MODULE 3 – LAB EXERCISES

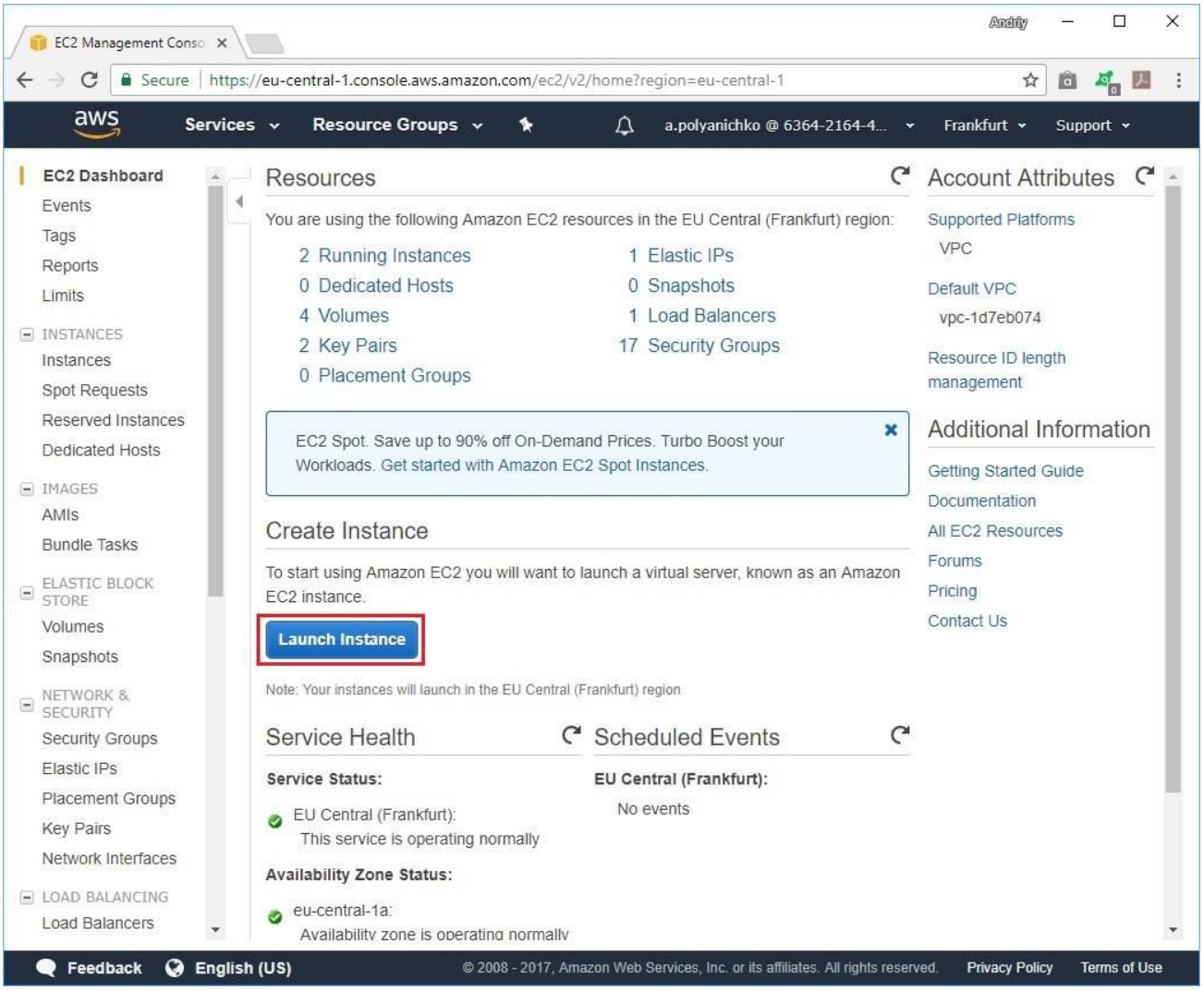
The lab exercises described below are intended to help you in practical learning of Amazon Elastic Compute Cloud (EC2) service.

Before doing the lab you must be signed-in AWS Management Console as described in Module 1 lab.

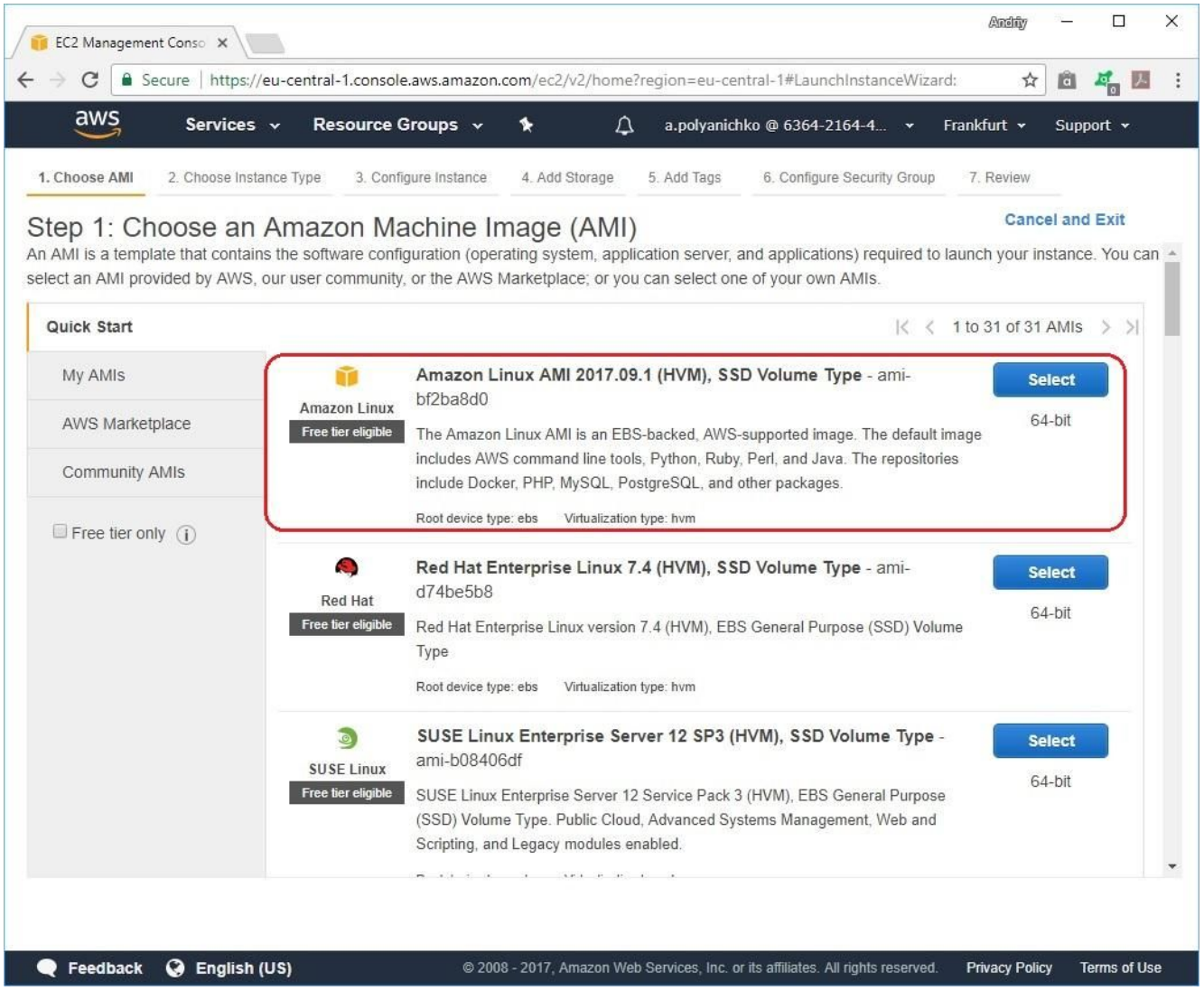
1. Launch a Linux Virtual Machine on EC2 Instance

Please find EC2 link around AWS services on Console main page and click it:

EC2 Dashboard page will be opened:

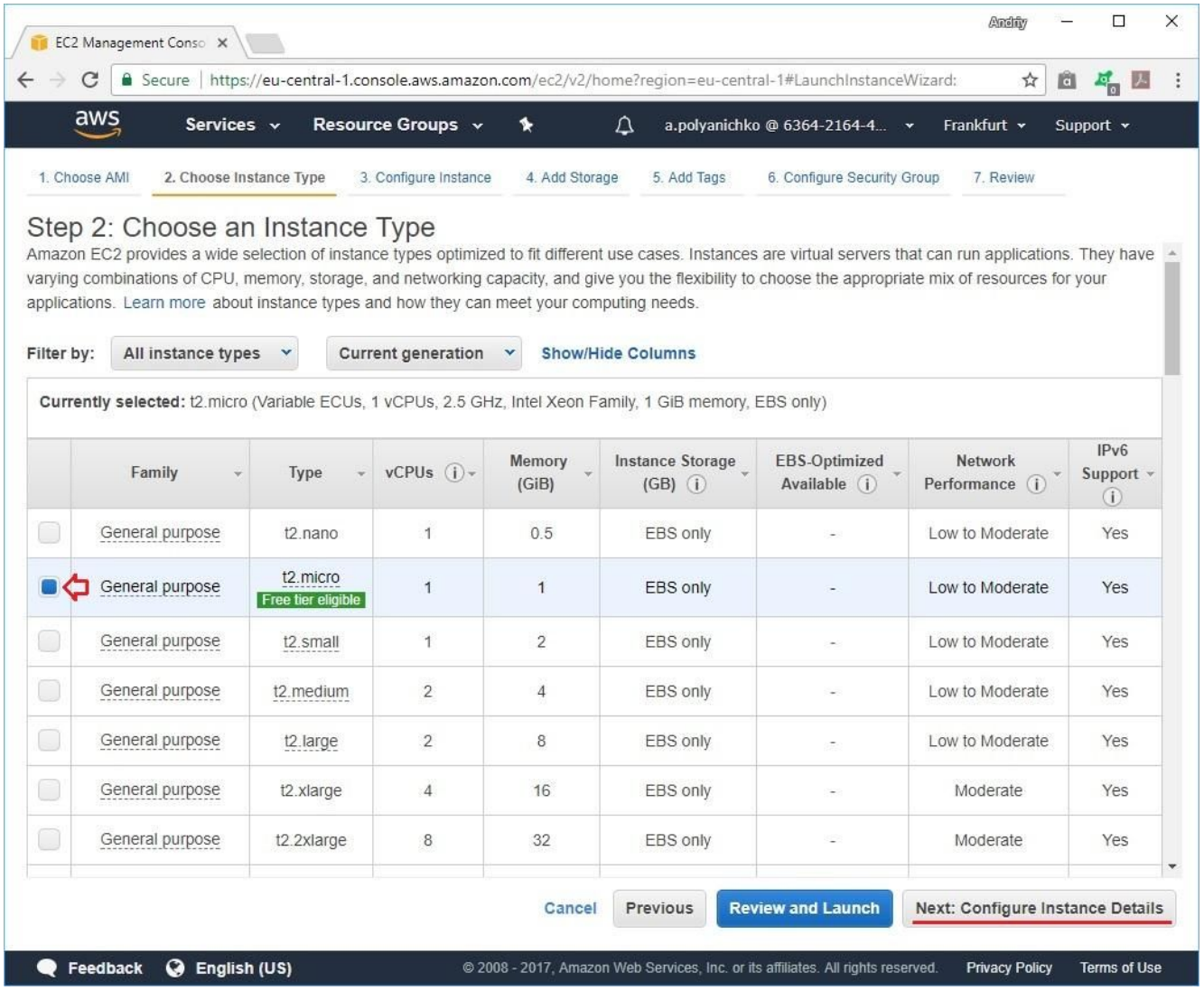


Click on “Launch Instance” button will open EC2 instance creation wizard:



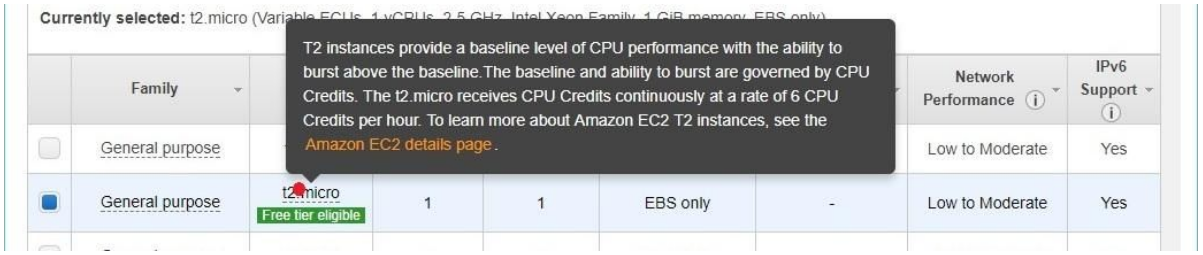
Our target for the current lab is Amazon Linux AMI so please click on “Select” button to the right of the desired AMI type.

On the next page EC2 instance type must be selected for operation as virtual hardware platform for our Linux machine:



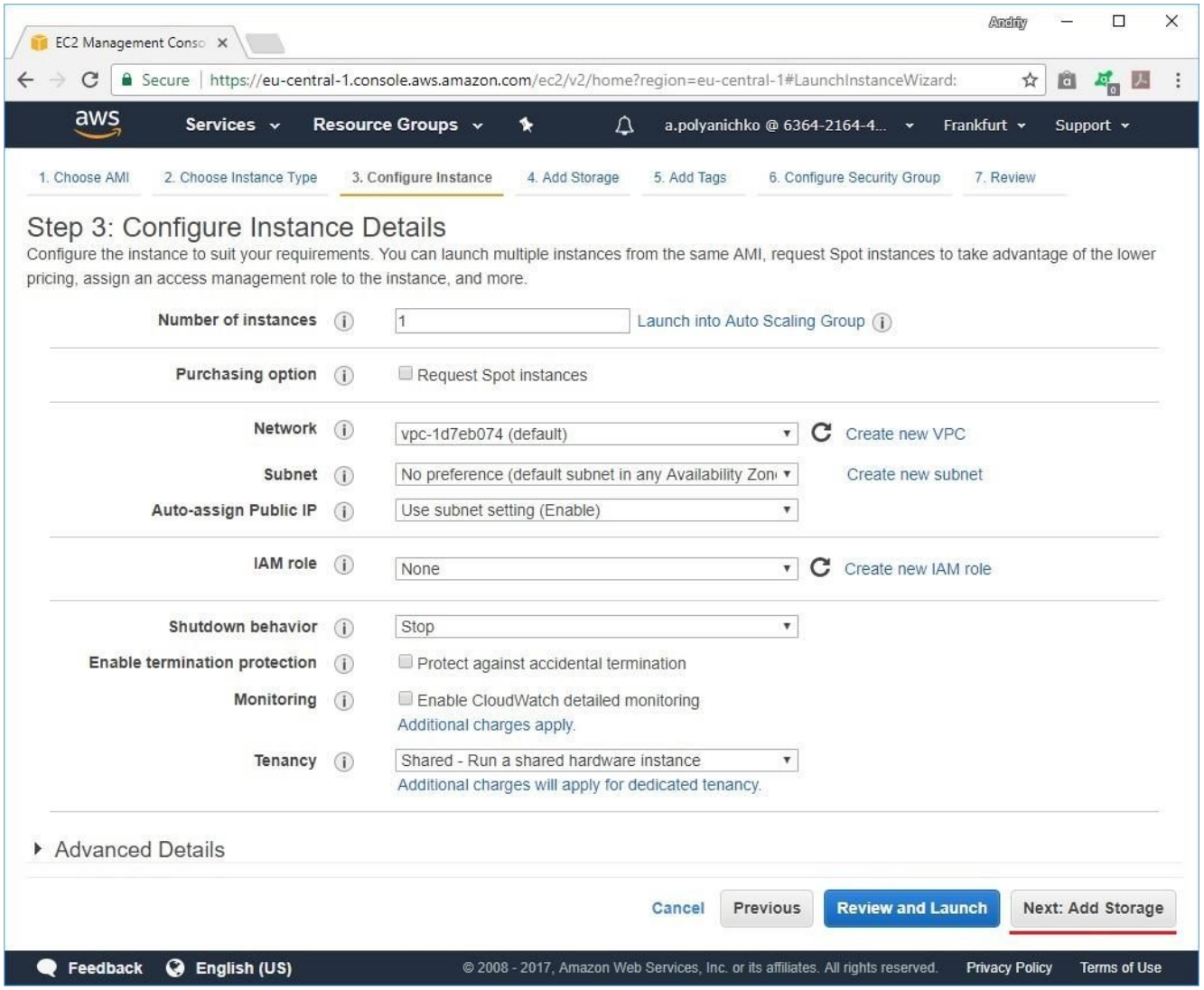
We will order "t2.micro" as instance type for our lab. This type provides you with enough resources for hands-on exercise and besides it is free of charge (please refers to Module 1 training manual for free tier services description).

