

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:

The screenshot shows the AWS Management Console for the EC2 service in the EU Central (Frankfurt) region. The left sidebar contains navigation links for the EC2 Dashboard, Events, Tags, Reports, Limits, INSTANCES (Instances, Spot Requests, Reserved Instances, Dedicated Hosts), IMAGES (AMIs, Bundle Tasks), ELASTIC BLOCK STORE (Volumes, Snapshots), NETWORK & SECURITY (Security Groups, Elastic IPs, Placement Groups, Key Pairs, Network Interfaces), and LOAD BALANCING (Load Balancers). The main content area is titled 'Resources' and lists the following EC2 resources: 2 Running Instances, 0 Dedicated Hosts, 4 Volumes, 2 Key Pairs, 0 Placement Groups, 1 Elastic IPs, 0 Snapshots, 1 Load Balancers, and 17 Security Groups. A promotional banner for EC2 Spot instances is displayed. Below the banner is the 'Create Instance' section, which includes a 'Launch Instance' button highlighted with a red box. The 'Service Health' section shows that the EU Central (Frankfurt) service is operating normally. The 'Scheduled Events' section shows no events. The 'Account Attributes' section on the right lists supported platforms, VPC, default VPC, and resource ID length management. The 'Additional Information' section on the right provides links to the Getting Started Guide, Documentation, All EC2 Resources, Forums, Pricing, and Contact Us.

EC2 Management Console

Secure | https://eu-central-1.console.aws.amazon.com/ec2/v2/home?region=eu-central-1

aws Services Resource Groups a.polyanichko @ 6364-2164-4... Frankfurt Support

EC2 Dashboard

- Events
- Tags
- Reports
- Limits
- INSTANCES
 - Instances
 - Spot Requests
 - Reserved Instances
 - Dedicated Hosts
- IMAGES
 - AMIs
 - Bundle Tasks
- ELASTIC BLOCK STORE
 - Volumes
 - Snapshots
- NETWORK & SECURITY
 - Security Groups
 - Elastic IPs
 - Placement Groups
 - Key Pairs
 - Network Interfaces
- LOAD BALANCING
 - Load Balancers

Resources

You are using the following Amazon EC2 resources in the EU Central (Frankfurt) region:

- 2 Running Instances
- 0 Dedicated Hosts
- 4 Volumes
- 2 Key Pairs
- 0 Placement Groups
- 1 Elastic IPs
- 0 Snapshots
- 1 Load Balancers
- 17 Security Groups

EC2 Spot. Save up to 90% off On-Demand Prices. Turbo Boost your Workloads. Get started with Amazon EC2 Spot Instances.

Create Instance

To start using Amazon EC2 you will want to launch a virtual server, known as an Amazon EC2 instance.

Launch Instance

Note: Your instances will launch in the EU Central (Frankfurt) region

Service Health

Service Status:

- EU Central (Frankfurt): This service is operating normally

Availability Zone Status:

- eu-central-1a: Availability zone is operating normally

Scheduled Events

EU Central (Frankfurt):

- No events

Account Attributes

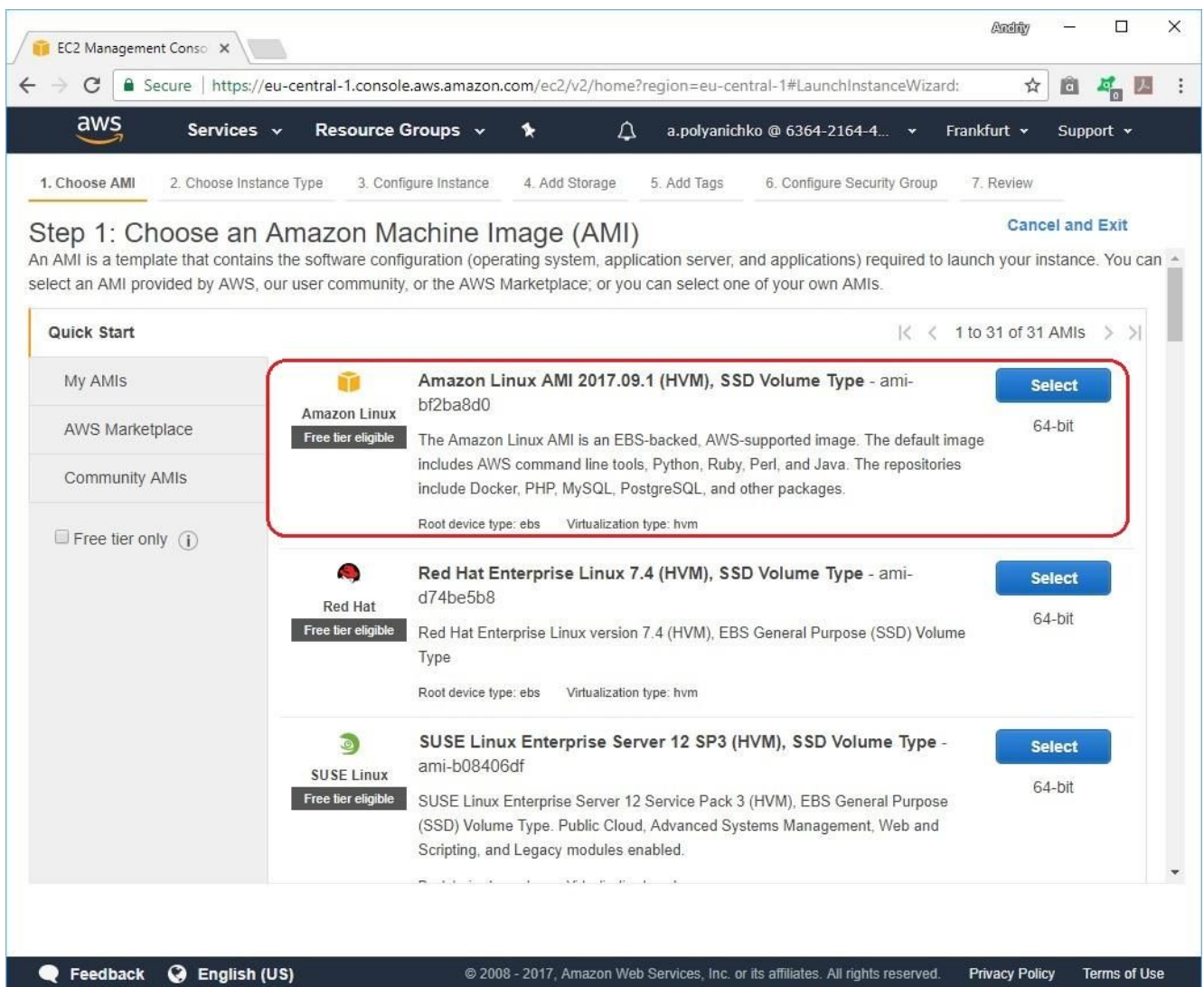
- Supported Platforms
- VPC
- Default VPC
- vpc-1d7eb074
- Resource ID length management

Additional Information

- Getting Started Guide
- Documentation
- All EC2 Resources
- Forums
- Pricing
- Contact Us

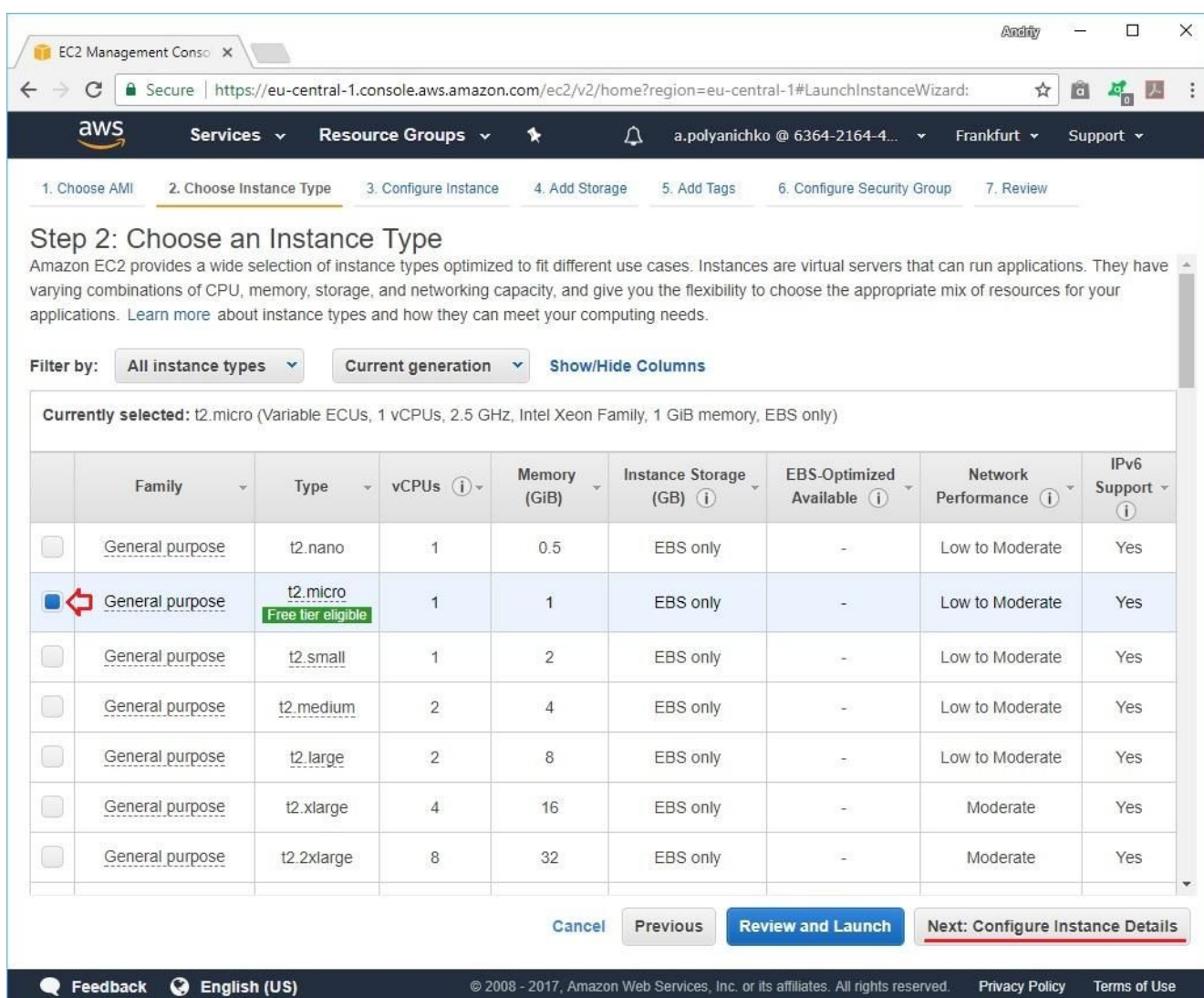
Feedback English (US) © 2008 - 2017, Amazon Web Services, Inc. or its affiliates. All rights reserved. Privacy Policy Terms of Use

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:



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](#)

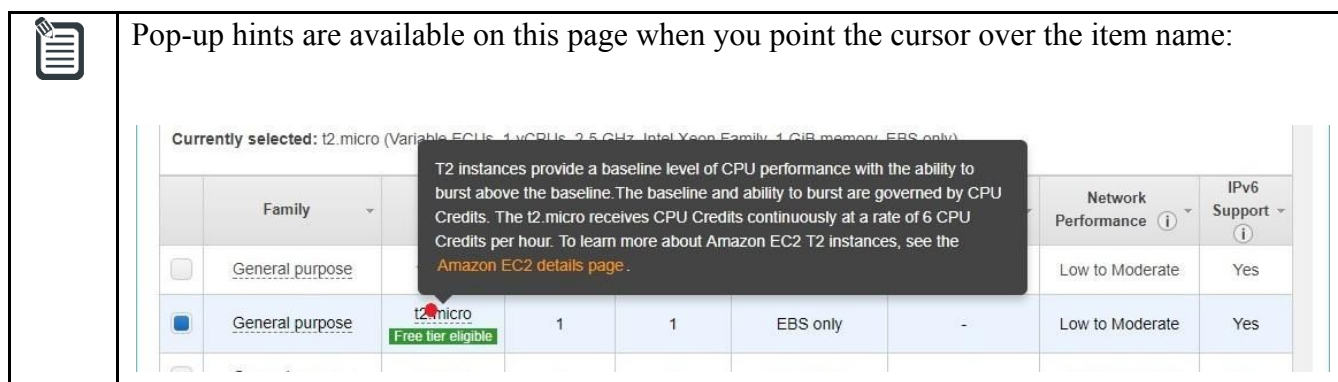
Currently selected: t2.micro (Variable ECUs, 1 vCPUs, 2.5 GHz, Intel Xeon Family, 1 GiB memory, EBS only)

	Family	Type	vCPUs	Memory (GiB)	Instance Storage (GB)	EBS-Optimized Available	Network Performance	IPv6 Support
<input type="checkbox"/>	General purpose	t2.nano	1	0.5	EBS only	-	Low to Moderate	Yes
<input checked="" type="checkbox"/>	General purpose	t2.micro <small>Free tier eligible</small>	1	1	EBS only	-	Low to Moderate	Yes
<input type="checkbox"/>	General purpose	t2.small	1	2	EBS only	-	Low to Moderate	Yes
<input type="checkbox"/>	General purpose	t2.medium	2	4	EBS only	-	Low to Moderate	Yes
<input type="checkbox"/>	General purpose	t2.large	2	8	EBS only	-	Low to Moderate	Yes
<input type="checkbox"/>	General purpose	t2.xlarge	4	16	EBS only	-	Moderate	Yes
<input type="checkbox"/>	General purpose	t2.2xlarge	8	32	EBS only	-	Moderate	Yes

[Cancel](#) [Previous](#) [Review and Launch](#) [Next: Configure Instance Details](#)

Feedback English (US) © 2008 - 2017, Amazon Web Services, Inc. or its affiliates. All rights reserved. [Privacy Policy](#) [Terms of Use](#)

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:

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

T2 instances provide a baseline level of CPU performance with the ability to burst above the baseline. The baseline and ability to burst are governed by CPU Credits. The t2.micro receives CPU Credits continuously at a rate of 6 CPU Credits per hour. To learn more about Amazon EC2 T2 instances, see the [Amazon EC2 details page](#).

