

## Task 02\_report

### Task 1

#### Creation of EC2 t2.micro instance on Amazon Linux 2 AMI (HVM)

Step 1: Choose an Amazon Machine Image (AMI)

Quick Start

My AMIs

AWS Marketplace

Community AMIs

Free tier only

Amazon Linux 2 AMI (HVM) - Kernel 5.10, SSD Volume Type - ami-0ddc0ebd8702e00db (64-bit x86) / ami-0ab6e1041842e4895 (64-bit Arm)  
Amazon Linux 2 comes with five years support. It provides Linux kernel 5.10 tuned for optimal performance on Amazon EC2, systemd 219, GCC 7.3, Glibc 2.26, Binutils 2.29.1, and the latest software packages through extras. This AMI is the successor of the Amazon Linux AMI that is now under maintenance only mode and has been removed from this wizard.

Root device type: ebs Virtualization type: hvm ENA Enabled: Yes

Select

Amazon Linux 2 AMI (HVM) - Kernel 4.14, SSD Volume Type - ami-056343e91872518f7 (64-bit x86) / ami-0864ce28fc4fc4f7c (64-bit Arm)  
Amazon Linux 2 comes with five years support. It provides Linux kernel 4.14 tuned for optimal performance on Amazon EC2, systemd 219, GCC 7.3, Glibc 2.26, Binutils 2.29.1, and the latest software packages through extras. This AMI is the successor of the Amazon Linux AMI that is now under maintenance only mode and has been removed from this wizard.

Root device type: ebs Virtualization type: hvm ENA Enabled: Yes

Select

Cancel and Exit

Search by Systems Manager parameter

#### Adding AWS\_EC2\_full\_access\_S3 role to the instance

Step 3: Configure Instance Details

Placement group  Add instance to placement group

Capacity Reservation  Open

Domain join directory  No directory  Create new directory

IAM role  AWS\_EC2\_full\_access\_S3  Create new IAM role

Shutdown behavior  Stop

Stop - Hibernate behavior  Enable hibernation as an additional stop behavior

#### Selecting needed security groups (by-ru and europe)

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 ID	Name	Description	Actions
sg-028f212c4c78b6b6f	default	default VPC security group	<a href="#">Copy to new</a>
sg-0fbf42a5fb4bc1004	dilab-training	for_kb	<a href="#">Copy to new</a>
sg-04263b4d0f2baa68e	epam-by-ru	Belarus, Russia offices	<a href="#">Copy to new</a>
sg-033758f5cb3c86c01	epam-europe	Europe offices	<a href="#">Copy to new</a>
sg-04f7c707e6e9f4c1c	epam-world	US, Canada, KZ, China, India, Armenia offices	<a href="#">Copy to new</a>

Inbound rules for sg-033758f5cb3c86c01 (Selected security groups: sg-04263b4d0f2baa68e, sg-033758f5cb3c86c01)

Type	Protocol	Port Range	Source	Description
All traffic	All	All	sg-033758f5cb3c86c01 (epam-europe)	
All traffic	All	All	pl-0e6facc7c09b2788e	epam-europe prefix...

[Cancel](#) [Previous](#) [Review and Launch](#)

## Step 7: Review Instance Launch

Instance Details

Number of instances	1	Purchasing option	On demand
Network	vpc-06706d0e729f3fb1a		
Subnet	No preference (default subnet in any Availability Zone)		
EBS-optimized	No		
Monitoring	No		
Termination protection	No		
Shutdown behavior	Stop		
Stop - Hibernate behavior	Disabled		
Capacity Reservation	open		
IAM role	AWS_EC2_full_access_S3		
Domain join directory	None		
Tenancy	default		
Credit specification	Standard		
Host ID			
Host resource group name			
Affinity	Off		
Kernel ID	Use default		
RAM disk ID	Use default		
Enclave	false		
Metadata accessible	Enabled		
Metadata version	V1 and V2 (token optional)		
Metadata token response hop limit	1		
Allow tags in metadata	Disabled		
User data			
Assign Public IP	Use subnet setting (Enable)		
Assign IPv6 IP	Use subnet setting (Enable)		

[Edit instance details](#)

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

## Selecting of my existing key pair (ssh)

Launch

Stop

Disabled

open

AWS\_EC2\_full\_access

None

default

Standard

Off

Use default

Use default

false

Enabled

V1 and V2 (token optional)

1

Disabled

Use subnet setting (Enable)

Use subnet setting (Enable)

IP name

Enabled

Disabled

**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. Amazon EC2 supports ED25519 and RSA key pair types.

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

I acknowledge that I have access to the corresponding private key file, and that without this file, I won't be able to log into my instance.

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

Instance was created and is running.

#### Launch Status

Your instances are now launching
The following instance launches have been initiated: i-070b27166e777ddd8 <a href="#">View launch log</a>
Get notified of estimated charges
Create billing alerts to get an email notification when estimated charges on your AWS bill exceed an amount.

Instances (1/26) <a href="#">Info</a>		<a href="#">C</a>	<a href="#">Connect</a>	<a href="#">Instance state ▾</a>	<a href="#">Actions</a>
<input type="text"/> Search					
Name	Instance ID	Instance state	Instance type	Status check	A
katsiaryna-novikava-ec2-fro...	i-0e616154e6ee5e258	Running	t2.micro	Initializing	N
<input checked="" type="checkbox"/> hanna_yaruk	i-070b27166e777ddd8	Running	t2.micro	2/2 checks passed	N

Connecting to the instance by ssh

```
PS C:\Users\Hanna> ssh ec2-user@ec2-3-127-150-158.eu-central-1.compute.amazonaws.com
Last login: Wed Mar 30 18:45:36 2022 from 86.57.255.94
              _.-|_ _|_
              -| |(_ /   Amazon Linux 2 AMI
              ---| \---|_|

https://aws.amazon.com/amazon-linux-2/
[ec2-user@ip-172-31-42-195 ~]$ |
```

Installing Postgresql on virtual machine:

```
PS C:\Users\Hanna> ssh ec2-user@ec2-3-127-150-158.eu-central-1.compute.amazonaws.com
Last login: Wed Mar 30 18:45:36 2022 from 86.57.255.94
              _.-|_ _|_
              -| |(_ /   Amazon Linux 2 AMI
              ---| \---|_|

https://aws.amazon.com/amazon-linux-2/
[ec2-user@ip-172-31-42-195 ~]$ sudo tee /etc/yum.repos.d/pgdg.repo<<EOF
> [pgdg13]
> name=PostgreSQL 13 for RHEL/CentOS 7 - x86_64
> baseurl=https://download.postgresql.org/pub/repos/yum/13/redhat/rhel-7-x86_64
> enabled=1
> gpgcheck=0
> EOF
[pgdg13]
name=PostgreSQL 13 for RHEL/CentOS 7 - x86_64
baseurl=https://download.postgresql.org/pub/repos/yum/13/redhat/rhel-7-x86_64
enabled=1
gpgcheck=0
```

```
sudo yum update
```

```
[ec2-user@ip-172-31-42-195 ~]$ sudo yum update
Loaded plugins: extras_suggestions, langpacks, priorities, update-motd
amzn2-core
pgdg13
(1/2): pgdg13/group_gz
(2/2): pgdg13/primary_db
1 packages excluded due to repository priority protections
No packages marked for update
[ec2-user@ip-172-31-42-195 ~]$ |
```

```
sudo yum install postgresql13 postgresql13-server
```

```
Dependencies Resolved
=====
Package           Arch      Version       Repository   Size
=====
Installing:
  postgresql13      x86_64    13.6-1PGDG.rhel7  pgdg13     1.4 M
  postgresql13-server x86_64    13.6-1PGDG.rhel7  pgdg13     5.4 M
Installing for dependencies:
  postgresql13-libs  x86_64    13.6-1PGDG.rhel7  pgdg13    382 k
Transaction Summary
=====
Install 2 Packages (+1 Dependent package)

Total download size: 7.2 M
Installed size: 31 M
Is this ok [y/d/N]: |
```

```
Total                                         4.9 MB/s | 7.2 MB  00:00:01
Running transaction check
Running transaction test
Transaction test succeeded
Running transaction
  Installing : postgresql13-libs-13.6-1PGDG.rhel7.x86_64          1/3
  Installing : postgresql13-13.6-1PGDG.rhel7.x86_64                2/3
  Installing : postgresql13-server-13.6-1PGDG.rhel7.x86_64          3/3
  Verifying  : postgresql13-libs-13.6-1PGDG.rhel7.x86_64          1/3
  Verifying  : postgresql13-server-13.6-1PGDG.rhel7.x86_64          2/3
  Verifying  : postgresql13-13.6-1PGDG.rhel7.x86_64                3/3

Installed:
  postgresql13.x86_64 0:13.6-1PGDG.rhel7                  postgresql13-server.x86_64 0:13.6-1PGDG.rhel7

Dependency Installed:
  postgresql13-libs.x86_64 0:13.6-1PGDG.rhel7

Complete!
[ec2-user@ip-172-31-42-195 ~]$ |
```

Initializing of DB

```
sudo /usr/pgsql-13/bin/postgresql-13-setup initdb
```

```
[ec2-user@ip-172-31-42-195 ~]$ sudo /usr/pgsql-13/bin/postgresql-13-setup initdb
Initializing database ... OK
[ec2-user@ip-172-31-42-195 ~]$ |
```