Pop-up hints are available on this page when you point the cursor over the item name:



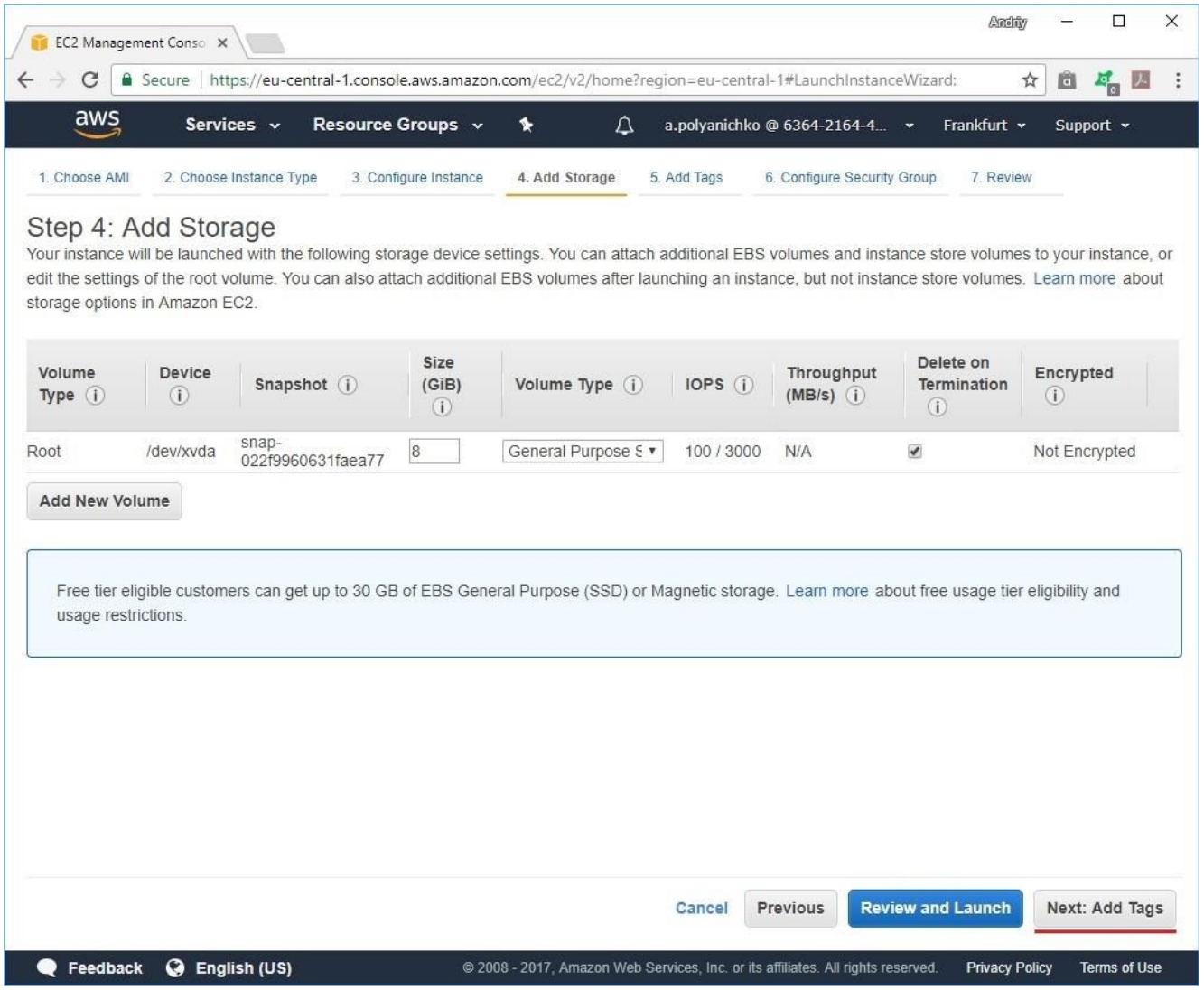
At this point you may directly start the instance with its default configurations, storage parameters, tags and security groups.

Please click on "Next: Configure instance Details" at the bottom of page:



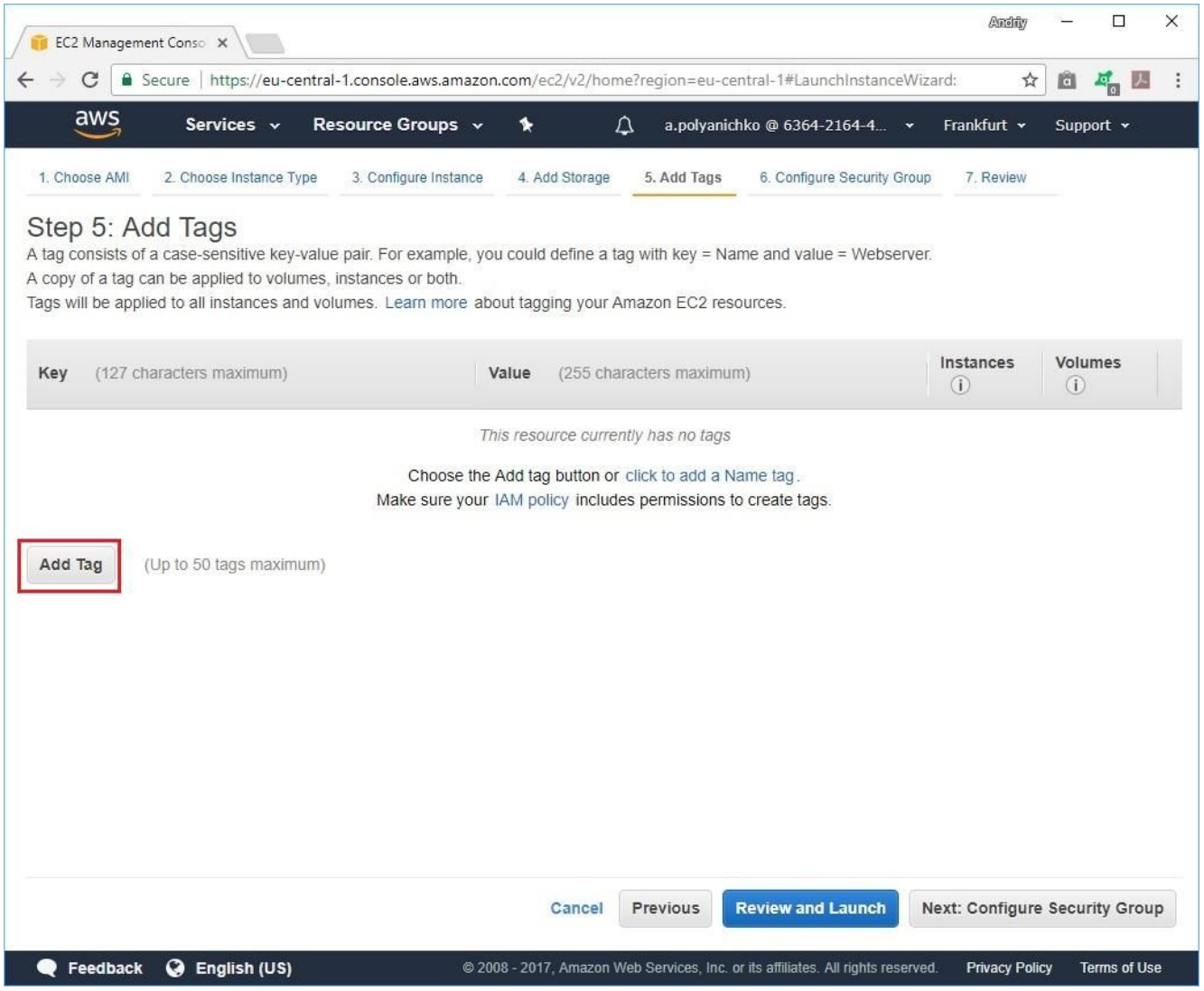
Here you may configure some instance details, please leave all parameters unchanged for training purpose.

Click “Next: Add Storage” button at the bottom of page:



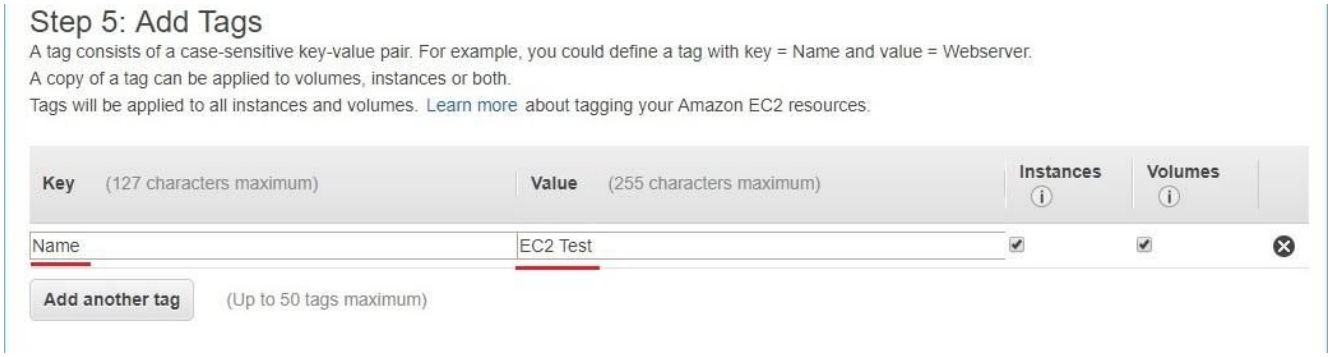
Here you may define additional storage volume for the instance we are about creation. Please leave the page unchanged for training purpose.

Click on “Next: Add Tags” button at the bottom of page:



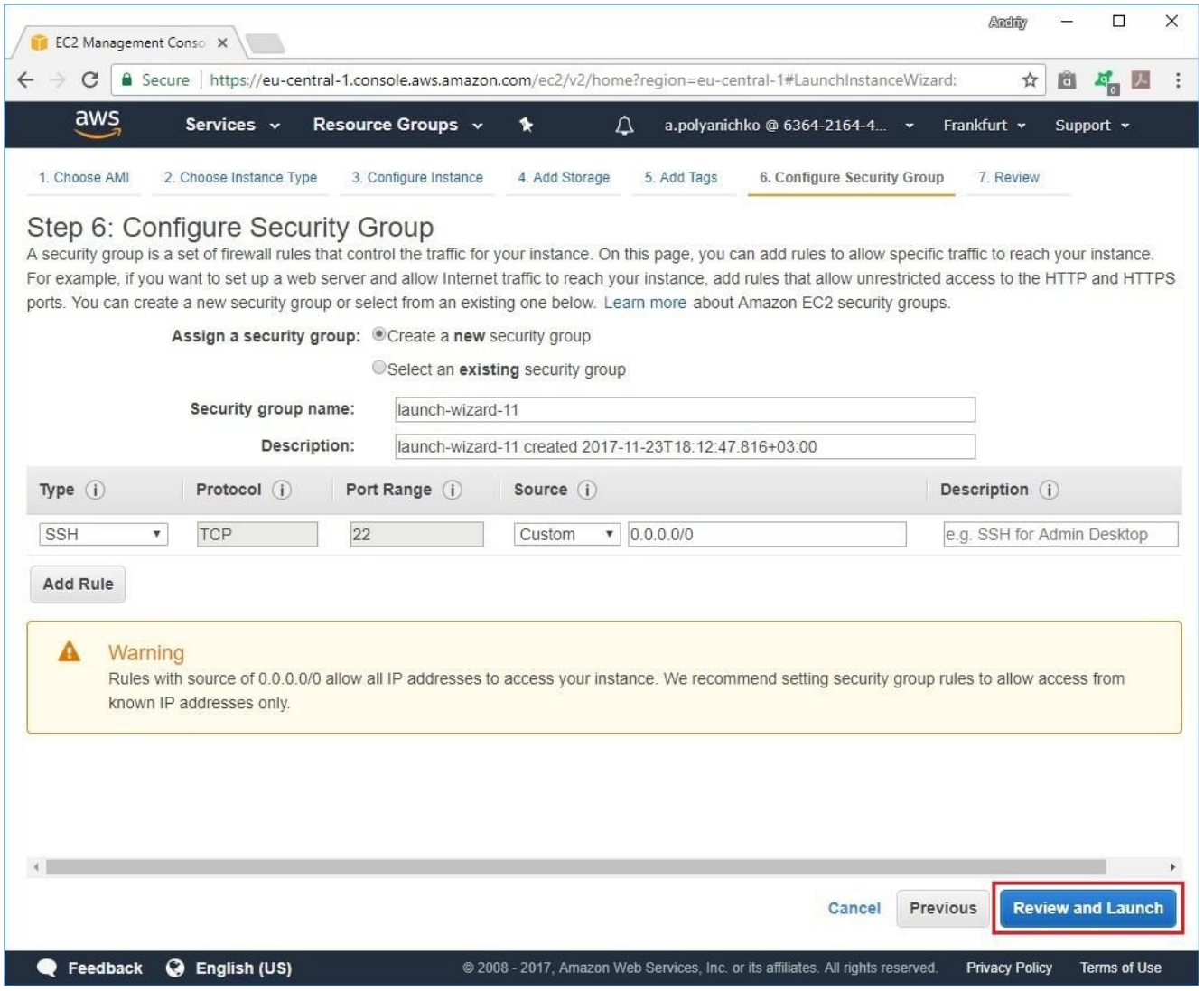
Let's name our instance using the tag attribute.

Click on "Add Tag" button and then set <Key> – <Value> tag pair as shown below:



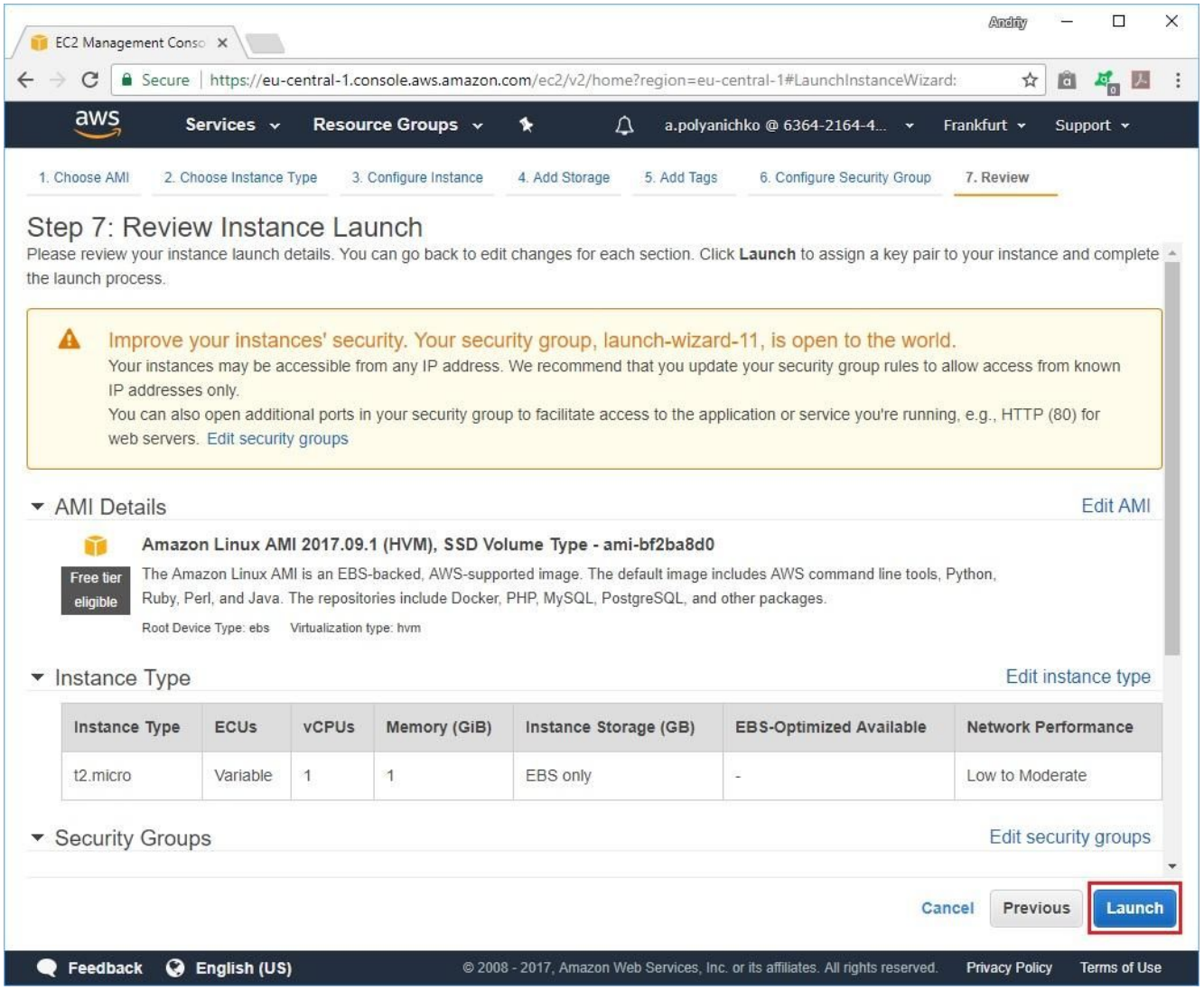
	In the given example "Name" is reserved Key name but you may use any keystroke instead of "EC2 Test" as tag value. Finally "EC2 Test" will be shown as instance name in EC2 Dashboard.

