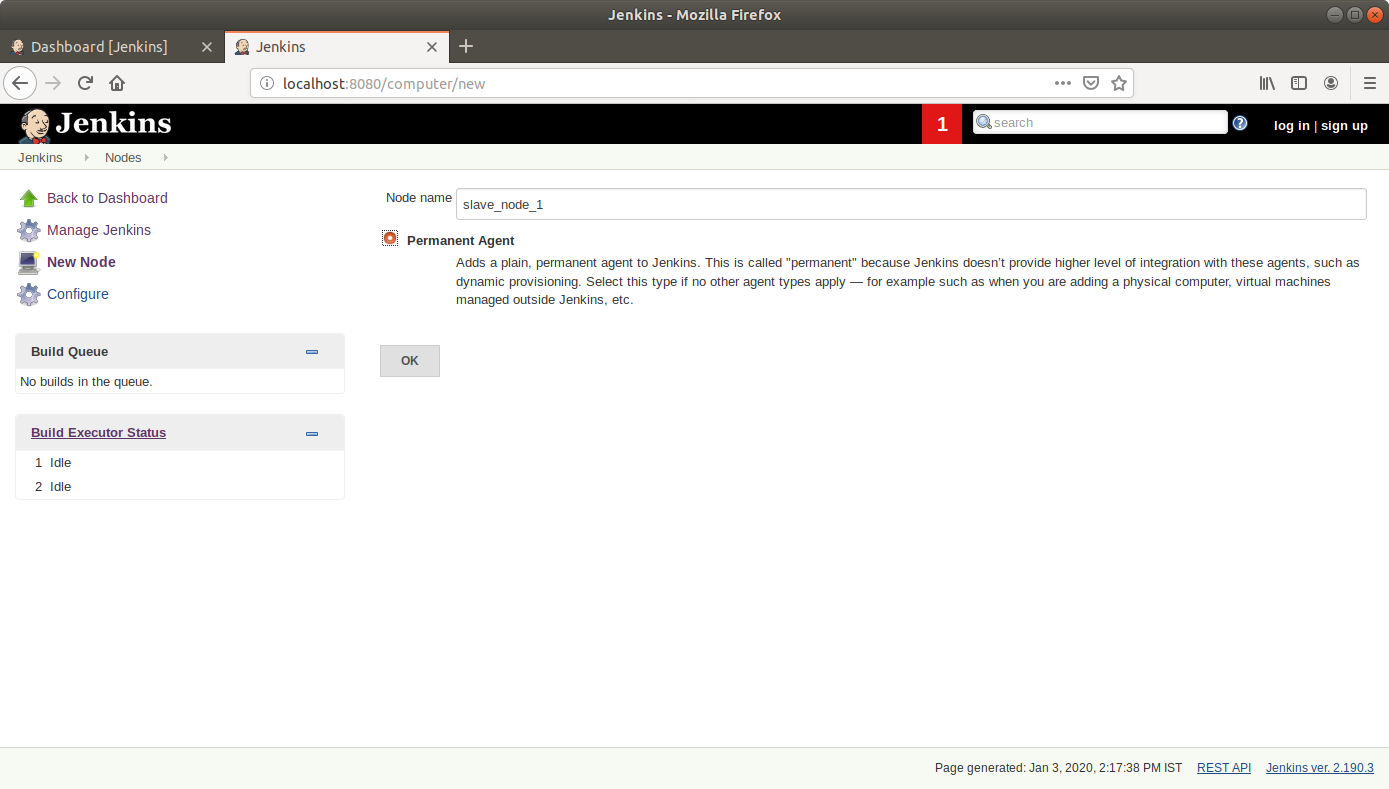
* Scroll down to Agents and enable inbound traffic at port 9007.