## Postgres service start

```
sudo systemctl start postgresql-13
```

```
[ec2-user@ip-172-31-42-195 ~]$ sudo systemctl start postgresql-13
[ec2-user@ip-172-31-42-195 ~]$ sudo systemctl status postgresql-13
● postgresql-13.service - PostgreSQL 13 database server
   Loaded: loaded (/usr/lib/systemd/system/postgresql-13.service; disabled; vendor preset: disabled)
   Active: active (running) since Wed 2022-03-30 19:05:37 UTC; 33s ago
     Docs: https://www.postgresql.org/docs/13/static/
  Process: 3894 ExecStartPre=/usr/pgsql-13/bin/postgresql-13-check-db-dir ${PGDATA} (code=exited, status=0/SUCCESS)
 Main PID: 3899 (postmaster)
    CGroup: /system.slice/postgresql-13.service
           ├─3899 /usr/pgsql-13/bin/postmaster -D /var/lib/pgsql/13/data/
           ├─3902 postgres: logger
           ├─3904 postgres: checkpointer
           ├─3905 postgres: background writer
           ├─3906 postgres: walwriter
           ├─3907 postgres: autovacuum launcher
           ├─3908 postgres: stats collector
           └─3909 postgres: logical replication launcher

Mar 30 19:05:37 ip-172-31-42-195.eu-central-1.compute.internal systemd[1]: Starting PostgreSQL 13 database server...
Mar 30 19:05:37 ip-172-31-42-195.eu-central-1.compute.internal postmaster[3899]: 2022-03-30 19:05:37.079 UTC [3899] ...
Mar 30 19:05:37 ip-172-31-42-195.eu-central-1.compute.internal postmaster[3899]: 2022-03-30 19:05:37.079 UTC [3899] ....
Mar 30 19:05:37 ip-172-31-42-195.eu-central-1.compute.internal systemd[1]: Started PostgreSQL 13 database server.
Hint: Some lines were ellipsized, use -l to show in full.
[ec2-user@ip-172-31-42-195 ~]$ |
```

## Changing the connection postgres settings

```
sudo nano /var/lib/pgsql/13/data/postgresql.conf
```

```
#-----
# CONNECTIONS AND AUTHENTICATION
#-----

# - Connection Settings -
listen_addresses = '*'          # what IP address(es) to listen on;
                                # comma-separated list of addresses;
                                # defaults to 'localhost'; use '*' for all
                                # (change requires restart)
port = 5432                      # (change requires restart)
max_connections = 100            # (change requires restart)
#superuser_reserved_connections = 3 # (change requires restart)
#unix_socket_directories = '/var/run/postgresql, /tmp' # comma-separated list of directories
                                # (change requires restart)
#unix_socket_group = ''          # (change requires restart)
#unix_socket_permissions = 0777  # begin with 0 to use octal notation
                                # (change requires restart)
#Bonjour = off                  # advertise server via Bonjour
                                # (change requires restart)
#Bonjour_name = ''              # defaults to the computer name
                                # (change requires restart)
|
# - TCP settings -
# see "man tcp" for details
```

```
Sudo nano /var/lib/pgsql/13/data/pg_hba.conf
```

```
GNU nano 2.9.8                               /var/lib/pgsql/13/data/pg_hba.conf

# TYPE  DATABASE      USER      ADDRESS             METHOD
#
# "local" is for Unix domain socket connections only
local  all          all                   peer
# IPv4 local connections:
host   all          all      0.0.0.0/0          md5
# IPv6 local connections:
host   all          all      ::1/128            scram-sha-256
# Allow replication connections from localhost, by a user with the
# replication privilege.
local  replication  all                   peer
host   replication  all      127.0.0.1/32        scram-sha-256
host   replication  all      ::1/128            scram-sha-256
```

Restart postgresql service to implement new settings

```
sudo systemctl restart postgresql-13
```

```
[ec2-user@ip-172-31-42-195 ~]$ sudo nano /var/lib/pgsql/13/data/postgresql.conf
[ec2-user@ip-172-31-42-195 ~]$ sudo nano /var/lib/pgsql/13/data/pg_hba.conf
[ec2-user@ip-172-31-42-195 ~]$ sudo systemctl restart postgresql-13
[ec2-user@ip-172-31-42-195 ~]$ sudo systemctl status postgresql-13
● postgresql-13.service - PostgreSQL 13 database server
   Loaded: loaded (/usr/lib/systemd/system/postgresql-13.service; disabled; vendor preset: disabled)
     Active: active (running) since Wed 2022-03-30 19:17:04 UTC; 23s ago
       Docs: https://www.postgresql.org/docs/13/static/
   Process: 4029 ExecStartPre=/usr/pgsql-13/bin/postgresql-13-check-db-dir ${PGDATA} (code=exited, status=0/SUCCESS)
 Main PID: 4034 (postmaster)
   Groups: /system.slice/postgresql-13.service
          └─4034 /usr/pgsql-13/bin/postmaster -D /var/lib/pgsql/13/data/
              ├─4037 postgres: logger
              ├─4039 postgres: checkpointer
              ├─4040 postgres: background writer
              ├─4041 postgres: walwriter
              ├─4042 postgres: autovacuum launcher
              ├─4043 postgres: stats collector
              └─4044 postgres: logical replication launcher

Mar 30 19:17:04 ip-172-31-42-195.eu-central-1.compute.internal systemd[1]: Stopped PostgreSQL 13 database server.
Mar 30 19:17:04 ip-172-31-42-195.eu-central-1.compute.internal systemd[1]: Starting PostgreSQL 13 database server...
Mar 30 19:17:04 ip-172-31-42-195.eu-central-1.compute.internal postmaster[4034]: 2022-03-30 19:17:04.659 UTC [4034] ...
Mar 30 19:17:04 ip-172-31-42-195.eu-central-1.compute.internal postmaster[4034]: 2022-03-30 19:17:04.659 UTC [4034] ...
Mar 30 19:17:04 ip-172-31-42-195.eu-central-1.compute.internal systemd[1]: Started PostgreSQL 13 database server.
Hint: Some lines were ellipsized, use -l to show in full.
[ec2-user@ip-172-31-42-195 ~]$
```

Changing the password for postgres user

```
sudo passwd postgres
```

```
[ec2-user@ip-172-31-42-195 ~]$ sudo passwd postgres
Changing password for user postgres.
New password:
BAD PASSWORD: The password is a palindrome
Retype new password:
passwd: all authentication tokens updated successfully.
[ec2-user@ip-172-31-42-195 ~]$ |
```

su - postgres

```
[ec2-user@ip-172-31-42-195 ~]$ su - postgres
Password:
-bash-4.2$ |
```

```
psql -c "ALTER USER postgres WITH PASSWORD '1111';"
```

```
[ec2-user@ip-172-31-42-195 ~]$ su - postgres
Password:
-bash-4.2$ psql -c "ALTER USER postgres WITH PASSWORD '1111';"
ALTER ROLE
-bash-4.2$ |
```

Create DB in postgresql

```
CREATE USER hanna WITH PASSWORD '1111';
CREATE DATABASE hanna_yaruk_db;
GRANT ALL ON DATABASE hanna_yaruk_db TO hanna;
ALTER DATABASE hanna_yaruk_db OWNER TO hanna;
```

```
[ec2-user@ip-172-31-42-195 ~]$ su - postgres
Password:
Last login: Wed Mar 30 19:19:36 UTC 2022 on pts/0
-bash-4.2$ psql
psql (13.6)
Type "help" for help.

postgres=# clear
postgres=# CREATE USER hanna WITH PASSWORD '1111';
ERROR: syntax error at or near "clear"
LINE 1: clear
      ^
postgres=# CREATE USER hanna WITH PASSWORD '1111';
CREATE ROLE
postgres=# CREATE DATABASE hanna_yaruk_db;
CREATE DATABASE
postgres=# GRANT ALL ON DATABASE hanna_yaruk_db TO hanna;
GRANT
postgres=# ALTER DATABASE hanna_yaruk_db OWNER TO hanna;
ALTER DATABASE
postgres=#

```

Select the list of databases

```
\l
List of databases
Name | Owner | Encoding | Collate | Ctype | Access privileges
-----+-----+-----+-----+-----+-----+
hanna_yaruk_db | hanna | UTF8 | en_US.UTF-8 | en_US.UTF-8 | =Tc/hanna +  

                |       |       |       |       | hanna=CTc/hanna  

postgres | postgres | UTF8 | en_US.UTF-8 | en_US.UTF-8 | =c/postgres +  

template0 | postgres | UTF8 | en_US.UTF-8 | en_US.UTF-8 | postgres=CTc/postgres  

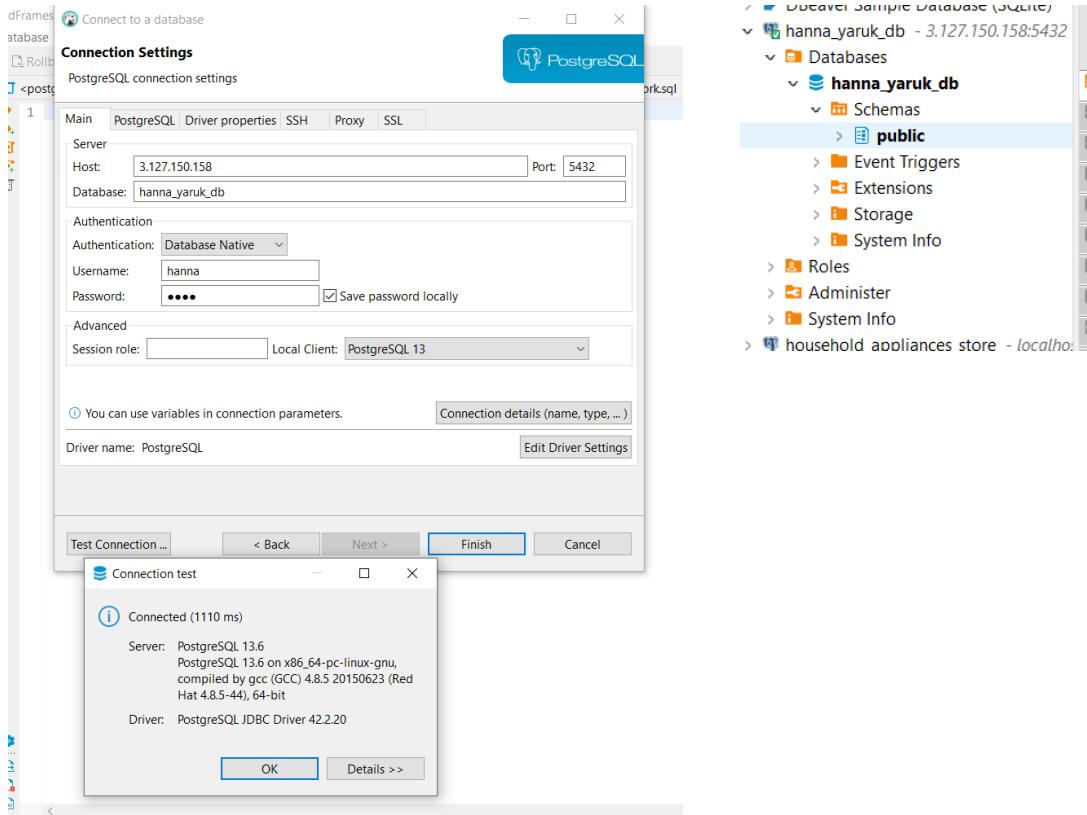
template1 | postgres | UTF8 | en_US.UTF-8 | en_US.UTF-8 | =c/postgres +  

                |       |       |       |       | postgres=CTc/postgres
(4 rows)

postgres=#