Click “Next: Configure Security Group” button at the bottom of page:



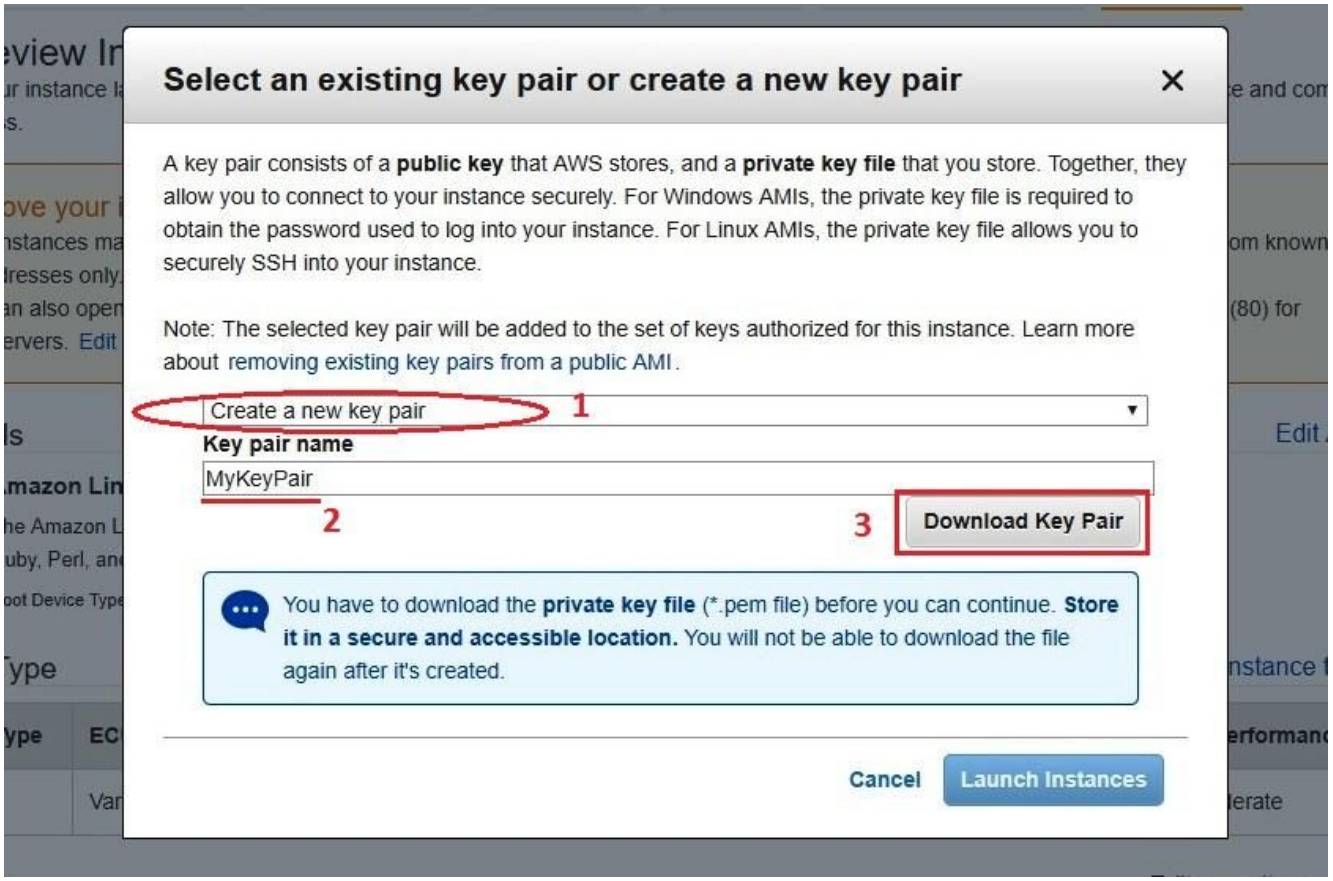
Please review the default Security Group Configuration for the instance and leave it unchanged for training purpose.

Click “Review and Launch” button at the bottom of page:



Finally you may perform the last check before starting and launch new instance.

Click on “Launch” button at the bottom of page/ The system will request you to select an existing key pair or create new one:

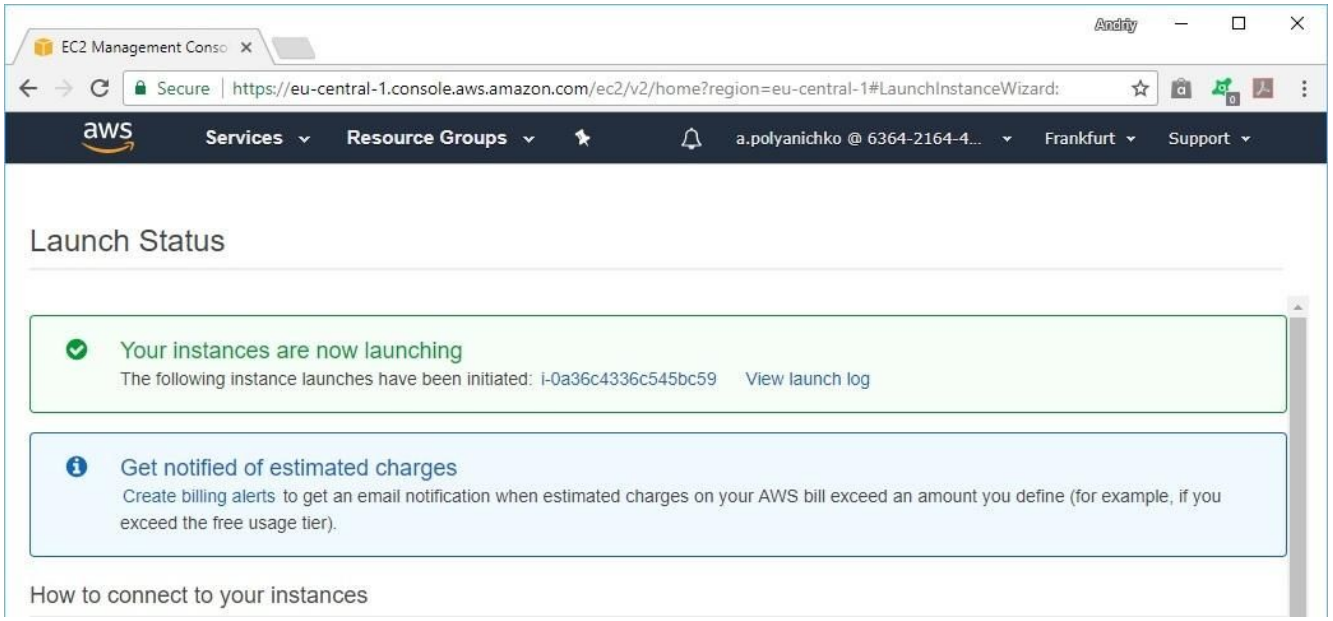


In our example we will try to create new key pair in 3 steps:

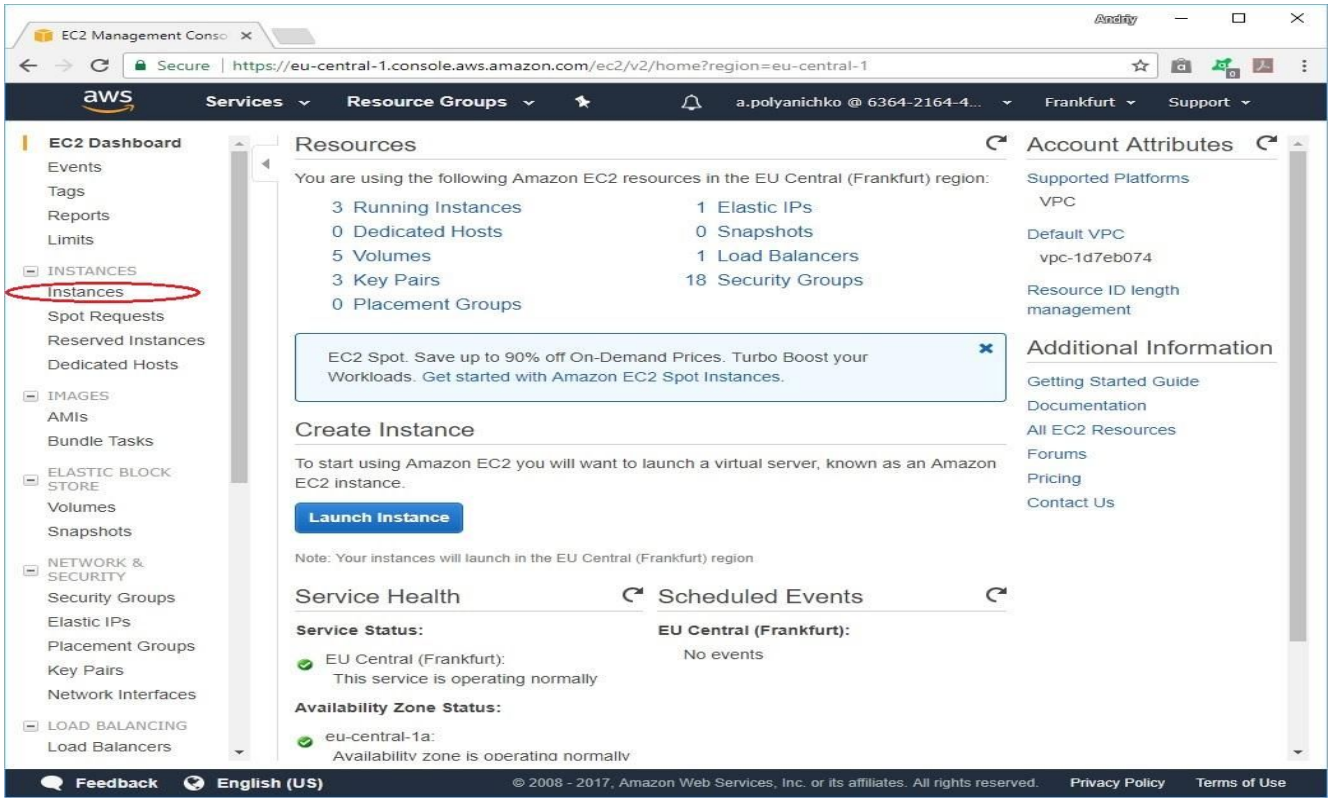
- Select “Create a new key pair” option from scroll-down list;
- Come up with a name for new key pair;
- And finally download key pair file and save in on your PC:

⚠	It is recommended to save key pair files (*.pem) in .ssh subfolder of User directory as shown on the screenshot above.

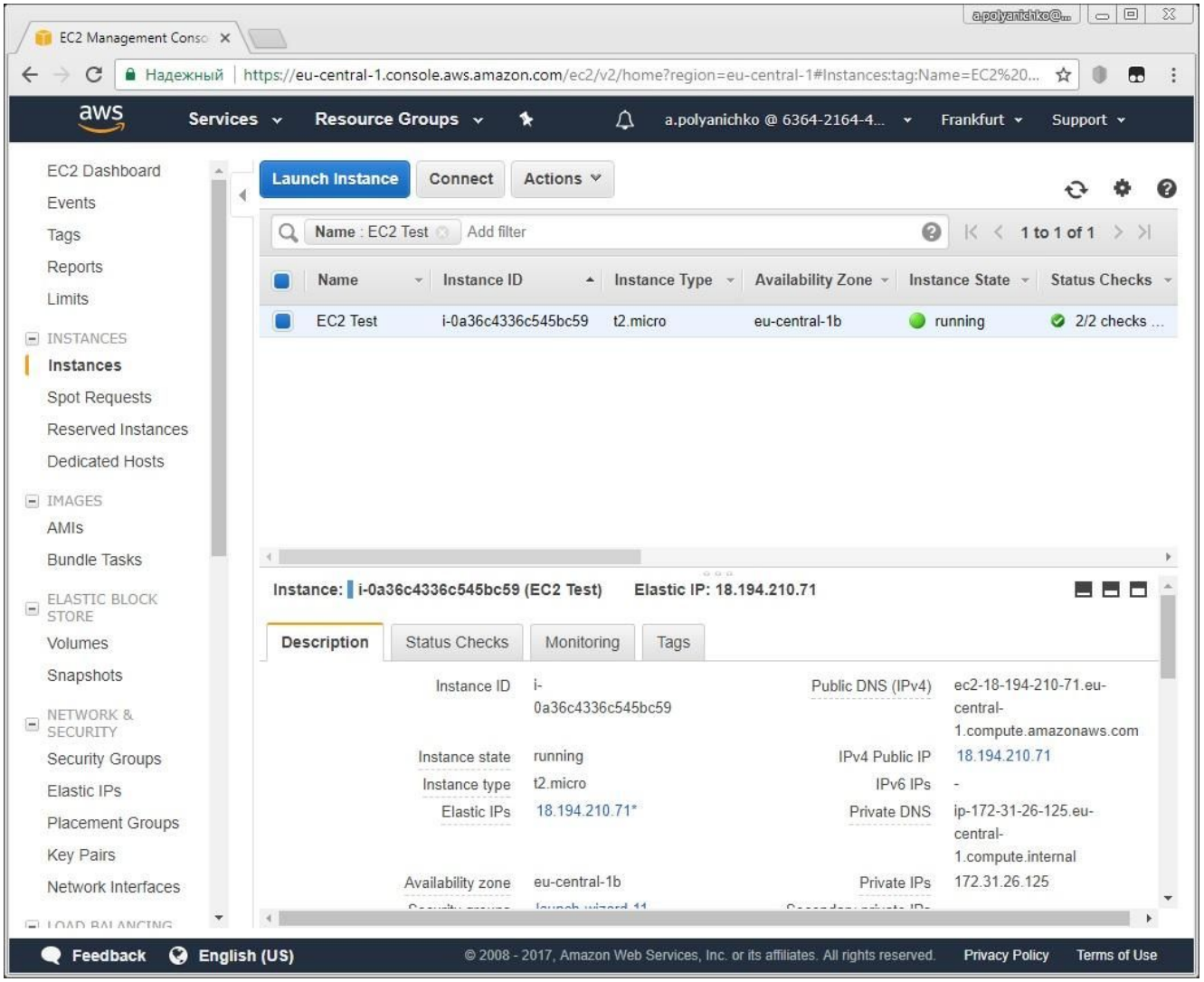
As soon as key pair file has download, “Launch Instances” button at the dialog window will become available. Click it to launch the instance:



Please return to EC2 Dashboard and click on “instances” link on the left-hand menu band:



You can found your EC2 instance with given name in the list of existing instances:



Please select the instance and explore it for:

- Instance state;
- Public DNS Name;
- Public IP address.

At this point you may connect your instance via SSH.

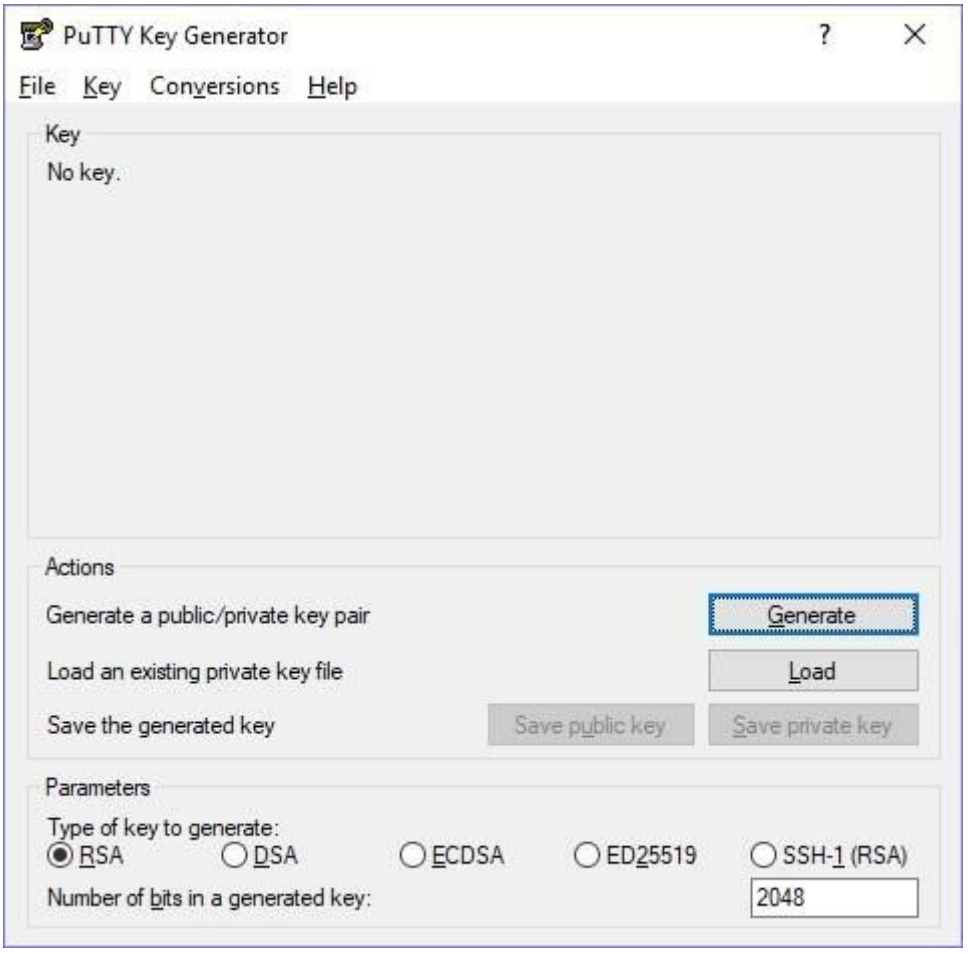
If you have Git installed on your PC you may connect your instance in a simplest way using Git BASH command:

	If you have Git installed on your PC you may connect your instance in a simplest way using Git BASH command: **ssh –i 'c:\Users\yourusername\.ssh\MyKeyPair.pem' ec2-user@{IP_Address}**

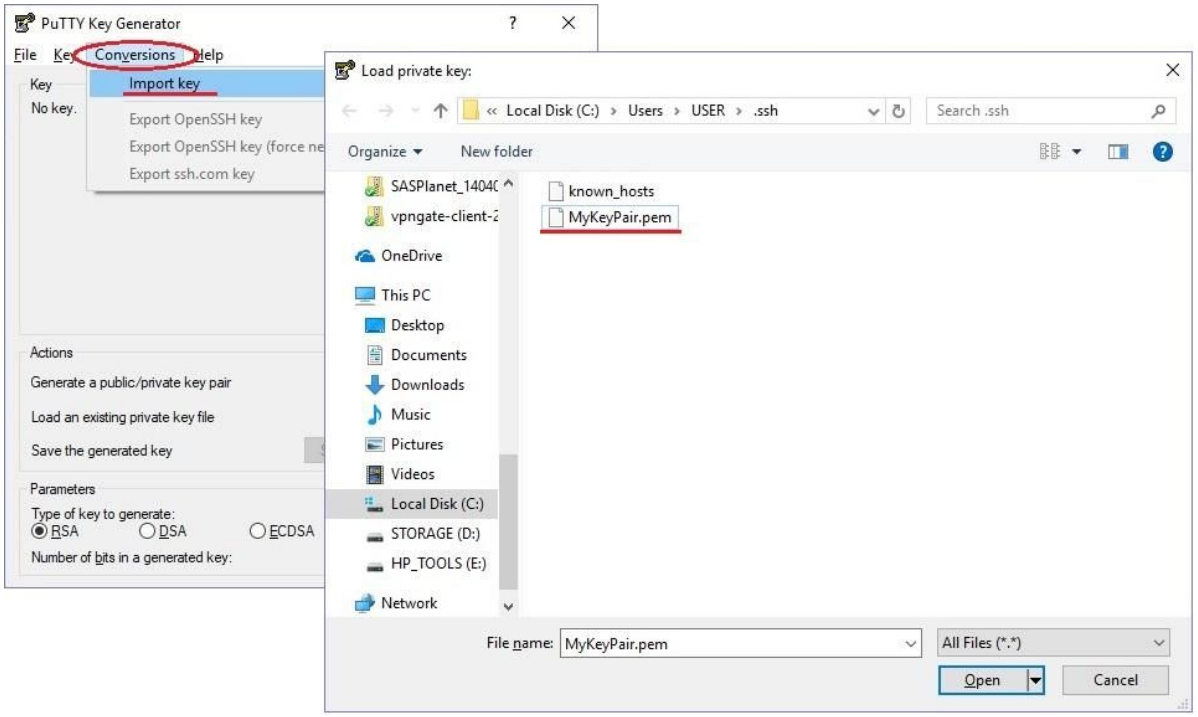
Let’s try to connect your instance using PuTTY SSH/Telnet/Terminal emulator package.