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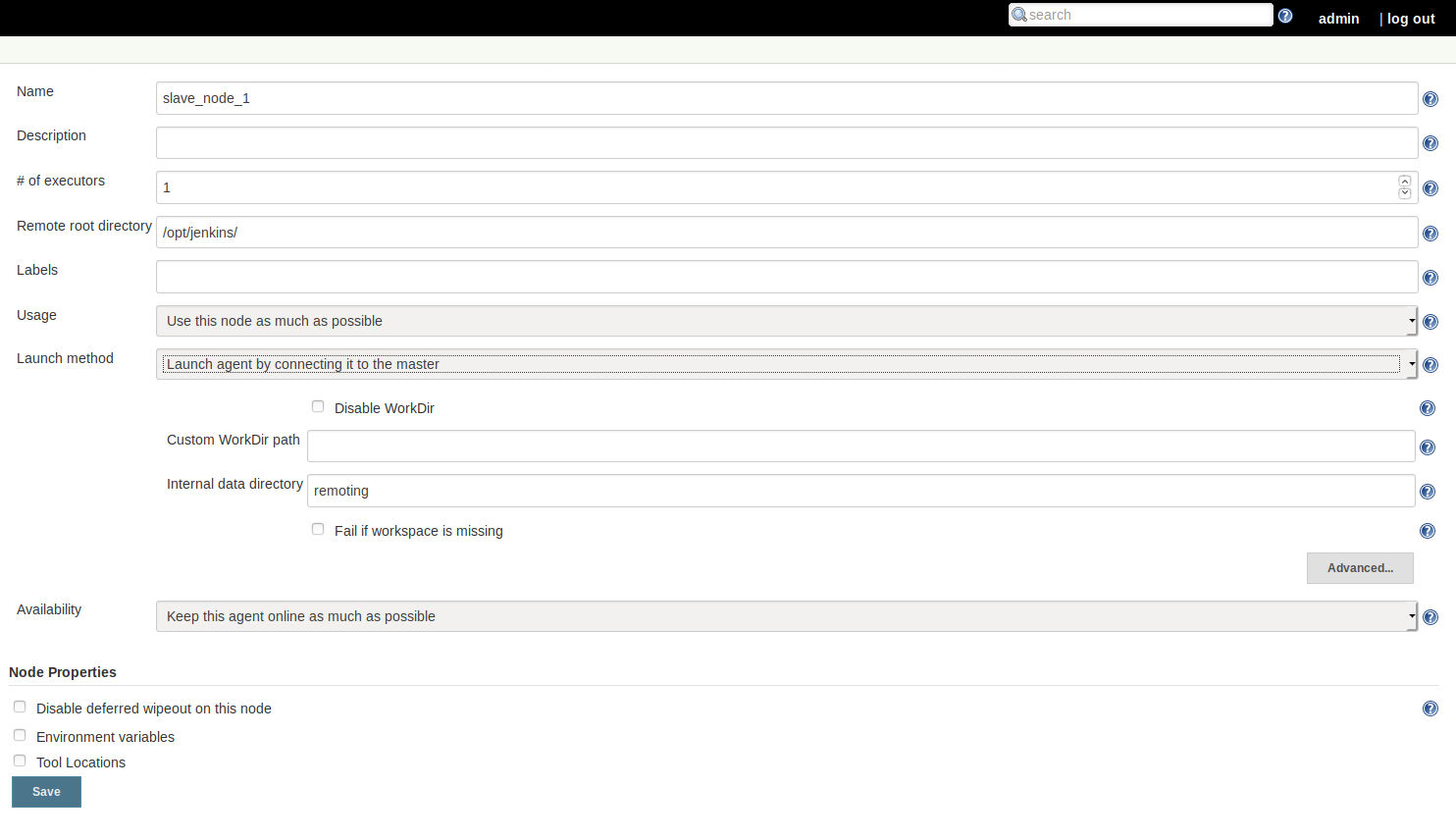
* From the Jenkins dashboard, click on *Manage Jenkins* and select *Manage Nodes*