```

Connect to the DB with DBeaver



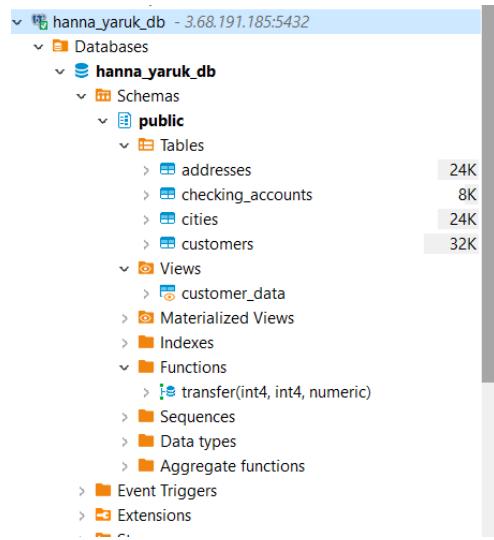
**The data for connection:**

User name – **hanna**

Password **1111**

DB name – **hanna\_yaruk\_db**

Tables, view and a procedure were created. File with script is in the bucket.



The screenshot shows the pgAdmin interface with the database **hanna\_yaruk\_db** selected. Under the **public** schema, there are four tables: **addresses**, **checking\_accounts**, **cities**, and **customers**. There is also a function named **transfer**.

```
hanna_yaruk_db=# \dt
      List of relations
 Schema |        Name         | Type  | Owner
-----+---------------------+-----+
 public | addresses        | table | hanna
 public | checking_accounts | table | hanna
 public | cities           | table | hanna
 public | customers        | table | hanna
(4 rows)
```

## Task 2.

Take the file for copying from S3 bucket:

Object overview

Owner: 850c42ffd2ef9a0be7cf91ba4266dd73ba401a64b6aed9944a92bd5dcec3adb4

AWS Region: EU (Frankfurt) eu-central-1

Last modified: March 29, 2022, 22:31:36 (UTC+03:00)

Size: 965.9 KB

Type: json

Key: test/1.json

S3 URI: s3://hanna-yaruk/test/1.json

Amazon Resource Name (ARN): arn:aws:s3:::hanna-yaruk/test/1.json

Entity tag (Etag): bc8fef22df40bf86e068b014ea24f664

Object URL: https://hanna-yaruk.s3.eu-central-1.amazonaws.com/test/1.json

Get this file using AWS\_EC2\_full\_access\_S3 role to the instance

```
aws s3 cp s3://hanna-yaruk/test/1.json .
```

```
[ec2-user@ip-172-31-42-195 ~]$ cat ~/.aws/credentials
[ec2-user@ip-172-31-42-195 ~]$ aws s3 cp s3://hanna-yaruk/test/1.json .
download: s3://hanna-yaruk/test/1.json to ./1.json
[ec2-user@ip-172-31-42-195 ~]$ ls
1.json
[ec2-user@ip-172-31-42-195 ~]$ |
```

### Task 3

For creating a snapshot of EBS root volume is needed to stop instance.

Instances (1/33) <a href="#">Info</a>					<a href="#">C</a>	<a href="#">Connect</a>	Instance state ▲	Actions ▼	<a href="#">More</a>
Name	Instance ID	Instance state	Instance type						
<input type="checkbox"/> volha_soika1	i-0a6ebc661c82079fb	<span>Stopped</span> <a href="#">Details</a> <a href="#">Logs</a>	t2.micro				Stop instance		
<input type="checkbox"/> Andrei_Bialecki_ec2	i-07f5b637af3735c94	<span>Running</span> <a href="#">Details</a> <a href="#">Logs</a>	t2.micro				Start instance	<a href="#">Alarm status</a>	No alarms +
<input type="checkbox"/> katsiaryna-novikava-ec2	i-06bb9aa5c7bfae116	<span>Stopped</span> <a href="#">Details</a> <a href="#">Logs</a>	t2.micro				Reboot instance	<a href="#">Alarm status</a>	No alarms +
<input type="checkbox"/> volha_soika1	i-043150cccd171496	<span>Terminated</span> <a href="#">Details</a> <a href="#">Logs</a>	t2.micro				Hibernate instance	<a href="#">Alarm status</a>	No alarms +
<input type="checkbox"/> maksim_martynau_instance...	i-0a137613b4dcea1d3	<span>Stopped</span> <a href="#">Details</a> <a href="#">Logs</a>	t2.micro				Terminate instance	<a href="#">Alarm status</a>	No alarms +
<input type="checkbox"/> maxim-maskalenka-ec2	i-0238672c97e5739ea	<span>Stopped</span> <a href="#">Details</a> <a href="#">Logs</a>	t2.micro					<a href="#">Alarm status</a>	No alarms +
<input checked="" type="checkbox"/> hanna_yaruk	i-070b27166e777ddd8	<span>Running</span> <a href="#">Details</a> <a href="#">Logs</a>	t2.micro					<a href="#">Alarm status</a>	No alarms +
<input type="checkbox"/> Ildarislam_Superovich	i-0f20802402272764d0	<span>Running</span> <a href="#">Details</a> <a href="#">Logs</a>	t2.micro					<a href="#">Alarm status</a>	No alarms +

### Create the snapshot

Volumes (1/1)

Name	Volume ID	Type	Size	IOPS	Throughput
<input checked="" type="checkbox"/> volha_soika1	vol-08b1712f4d588dd99	gp2	8 GiB	100	-

[Actions](#) [Create volume](#)

Modify volume  
Create snapshot  
Create snapshot lifecycle policy  
Delete volume  
Attach volume  
Detach volume  
Force detach volume  
Manage auto-enabled I/O  
Manage tags

1 / 1 Available

21:40 GMT+3 eu-central-1

Details

Volume ID

Description  
Add a description for your snapshot  
  
255 characters maximum.

Encryption [Info](#)  
Not encrypted

Tags [Info](#)  
A tag is a label that you assign to an AWS resource. Each tag consists of a key and an optional value. You can use tags to search and filter your resources or track your AWS costs.

No tags associated with the resource.  
[Add tag](#)  
You can add 50 more tags.

[Cancel](#) [Create snapshot](#)

Snapshot is successfully created

Successfully created snapshot snap-002bd5167097bc3f5 from volume vol-08b1712f4d588dd99.  
If you need your snapshot to be immediately available consider using Fast Snapshot Restore.

[Manage fast snapshot restore](#) [X](#)

Volumes (45)

[Actions](#) [Create volume](#)

EC2 > Snapshots > snap-002bd5167097bc3f5			
snap-002bd5167097bc3f5			
<b>Snapshot settings</b>			
Snapshot ID snap-002bd5167097bc3f5	Size 8 GiB	Progress Unavailable	Snapshot status Pending
Owner 260586643565	Volume ID vol-08b1712f4d588dd99	Started Wed Mar 30 2022 23:21:57 GMT+0300 (Москва, стандартное время)	Product codes -
Encryption Not encrypted	KMS key ID -	KMS key alias -	KMS key ARN -
Fast snapshot restore -	Description hanna_yaruk_snapshot		

## Create image from snapshot

EC2 > Snapshots > snap-002bd5167097bc3f5 > Create image from snapshot

### Create image from snapshot Info

Create a new image from a snapshot taken from the root device volume of an instance.

Image settings	
Snapshot ID snap-002bd5167097bc3f5	
Image name A descriptive name for the image. hanna_yaruk_img	3 - 128 characters. Valid characters are a-z, A-Z, 0-9, spaces, and - _ . / [ ] ^ @.
Description A description for the image. Img from snapshot of root EBS volume	255 characters maximum
Architecture <small>Info</small> Select i386 for 32-bit or x86_64 for 64-bit. x86_64	
Root device name <small>Info</small> The device name that is reserved for the root volume.	

## AMI is successfully created

Image summary for ami-043d54474dae08421			
Actions		Launch instance from AMI	
AMI ID ami-043d54474dae08421	Image type machine	Platform details Linux/UNIX	Root device type EBS
AMI name hanna_yaruk_img	Owner account ID 260586643565	Architecture x86_64	Usage operation RunInstances
Root device name /dev/sda1	Status Available	Source 260586643565/hanna_yaruk_img	Virtualization type hvm
Boot mode -	State reason -	Creation date Wed Mar 30 2022 23:26:20 GMT+0300 (Москва, стандартное время)	Kernel ID -
Block devices /dev/sda1=snap-002bd5167097bc3f5:8:true:gp2	Description Img from snapshot of root EBS volume	Product codes -	RAM disk ID -
Deprecation time -	Last launched time -		
<a href="#">Permissions</a>   <a href="#">Storage</a>   <a href="#">Tags</a>			
Image share permission			

Amazon Machine Images (AMIs) (1/48) [Info](#)

[C](#) [Recycle Bin](#) [EC2 Image I](#)

Owned by me ▾  Search

<input type="checkbox"/>	Name	AMI ID	AMI name	S
<input type="checkbox"/>	dilab-volha-shnip-ami-root	ami-01809860bf867c518	dilab-volha-shnip-image-root	2
<input type="checkbox"/>	dilab-kate-parcheusksya-ami	ami-01ca34a6567a16d23	dilab-kate-parcheusksaya-ami	2
<input type="checkbox"/>	dilab-tatsiana-khmialnitskaya-ami1	ami-01e51b2d1b498ac18	dilab-tatsiana-khmialnitskaya-a...	2
<input type="checkbox"/>	-	ami-01ffb98201ec7b5b3	dilab-natallia-semianiuk-v3	2
<input type="checkbox"/>	dilab-volha-yarotskaya-ami-root	ami-023450f2f092527ac	img-volha-yarostkaya-snapshot	2
<input type="checkbox"/>	dilab-natallia-viniarskaya-ami	ami-043b45780aa2ea98d	dilab-natallia-viniarskaya-image	2
<input checked="" type="checkbox"/>	dilab-hanna-yaruk-ami-root	ami-043d54474dae08421	hanna_yaruk_img	2
<input type="checkbox"/>	dilab-maryia-ivanko-ami	ami-044f36391ff61059c	dilab-maryia-ivanko-ami	2

## Task 4

Make a copy of the instance from the image

The screenshot shows the AWS Step 7: Review Instance Launch wizard. At the top, there are tabs: 1. Choose AMI, 2. Choose Instance Type, 3. Configure Instance, 4. Add Storage, 5. Add Tags, 6. Configure Security Group, and 7. Review. The 7. Review tab is selected. Below the tabs, it says "Step 7: Review Instance Launch". It lists two security groups: sg-033758f5cb3c86c01 (epam-europe) and sg-04263b4d0f2baa68e (epam-by-ru). Under "All selected security groups inbound rules", there are four entries:

Type	Protocol	Port Range	Source	Description
All traffic	All	All	sg-033758f5cb3c86c01 (epam-europe)	
All traffic	All	All	pl-0e6facc7b09b2788e	epam-europe prefix...
All traffic	All	All	sg-04263b4d0f2baa68e (epam-by-ru)	
All traffic	All	All	pl-0becef262e0070db5	epam-by-ru prefix ...