First of all you must convert our public key file from “classical” SSH-RSA format (.pem) to format for PuTTY (.ppk). You will need Puttygen application included in PuTTY package by default.

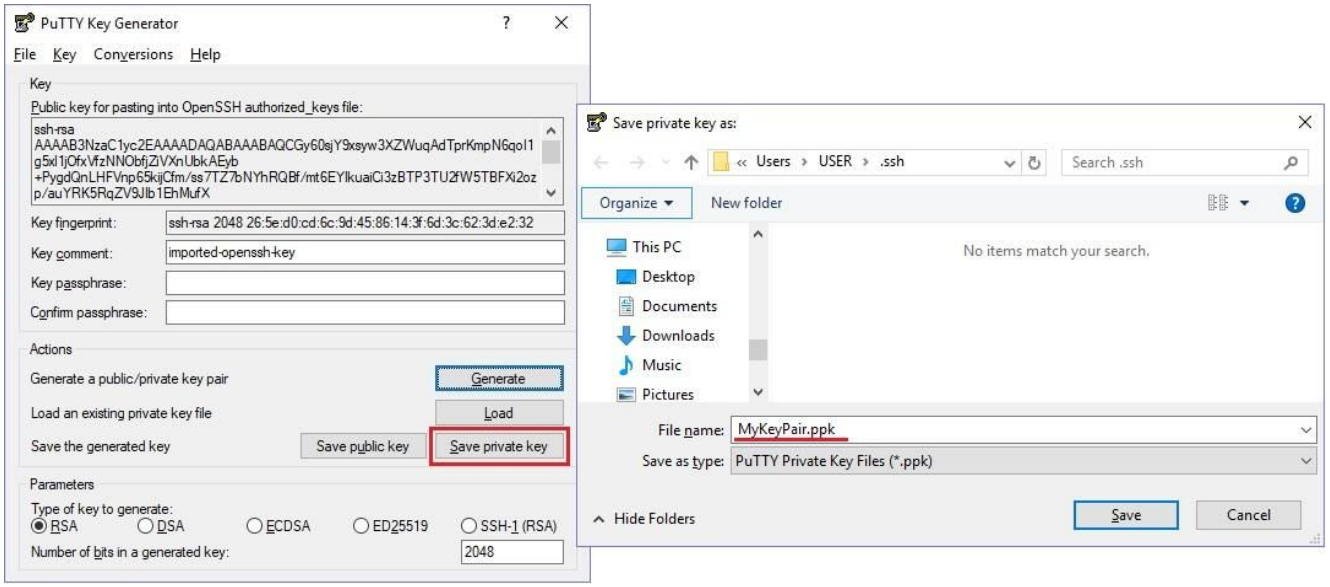
Start Puttygen application:



Using “Conversion” → “Import” command open .pem private key file created at previous step of the lab:

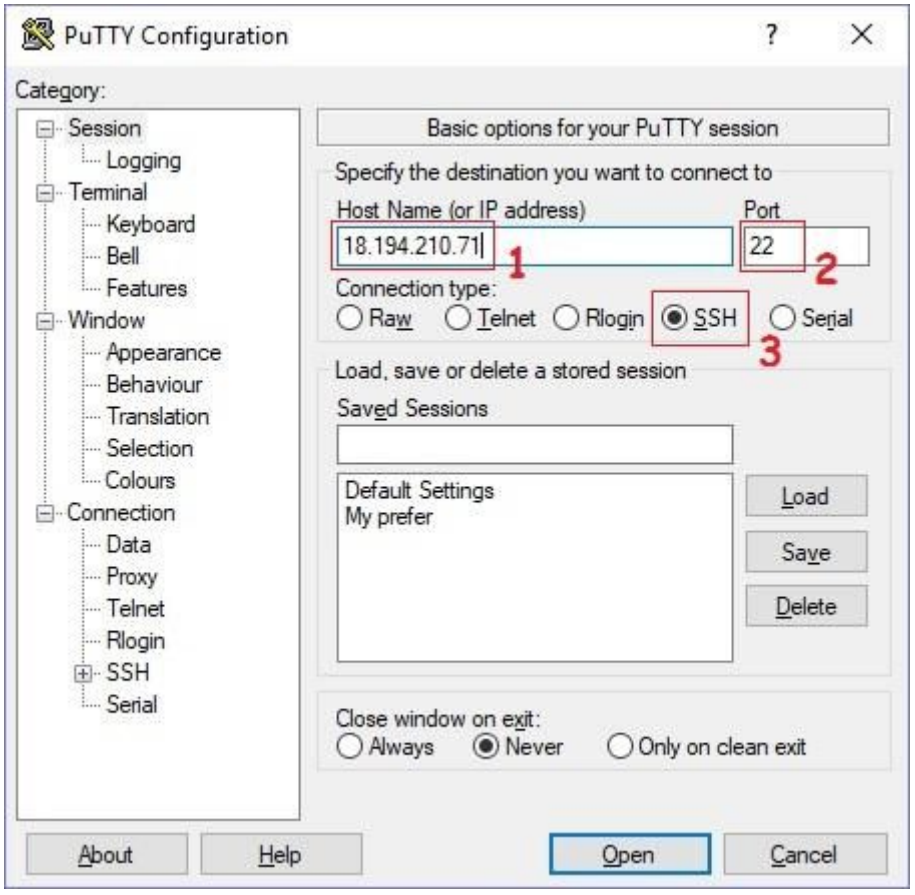


Save your private key in PuTTY SSH-RSA format using “Save private key” button:

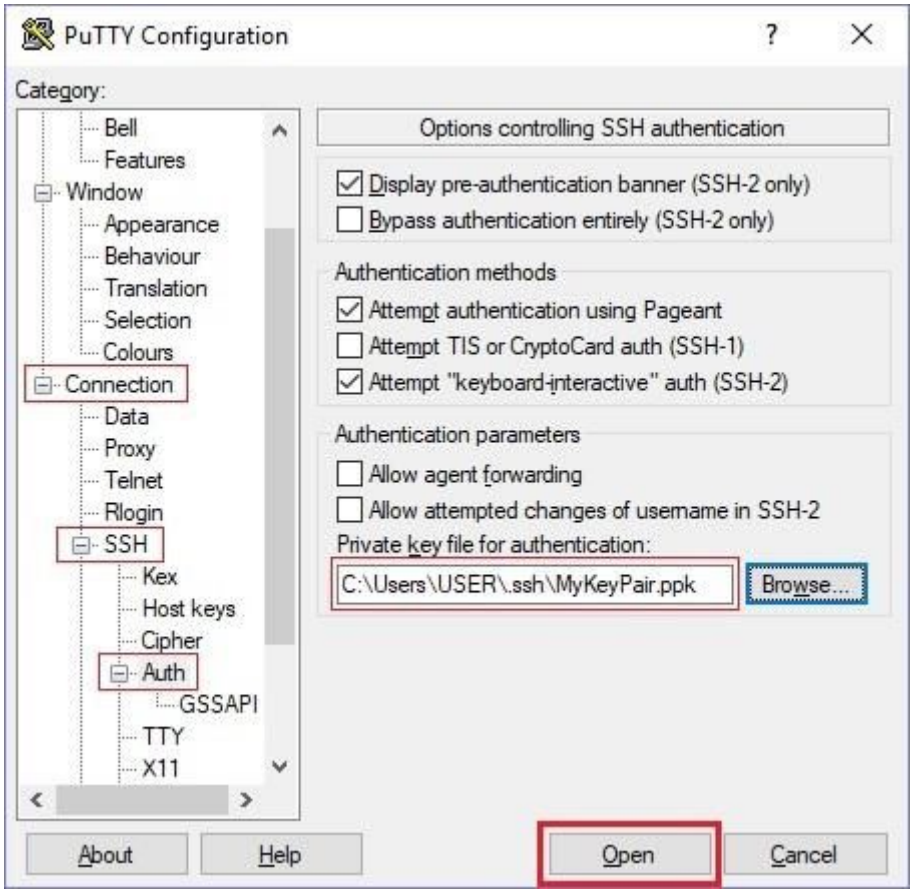


(Please answer “Yes” on system request if you really want to save your key without a passphrase).

Start PuTTY application and specify connection options as shown:

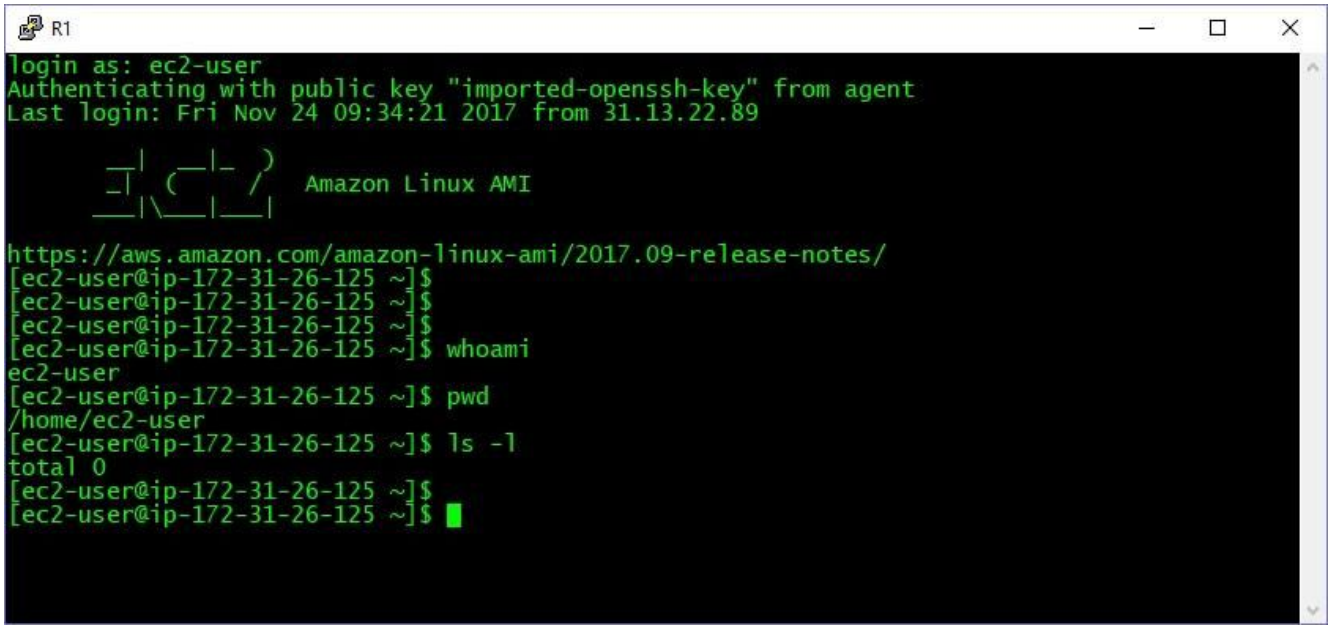


- Host IP address (it is exactly Elastic IP for our EC2 Instance);
- Port number – 22;
- Connection type – SSH;
- Authentication options including .ppk file as shown below:



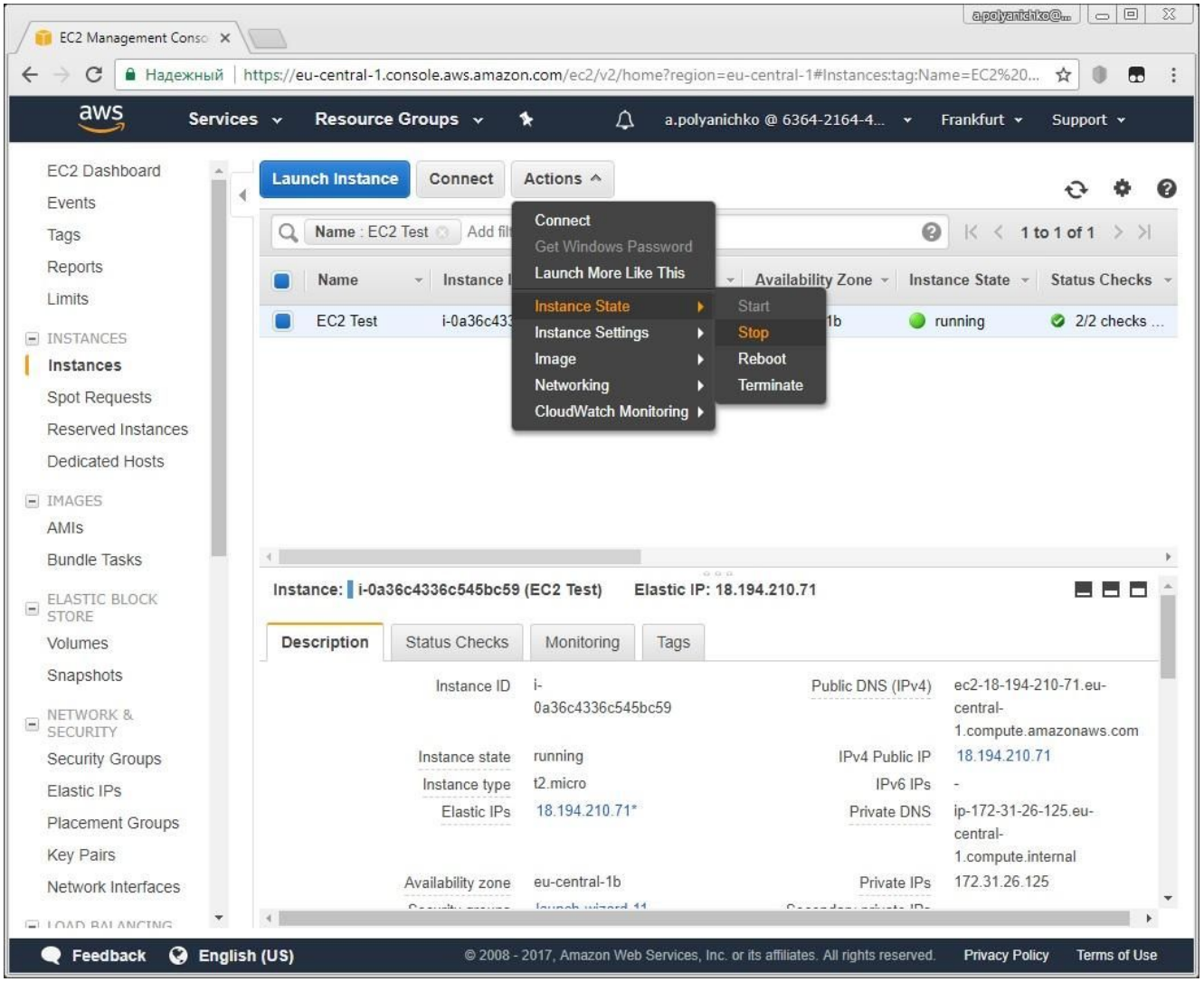
Finally click “Open” button and type **ec2-user** as username on system request.