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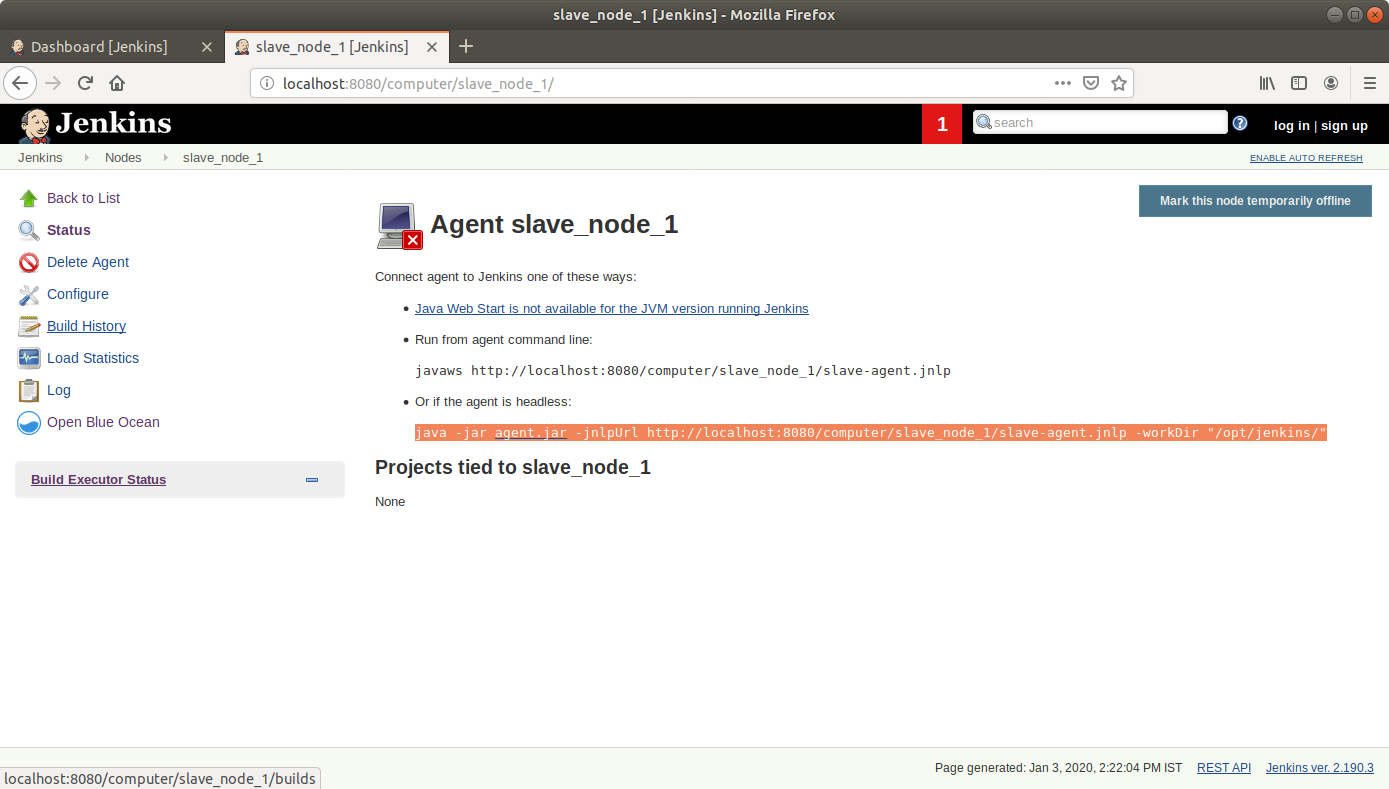
* Give a name to the node and then click OK. Select the *Permanent Agent* checkbox.



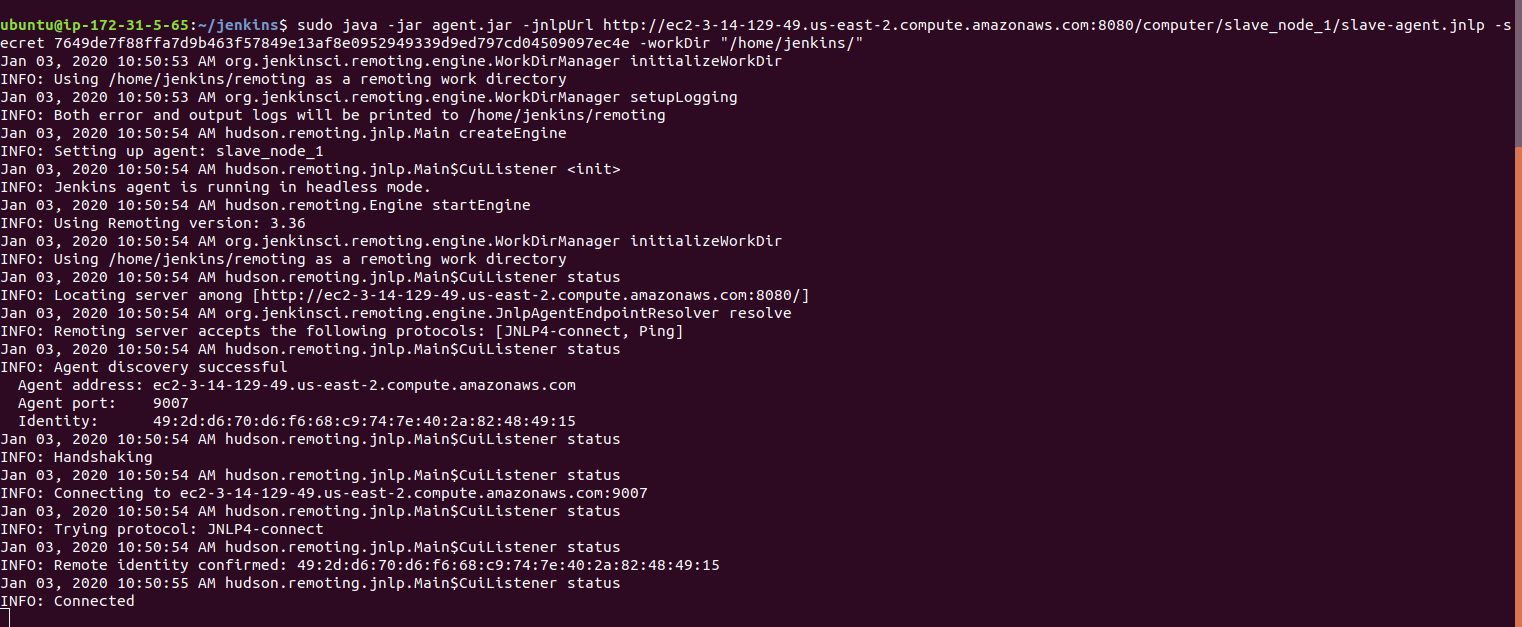
* Enter the required information as shown in the screenshot below:



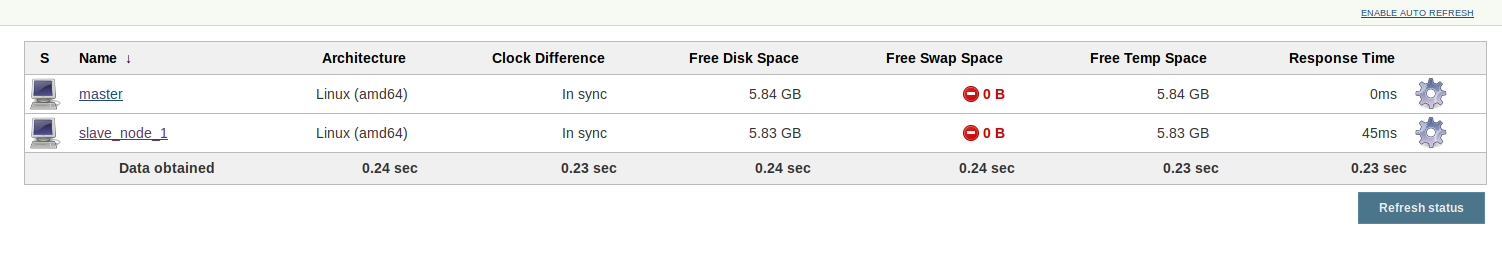
* Click on the *agent.ja*r hyperlink in the new page and copy the link on the new page.
* Copy the command given on the page to be run from the slave agent.



* SSH to the EC2 instance acting as the slave node.
* Create a directory at the path specified as *Remote root directory*.
* Download the agent.jar file to the newly created directory using the wget command.
* Run the command copied from the Jenkins master to connect the instance to master