Below this, there are sections for "Instance Details" (with "Edit instance details" link) and "Storage" (with "Edit storage" link). The Storage section shows one volume:

Volume Type	Device	Snapshot	Size (GiB)	Volume Type	IOPS	Throughput (MB/s)	Delete on Termination	Encrypted
Root	/dev/sda1	snap-002bd5167097bc3f5	8	gp2	100 / 3000	N/A	Yes	Not Encrypted

There is also a "Tags" section (with "Edit tags" link) and a bottom row with "Cancel", "Previous", and "Launch" buttons.

The screenshot shows the AWS Instances page. It displays a table of instances with one entry:

Name	Instance ID	Instance state	Instance type	Status check	Alarm status	Availability Zone	Pu...
hanna_yaruk_2.0	i-0300649116cf5a87e	Running	t2.micro	-	No alarms	eu-central-1b	ec2...

At the top right of the Instances page, there are buttons for "Launch instances" and other actions.

Get the access to the instance

```
ssh ec2-user@ec2-3-120-115-194.eu-central-1.compute.amazonaws.com
```

```
PS C:\Users\Hanna> ssh ec2-user@ec2-3-120-115-194.eu-central-1.compute.amazonaws.com
Last login: Wed Mar 30 20:36:35 2022 from 86.57.255.94
```

```
--| --|_
-| (   /
---|\---|___|
Amazon Linux 2 AMI

https://aws.amazon.com/amazon-linux-2/
[ec2-user@ip-172-31-39-100 ~]$ |
```

EC2 > Instances > i-0300649116cf5a87e

**Instance summary for i-0300649116cf5a87e (hanna\_yaruk\_2.0)** [Info](#)

Updated less than a minute ago

Instance ID <a href="#">i-0300649116cf5a87e (hanna_yaruk_2.0)</a>	Public IPv4 address <a href="#">3.120.115.194   open address</a>	Private IPv4 addresses <a href="#">172.31.39.100</a>
IPv6 address -	Instance state <a href="#">Running</a>	Public IPv4 DNS <a href="#">ec2-3-120-115-194.eu-central-1.compute.amazonaws.com   open address</a>
Hostname type IP name: ip-172-31-39-100.eu-central-1.compute.internal	Private IP DNS name (IPv4 only) <a href="#">ip-172-31-39-100.eu-central-1.compute.internal</a>	Private resource DNS name IPv4 (A)

Private IP DNS name (IPv4 only) [Найти в Яндексе](#) Копировать Private resource DNS name  
IPv4 (A)

Instance type  
t2.micro

AWS Compute Optimizer finds:  
No recommendations available

[Details](#) [Security](#) [Networking](#)

[Instance details](#) [Info](#)

ec2-user@ip-172-31-39-100:~ \$ cat /etc/hostname  
ip-172-31-39-100.eu-central-1.compute.internal  
[ec2-user@ip-172-31-39-100 ~]\$ ls  
1.json  
[ec2-user@ip-172-31-39-100 ~]\$ |

The file from the hanna-aruk instance is now either on hanna-yaruk-2.0 instance

## Task 5.

### Version 1.

APACHE (installation on EC2 with name hanna\_yaruk)

Create html page in nano (html code was copied from example.com)

nano index.html

```
GNU nano 2.9.8                                     yaruk.html

<!doctype html>
<html>
<head>
    <title>Apache HTTPD</title>

    <meta charset="utf-8" />
    <meta http-equiv="Content-type" content="text/html; charset=utf-8" />
    <meta name="viewport" content="width=device-width, initial-scale=1" />
    <style type="text/css">
body {
    background-color: #f0f0f2;
    margin: 0;
    padding: 0;
    font-family: -apple-system, system-ui, BlinkMacSystemFont, "Segoe UI", "Open Sans", "Helvetica Neue", Helvetica, Arial, sans-serif;
}

div {
    width: 600px;
    margin: 5em auto;
    padding: 2em;
    background-color: #fdfdff;
    border-radius: 0.5em;
    box-shadow: 2px 3px 7px 2px rgba(0,0,0,0.02);
}

a:link, a:visited {
    color: #3888ff;
    text-decoration: none;
}
@media (max-width: 700px) {
    div {
        margin: 0 auto;
        width: auto;
    }
}
</style>
```

Copy this html page to my S3 bucket (hanna-yaruk) from EC2 (with attached S3 role)

```
[ec2-user@ip-172-31-39-100 ~]$ ls
1.json  yaruk.html
[ec2-user@ip-172-31-39-100 ~]$ aws s3 cp ./yaruk.html s3://hanna-yaruk/reports/yaruk.html
upload: ./yaruk.html to s3://hanna-yaruk/reports/yaruk.html
[ec2-user@ip-172-31-39-100 ~]$ |
```

The screenshot shows the Amazon S3 console interface. The path is 'Amazon S3 > Buckets > hanna-yaruk > reports/'. The 'Objects' tab is selected. There are two objects listed: 'Task\_01\_report.docx' (Type: docx, Last modified: March 29, 2022, 22:56:00 (UTC+03:00), Size: 970.9 KB, Storage class: Standard) and 'yaruk.html' (Type: html, Last modified: March 31, 2022, 17:34:07 (UTC+03:00), Size: 1.1 KB, Storage class: Standard). A 'Copy S3 URI' button is visible at the top right of the object list. The 'Properties' tab is also present but not selected.

## Apache httpd installation

```
> sudo yum install httpd
```

```
Dependencies Resolved
=====
Package          Arch    Version      Repository      Size
=====
Installing:
httpd           x86_64  2.4.52-1.amzn2   amzn2-core       1.3 M
Installing for dependencies:
apr              x86_64  1.7.0-9.amzn2   amzn2-core      122 k
apr-util         x86_64  1.6.1-5.amzn2.0.2  amzn2-core      99 k
apr-util-bdb    x86_64  1.6.1-5.amzn2.0.2  amzn2-core      19 k
generic-logos-httd
httpd-filesystem
httpd-tools
mailcap
mod_http2
noarch          18.0.0-4.amzn2   amzn2-core      19 k
noarch          2.4.52-1.amzn2   amzn2-core      24 k
noarch          2.4.52-1.amzn2   amzn2-core      88 k
noarch          2.1.41-2.amzn2   amzn2-core      31 k
x86_64          1.15.19-1.amzn2.0.1  amzn2-core      149 k

Transaction Summary
=====
Install 1 Package (+8 Dependent packages)

Total download size: 1.9 M
Installed size: 5.2 M
Is this ok [y/d/N]: |
```

## Start Apache httpd service:

```
> sudo systemctl start httpd
```

```
[ec2-user@ip-172-31-42-195 ~]$ sudo systemctl start httpd
[ec2-user@ip-172-31-42-195 ~]$ sudo systemctl status httpd
● httpd.service - The Apache HTTP Server
  Loaded: loaded (/usr/lib/systemd/system/httpd.service; disabled; vendor preset: disabled)
  Active: active (running) since Thu 2022-03-31 14:37:35 UTC; 3s ago
    Docs: man:httpd.service(8)
 Main PID: 3460 (httpd)
  Status: "Processing requests..."
   CGroup: /system.slice/httpd.service
           ├─3460 /usr/sbin/httpd -DFOREGROUND
           ├─3461 /usr/sbin/httpd -DFOREGROUND
           ├─3462 /usr/sbin/httpd -DFOREGROUND
           ├─3463 /usr/sbin/httpd -DFOREGROUND
           ├─3464 /usr/sbin/httpd -DFOREGROUND
           └─3465 /usr/sbin/httpd -DFOREGROUND

Mar 31 14:37:35 ip-172-31-42-195.eu-central-1.compute.internal systemd[1]: Starting The Apache HTTP Server...
Mar 31 14:37:35 ip-172-31-42-195.eu-central-1.compute.internal systemd[1]: Started The Apache HTTP Server.
[ec2-user@ip-172-31-42-195 ~]$ |
```

## Apache in browser (via public IP):



This page is used to test the proper operation of the Apache HTTP server after it has been installed. If you can read this page, it means that the Apache HTTP server installed at this site is working properly.

If you are a member of the general public:  
The fact that you are seeing this page indicates that the website you just visited is either experiencing problems, or is undergoing routine maintenance.  
If you would like to let the administrators of this website know that you've seen this page instead of the page you expected, you should send them e-mail. In general, mail sent to the name "webmaster" and directed to the website's domain should reach the appropriate person.  
For example, if you experienced problems while visiting [www.example.com](http://www.example.com), you should send e-mail to "webmaster@example.com".