You will be connected to your EC2 instance with Amazon Linux and will be able to operate commands there:

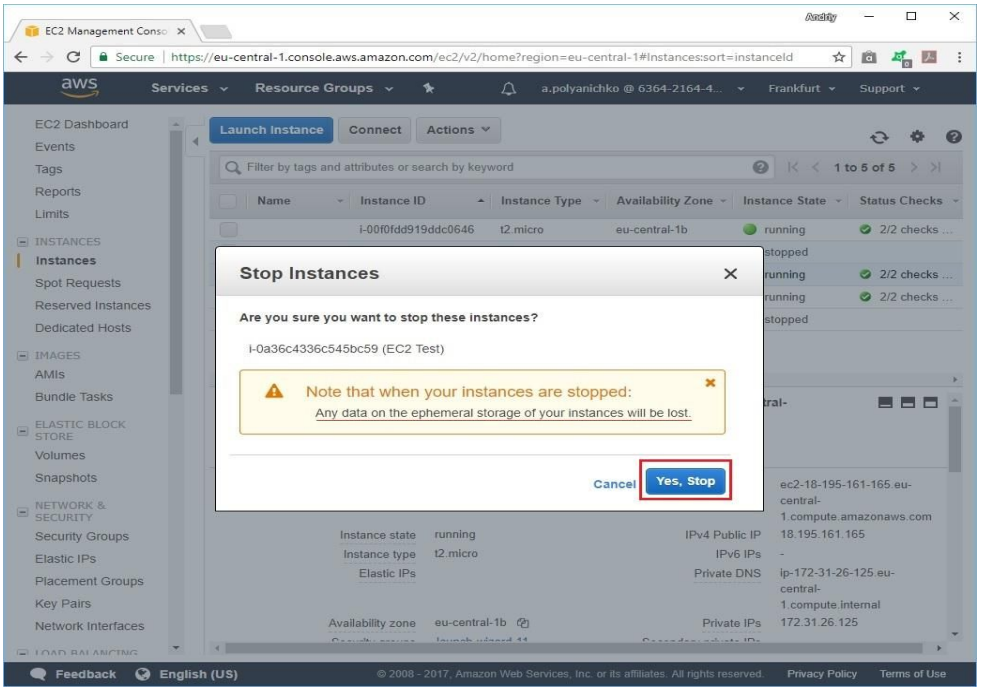


2. Manage EC2 Instance operational State

Select your EC2 instance and open “Actions” → “Instance State” top menu:



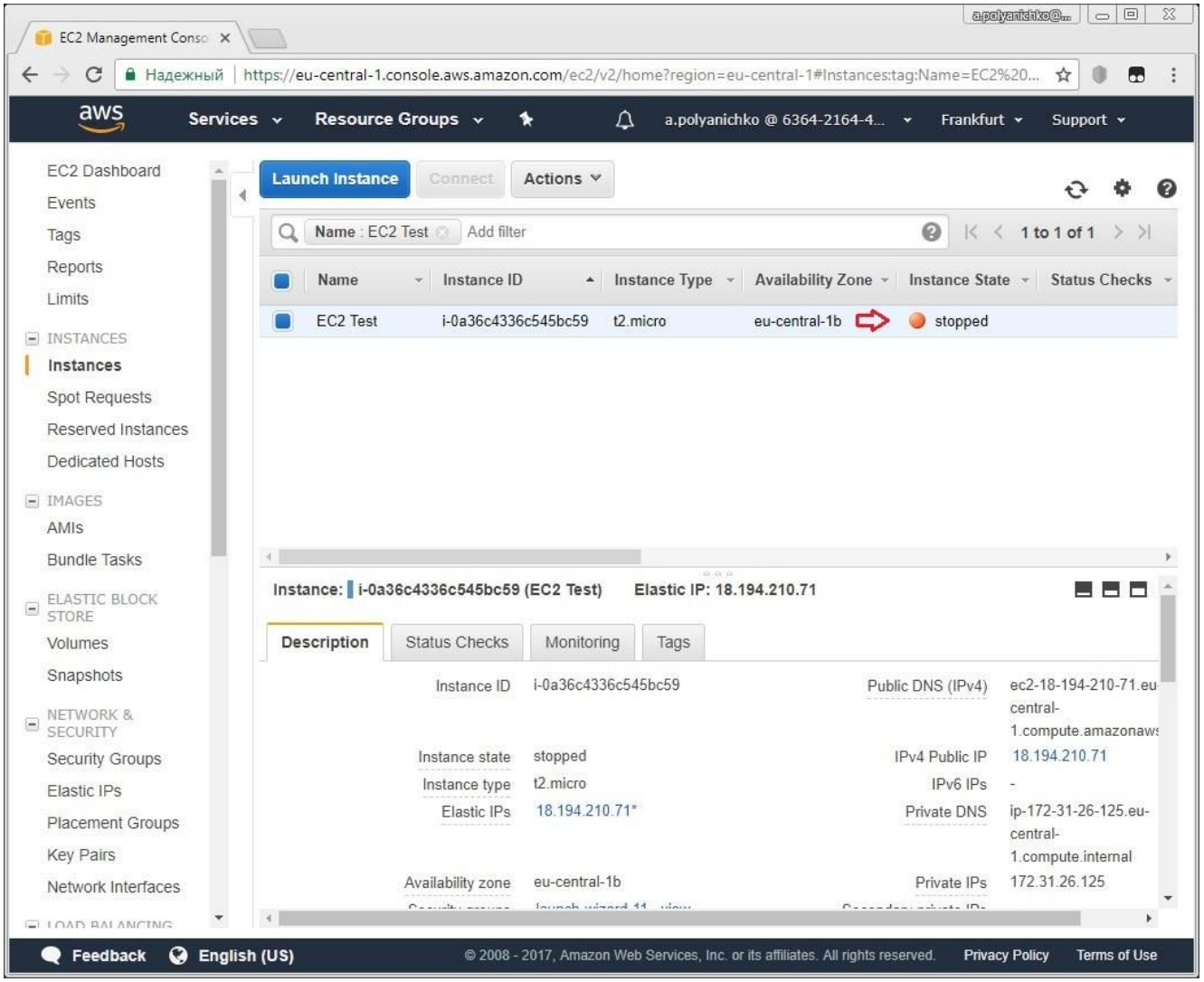
Try to use “Stop” command and point your attention on the system warnings:



Please take in account that you will lost all the data in ephemeral storage when the instance is stopped.

Click on “Yes, Stop” button to stop the instance:

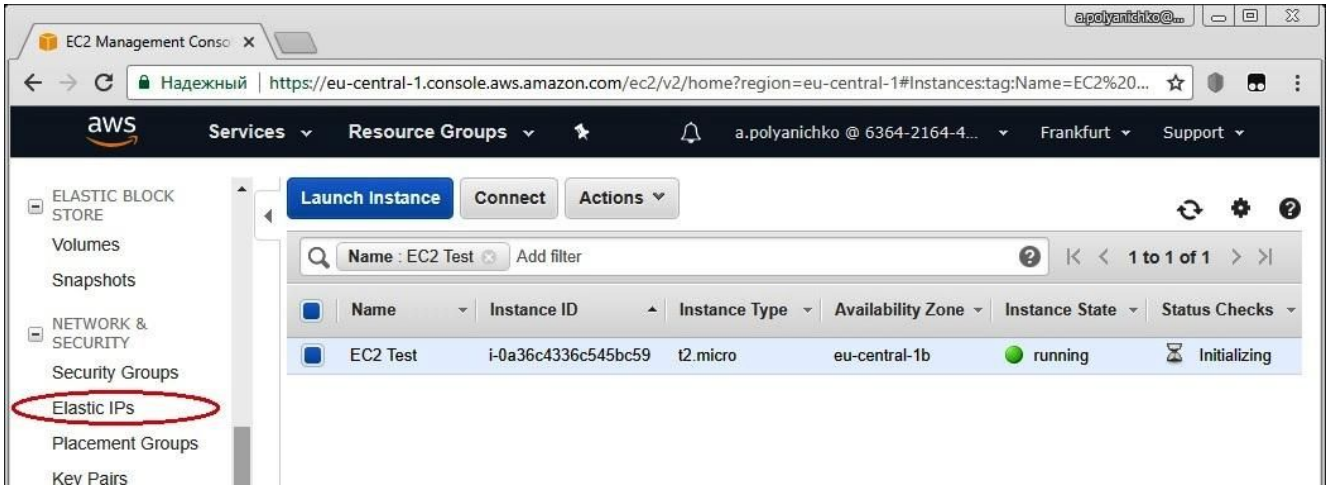
And the instance is changing state to Stopped after some time:



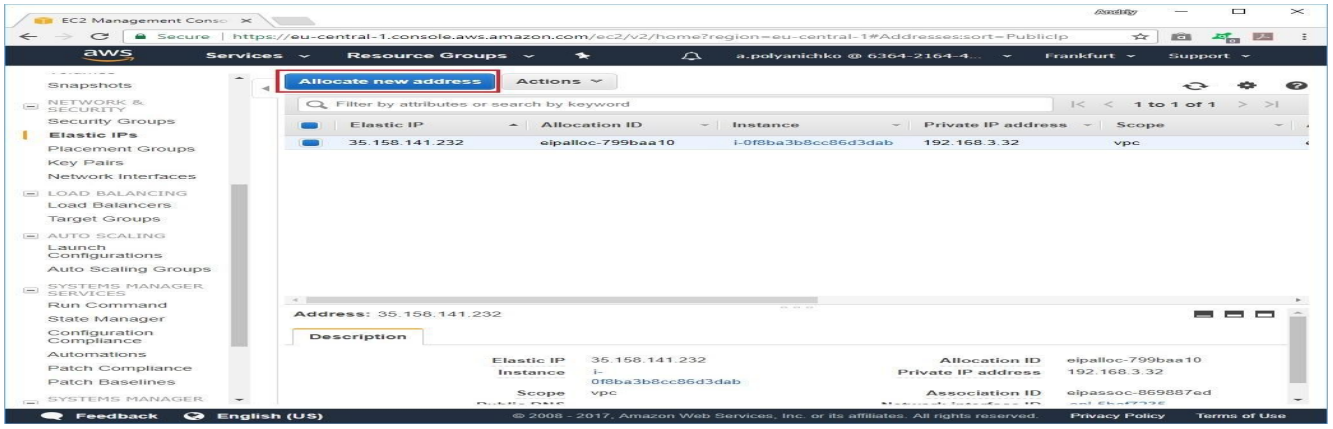
Now please try to start the instance which was stopped before and track the state changing.

3. Elastic IP assigning for EC2 instance

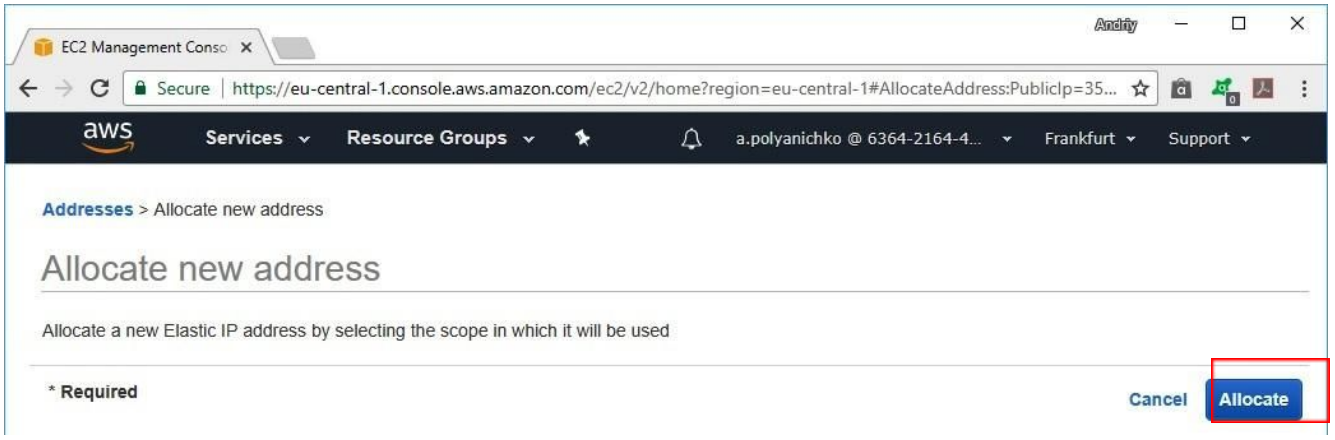
Open “Elastic IPs” item on the left side menu ribbon:



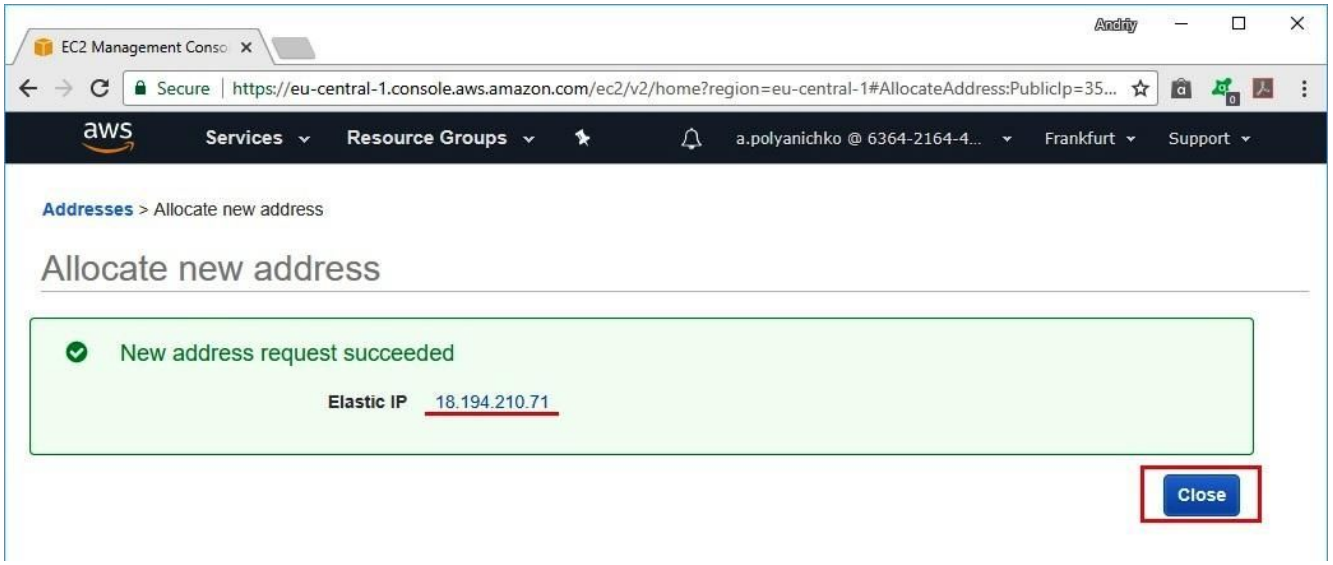
Elastic IPs Management page will be opened:



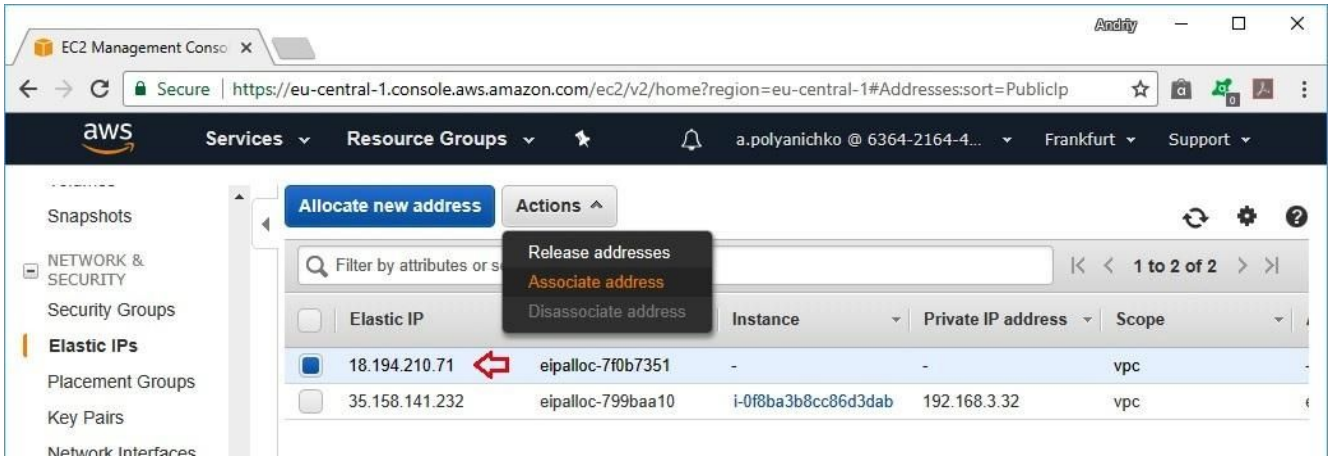
Click on “Allocate new address” button to acquire new Elastic IP address:



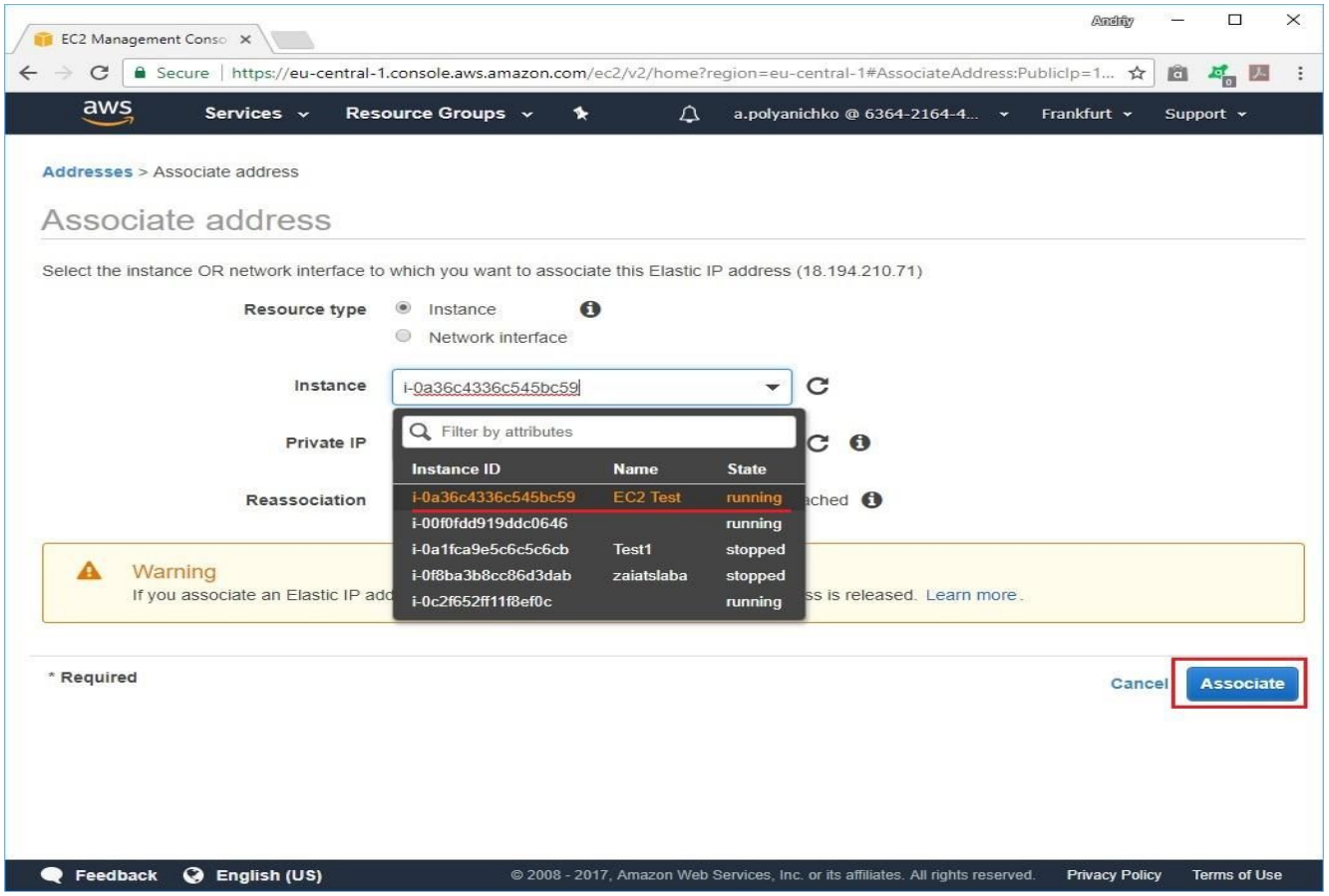
Click on “Allocate” button to continue:



Note your new IP address and then click on “Close” button to return to Elastic IPs Management page.

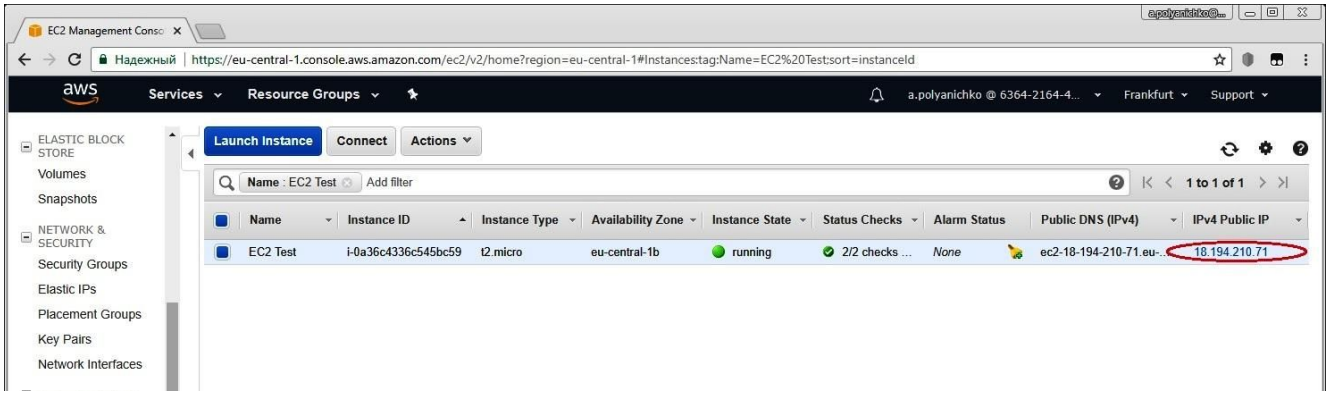


Select noted IP address and then release “Actions” → “Associate address” command:



Determine the instance (by name or, if absent, by Instance ID) and click “Associate” button below.

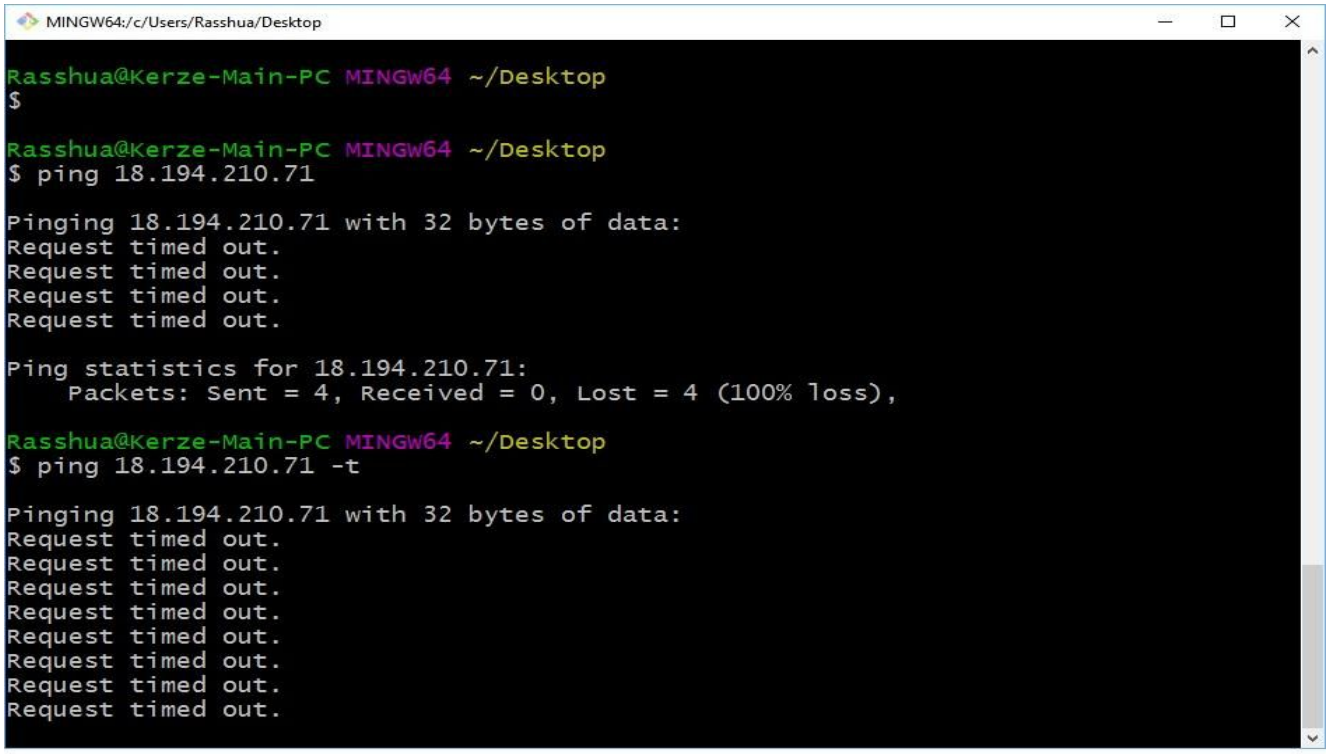
The Elastic IP will be associated with your EC2 instance and you will see it on Instances page of EC2 Dashboard:



As you can see, IPv4 Public IP value becomes blue and clickable. It means that Elastic IP is in use for the instance.

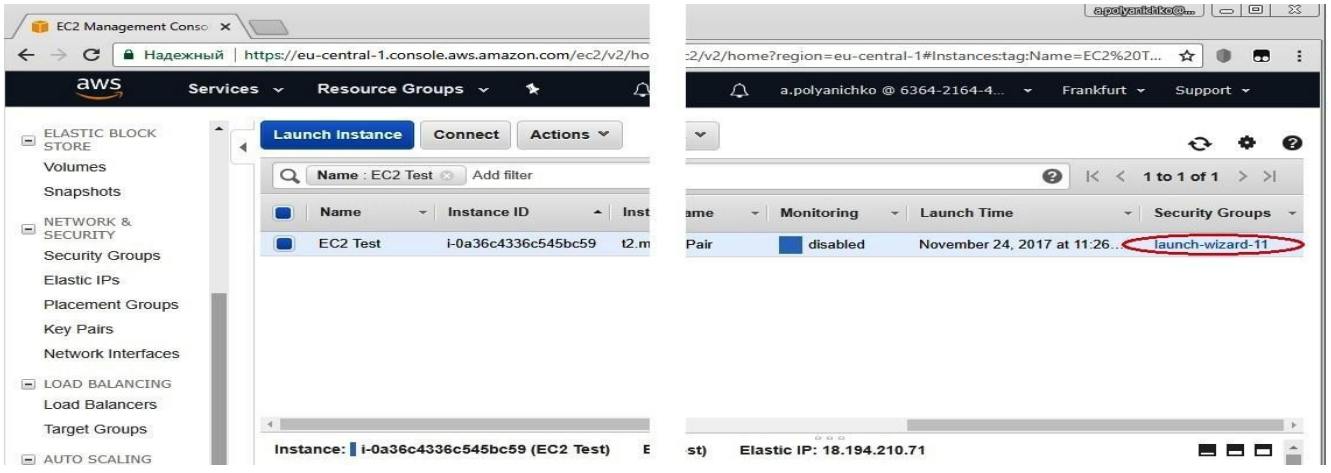
4. Example of configuring Security Group parameters

Try to use Ping command for your EC2 instance via Elastic IP:

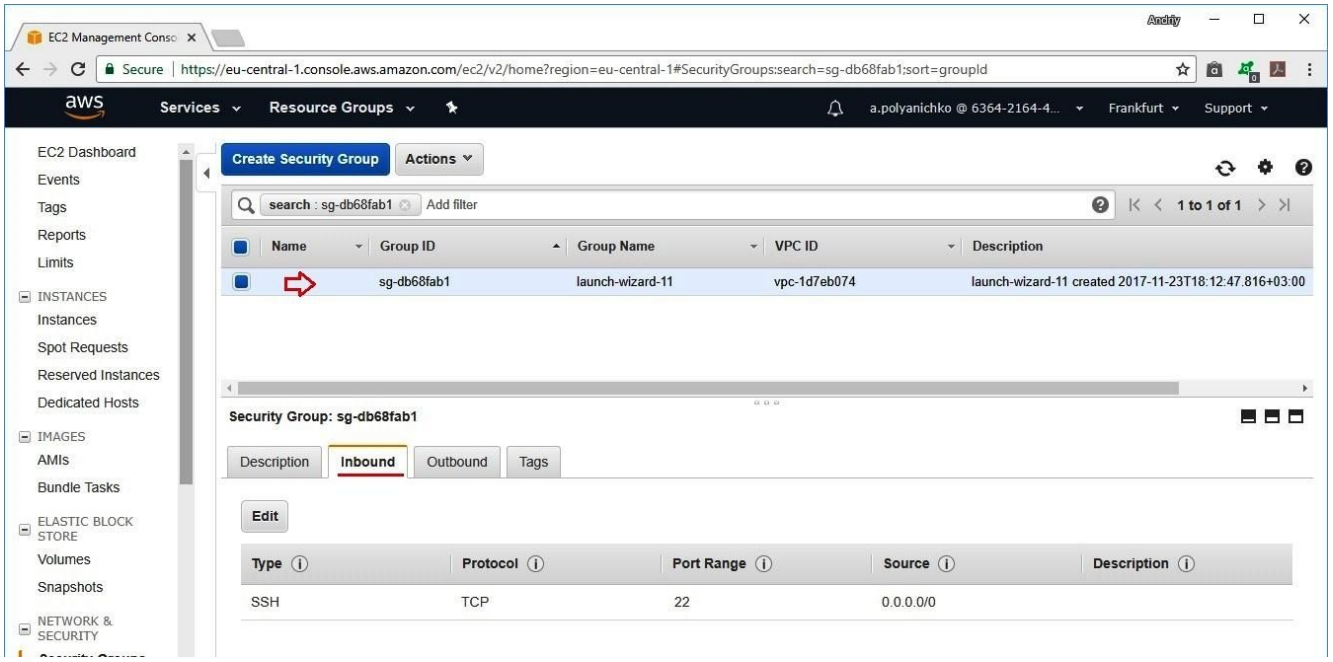


Normally you must see the picture like on screenshot above and it means that your EC2 doesn't return any reply on ICMP requests. Please leave the command window opened with active `ping -t` command

Let's try to check associated Security Group for our instance:

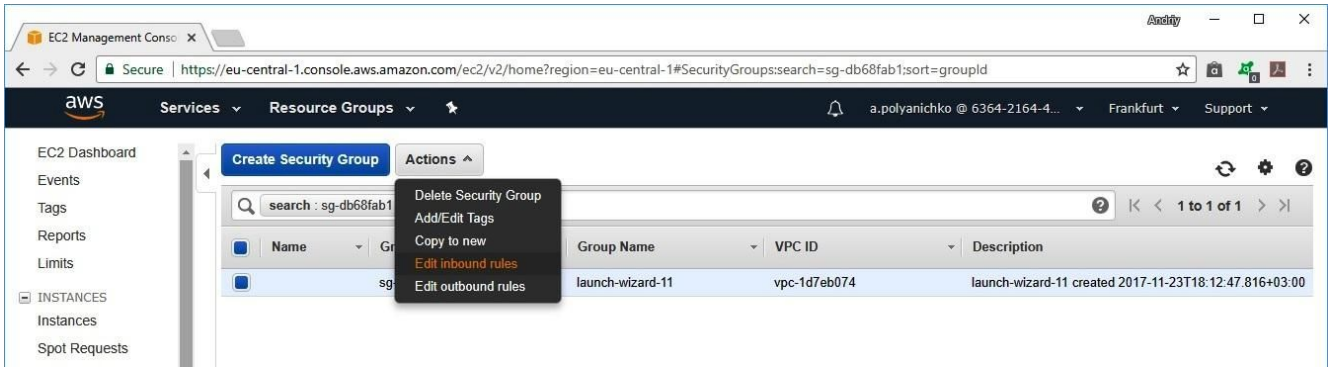


You need to scroll your instance to right and to find Security Group column. Click on Security Group ID for selected EC2:

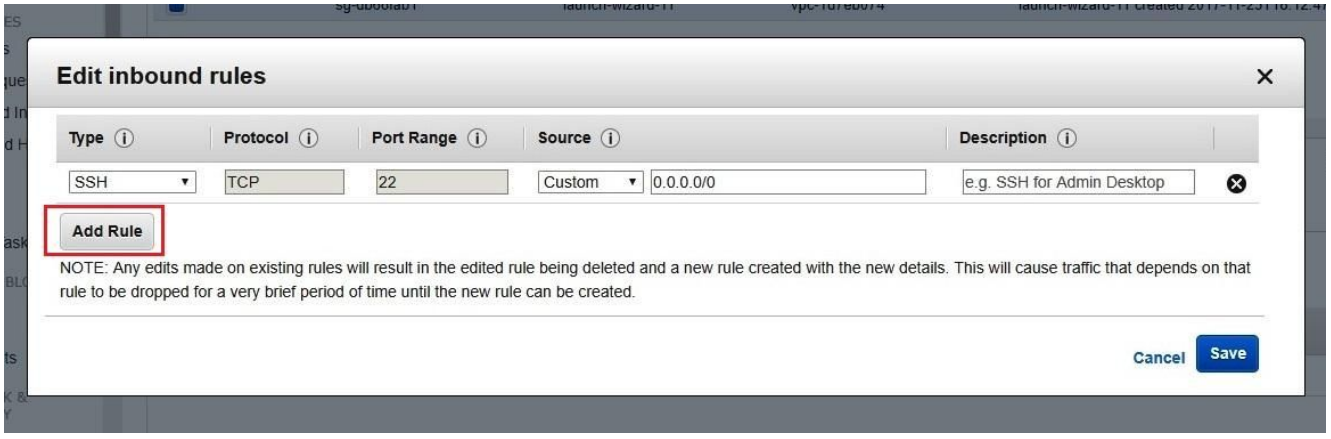


On the next page, for selected Security Group you may check “Inbound” tab and ensure that only SSH connectivity is allowed by default.