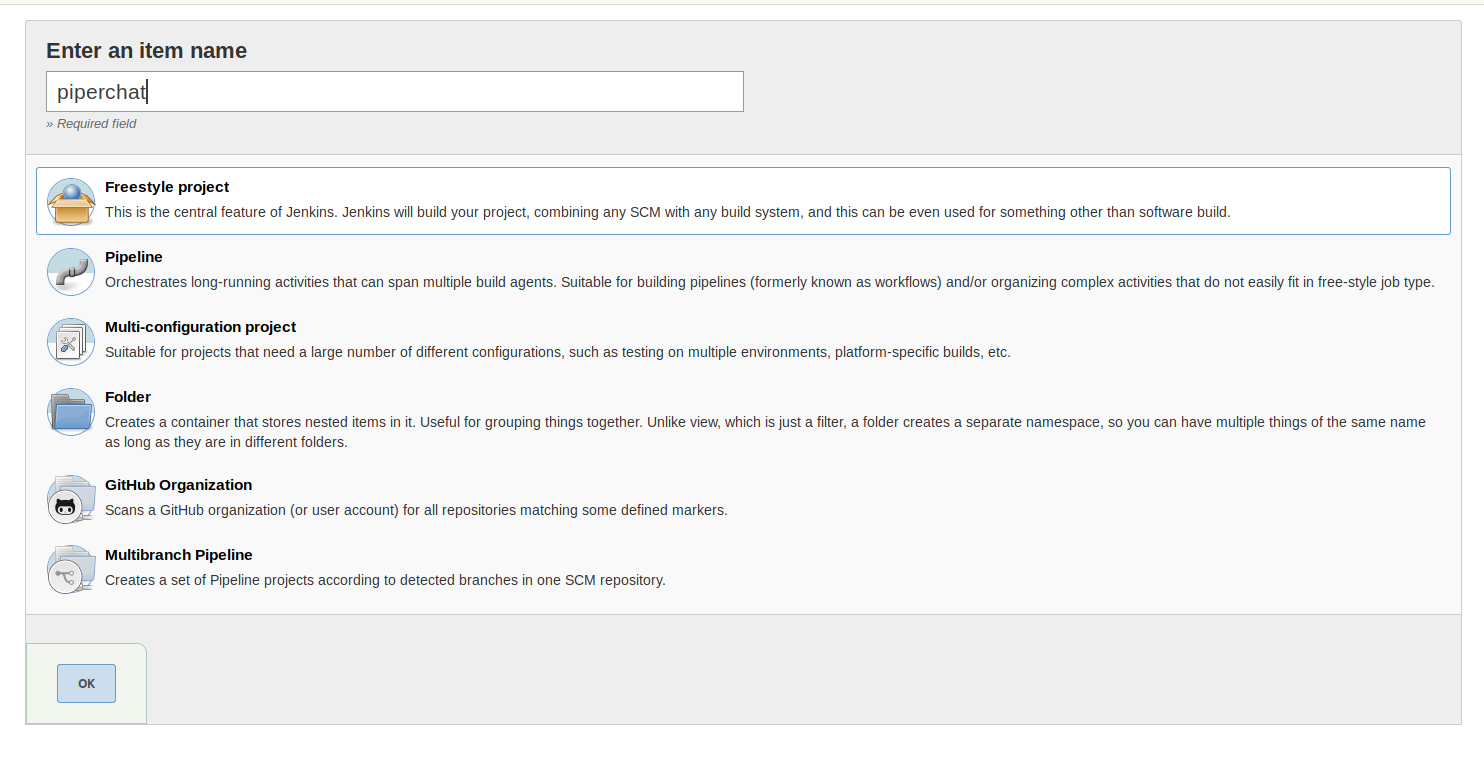


* The slave node will show as connected to the master UI.