If you are the website administrator:  
You may now add content to the directory `/var/www/html/`. Note that until you do so, people visiting your website will see this page, and not your content. To prevent this page from ever being used, follow the instructions in the file `/etc/httpd/conf.d/welcome.conf`.  
You are free to use the image below on web sites powered by the Apache HTTP Server:

 2.4

Copying created html document (yaruk.html) to /var/www/html/:

```
> sudo cp ./yaruk.html /var/www/html/
```

```
[ec2-user@ip-172-31-42-195 ~]$ sudo cp ./yaruk.html /var/www/html/
[ec2-user@ip-172-31-42-195 ~]$ sudo ls /var/www/html/
yaruk.html
[ec2-user@ip-172-31-42-195 ~]$ |
```

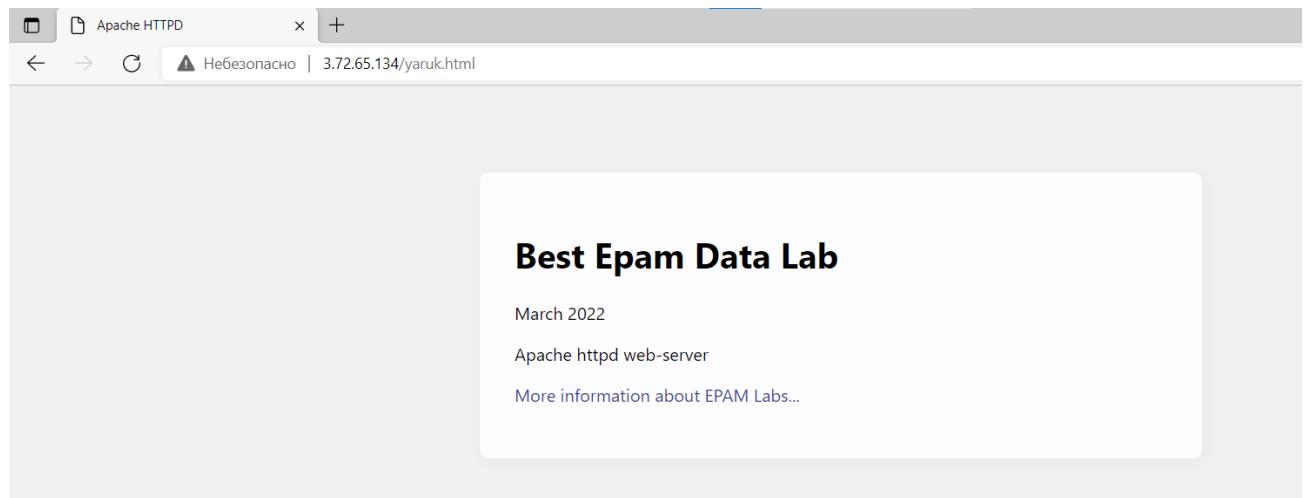
Restarting HTTPD service:

```
> sudo systemctl restart httpd
```

```
[ec2-user@ip-172-31-42-195 ~]$ sudo systemctl start httpd
[ec2-user@ip-172-31-42-195 ~]$ sudo systemctl status httpd
● httpd.service - The Apache HTTP Server
  Loaded: loaded (/usr/lib/systemd/system/httpd.service; disabled; vendor preset: disabled)
  Active: active (running) since Thu 2022-03-31 14:43:29 UTC; 7s ago
    Docs: man:httpd.service(8)
 Main PID: 3660 (httpd)
   Status: "Processing requests..."
  CGroup: /system.slice/httpd.service
          ├─3660 /usr/sbin/httpd -DFOREGROUND
          ├─3661 /usr/sbin/httpd -DFOREGROUND
          ├─3662 /usr/sbin/httpd -DFOREGROUND
          ├─3663 /usr/sbin/httpd -DFOREGROUND
          ├─3664 /usr/sbin/httpd -DFOREGROUND
          └─3665 /usr/sbin/httpd -DFOREGROUND

Mar 31 14:43:29 ip-172-31-42-195.eu-central-1.compute.internal systemd[1]: Starting The Apache HTTP Server...
Mar 31 14:43:29 ip-172-31-42-195.eu-central-1.compute.internal systemd[1]: Started The Apache HTTP Server.
[ec2-user@ip-172-31-42-195 ~]$ |
```

Testing availability of my page in /var/www/html/yaruk.html:



Version 2

## NGINX (installation on EC2 with name hanna\_yaruk\_2.0)

Create html page in nano (html code was copied from example.com)

## nano index.html

```
GNU nano 2.9.8                               index.html

<!DOCTYPE html>
<html>
<head>
    <title>Best Epam Data Lab March_2022</title>

    <meta charset="utf-8" />
    <meta http-equiv="Content-type" content="text/html; charset=utf-8" />
    <meta name="viewport" content="width=device-width, initial-scale=1" />
    <style type="text/css">
body {
    background-color: #f0f0f2;
    margin: 0;
    padding: 0;
    font-family: -apple-system, system-ui, BlinkMacSystemFont, "Segoe UI", "Open Sans", "Helvetica Neue", Helvetica, Arial, sans-serif;
}

div {
    width: 600px;
    margin: 5em auto;
    padding: 2em;
    background-color: #fdfdff;
    border-radius: 0.5em;
    box-shadow: 2px 3px 7px 2px rgba(0,0,0,0.02);
}

a:link, a:visited {
    color: #38488F;
    text-decoration: none;
}

@media (max-width: 700px) {
    div {
        margin: 0 auto;
        width: auto;
    }
}
</style>
```

```
sudo amazon-linux-extras install nginx1
```

```
Dependencies Resolved
=====
Package           Arch      Version       Repository   Size
=====
Installing:
nginx            x86_64    1:1.20.0-2.amzn2.0.4   amzn2extra-nginx1 579 k
Installing for dependencies:
gperftools-libs x86_64    2.6.1-1.amzn2          amzn2-core        274 k
nginx-filesystem noarch   1:1.20.0-2.amzn2.0.4   amzn2extra-nginx1 23 k
openssl111-libs x86_64    1:1.1.1g-12.amzn2.0.7   amzn2-core        1.4 M
openssl111-pkcs1 x86_64    0.4.10-6.amzn2.0.1     amzn2-core        61 k

Transaction Summary
=====
Install 1 Package (+4 Dependent packages)

Total download size: 2.3 M
Installed size: 6.6 M
Is this ok [y/d/N]: |
```

```
[ec2-user@ip-172-31-39-100 ~]$ sudo systemctl status nginx
● nginx.service - The nginx HTTP and reverse proxy server
  Loaded: loaded (/usr/lib/systemd/system/nginx.service; disabled; vendor preset: disabled)
    Active: inactive (dead)
[ec2-user@ip-172-31-39-100 ~]$ sudo systemctl start nginx
[ec2-user@ip-172-31-39-100 ~]$ sudo systemctl status nginx
● nginx.service - The nginx HTTP and reverse proxy server
  Loaded: loaded (/usr/lib/systemd/system/nginx.service; disabled; vendor preset: disabled)
  Active: active (running) since Wed 2022-03-30 20:44:48 UTC; 5s ago
    Process: 3830 ExecStart=/usr/sbin/nginx (code=exited, status=0/SUCCESS)
   Process: 3826 ExecStartPre=/usr/sbin/nginx -t (code=exited, status=0/SUCCESS)
   Process: 3825 ExecStartPre=/usr/bin/rm -f /run/nginx.pid (code=exited, status=0/SUCCESS)
  Main PID: 3832 (nginx)
     CGroup: /system.slice/nginx.service
             ├─3832 nginx: master process /usr/sbin/nginx
             └─3833 nginx: worker process

Mar 30 20:44:48 ip-172-31-39-100.eu-central-1.compute.internal systemd[1]: Starting The nginx HTTP and reverse prox.....
Mar 30 20:44:48 ip-172-31-39-100.eu-central-1.compute.internal nginx[3826]: nginx: the configuration file /etc/nginx...
Mar 30 20:44:48 ip-172-31-39-100.eu-central-1.compute.internal nginx[3826]: nginx: configuration file /etc/nginx/ng...
Mar 30 20:44:48 ip-172-31-39-100.eu-central-1.compute.internal systemd[1]: Started The nginx HTTP and reverse proxy...
Hint: Some lines were ellipsized, use -l to show in full.
[ec2-user@ip-172-31-39-100 ~]$
```

## Default page

The screenshot shows a web browser window with the following details:

- Address bar: Telegra... 3.120.115.194
- Title bar: Test Page for the Nginx HTTP Server on Amazon Linux
- Content area:
  - Header: Welcome to **nginx** on Amazon Linux!
  - Text: This page is used to test the proper operation of the **nginx** HTTP server after it has been installed. If you can read this page, it means that the web server installed at this site is working properly.
  - Section titled "Website Administrator":
    - This is the default `index.html` page that is distributed with **nginx** on Amazon Linux. It is located in `/usr/share/nginx/html`.
    - You should now put your content in a location of your choice and edit the `root` configuration directive in the **nginx** configuration file `/etc/nginx/nginx.conf`.
- Footer: NGINX

## Pushing created page instead of default page

```
[ec2-user@ip-172-31-39-100 ~]$ sudo cp ./index.html /usr/share/nginx/index.html
[ec2-user@ip-172-31-39-100 ~]$ sudo systemctl start nginx
[ec2-user@ip-172-31-39-100 ~]$ sudo systemctl status nginx
● nginx.service - The nginx HTTP and reverse proxy server
   Loaded: loaded (/usr/lib/systemd/system/nginx.service; disabled; vendor preset: disabled)
   Active: active (running) since Wed 2022-03-30 21:16:42 UTC; 5s ago
     Process: 4372 ExecStart=/usr/sbin/nginx (code=exited, status=0/SUCCESS)
    Process: 4367 ExecStartPre=/usr/sbin/nginx -t (code=exited, status=0/SUCCESS)
   Process: 4366 ExecStartPre=/usr/bin/rm -f /run/nginx.pid (code=exited, status=0/SUCCESS)
 Main PID: 4375 (nginx)
    CGroup: /system.slice/nginx.service
            └─4375 nginx: master process /usr/sbin/nginx
                ├─4376 nginx: worker process
                └─4376 nginx: worker process

Mar 30 21:16:42 ip-172-31-39-100.eu-central-1.compute.internal systemd[1]: Starting The nginx HTTP and reverse proxy server...
Mar 30 21:16:42 ip-172-31-39-100.eu-central-1.compute.internal nginx[4367]: nginx: the configuration file /etc/nginx/nginx.conf syntax is ok
Mar 30 21:16:42 ip-172-31-39-100.eu-central-1.compute.internal nginx[4367]: nginx: configuration file /etc/nginx/nginx.conf test is successful
Mar 30 21:16:42 ip-172-31-39-100.eu-central-1.compute.internal systemd[1]: Started The nginx HTTP and reverse proxy server.
[ec2-user@ip-172-31-39-100 ~]$ |
```

## Open the page by public DNS in browser

<http://ec2-3-120-115-194.eu-central-1.compute.amazonaws.com/>

The screenshot shows a web browser window with the following details:

- Address bar: ec2-3-120-115-194.eu-central-1.compute.amazonaws.com Best Epam Data Lab March\_2022
- Content area:
  - Section title: Best Epam Data Lab
  - Date: March 2022
  - Text: More information about EPAM Labs...