	Family	Type	vCPUs	Memory (GiB)	Instance Storage (GB)	EBS-Optimized Available	Network Performance	IPv6 Support
<input type="checkbox"/>	General purpose	t2.nano	1	0.5	EBS only	-	Low to Moderate	Yes
<input checked="" type="checkbox"/>	General purpose	t2.micro <small>Free tier eligible</small>	1	1	EBS only	-	Low to Moderate	Yes
<input type="checkbox"/>	General purpose	t2.small	1	2	EBS only	-	Low to Moderate	Yes
<input type="checkbox"/>	General purpose	t2.medium	2	4	EBS only	-	Low to Moderate	Yes
<input type="checkbox"/>	General purpose	t2.large	2	8	EBS only	-	Low to Moderate	Yes
<input type="checkbox"/>	General purpose	t2.xlarge	4	16	EBS only	-	Moderate	Yes
<input type="checkbox"/>	General purpose	t2.2xlarge	8	32	EBS only	-	Moderate	Yes

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:

EC2 Management Console

Secure | https://eu-central-1.console.aws.amazon.com/ec2/v2/home?region=eu-central-1#LaunchInstanceWizard:

Services Resource Groups a.polyanichko @ 6364-2164-4... Frankfurt Support

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

Step 3: Configure Instance Details

Configure the instance to suit your requirements. You can launch multiple instances from the same AMI, request Spot instances to take advantage of the lower pricing, assign an access management role to the instance, and more.

Number of instances ⓘ 1 [Launch into Auto Scaling Group](#) ⓘ

Purchasing option ⓘ ☐ Request Spot instances

Network ⓘ vpc-1d7eb074 (default) [Create new VPC](#)

Subnet ⓘ No preference (default subnet in any Availability Zone) [Create new subnet](#)

Auto-assign Public IP ⓘ Use subnet setting (Enable)

IAM role ⓘ None [Create new IAM role](#)

Shutdown behavior ⓘ Stop

Enable termination protection ⓘ ☐ Protect against accidental termination

Monitoring ⓘ ☐ Enable CloudWatch detailed monitoring
Additional charges apply.

Tenancy ⓘ Shared - Run a shared hardware instance
Additional charges will apply for dedicated tenancy.

▶ Advanced Details

[Cancel](#) [Previous](#) [Review and Launch](#) [Next: Add Storage](#)

Feedback English (US) © 2008 - 2017, Amazon Web Services, Inc. or its affiliates. All rights reserved. Privacy Policy Terms of Use

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:

EC2 Management Console

Secure | https://eu-central-1.console.aws.amazon.com/ec2/v2/home?region=eu-central-1#LaunchInstanceWizard:

aws Services Resource Groups a.polyanichko @ 6364-2164-4... Frankfurt Support

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

Step 4: Add Storage

Your instance will be launched with the following storage device settings. You can attach additional EBS volumes and instance store volumes to your instance, or edit the settings of the root volume. You can also attach additional EBS volumes after launching an instance, but not instance store volumes. [Learn more](#) about storage options in Amazon EC2.

Volume Type	Device	Snapshot	Size (GiB)	Volume Type	IOPS	Throughput (MB/s)	Delete on Termination	Encrypted
Root	/dev/xvda	snap-022f9960631faea77	8	General Purpose	100 / 3000	N/A	<input checked="" type="checkbox"/>	Not Encrypted

[Add New Volume](#)

Free tier eligible customers can get up to 30 GB of EBS General Purpose (SSD) or Magnetic storage. [Learn more](#) about free usage tier eligibility and usage restrictions.

Cancel Previous **Review and Launch** Next: Add Tags

Feedback English (US) © 2008 - 2017, Amazon Web Services, Inc. or its affiliates. All rights reserved. Privacy Policy Terms of Use

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:

EC2 Management Console

Secure | https://eu-central-1.console.aws.amazon.com/ec2/v2/home?region=eu-central-1#LaunchInstanceWizard:

aws Services Resource Groups a.polyanichko @ 6364-2164-4... Frankfurt Support

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

Step 5: Add Tags

A tag consists of a case-sensitive key-value pair. For example, you could define a tag with key = Name and value = Webserver.
A copy of a tag can be applied to volumes, instances or both.
Tags will be applied to all instances and volumes. [Learn more](#) about tagging your Amazon EC2 resources.

Key (127 characters maximum)	Value (255 characters maximum)	Instances	Volumes
This resource currently has no tags			

Choose the Add tag button or click to add a Name tag.
Make sure your IAM policy includes permissions to create tags.

Add Tag (Up to 50 tags maximum)

Cancel Previous **Review and Launch** Next: Configure Security Group

Feedback English (US) © 2008 - 2017, Amazon Web Services, Inc. or its affiliates. All rights reserved. Privacy Policy Terms of Use

Let's name our instance using the tag attribute.

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

Step 5: Add Tags

A tag consists of a case-sensitive key-value pair. For example, you could define a tag with key = Name and value = Webserver.
A copy of a tag can be applied to volumes, instances or both.
Tags will be applied to all instances and volumes. [Learn more](#) about tagging your Amazon EC2 resources.

Key (127 characters maximum)	Value (255 characters maximum)	Instances	Volumes
Name	EC2 Test	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

Add another tag (Up to 50 tags maximum)



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:

EC2 Management Console

Secure | https://eu-central-1.console.aws.amazon.com/ec2/v2/home?region=eu-central-1#LaunchInstanceWizard:

aws Services Resource Groups a.polyanichko @ 6364-2164-4... Frankfurt Support

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

Step 6: Configure Security Group

A security group is a set of firewall rules that control the traffic for your instance. On this page, you can add rules to allow specific traffic to reach your instance. For example, if you want to set up a web server and allow Internet traffic to reach your instance, add rules that allow unrestricted access to the HTTP and HTTPS ports. You can create a new security group or select from an existing one below. [Learn more](#) about Amazon EC2 security groups.

Assign a security group: ☒ Create a **new** security group ☐ Select an **existing** security group

Security group name:

Description:

Type	Protocol	Port Range	Source	Description
SSH	TCP	22	Custom 0.0.0.0/0	e.g. SSH for Admin Desktop

Add Rule

Warning

Rules with source of 0.0.0.0/0 allow all IP addresses to access your instance. We recommend setting security group rules to allow access from known IP addresses only.

Cancel Previous **Review and Launch**

Feedback English (US) © 2008 - 2017, Amazon Web Services, Inc. or its affiliates. All rights reserved. Privacy Policy Terms of Use

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:

EC2 Management Console

Secure | https://eu-central-1.console.aws.amazon.com/ec2/v2/home?region=eu-central-1#LaunchInstanceWizard:

Services Resource Groups a.polyanichko @ 6364-2164-4... Frankfurt Support

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

Step 7: Review Instance Launch

Please review your instance launch details. You can go back to edit changes for each section. Click **Launch** to assign a key pair to your instance and complete the launch process.

⚠ Improve your instances' security. Your security group, launch-wizard-11, is open to the world.

Your instances may be accessible from any IP address. We recommend that you update your security group rules to allow access from known IP addresses only.

You can also open additional ports in your security group to facilitate access to the application or service you're running, e.g., HTTP (80) for web servers. [Edit security groups](#)

▼ AMI Details [Edit AMI](#)

Free tier eligible **Amazon Linux AMI 2017.09.1 (HVM), SSD Volume Type - ami-bf2ba8d0**

The Amazon Linux AMI is an EBS-backed, AWS-supported image. The default image includes AWS command line tools, Python, Ruby, Perl, and Java. The repositories include Docker, PHP, MySQL, PostgreSQL, and other packages.

Root Device Type: ebs Virtualization type: hvm

▼ Instance Type [Edit instance type](#)

Instance Type	ECUs	vCPUs	Memory (GiB)	Instance Storage (GB)	EBS-Optimized Available	Network Performance
t2.micro	Variable	1	1	EBS only	-	Low to Moderate

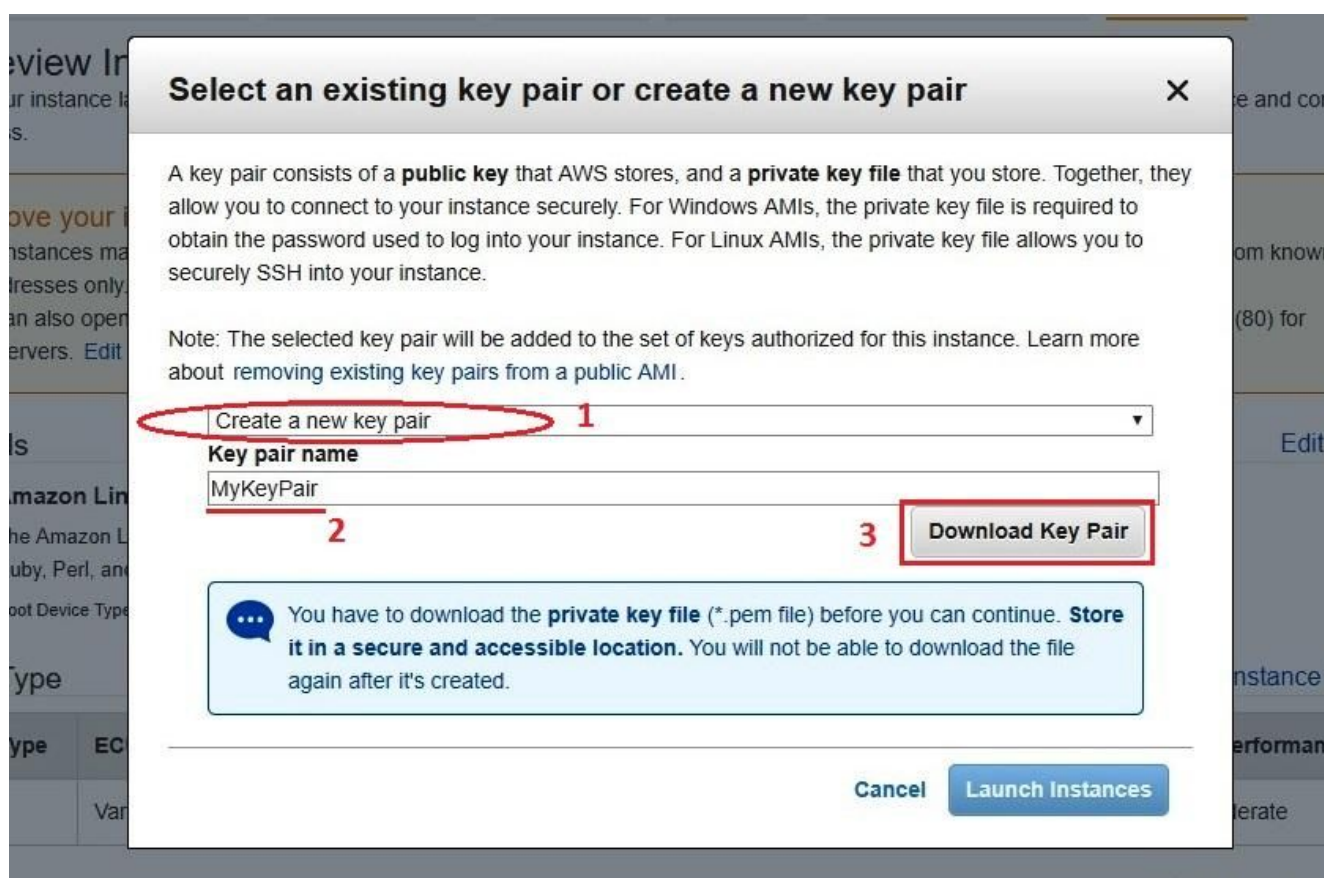
▼ Security Groups [Edit security groups](#)

[Cancel](#) [Previous](#) **[Launch](#)**

Feedback English (US) © 2008 - 2017, Amazon Web Services, Inc. or its affiliates. All rights reserved. Privacy Policy Terms of Use

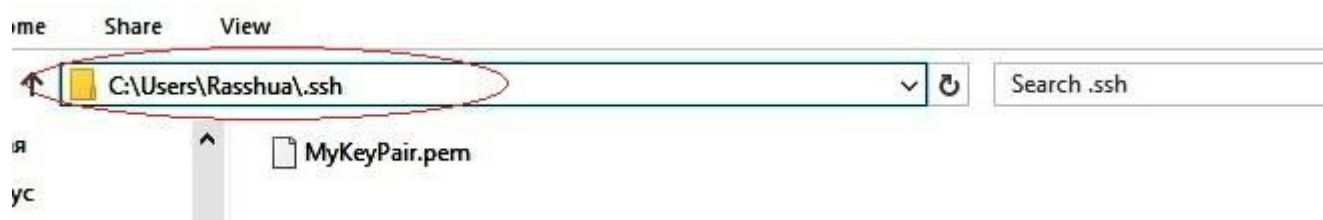
Finally you may perform the last check before starting and launch new instance.