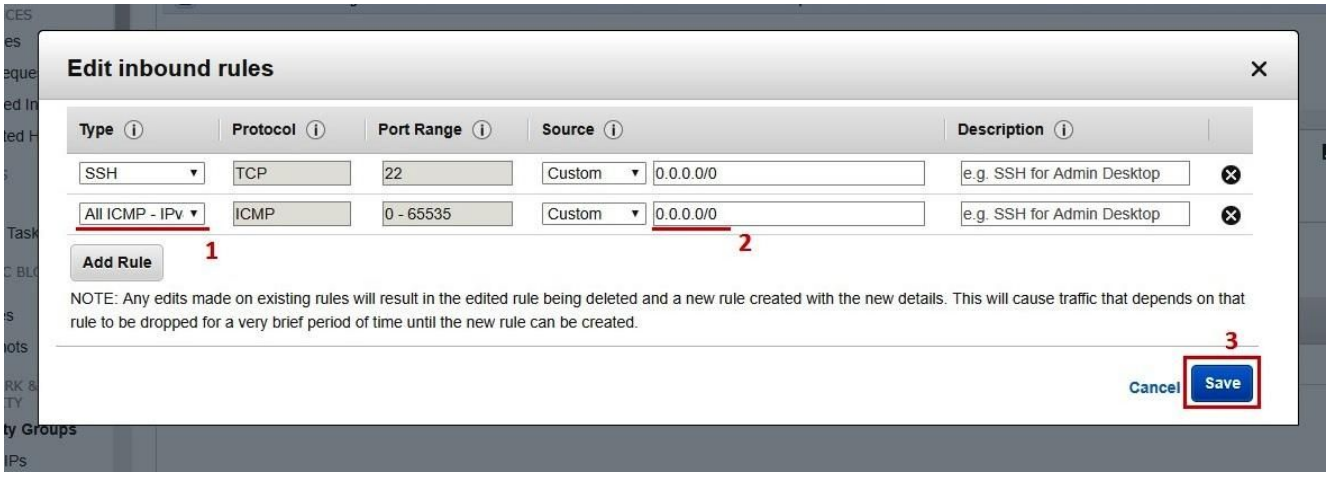
Let’s enable ICMP packets for inbound traffic. Click on “Actions” → “Edit inbound rules” item from top menu:



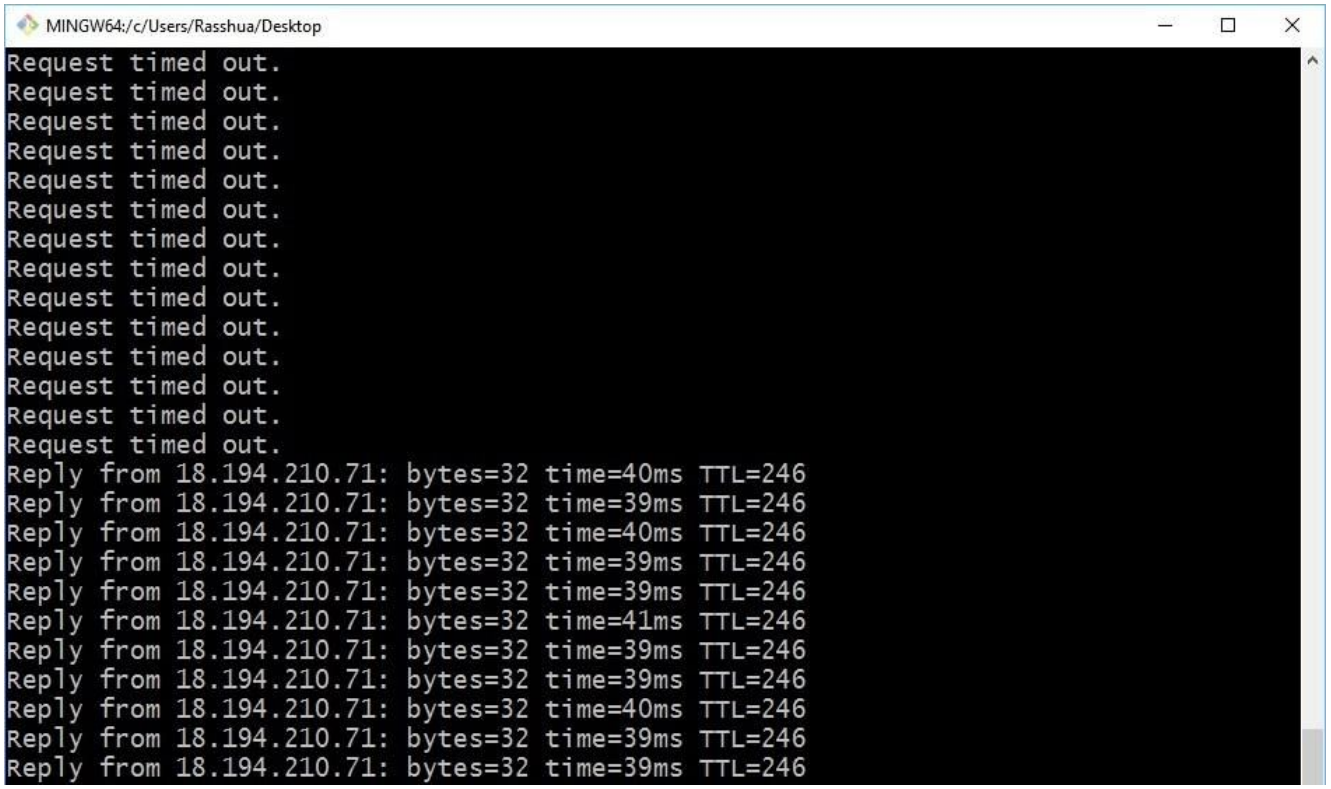
Now you are able to add new rules for inbound traffic:



Click on “Add Rule” button and then determine the rule for ICMP traffic as shown below:



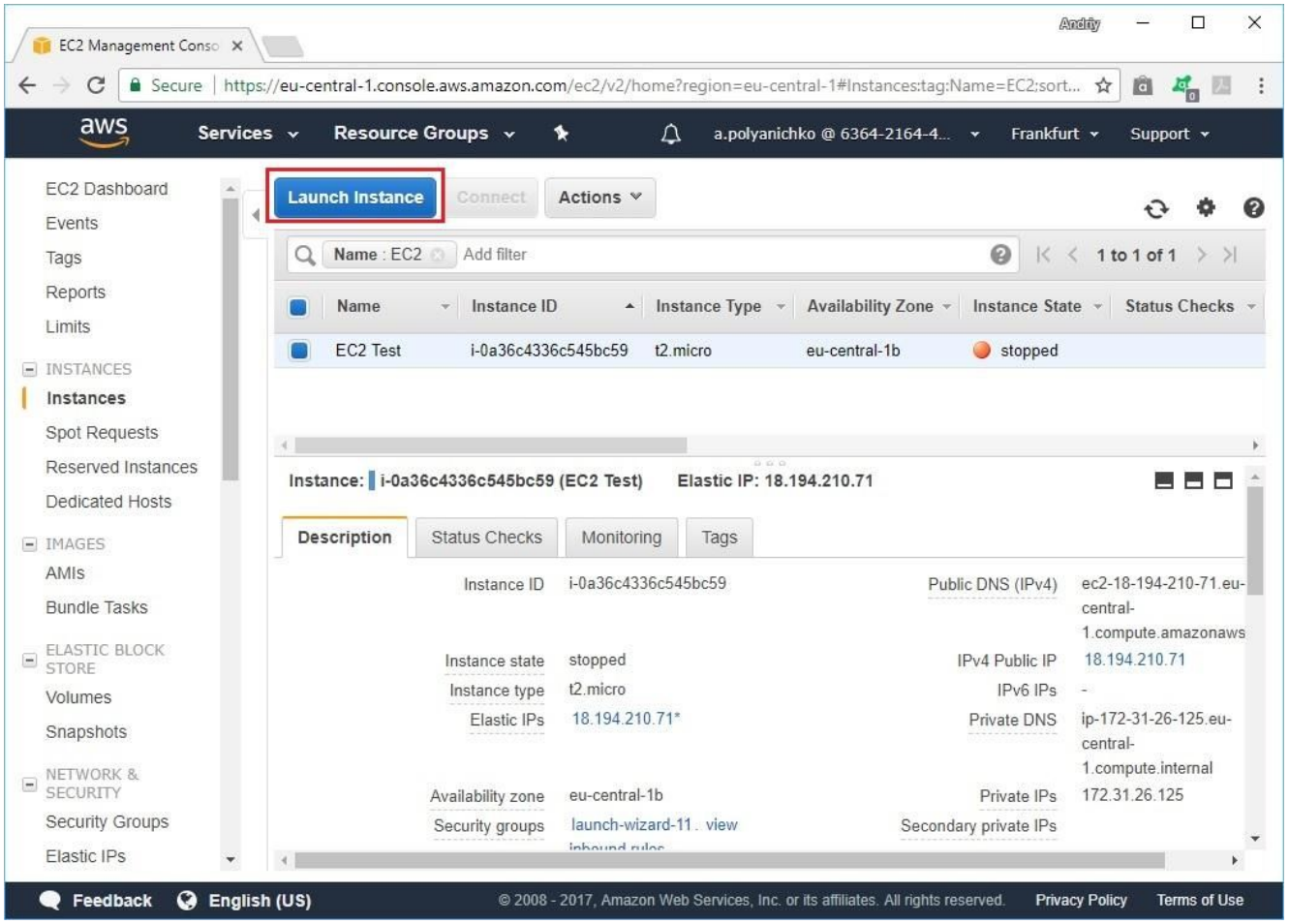
Click on “Save” button and check `ping -t` output in command window:


MINGW64:/c/Users/Rasshua/Desktop
Request timed out.
Request timed out.
Request timed out.
Request timed out.
Request timed out.
Request timed out.
Request timed out.
Request timed out.
Request timed out.
Request timed out.
Request timed out.
Request timed out.
Request timed out.
Request timed out.
Reply from 18.194.210.71: bytes=32 time=40ms TTL=246
Reply from 18.194.210.71: bytes=32 time=39ms TTL=246
Reply from 18.194.210.71: bytes=32 time=40ms TTL=246
Reply from 18.194.210.71: bytes=32 time=39ms TTL=246
Reply from 18.194.210.71: bytes=32 time=39ms TTL=246
Reply from 18.194.210.71: bytes=32 time=41ms TTL=246
Reply from 18.194.210.71: bytes=32 time=39ms TTL=246
Reply from 18.194.210.71: bytes=32 time=39ms TTL=246
Reply from 18.194.210.71: bytes=32 time=40ms TTL=246
Reply from 18.194.210.71: bytes=32 time=39ms TTL=246
Reply from 18.194.210.71: bytes=32 time=39ms TTL=246

5. Creating EC2 Instance with additional EBS volume

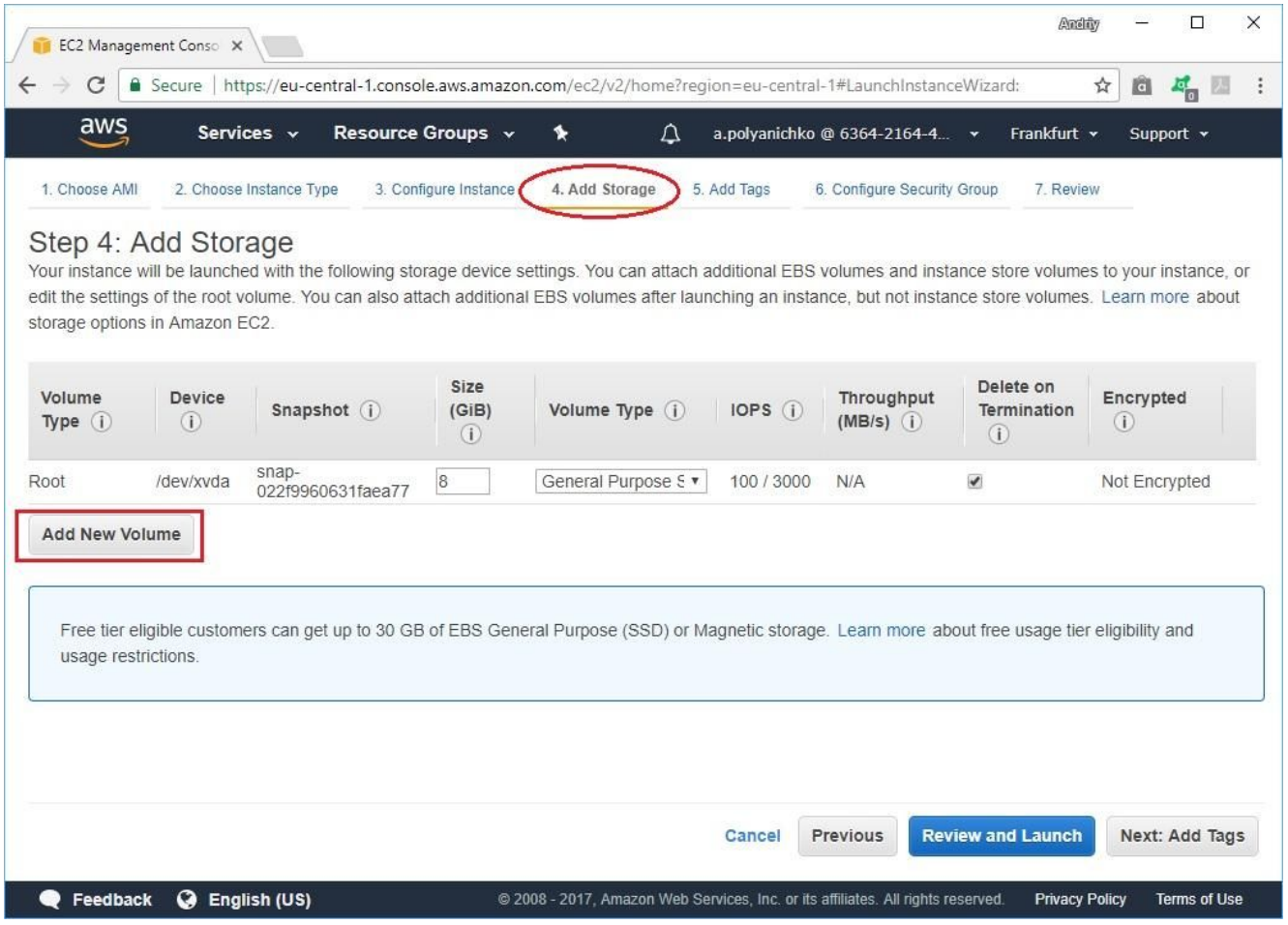
In the exercise below we will try to create Amazon Linux AMI on EC2 Instance and we will attach additional EBS volume to the instance we are creating.

Start from “Launch Instance” button:

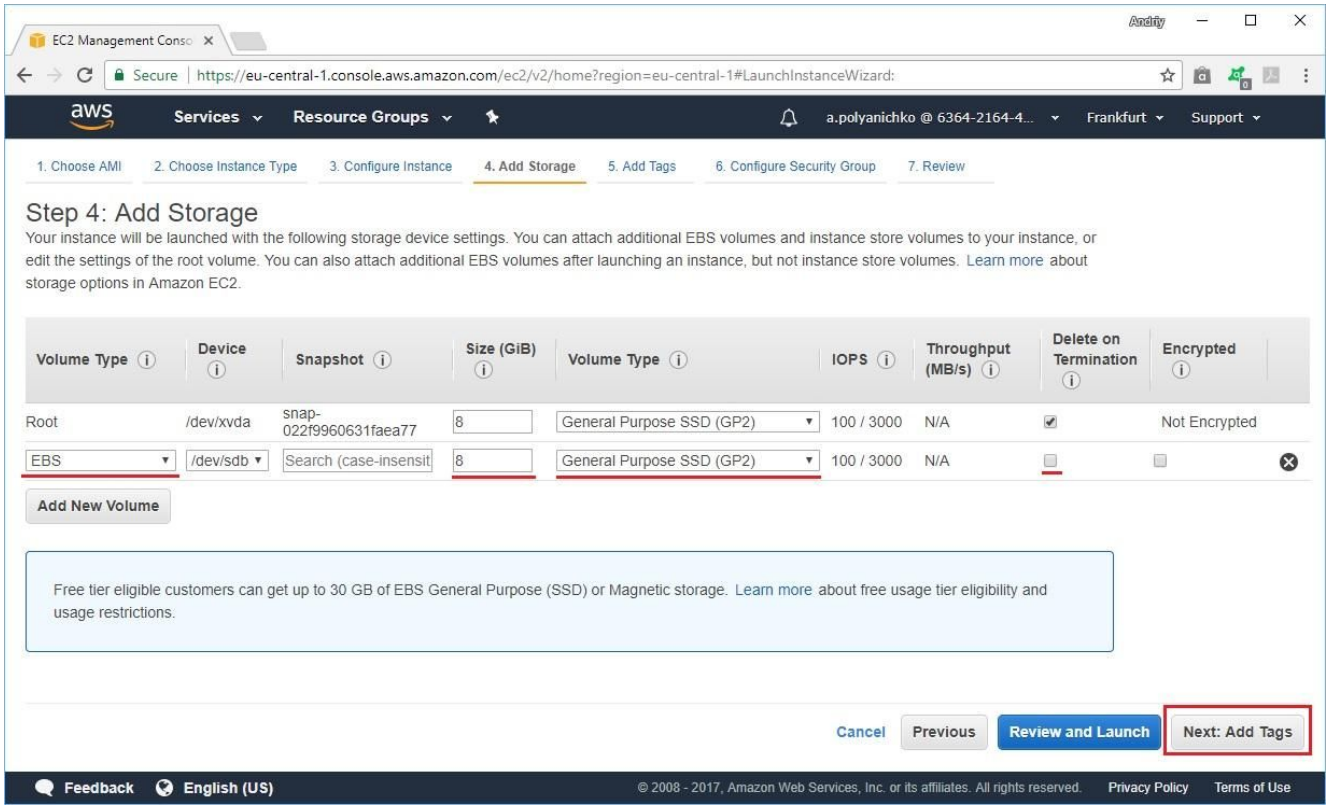


The process of creation is similar to the one described in paragraph 1.