## Task\_06

### Create SNS topic

#### Create topic

**Details**

Type [Info](#)  
Topic type cannot be modified after topic is created

FIFO first-in, first-out

- Strictly-preserved message ordering
- Exactly-once message delivery
- High throughput, up to 300 publishes/second
- Subscription protocols: SQS, Lambda, HTTP, SMS, email, mobile application endpoints

Standard

- Best-effort message ordering
- At-least once message delivery
- Highest throughput in publishes/second
- Subscription protocols: SQS, Lambda, HTTP, SMS, email, mobile application endpoints

Name  
  
Maximum 256 characters. Can include alphanumeric characters, hyphens (-) and underscores (\_).

Display name - *optional*  
To use this topic with SMS subscriptions, enter a display name. Only the first 10 characters are displayed in an SMS message. [Info](#)  
  
Maximum 100 characters.

### Create subscription

Subscription to hanna-yaruk-sns-topic created successfully.  
The ARN of the subscription is arn:aws:sns:eu-central-1:260586643565:hanna-yaruk-sns-topic:41a3a873-76cd-40b4-a0fb-c91c8a790ce0.

Amazon SNS > Topics > hanna-yaruk-sns-topic > Subscription: 41a3a873-76cd-40b4-a0fb-c91c8a790ce0

Subscription: 41a3a873-76cd-40b4-a0fb-c91c8a790ce0

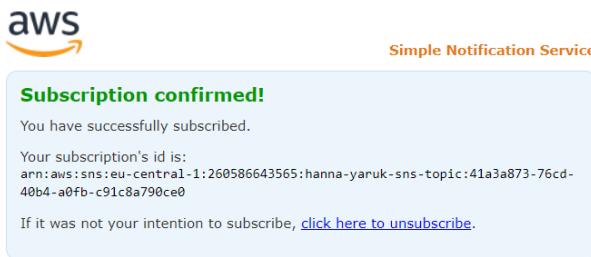
[Edit](#) [Delete](#)

**Details**

ARN arn:aws:sns:eu-central-1:260586643565:hanna-yaruk-sns-topic:41a3a873-76cd-40b4-a0fb-c91c8a790ce0	Status <a href="#">Pending confirmation</a>
Endpoint hanna_yaruk@epam.com	Protocol EMAIL
Topic hanna-yaruk-sns-topic	

[Subscription filter policy](#) | [Redrive policy \(dead-letter queue\)](#)

### Subscription confirmed



Subscriptions (36)

[Edit](#) [Delete](#) [Request confirmation](#) [Confirm subscription](#) [Create subscription](#)

ID	Endpoint	Status	Protocol	Topic
41a3a873-76cd-40b4-a0fb-c91c8a790ce0	hanna_yaruk@epam.com	<a href="#">Confirmed</a>	EMAIL	hanna-yaruk-sns-topic

## Select metric in CloudWatch

The screenshot shows the 'Select metric' dialog box. At the top, there's a search bar with 'CPUUtilization' and tabs for 'Browse', 'Query', 'Graphed metrics (1)', 'Options', and 'Source'. Below the tabs are buttons for 'Add math' and 'Add query'. A section titled 'Metrics (902)' shows a list of metrics for EC2 instances. The list includes columns for 'Instance name', 'InstanceId', and 'Metric name'. One instance, 'hanna\_yaruk', has its 'Metric name' set to 'CPUUtilization'. The 'Select metric' button is highlighted at the bottom right.

## Alarm creation

The screenshot shows the 'Conditions' step in the alarm creation wizard. It starts with a 'Threshold type' section where 'Static' is selected. Below that, it asks 'Whenever CPUUtilization is...'. Under 'Define the alarm condition', 'Greater/Equal' is selected. It then asks 'than...'. Under 'Define the threshold value', the number '60' is entered. A note says 'Must be a number'. At the bottom, there's a '► Additional configuration' link.

## Configure actions

### Notification

#### Alarm state trigger

Define the alarm state that will trigger this action.

[Remove](#)

In alarm

The metric or expression is outside of the defined threshold.

OK

The metric or expression is within the defined threshold.

Insufficient data

The alarm has just started or not enough data is available.

#### Select an SNS topic

Define the SNS (Simple Notification Service) topic that will receive the notification.

Select an existing SNS topic

Create new topic

Use topic ARN

#### Send a notification to...

hanna-yaruk-sns-topic X

Only email lists for this account are available.

#### Email (endpoints)

[hanna\\_yaruk@epam.com](#) - [View in SNS Console](#)

[Add notification](#)

## Preview and create

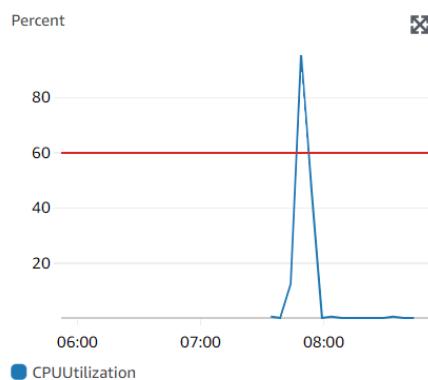
### Step 1: Specify metric and conditions

[Edit](#)

#### Metric

##### Graph

This alarm will trigger when the blue line goes above the red line for 1 datapoints within 1 minute.



Namespace

AWS/EC2

Metric name

CPUUtilization

InstanceId

i-070b27166e777ddd8

Instance name

hanna\_yaruk

Statistic

Average

Period

1 minute

Alarm was created

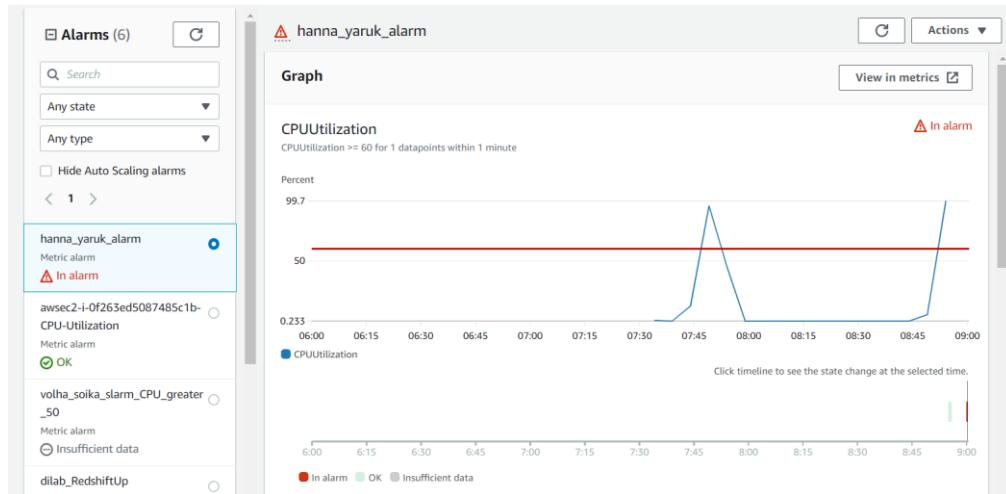
Alarms (1/6)					<input type="checkbox"/> Hide Auto Scaling alarms	<input type="button" value="Clear selection"/>	<input type="button" value="C"/>	<input type="button" value="Create composite alarm"/>	<input type="button" value="Actions ▾"/>	<input type="button" value="Create alarm"/>
					<input type="text" value="Search"/>	<input type="button" value="Any state"/>	<input type="button" value="Any type"/>	<input type="button" value="&lt; 1 &gt;"/>	<input type="button" value="⚙"/>	
-	Name	State	Last state update	Conditions	Actions					
<input checked="" type="checkbox"/>	hanna_yaruk_alarm	<span>⚠ Insufficient data</span>	2022-03-31 11:52:57	CPUUtilization $\geq 60$ for 1 datapoints within 1 minute	<span>Actions enabled</span>					
<input type="checkbox"/>	awsec2-i-0f263ed5087485c1b-CPU-	<span>🟢 OK</span>	2022-03-31 11:09:45	CPUUtilization $\geq 80$ for 1 datapoints within 5 minutes	<span>Actions enabled</span>					

Stress test starting

sudo stress --cpu8

```
ec2-user@ip-172-31-42-195:~ + - 
[ec2-user@ip-172-31-42-195 ~]$ sudo stress --cpu 8
stress: info: [4132] dispatching hogs: 8 cpu, 0 io, 0 vm, 0 hdd
```

Alarm in work



Notification on email:

## ALARM: "hanna\_yaruk\_alarm" in EU (Frankfurt)

Перевести сообщение на: Русский | Никогда не переводить с этого языка: Английский

**H hanna-yaruk-sns-topic <no-reply@sns.amazonaws.com>** 31.03.2022, Чт, 12:00  
Кому: Hanna Yaruk

You are receiving this email because your Amazon CloudWatch Alarm "hanna\_yaruk\_alarm" in the EU (Frankfurt) region has entered the ALARM state, because "Threshold Crossed: 1 out of the last 1 datapoints [99.66830601092896 (31/03/22 08:54:00)] was greater than or equal to the threshold (60.0) (minimum 1 datapoint for OK -> ALARM transition)." at "Thursday 31 March, 2022 09:00:01 UTC".