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



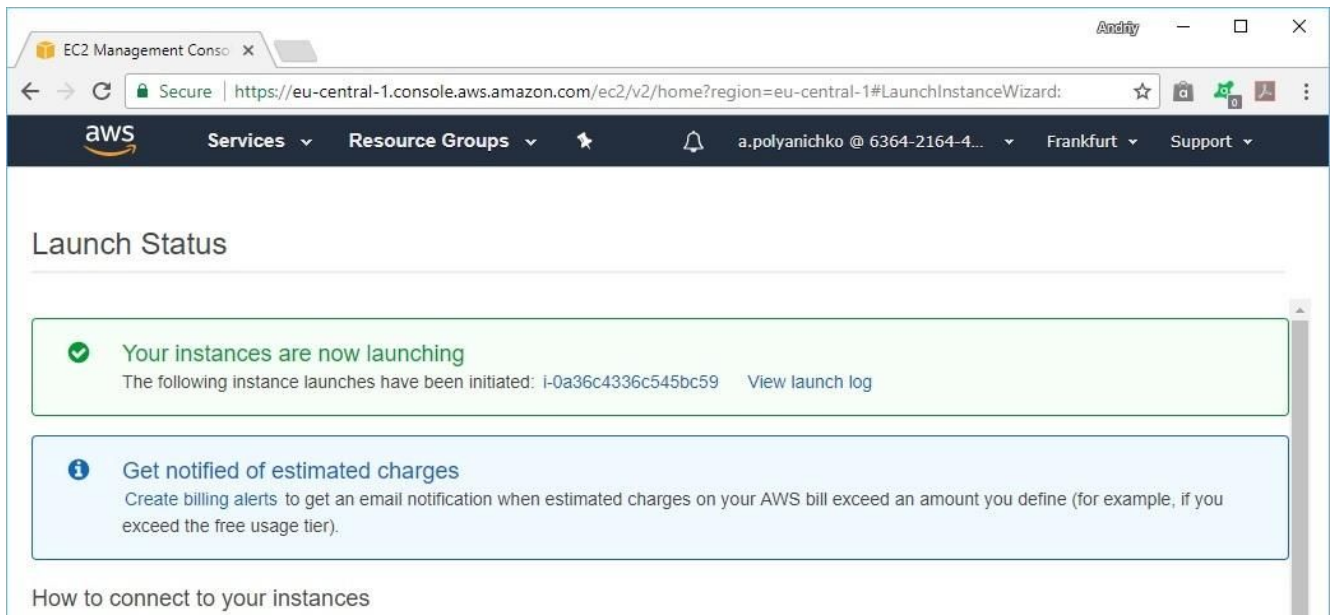
In our example we will try to create new key pair in 3 steps:

- 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:

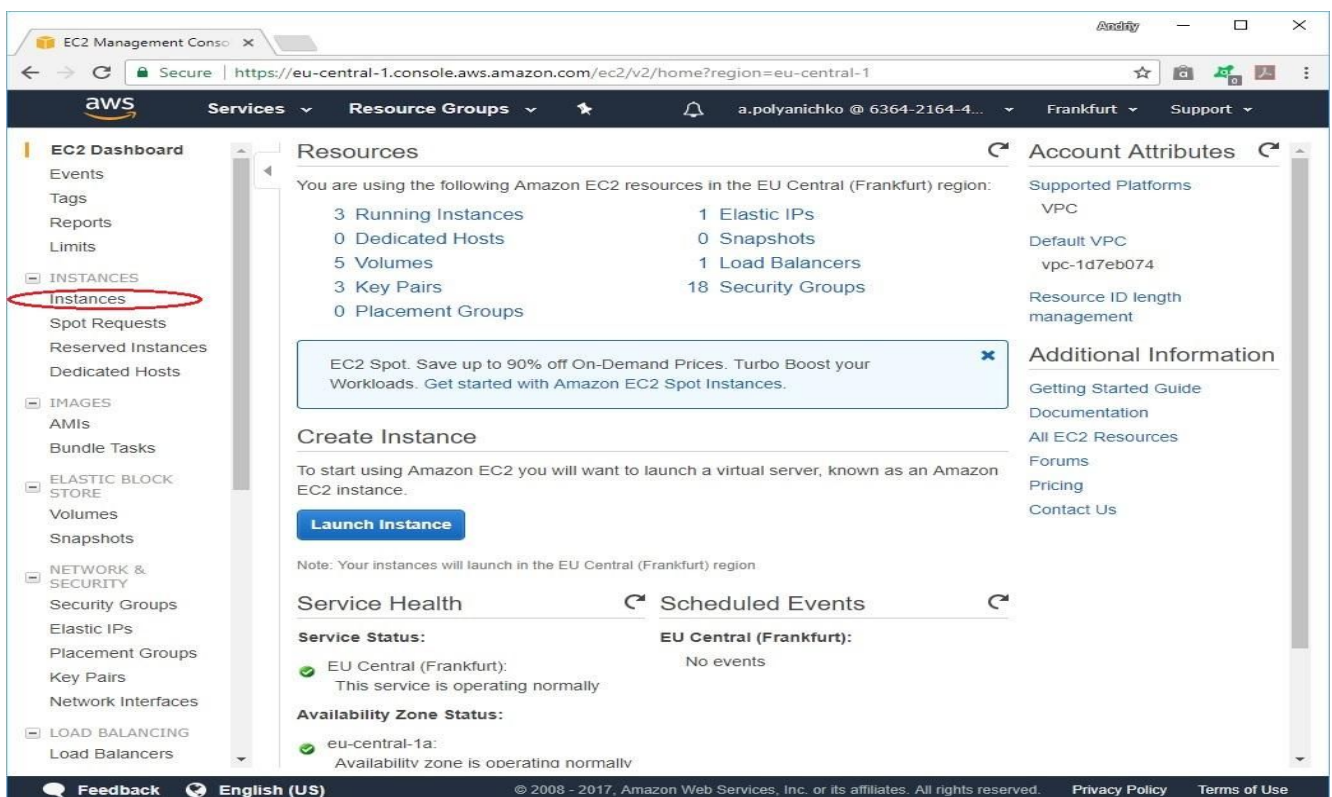


It is recommended to save key pair files (*.pem) in .ssh subfolder of User directory as shown on the screenshot above.

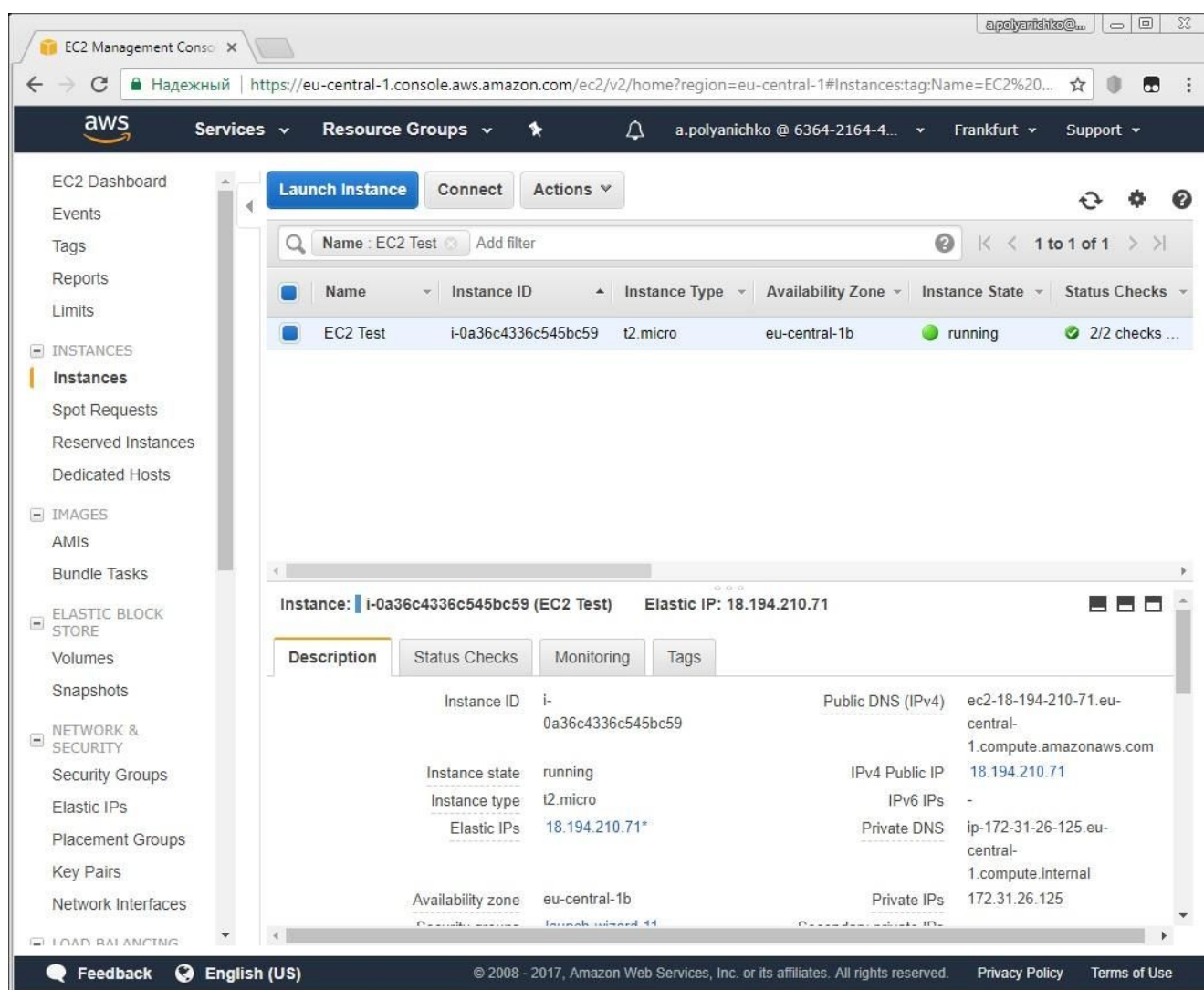
As soon as key pair file has download, “Launch Instances” button at the dialog window will become available. Click it to launch the instance:



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



You can find 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:

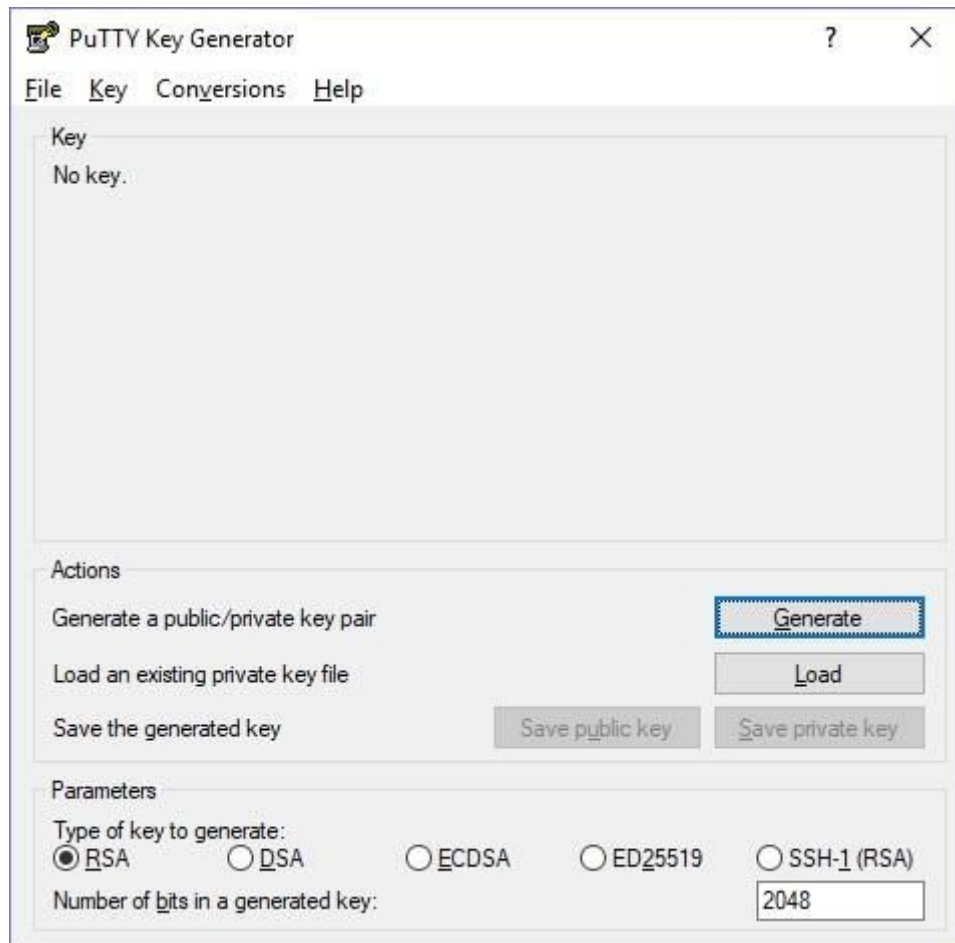
If you have Git installed on your PC you may connect your instance in a simplest way using Git BASH command:

```
ssh -i 'c:\Users\yourusername\.ssh\MyKeyPair.pem' ec2-user@{IP_Address}
```