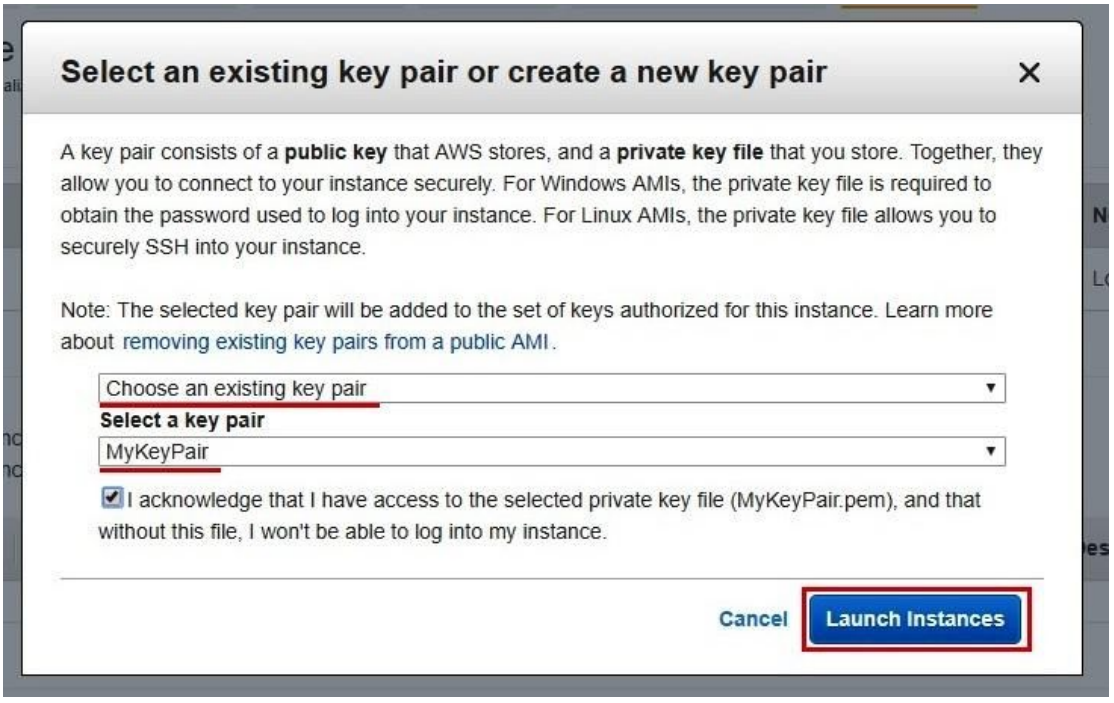
On the “Add storage” stage you will add EBS volume:



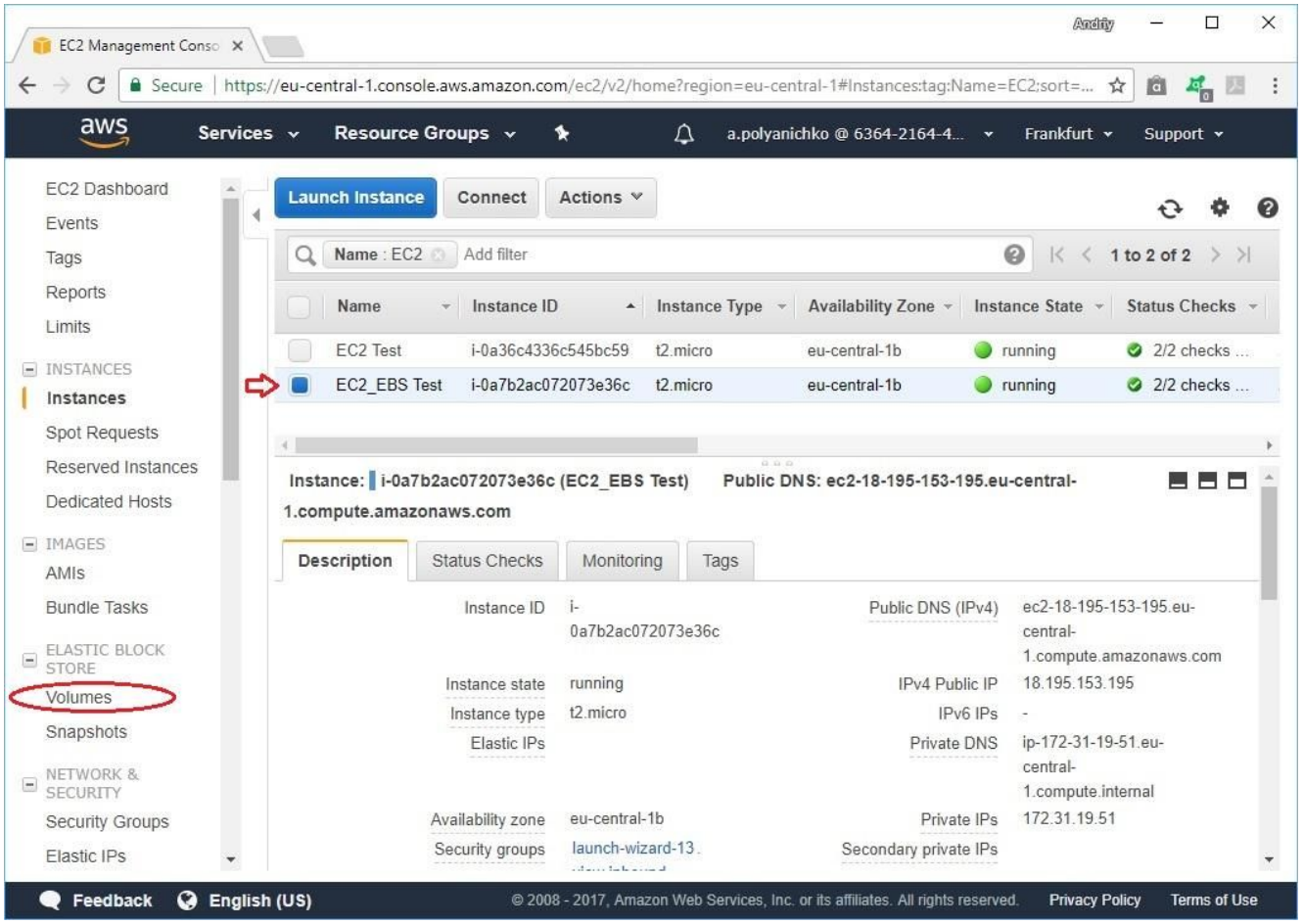
Click on “Add Volume” button and determine EBS volume parameters:



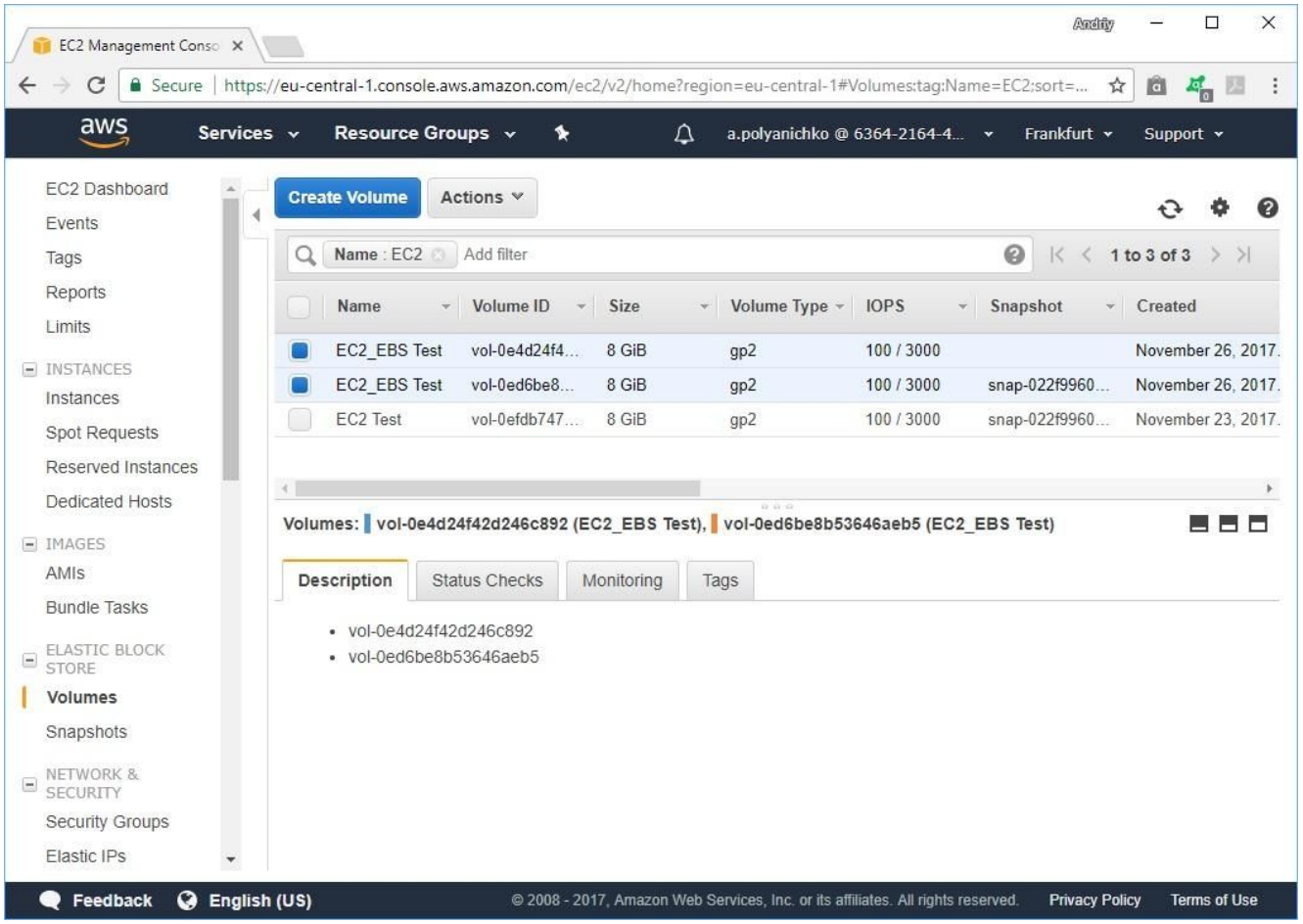
On the next stage, give your instance name “EC2_EBS Test” and launch it (please select an existing key pair for your instance):



Find your instance in EC2 Dashboard as running one:

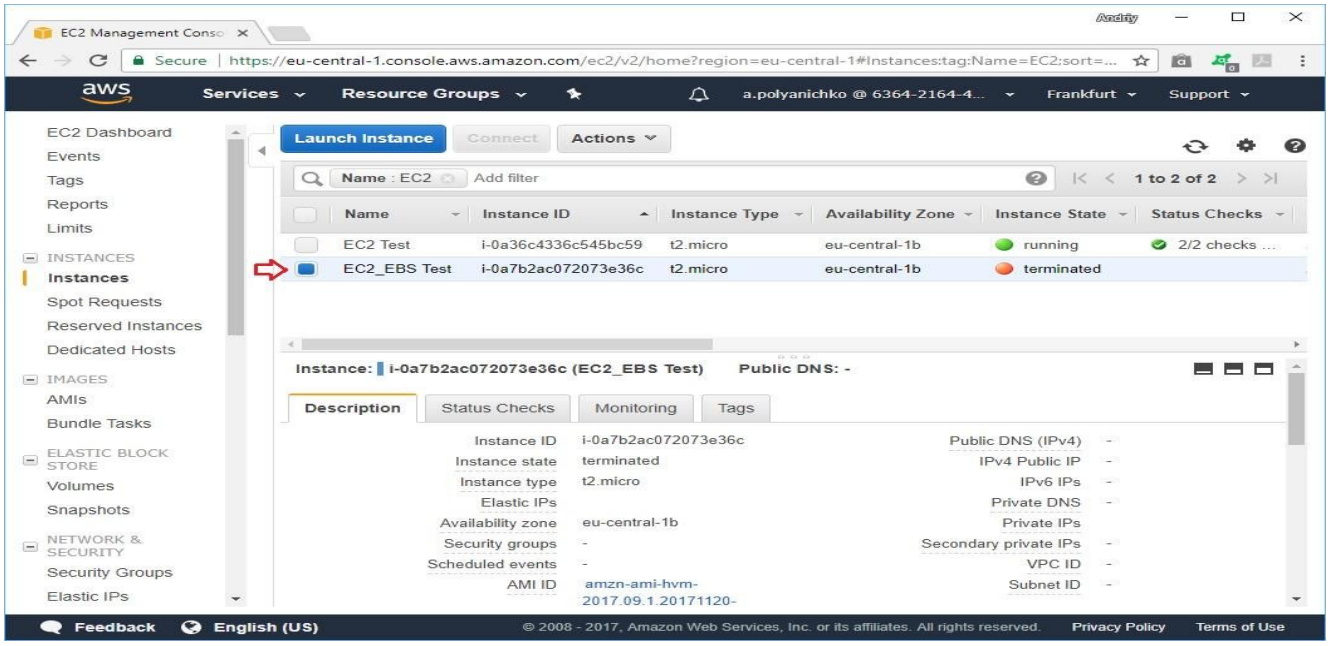


Find and open “Elastic Block Storage” → “Volumes” at the left-side menu ribbon:

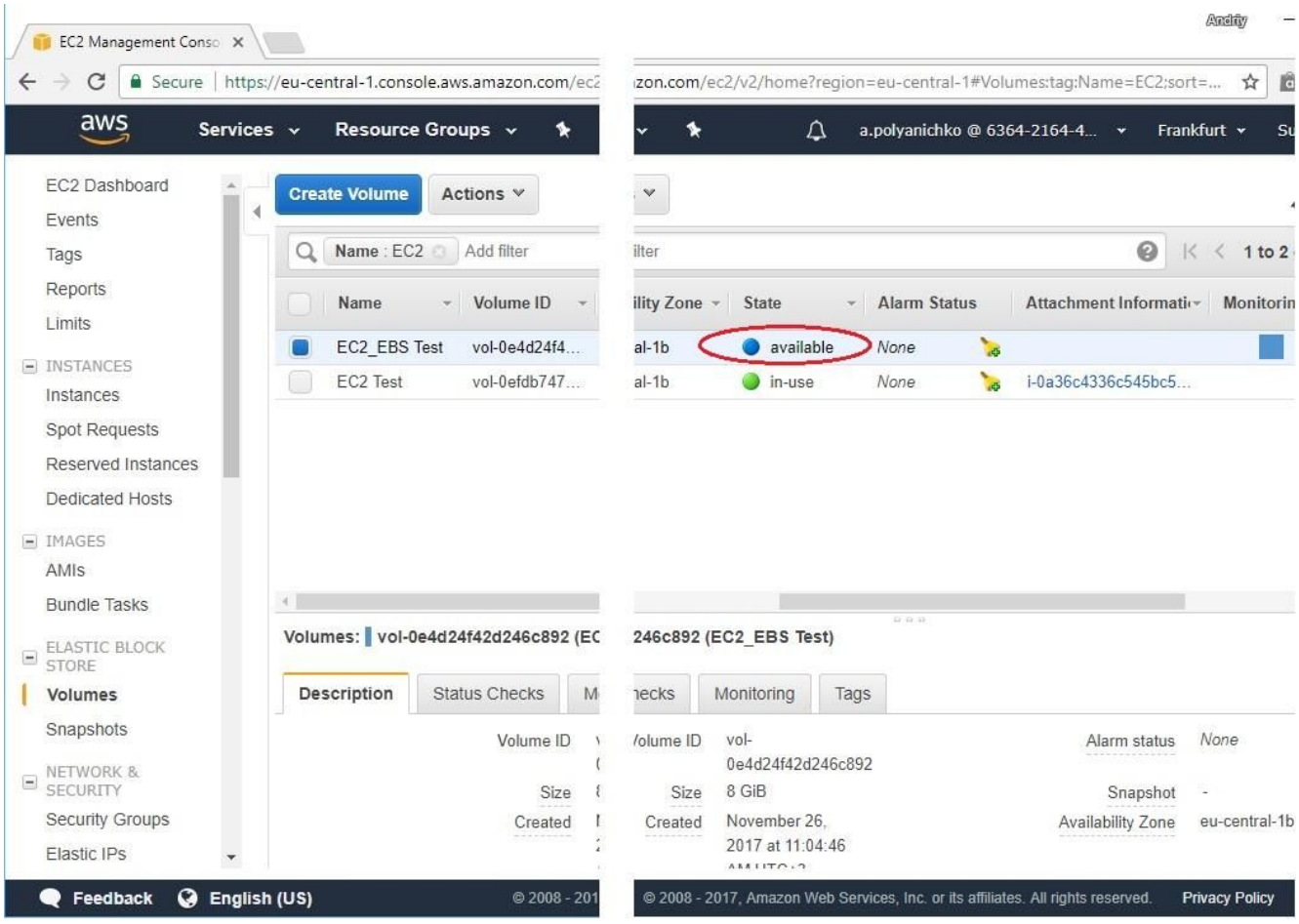


Ensure that two volumes are attached to “EC2_EBS Test” instance.

Try to stop and then terminate your “EC2_EBS Test” volume:



Open “Elastic Block Storage” → “Volumes” again and check / compare the status of “EC2_EBS Test” volumes when their parent instance was destroyed:



As you can see EBS volume remained available and it may be attached to another EC2 instance in the future.

⚠	Please take in account that availability of EBS volume(s) after deletion of EC2 instance is defining by “Delete on termination” checkbox at “Add Storage” stage when you are creating EC2 instance.