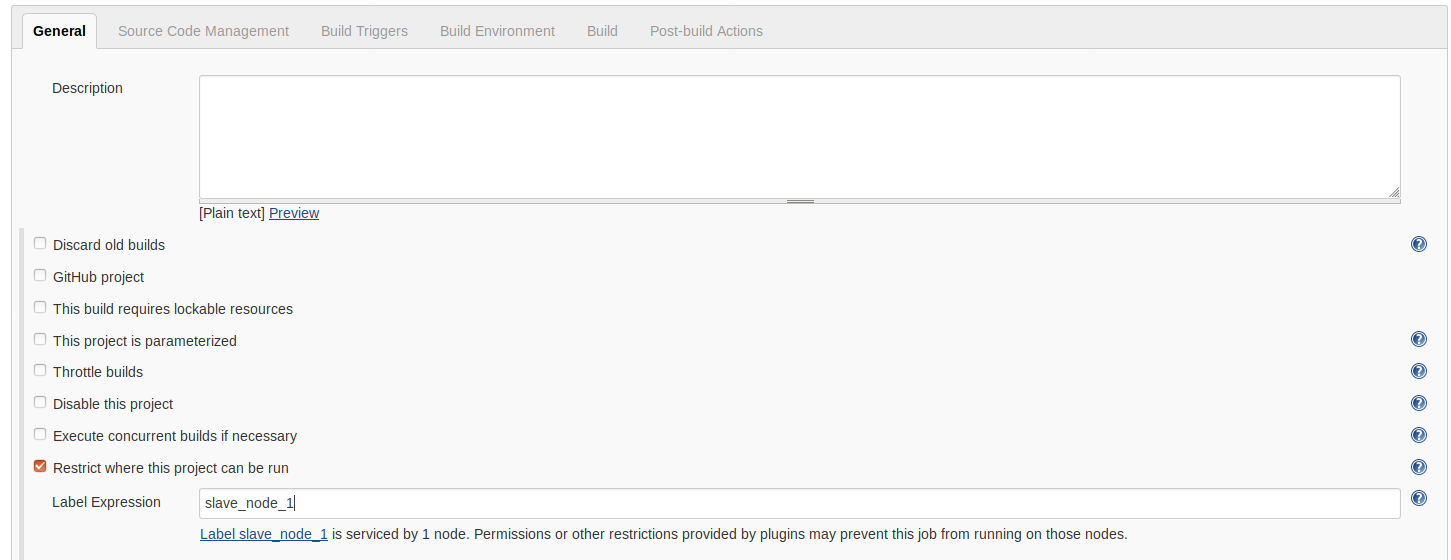


**Step 7:** Creating a build pipeline in Jenkins

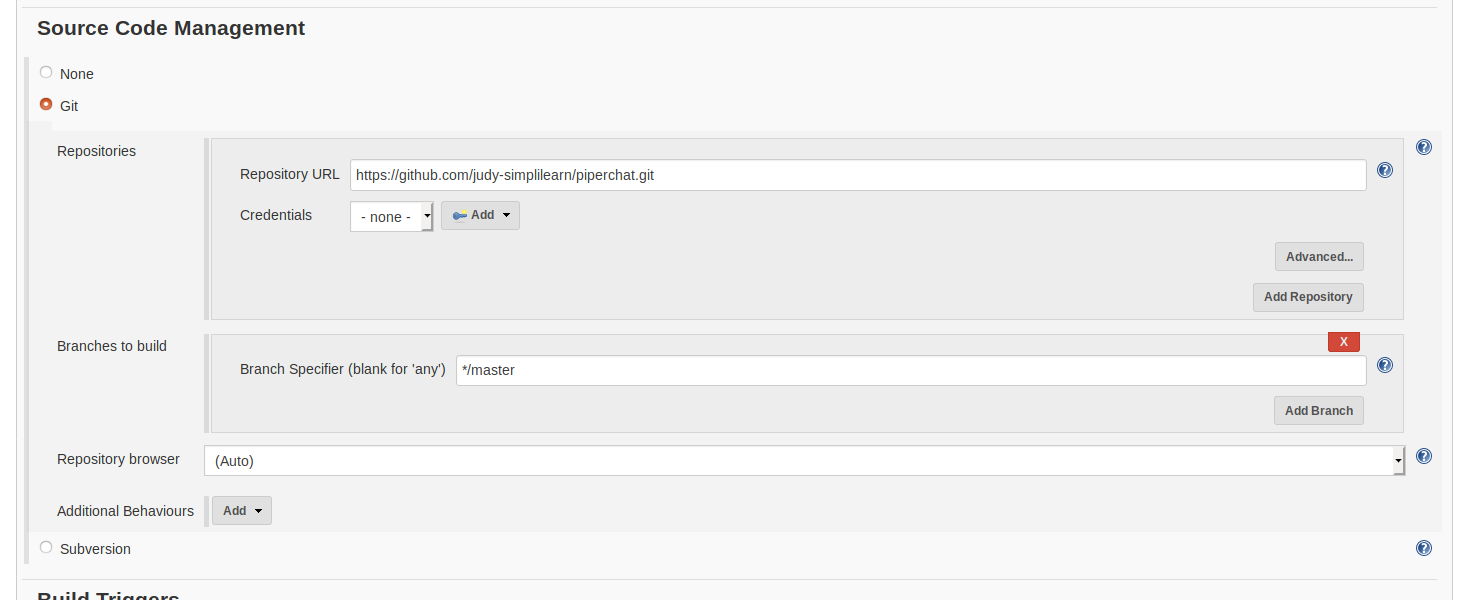
* Click on *New Item*.
* Enter a name for your build job.
* Select *Freestyle Job* as the build job type.



* Click OK.
* Under *General* tab on the configuration page, check the box that reads “*Restrict where this build will be run*” and enter the slave node’s name.



* Scroll down to the Source Code Management section.
* Select *Git in SCM.*
* Add the repository URL.



* Drag to the bottom and go to the *Build steps* section.
* Select on *Execute Shell command* from the drop-down.
* Enter the following command in the textbox:

**mvn clean package**



* Click *Save*.

**Step 7:** Running a deployment pipeline in Jenkins

* Click on *Build Now* in the project window.
* Jenkins will now build your pipeline and output the logs.
* The logs will show that the job is being run on the slave node.