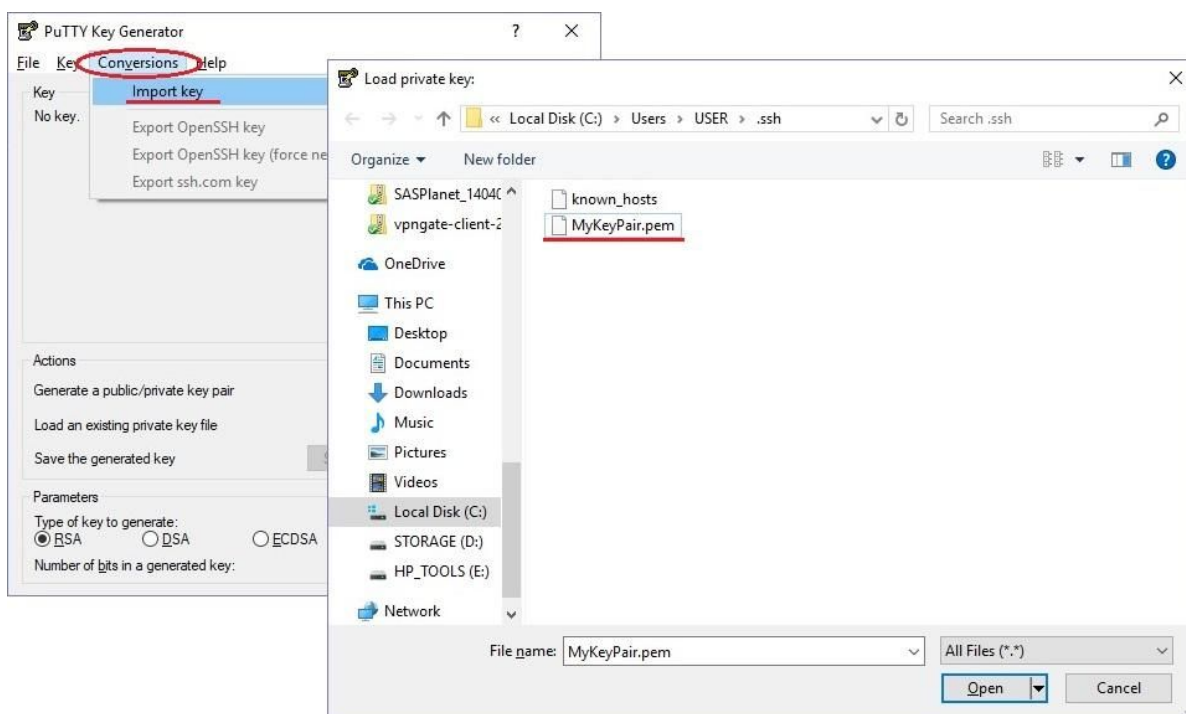
Let's try to connect your instance using PuTTY SSH/Telnet/Terminal emulator package.

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.

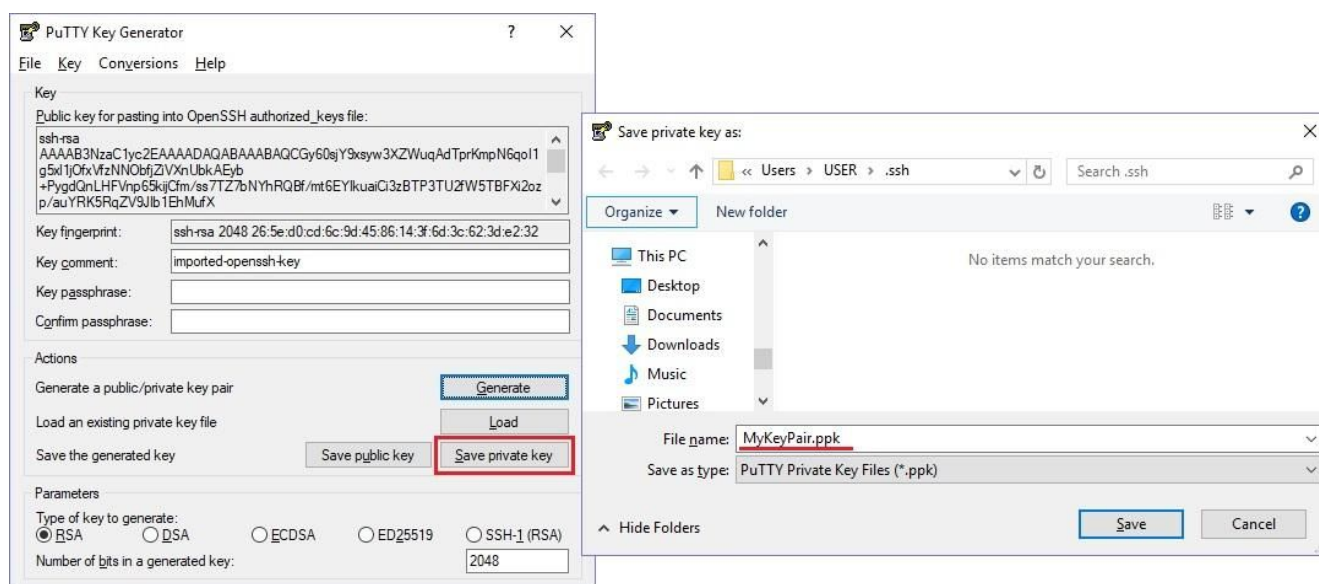
Start Puttygen application:



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

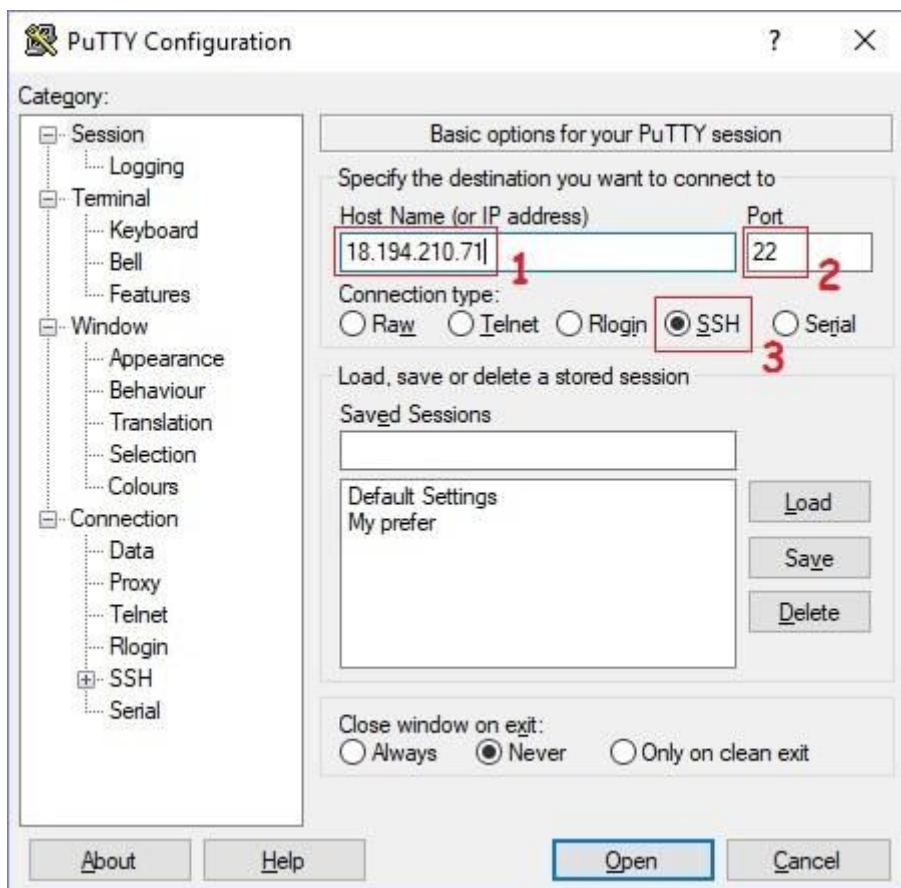


Save your private key in PuTTY SSH-RSA format using “Save private key” button:



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

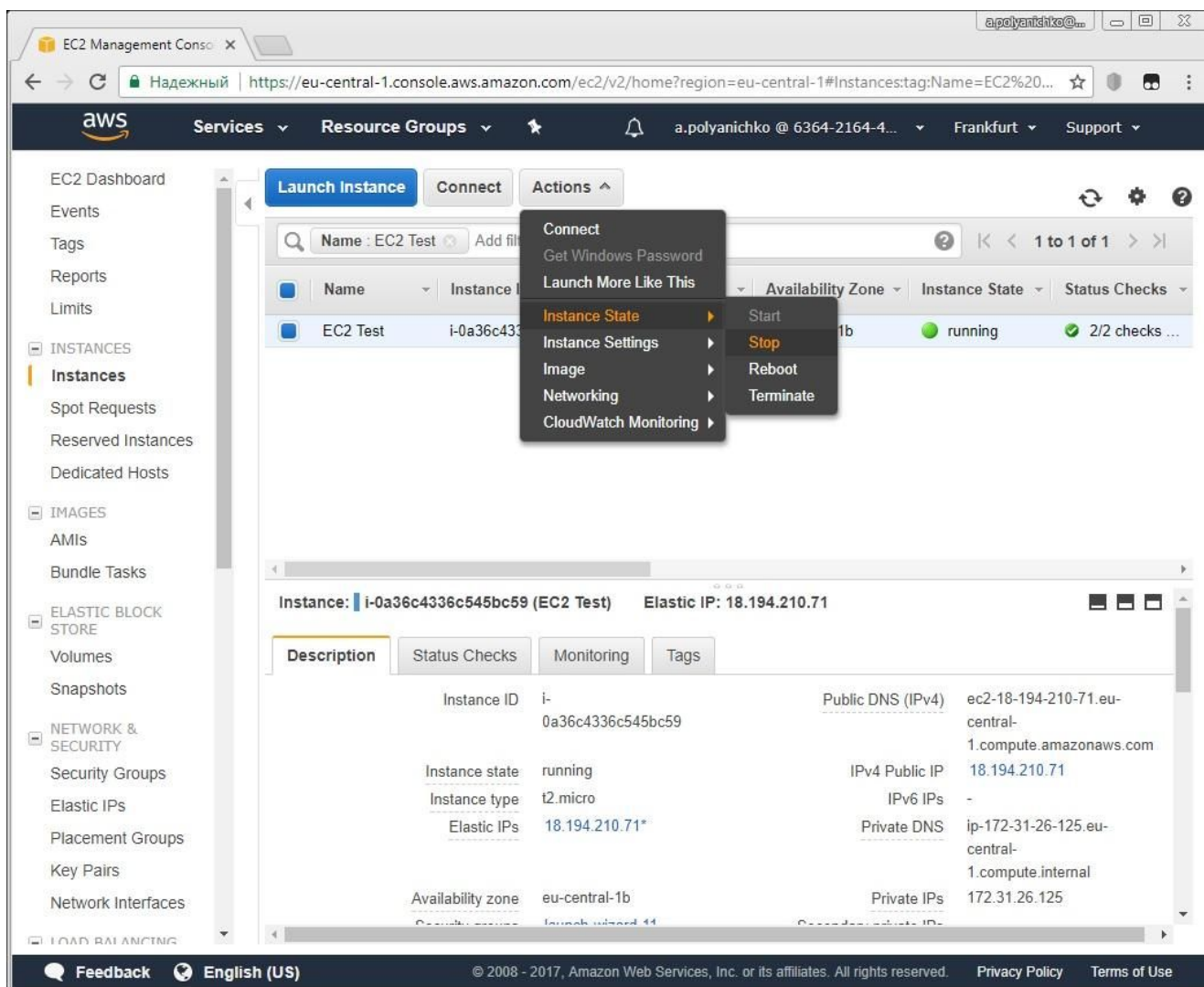
Start PuTTY application and specify connection options as shown:



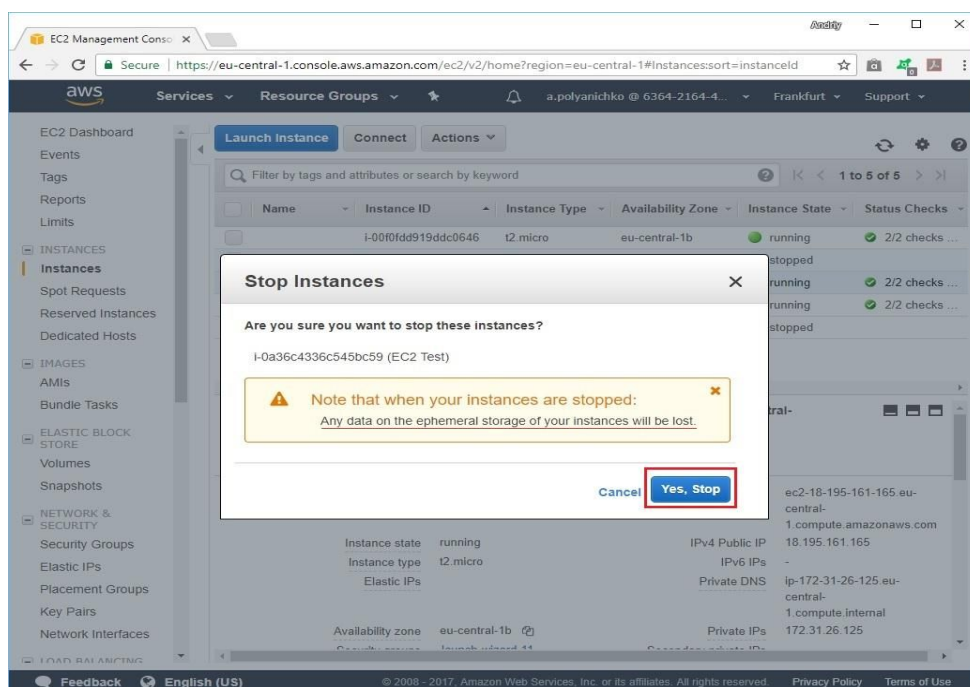
- Host IP address (it is exactly Elastic IP for our EC2 Instance);
- Port number – 22;
- Connection type – SSH;
- Authentication options including .ppk file as shown below:

2. Manage EC2 Instance operational State

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

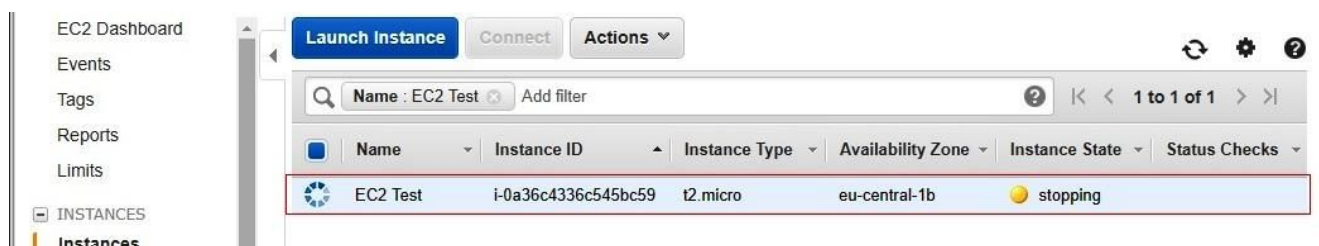


Try to use “Stop” command and point your attention on the system warnings:



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:

The screenshot displays the AWS Management Console for the eu-central-1 region. The left sidebar shows the navigation menu with categories like INSTANCES, IMAGES, ELASTIC BLOCK STORE, NETWORK & SECURITY, and LOAD BALANCING. The main content area shows a list of EC2 instances with a table containing columns for Name, Instance ID, Instance Type, Availability Zone, Instance State, and Status Checks. The instance 'EC2 Test' (ID: i-0a36c4336c545bc59) is shown as 'stopped'. Below the table, the details for this instance are expanded, showing the 'Description' tab with various attributes.

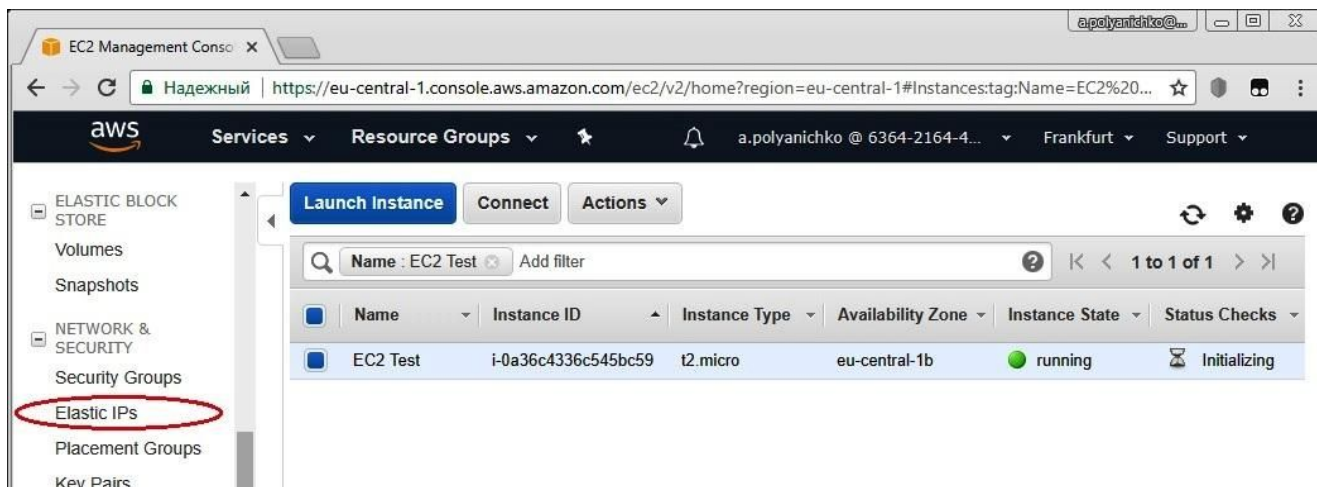
Name	Instance ID	Instance Type	Availability Zone	Instance State	Status Checks
EC2 Test	i-0a36c4336c545bc59	t2.micro	eu-central-1b	stopped	

Instance: i-0a36c4336c545bc59 (EC2 Test) Elastic IP: 18.194.210.71			
Description			
Instance ID	i-0a36c4336c545bc59	Public DNS (IPv4)	ec2-18-194-210-71.eu-central-1.compute.amazonaws.com
Instance state	stopped	IPv4 Public IP	18.194.210.71
Instance type	t2.micro	IPv6 IPs	-
Elastic IPs	18.194.210.71*	Private DNS	ip-172-31-26-125.eu-central-1.compute.internal
Availability zone	eu-central-1b	Private IPs	172.31.26.125

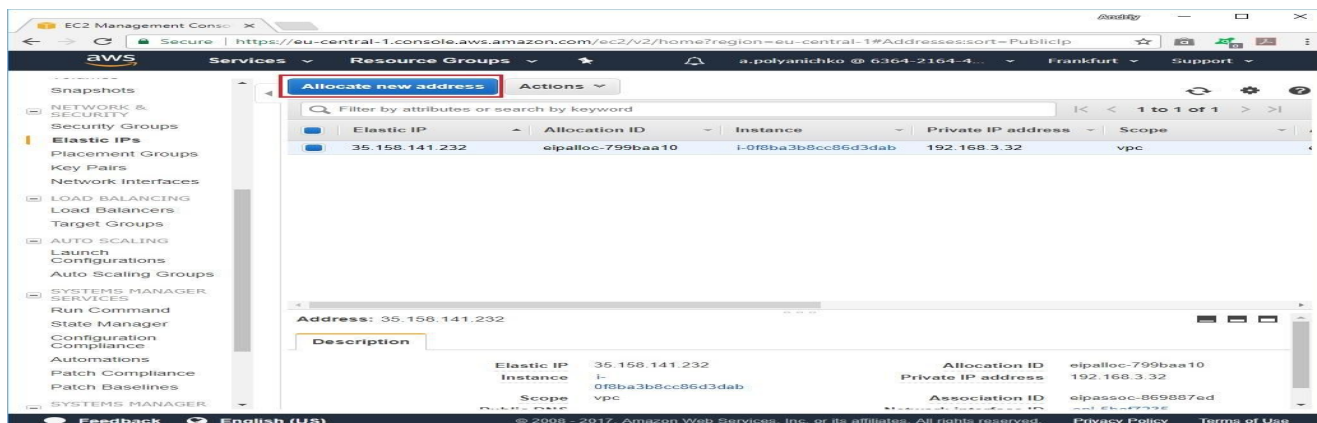
Now please try to start the instance which was stopped before and track the state changing.

3. Elastic IP assigning for EC2 instance

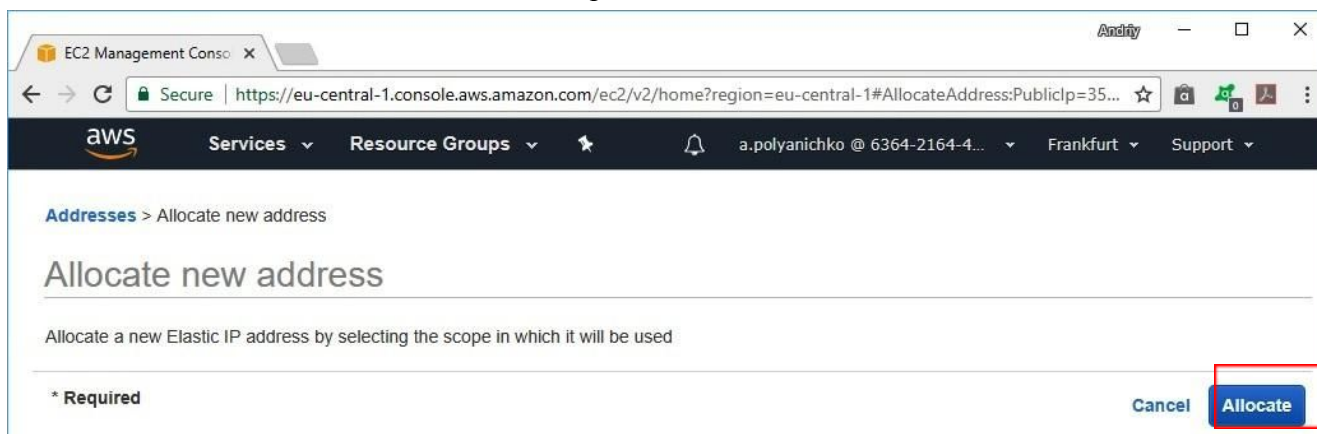
Open “Elastic IPs” item on the left side menu ribbon:



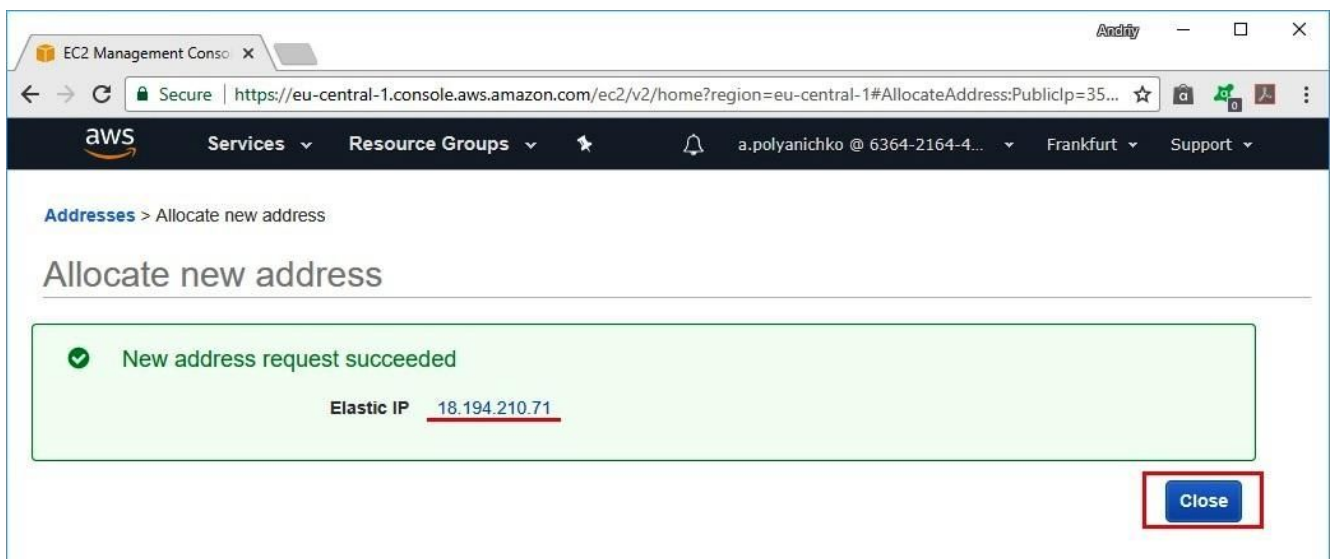
Elastic IPs Management page will be opened:



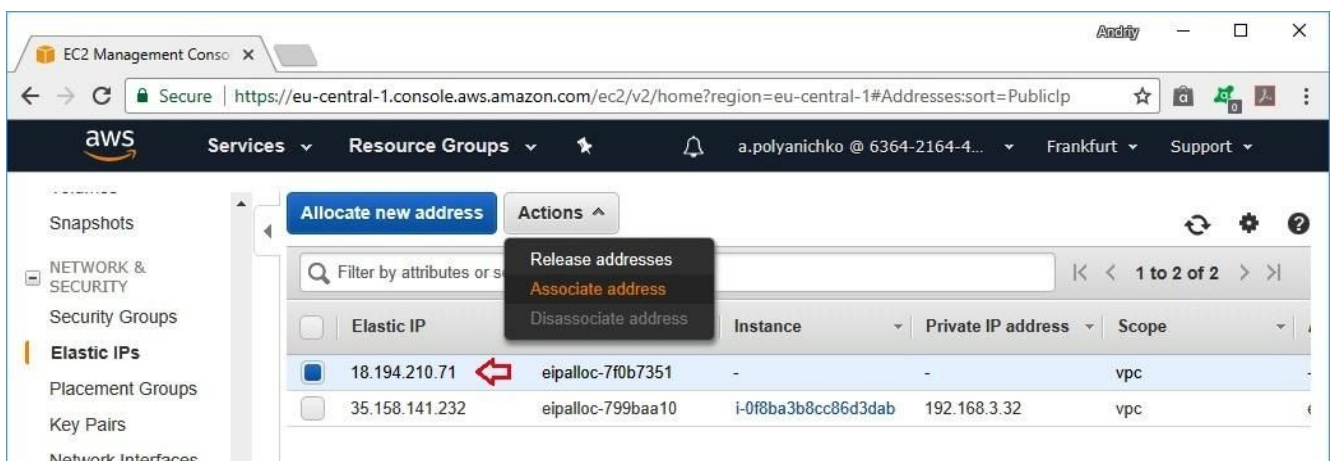
Click on “Allocate new address” button to acquire new Elastic IP address:



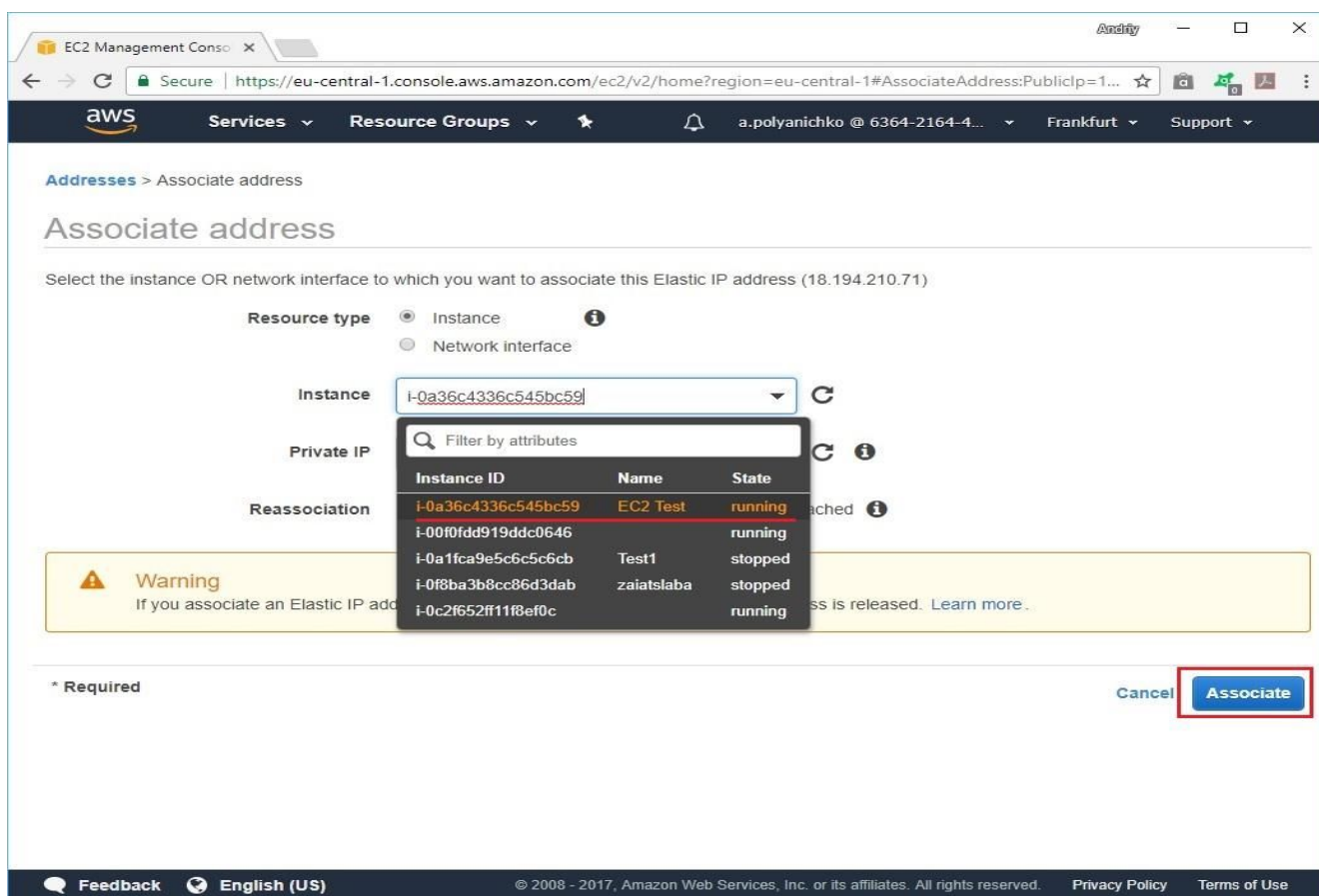
Click on “Allocate” button to continue:



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

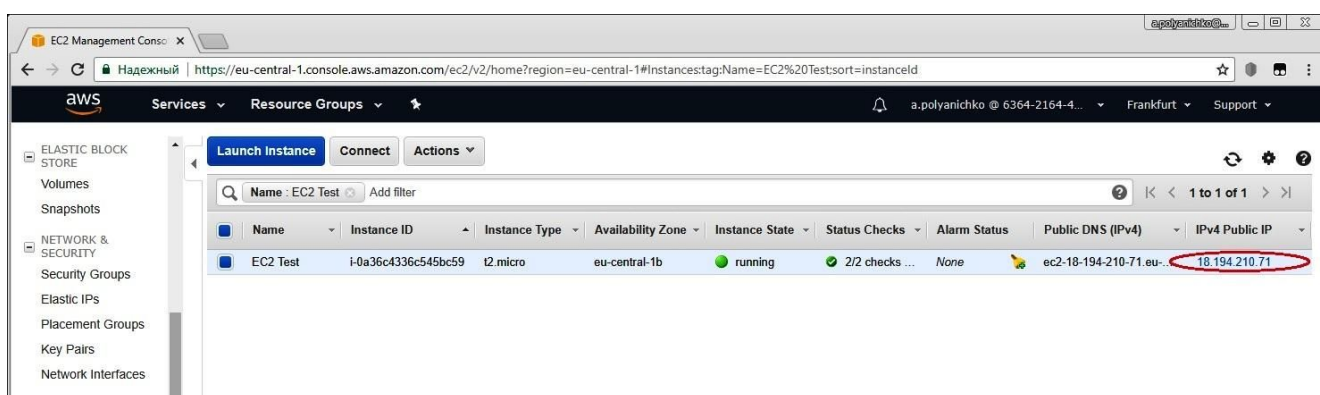


Select noted IP address and then release “Actions” → “Associate address” command:



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

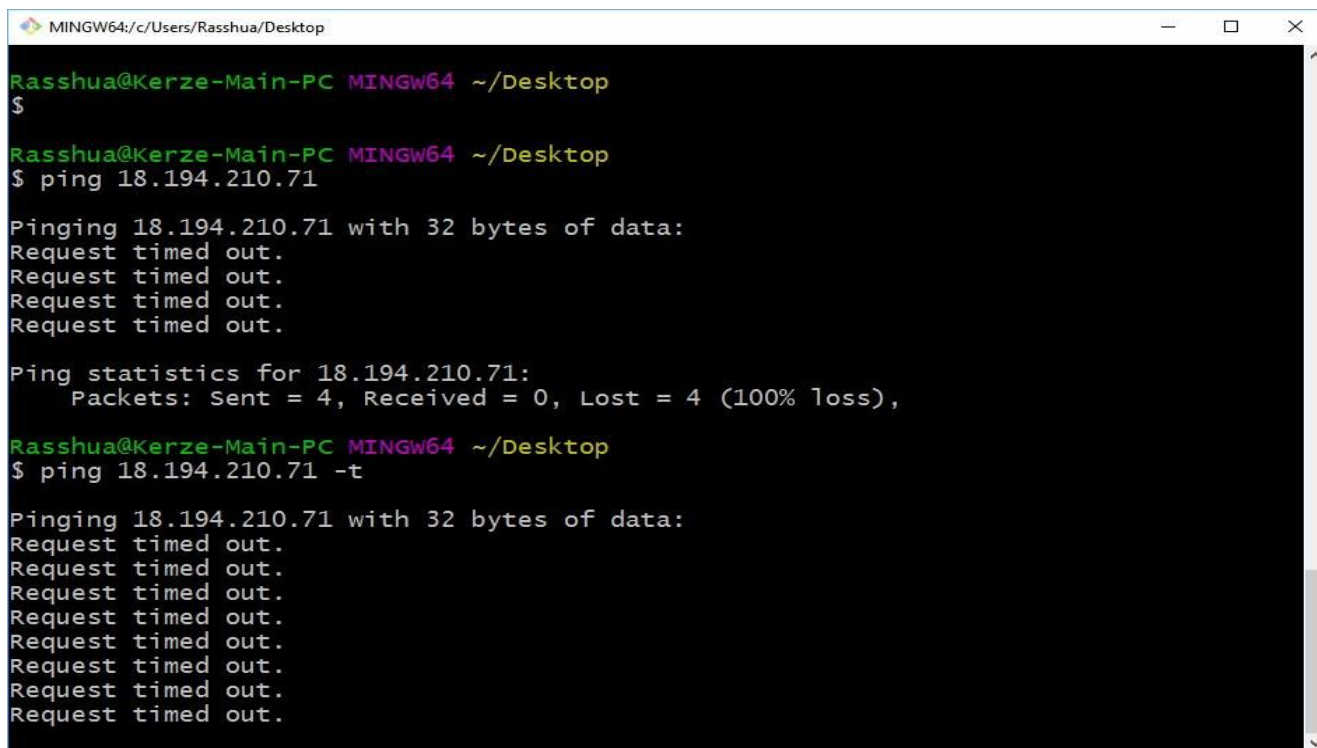
The Elastic IP will be associated with your EC2 instance and you will see it on Instances page of EC2 Dashboard:



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:



```

MINGW64; c:/Users/Rasshua/Desktop
Rasshua@Kerze-Main-PC MINGW64 ~/Desktop
$
Rasshua@Kerze-Main-PC MINGW64 ~/Desktop
$ ping 18.194.210.71

Pinging 18.194.210.71 with 32 bytes of data:
Request timed out.
Request timed out.
Request timed out.
Request timed out.

Ping statistics for 18.194.210.71:
    Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),

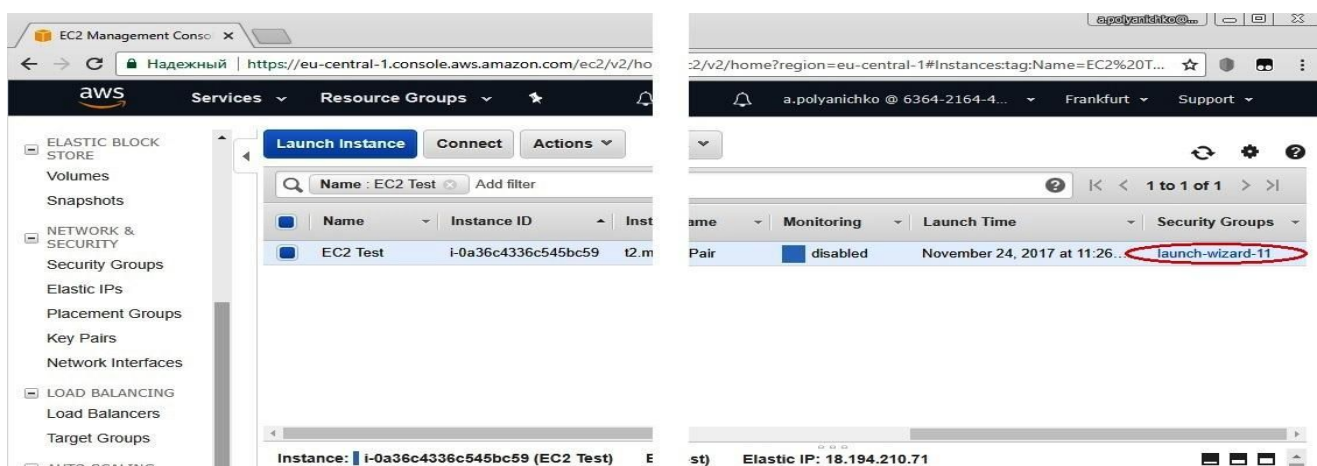
Rasshua@Kerze-Main-PC MINGW64 ~/Desktop
$ ping 18.194.210.71 -t

Pinging 18.194.210.71 with 32 bytes of data:
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.

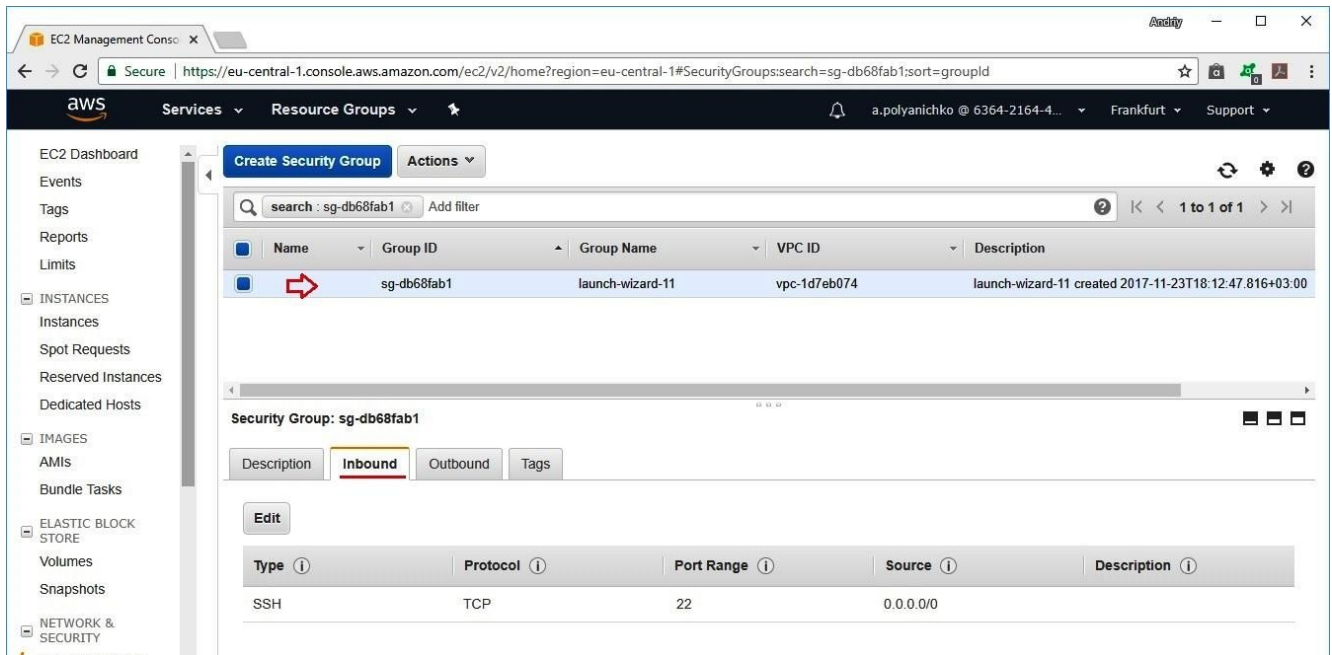
```

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:

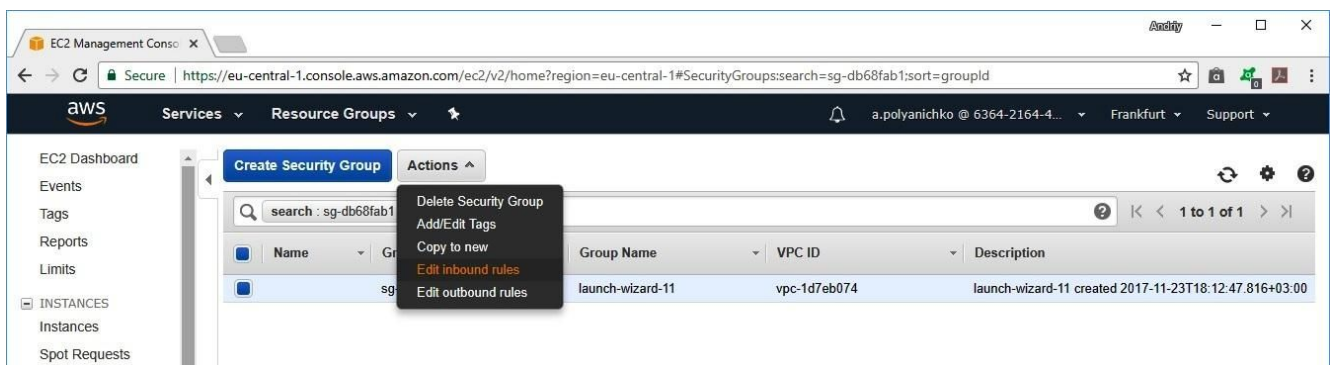


You need to scroll your instance to right and to find Security Group column. Click on Security Group ID for selected EC2:



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:

Edit inbound rules

Type	Protocol	Port Range	Source	Description
SSH	TCP	22	Custom 0.0.0.0/0	e.g. SSH for Admin Desktop

Add Rule

NOTE: Any edits made on existing rules will result in the edited rule being deleted and a new rule created with the new details. This will cause traffic that depends on that rule to be dropped for a very brief period of time until the new rule can be created.

Cancel **Save**

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

Edit inbound rules

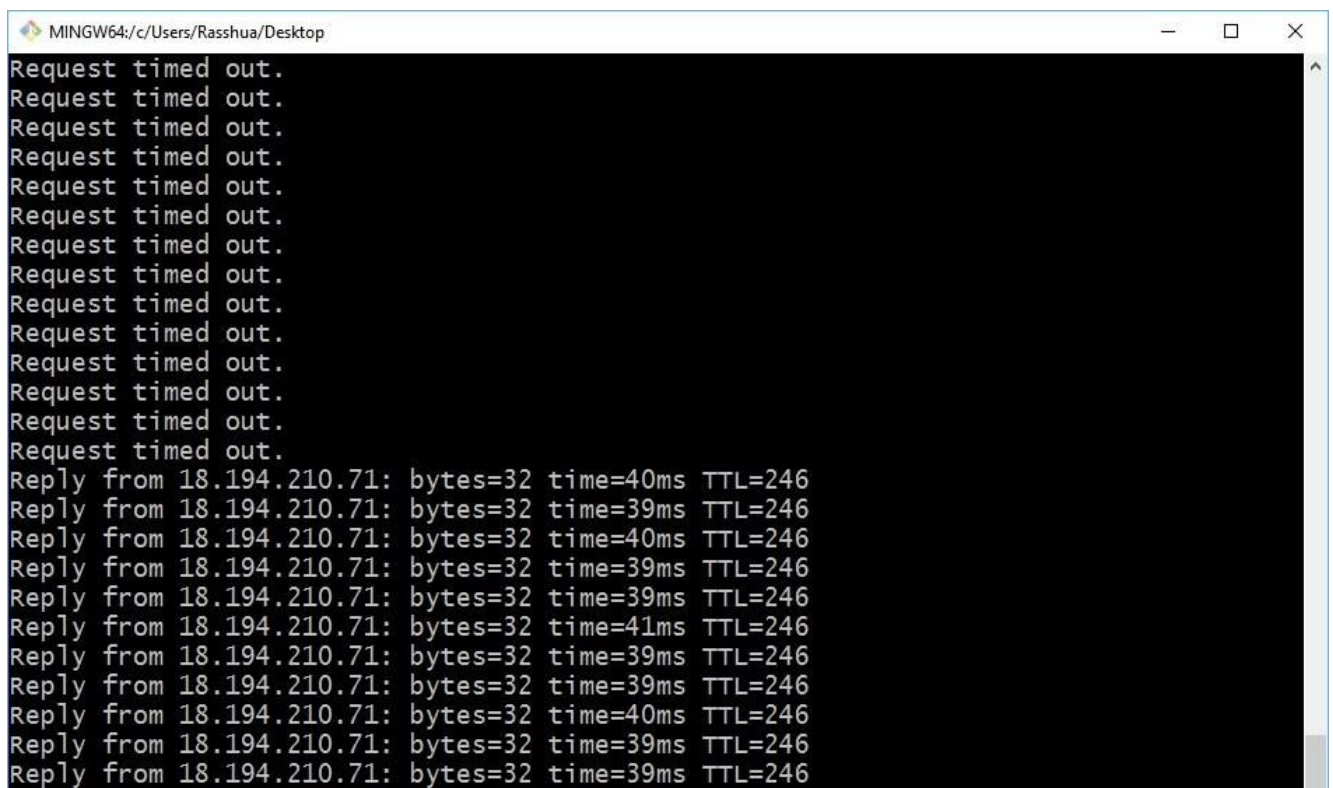
Type	Protocol	Port Range	Source	Description
SSH	TCP	22	Custom 0.0.0.0/0	e.g. SSH for Admin Desktop
All ICMP - IPv	ICMP	0 - 65535	Custom 0.0.0.0/0	e.g. SSH for Admin Desktop

Add Rule **1**

NOTE: Any edits made on existing rules will result in the edited rule being deleted and a new rule created with the new details. This will cause traffic that depends on that rule to be dropped for a very brief period of time until the new rule can be created.