View this alarm in the AWS Management Console:  
[https://urldefense.com/v3/\\_https://eu-central-1.console.aws.amazon.com/cloudwatch/deeplink.js?region=eu-central-1\\*alarmsV2:alarm\\*hanna\\_yaruk\\_alarm\\_!ly8!!GF\\_29dbcQlUBPA!itKSzASID\\_L5z3fedPEh2k\\_O2gXUxly89hwCHdaTozfv8rWQ0ejesXrRhqwN91A\\$](https://urldefense.com/v3/_https://eu-central-1.console.aws.amazon.com/cloudwatch/deeplink.js?region=eu-central-1*alarmsV2:alarm*hanna_yaruk_alarm_!ly8!!GF_29dbcQlUBPA!itKSzASID_L5z3fedPEh2k_O2gXUxly89hwCHdaTozfv8rWQ0ejesXrRhqwN91A$) [eu-central-1[.]console[.]aws[.]amazon[.]com]

Alarm Details:

- Name: hanna\_yaruk\_alarm
- Description:
- State Change: INSUFFICIENT\_DATA -> ALARM
- Reason for State Change: Threshold Crossed: 1 out of the last 1 datapoints [99.66830601092896 (31/03/22 08:54:00)] was greater than or equal to the threshold (60.0) (minimum 1 datapoint for OK -> ALARM transition).
- Timestamp: Thursday 31 March, 2022 09:00:01 UTC
- AWS Account:
- Alarm Arn: arn:aws:cloudwatch:eu-central-1: :alarm:hanna\_yaruk\_alarm

Threshold:

- The alarm is in the ALARM state when the metric is GreaterThanOrEqualToThreshold 60.0 for at least 1 of the last 1 period(s) of 60 seconds.

Additional step – stopping the stress app in instance

Ctrl + C



Alarm is OK

CloudWatch > Alarms

Alarms (6)  Hide Auto Scaling alarms   Actions

Name	State	Last state update	Conditions	Actions
hanna_yaruk_alarm	OK	2022-03-31 12:10:01	CPUUtilization >= 60 for 1 datapoints within 1 minute	Actions enabled

Metrics data not verified

## Task 07. Create CloudFormation

### Version A

Create template for cloudformation EC2 creation.

AWSTemplateFormatVersion: 2010-09-09

Resources:

EC2I3UXU3:

Type: 'AWS::EC2::Instance'

Properties:

InstanceType: t2.micro

AvailabilityZone: eu-central-1b

ImageId: ami-0dcc0ebde7b2e00db

SecurityGroupIds:

- sg-033758f5cb3c86c01

- sg-04263b4d0f2baa68e

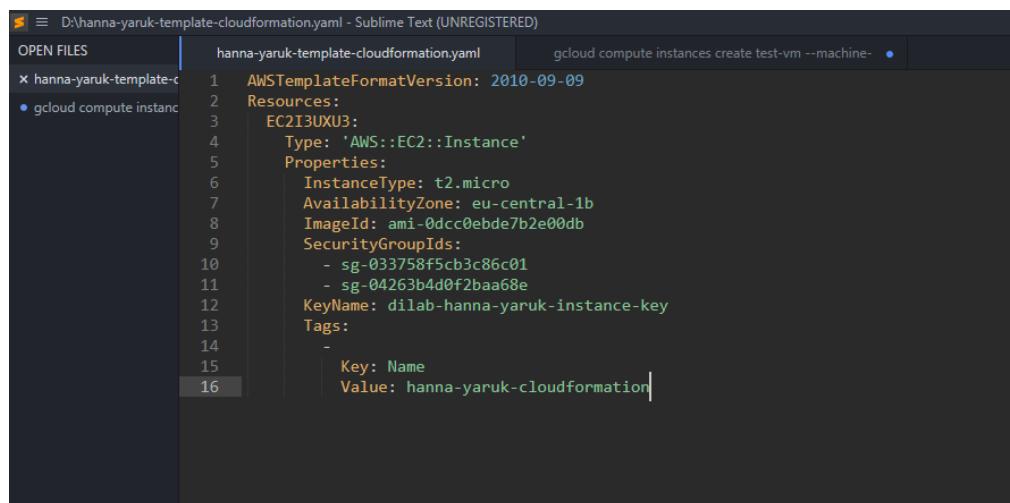
KeyName: dilab-hanna-yaruk-instance-key

Tags:

-

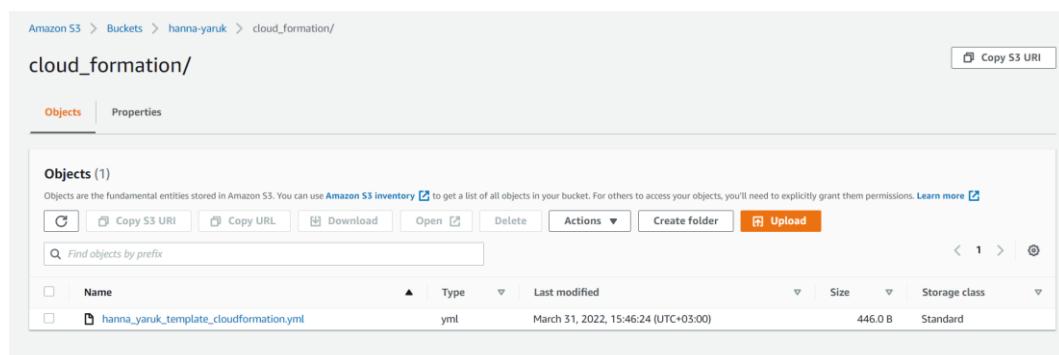
Key: Name

Value: hanna-yaruk-cloudformation



```
OPEN FILES      hanna-yaruk-template-cloudformation.yaml      gcloud compute instances create test-vm --machine-  
✖ hanna-yaruk-template-c  
• gcloud compute instances create test-vm --machine-type=n1-standard-1 --image=centos-7-v20210401 --image-project=centos-7 --boot-disk-size=10GB --tags=http-server,https-server --metadata-enable-ssh=true --network=default --subnet=default --region=europe-west4  
1 AWSTemplateFormatVersion: 2010-09-09  
2 Resources:  
3   EC2I3UXU3:  
4     Type: 'AWS::EC2::Instance'  
5     Properties:  
6       InstanceType: t2.micro  
7       AvailabilityZone: eu-central-1b  
8       ImageId: ami-0dcc0ebde7b2e00db  
9       SecurityGroupIds:  
10      - sg-033758f5cb3c86c01  
11      - sg-04263b4d0f2baa68e  
12       KeyName: dilab-hanna-yaruk-instance-key  
13       Tags:  
14         -  
15           Key: Name  
16           Value: hanna-yaruk-cloudformation|
```

### Uploading the template to S3 bucket



Amazon S3 > Buckets > hanna-yaruk > cloudFormation/

cloudFormation/ Copy S3 URI

Objects Properties

**Objects (1)**  
Objects are the fundamental entities stored in Amazon S3. You can use [Amazon S3 inventory](#) to get a list of all objects in your bucket. For others to access your objects, you'll need to explicitly grant them permissions. [Learn more](#)

C Copy S3 URI Copy URL Download Open Delete Actions Create folder Upload

Find objects by prefix

Name	Type	Last modified	Size	Storage class
hanna_yaruk_template_cloudformation.yaml	yml	March 31, 2022, 15:46:24 (UTC+03:00)	446.0 B	Standard

## Steps for Stack creation

**Prerequisite - Prepare template**

Prepare template  
Every stack is based on a template. A template is a JSON or YAML file that contains configuration information about the AWS resources you want to include in the stack.

Template is ready    Use a sample template    Create template in Designer

**Specify template**  
A template is a JSON or YAML file that describes your stack's resources and properties.

Template source  
Selecting a template generates an Amazon S3 URL where it will be stored.

Amazon S3 URL    Upload a template file

Amazon S3 URL  
`https://hanna-yaruk.s3.eu-central-1.amazonaws.com/cloudFormation/hanna_yaruk_template_cloudformation.yml`

Amazon S3 template URL  
S3 URL: `https://hanna-yaruk.s3.eu-central-1.amazonaws.com/cloudFormation/hanna_yaruk_template_cloudformation.yml`

**Specify stack details**

**Stack name**

Stack name  
`hanna-yaruk-stack`

Stack name can include letters (A-Z and a-z), numbers (0-9), and dashes (-).

**Parameters**  
Parameters are defined in your template and allow you to input custom values when you create or update a stack.

No parameters  
There are no parameters defined in your template

Hanna-yaruk-stack is created

hanna-yaruk-stack		<input type="button" value="Delete"/>	<input type="button" value="Update"/>	<input type="button" value="Stack actions ▾"/>	<input type="button" value="Create stack ▾"/>																								
		<input type="button" value="Stack info"/>	<input type="button" value="Events"/>	<input type="button" value="Resources"/>	<input type="button" value="Outputs"/>																								
		<input type="button" value="Parameters"/>	<input type="button" value="Template"/>	<input type="button" value="Change sets"/>																									
<b>Events (5)</b>																													
<input type="text" value="Search events"/>																													
<table><thead><tr><th>Timestamp</th><th>Logical ID</th><th>Status</th><th>Status reason</th></tr></thead><tbody><tr><td>2022-03-31 15:50:36 UTC+0300</td><td>hanna-yaruk-stack</td><td><span>CREATE_COMPLETE</span></td><td>-</td></tr><tr><td>2022-03-31 15:50:35 UTC+0300</td><td>EC2I3UXU3</td><td><span>CREATE_COMPLETE</span></td><td>-</td></tr><tr><td>2022-03-31 15:49:43 UTC+0300</td><td>EC2I3UXU3</td><td><span>CREATE_IN_PROGRESS</span></td><td>Resource creation Initiated</td></tr><tr><td>2022-03-31 15:49:41 UTC+0300</td><td>EC2I3UXU3</td><td><span>CREATE_IN_PROGRESS</span></td><td>-</td></tr><tr><td>2022-03-31 15:49:37 UTC+0300</td><td>hanna-yaruk-stack</td><td><span>CREATE_IN_PROGRESS</span></td><td>User Initiated</td></tr></tbody></table>						Timestamp	Logical ID	Status	Status reason	2022-03-31 15:50:36 UTC+0300	hanna-yaruk-stack	<span>CREATE_COMPLETE</span>	-	2022-03-31 15:50:35 UTC+0300	EC2I3UXU3	<span>CREATE_COMPLETE</span>	-	2022-03-31 15:49:43 UTC+0300	EC2I3UXU3	<span>CREATE_IN_PROGRESS</span>	Resource creation Initiated	2022-03-31 15:49:41 UTC+0300	EC2I3UXU3	<span>CREATE_IN_PROGRESS</span>	-	2022-03-31 15:49:37 UTC+0300	hanna-yaruk-stack	<span>CREATE_IN_PROGRESS</span>	User Initiated
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2022-03-31 15:49:43 UTC+0300	EC2I3UXU3	<span>CREATE_IN_PROGRESS</span>	Resource creation Initiated																										
2022-03-31 15:49:41 UTC+0300	EC2I3UXU3	<span>CREATE_IN_PROGRESS</span>	-																										
2022-03-31 15:49:37 UTC+0300	hanna-yaruk-stack	<span>CREATE_IN_PROGRESS</span>	User Initiated																										