Cancel **Save** **3**

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



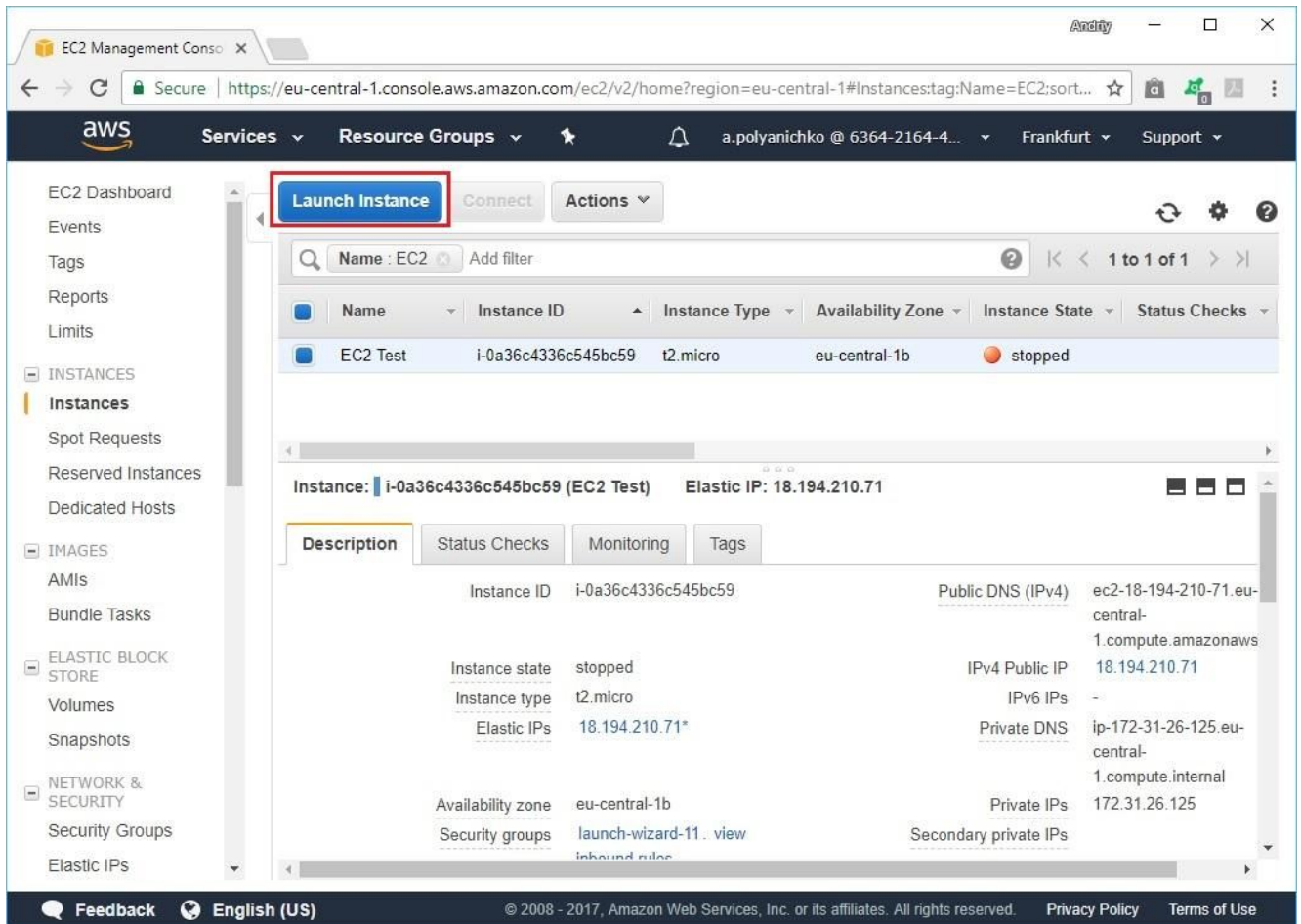
A screenshot of a MINGW64 terminal window. The title bar shows the path 'MINGW64; c:/Users/Rasshua/Desktop'. The terminal output consists of 14 lines of 'Request timed out.' followed by 10 lines of 'Reply from 18.194.210.71: bytes=32 time=40ms TTL=246'. The replies show varying times: 40ms, 39ms, 40ms, 39ms, 39ms, 41ms, 39ms, 39ms, 40ms, and 39ms.

```
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:

The screenshot shows the AWS Management Console interface for the EC2 Launch Wizard. The browser address bar indicates the URL: <https://eu-central-1.console.aws.amazon.com/ec2/v2/home?region=eu-central-1#LaunchInstanceWizard>. The navigation bar at the top includes the AWS logo, 'Services', 'Resource Groups', and a user profile 'a.polyanichko @ 6364-2164-4...'. The wizard progress bar shows seven steps: 1. Choose AMI, 2. Choose Instance Type, 3. Configure Instance, 4. Add Storage (highlighted with a red circle), 5. Add Tags, 6. Configure Security Group, and 7. Review.

Step 4: Add Storage

Your instance will be launched with the following storage device settings. You can attach additional EBS volumes and instance store volumes to your instance, or edit the settings of the root volume. You can also attach additional EBS volumes after launching an instance, but not instance store volumes. [Learn more](#) about storage options in Amazon EC2.

Volume Type	Device	Snapshot	Size (GiB)	Volume Type	IOPS	Throughput (MB/s)	Delete on Termination	Encrypted
Root	/dev/xvda	snap-022f9960631faea77	8	General Purpose S	100 / 3000	N/A	<input checked="" type="checkbox"/>	Not Encrypted

Add New Volume

Free tier eligible customers can get up to 30 GB of EBS General Purpose (SSD) or Magnetic storage. [Learn more](#) about free usage tier eligibility and usage restrictions.

At the bottom of the wizard, there are four buttons: 'Cancel', 'Previous', 'Review and Launch' (highlighted in blue), and 'Next: Add Tags'.

The footer contains 'Feedback', 'English (US)', and copyright information: '© 2008 - 2017, Amazon Web Services, Inc. or its affiliates. All rights reserved.' along with links to 'Privacy Policy' and 'Terms of Use'.

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

Step 4: Add Storage

Your instance will be launched with the following storage device settings. You can attach additional EBS volumes and instance store volumes to your instance, or edit the settings of the root volume. You can also attach additional EBS volumes after launching an instance, but not instance store volumes. [Learn more about storage options in Amazon EC2.](#)

Volume Type	Device	Snapshot	Size (GiB)	Volume Type	IOPS	Throughput (MB/s)	Delete on Termination	Encrypted
Root	/dev/xvda	snap-022f9960631faea77	8	General Purpose SSD (GP2)	100 / 3000	N/A	<input checked="" type="checkbox"/>	Not Encrypted
EBS	/dev/sdb	Search (case-insensit)	8	General Purpose SSD (GP2)	100 / 3000	N/A	<input type="checkbox"/>	<input type="checkbox"/>

[Add New Volume](#)

Free tier eligible customers can get up to 30 GB of EBS General Purpose (SSD) or Magnetic storage. [Learn more about free usage tier eligibility and usage restrictions.](#)

[Cancel](#) [Previous](#) [Review and Launch](#) [Next: Add Tags](#)

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

Select an existing key pair or create a new key pair

A key pair consists of a **public key** that AWS stores, and a **private key file** that you store. Together, they allow you to connect to your instance securely. For Windows AMIs, the private key file is required to obtain the password used to log into your instance. For Linux AMIs, the private key file allows you to securely SSH into your instance.

Note: The selected key pair will be added to the set of keys authorized for this instance. [Learn more about removing existing key pairs from a public AMI.](#)

Choose an existing key pair

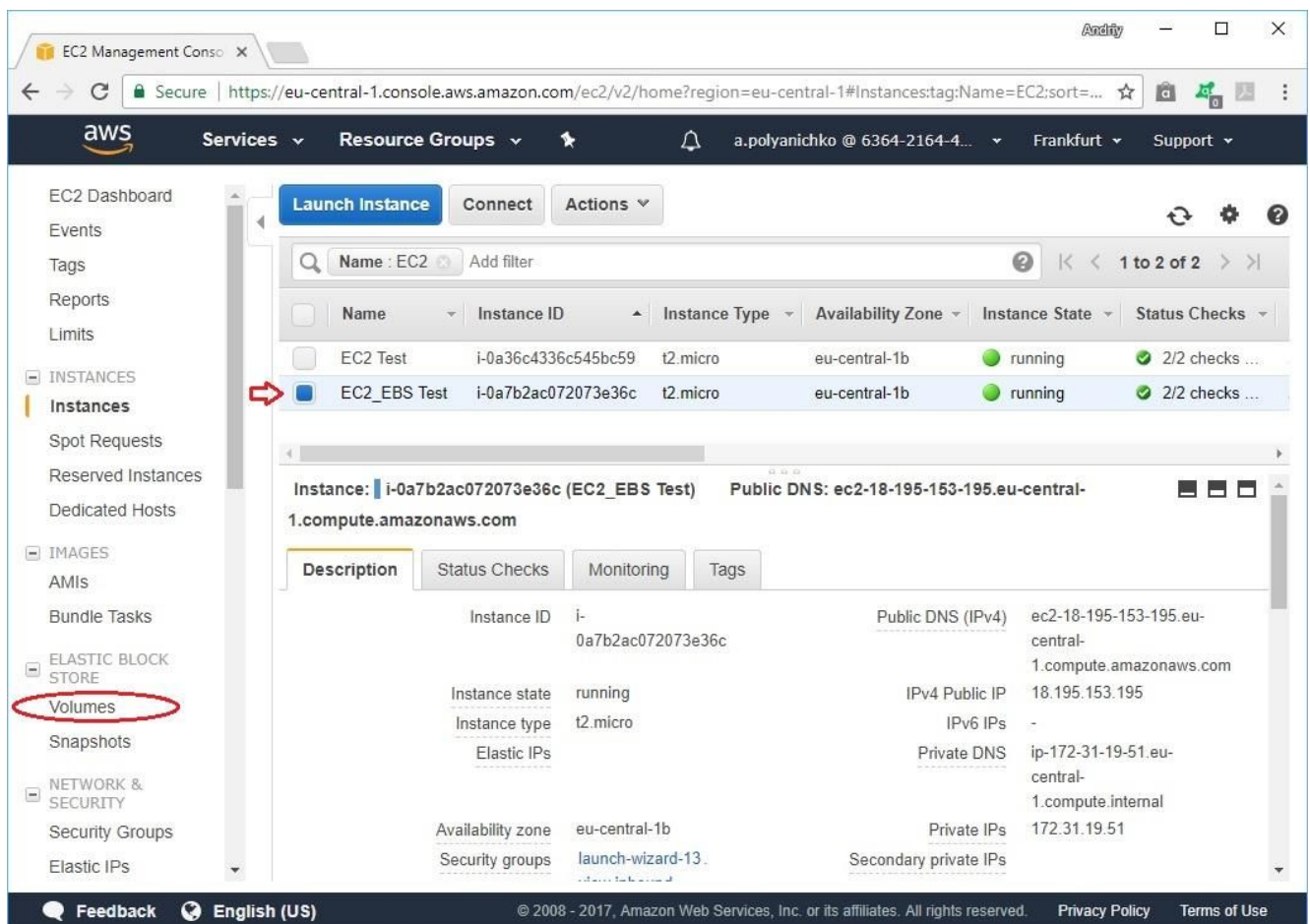
Select a key pair

MyKeyPair

☒ I acknowledge that I have access to the selected private key file (MyKeyPair.pem), and that without this file, I won't be able to log into my instance.

[Cancel](#) [Launch Instances](#)

Find your instance in EC2 Dashboard as running one:



The screenshot shows the AWS Management Console for the EC2 service in the eu-central-1 region. The left sidebar contains a navigation menu with categories like INSTANCES, IMAGES, ELASTIC BLOCK STORE, and NETWORK & SECURITY. The 'Volumes' option under 'ELASTIC BLOCK STORE' is highlighted with a red circle. The main content area displays a list of EC2 instances. The instance 'EC2_EBS Test' with ID 'i-0a7b2ac072073e36c' is selected, indicated by a red arrow. Below the list, the details for this instance are shown, including its state (running), type (t2.micro), and various IP addresses.

Name	Instance ID	Instance Type	Availability Zone	Instance State	Status Checks
EC2 Test	i-0a36c4336c545bc59	t2.micro	eu-central-1b	running	2/2 checks ...
EC2_EBS Test	i-0a7b2ac072073e36c	t2.micro	eu-central-1b	running	2/2 checks ...

Instance: **i-0a7b2ac072073e36c (EC2_EBS Test)** Public DNS: **ec2-18-195-153-195.eu-central-1.compute.amazonaws.com**

Description		Status Checks	Monitoring	Tags
Instance ID	i-0a7b2ac072073e36c	Public DNS (IPv4)	ec2-18-195-153-195.eu-central-1.compute.amazonaws.com	
Instance state	running	IPv4 Public IP	18.195.153.195	
Instance type	t2.micro	IPv6 IPs	-	
Elastic IPs		Private DNS	ip-172-31-19-51.eu-central-1.compute.internal	
Availability zone	eu-central-1b	Private IPs	172.31.19.51	
Security groups	launch-wizard-13	Secondary private IPs		

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

EC2 Management Console

Services Resource Groups

EC2 Dashboard

Create Volume Actions

Name: EC2 Add filter

	Name	Volume ID	Size	Volume Type	IOPS	Snapshot	Created
<input checked="" type="checkbox"/>	EC2_EBS Test	vol-0e4d24f4...	8 GiB	gp2	100 / 3000		November 26, 2017.
<input checked="" type="checkbox"/>	EC2_EBS Test	vol-0ed6be8...	8 GiB	gp2	100 / 3000	snap-022f9960...	November 26, 2017.
<input type="checkbox"/>	EC2 Test	vol-0efdb747...	8 GiB	gp2	100 / 3000	snap-022f9960...	November 23, 2017.

Volumes: vol-0e4d24f42d246c892 (EC2_EBS Test), vol-0ed6be8b53646aeb5 (EC2_EBS Test)

Description Status Checks Monitoring Tags

- vol-0e4d24f42d246c892
- vol-0ed6be8b53646aeb5

Feedback English (US) © 2008 - 2017, Amazon Web Services, Inc. or its affiliates. All rights reserved. Privacy Policy Terms of Use

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

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

EC2 Management Console

Services Resource Groups

EC2 Dashboard

Launch Instance Connect Actions

Name: EC2 Add filter

	Name	Instance ID	Instance Type	Availability Zone	Instance State	Status Checks
<input type="checkbox"/>	EC2 Test	i-0a36c4336c545bc59	t2.micro	eu-central-1b	running	2/2 checks ...
<input checked="" type="checkbox"/>	EC2_EBS Test	i-0a7b2ac072073e36c	t2.micro	eu-central-1b	terminated	

Instance: i-0a7b2ac072073e36c (EC2_EBS Test) Public DNS: -

Description Status Checks Monitoring Tags

Property	Value	Property	Value
Instance ID	i-0a7b2ac072073e36c	Public DNS (IPv4)	-
Instance state	terminated	IPv4 Public IP	-
Instance type	t2.micro	IPv6 IPs	-
Elastic IPs	-	Private DNS	-
Availability zone	eu-central-1b	Private IPs	-
Security groups	-	Secondary private IPs	-
Scheduled events	-	VPC ID	-
AMI ID	amzn-ami-hvm-2017.09.1.20171120-	Subnet ID	-

Feedback English (US) © 2008 - 2017, Amazon Web Services, Inc. or its affiliates. All rights reserved. Privacy Policy Terms of Use

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

The screenshot displays the AWS Management Console interface for EC2 Volumes. On the left, the navigation pane shows the 'Volumes' section under 'ELASTIC BLOCK STORE'. The main content area shows a list of volumes. The volume 'EC2_EBS Test' (ID: vol-0e4d24f42d246c892) is selected, and its status is 'available', which is circled in red. The detailed view on the right shows the volume's metadata, including its size (8 GiB) and availability zone (eu-central-1b).

Availability Zone	State	Alarm Status	Attachment Information
eu-central-1b	available	None	
eu-central-1b	in-use	None	i-0a36c4336c545bc5...

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.