The instance from the stack was created

Instances (59) <a href="#">Info</a>			<a href="#">C</a>	<a href="#">Connect</a>	Instance state	Actions	<a href="#">Launch instances</a>	
	Name	Instance ID	Instance state	Instance type	Status check	Alarm status	Availability Zone	Pul
<input type="checkbox"/>	hanna-yaruk-cloudformation	i-0d4660658150ba9d8	<span>Running</span>	t2.micro	<span>2/2 checks passed</span>	No alarms	eu-central-1b	ec2
<input type="checkbox"/>	hanna-yaruk-cloudformation	i-0e556d8b5df5a42d1	<span>Terminated</span>	t2.micro	-	No alarms	eu-central-1b	-
<input type="checkbox"/>	hanna-yaruk-cloudformation	i-0f18c426747bedefb	<span>Terminated</span>	t2.micro	-	No alarms	eu-central-1b	-
<input type="checkbox"/>	aksana_	i-0dc63ad99a1906846	<span>Running</span>	t2.micro	<span>2/2 checks passed</span>	No alarms	eu-central-1b	ec2
<input type="checkbox"/>	-	i-0e40eaa294740cdd6	<span>Terminated</span>	t2.micro	-	No alarms	eu-central-1b	-
<input type="checkbox"/>	tatsiana_ _from_i...	i-075f1b85a933b0813	<span>Stopped</span>	t2.micro	-	No alarms	eu-central-1b	-
<input type="checkbox"/>	Irina_ser	i-023f8reh79a506688	<span>Running</span>	t2.micro	<span>2/2 checks passed</span>	No alarms	eu-central-1b	ec2

The instance is available to connect via ssh:

The screenshot shows the AWS Management Console EC2 Instances page with several instances listed. One instance, "hanna-yaruk-cloudformation" (Instance ID: i-0d4660658150ba9d8), is selected. The instance summary pane displays its details: Instance ID (i-0d4660658150ba9d8), Public IPv4 address (54.93.74.189), Private IPv4 addresses (172.31.44.69), and Instance state (Running). A tooltip indicates the Public IPv4 DNS has been copied. Below this, a Windows PowerShell window is open, showing the command "ssh ec2-user@ec2-54-93-74-189.eu-central-1.compute.amazonaws.com" and the resulting output. The output includes a warning about the host fingerprint and a confirmation message. The instance is identified as "Amazon Linux 2 AMI".

```
PS C:\Users\Hanna> ssh ec2-user@ec2-54-93-74-189.eu-central-1.compute.amazonaws.com
The authenticity of host 'ec2-54-93-74-189.eu-central-1.compute.amazonaws.com (54.93.74.189)' can't be established.
ECDSA key fingerprint is SHA256:XZTNF8nCDAb0b2FwY8UCVCPQtPIX6DhNoyuU88jdM.
Are you sure you want to continue connecting (yes/no/[fingerprint])? yes
Warning: Permanently added 'ec2-54-93-74-189.eu-central-1.compute.amazonaws.com,54.93.74.189' (ECDSA) to the list of known hosts.

[ec2-user@ip-172-31-44-69 ~]$
```

## Version B

Create Cloudformation with Image Id from my Image dilab-hanna-yaruk-ami-root (hanna-yaruk-stack-img).

The same steps like in Version A

AWSTemplateFormatVersion: 2010-09-09

Resources:

EC2I3UXU3:

Type: 'AWS::EC2::Instance'

Properties:

InstanceType: t2.micro

AvailabilityZone: eu-central-1b

ImageId: **ami-043d54474dae08421**

SecurityGroupIds:

- sg-033758f5cb3c86c01

- sg-04263b4d0f2baa68e

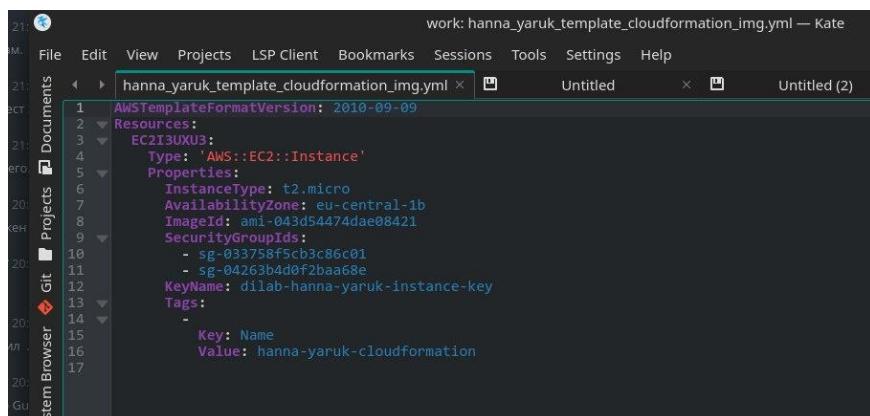
KeyName: dilab-hanna-yaruk-instance-key

Tags:

-

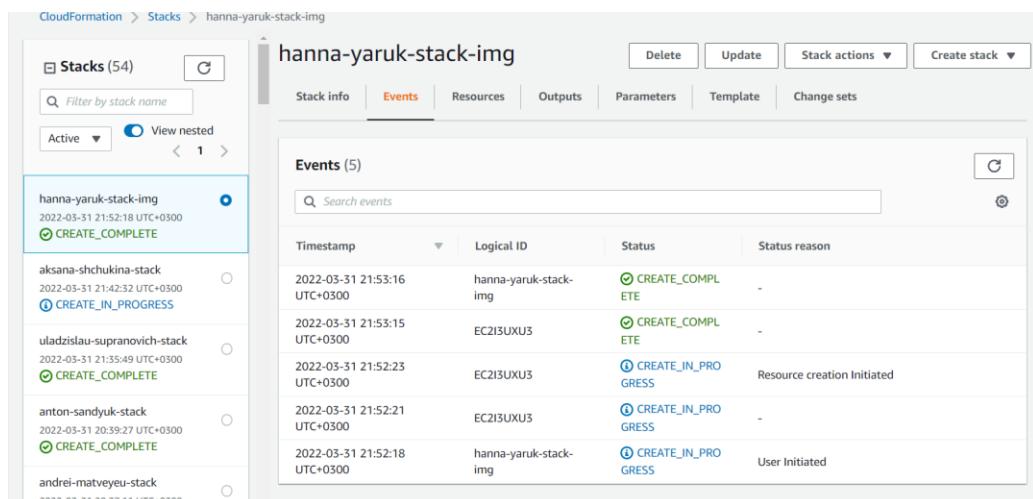
Key: Name

Value: hanna-yaruk-cloudformation



```
1 AWSTemplateFormatVersion: 2010-09-09
2 Resources:
3   EC2I3UXU3:
4     Type: 'AWS::EC2::Instance'
5     Properties:
6       InstanceType: t2.micro
7       AvailabilityZone: eu-central-1b
8       ImageId: ami-043d54474dae08421
9       SecurityGroupIds:
10      - sg-033758f5cb3c86c01
11      - sg-04263b4d0f2baa68e
12     KeyName: dilab-hanna-yaruk-instance-key
13     Tags:
14       Key: Name
15       Value: hanna-yaruk-cloudformation
```

The instance from the stack was created



CloudFormation > Stacks > hanna-yaruk-stack-img

Stacks (54)

hanna-yaruk-stack-img

2022-03-31 21:52:18 UTC+0300

CREATE\_COMPLETE

Events (5)

Timestamp	Logical ID	Status	Status reason
2022-03-31 21:53:16 UTC+0300	hanna-yaruk-stack-img	CREATE_COMPLETE	-
2022-03-31 21:53:15 UTC+0300	EC2I3UXU3	CREATE_COMPLETE	-
2022-03-31 21:52:23 UTC+0300	EC2I3UXU3	CREATE_IN_PROGRESS	Resource creation Initiated
2022-03-31 21:52:21 UTC+0300	EC2I3UXU3	CREATE_IN_PROGRESS	-
2022-03-31 21:52:18 UTC+0300	hanna-yaruk-stack-img	CREATE_IN_PROGRESS	User Initiated

Stacks (54)				
	Stack name	Status	Created time	Description
<input type="radio"/>	hanna-yaruk-stack-img	<span>CREATE_COMPLETE</span>	2022-03-31 21:52:18 UTC+0300	-
<input type="radio"/>	aksana- stack	<span>CREATE_IN_PROGRESS</span>	2022-03-31 21:42:32 UTC+0300	-
<input type="radio"/>	uladzislau- .stack	<span>CREATE_COMPLETE</span>	2022-03-31 21:35:49 UTC+0300	-

The instance is available to connect via ssh:

EC2 > Instances > i-013ac178913806e21

Instance summary for i-013ac178913806e21 (hanna-yaruk-cloudformation-img) Info C Connect Instance state ▾ Actions ▾

Updated less than a minute ago

Instance ID <a href="#">i-013ac178913806e21 (hanna-yaruk-cloudformation-img)</a>	Public IPv4 address <a href="#">18.195.63.198   open address</a>	Private IPv4 addresses <a href="#">172.31.34.249</a>
IPv6 address -	Instance state <span>Running</span>	<span>Public IPv4 DNS copied</span> <a href="#">ec2-18-195-63-198.eu-central-1.compute.amazonaws.com   open address</a>

IP: [ec2-user@ip-172-31-34-249:~](#) + ×

```
PS C:\Users\Hanna> ssh ec2-user@ec2-18-195-63-198.eu-central-1.compute.amazonaws.com
Last login: Thu Mar 31 19:26:54 2022 from 86.57.255.94
t2
 _|_ / Amazon Linux 2 AMI
Av
No https://aws.amazon.com/amazon-linux-2/
[ec2-user@ip-172-31-34-249 ~]$ |
```