



Звіт до лабораторної роботи №5:
«Створення віртуальної машини»
з дисципліни «Інтеграція та адміністрування інформаційних систем»

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Мета роботи

Створення віртуальної машини. Налаштування фаєрволу для доступу до сервера по SSH. Підключення до серверу по SSH. Створення тегів для віртуальних машин. Створення АМІ використовуючи існуючу віртуальну машину. Автоматизація створення EC2 за допомогою terraform/ansible.

Хід виконання роботи

1. Choose AMI2. Choose Instance Type3. Configure Instance4. Add Storage5. Add Tags6. Configure Security Group7. Review

Step 1: Choose an Amazon Machine Image (AMI)
An AMI is a template that contains the software configuration (operating system, application server, and applications) required to launch your instance. You can select an AMI provided by AWS, our user community, or the AWS Marketplace; or you can select one of your own AMIs.

Q Search for an AMI by entering a search term e.g. "Windows"

Search by Systems Manager parameter

< 1 to 43 of 43 AMIs >

Quick Start

My AMIs

AWS Marketplace

Community AMIs

☐ Free tier only

Amazon Linux

Free tier eligible

Amazon Linux 2 AMI (HVM) - Kernel 5.10, SSD Volume Type - ami-002068ed284fb165b (64-bit x86) / ami-0a5899928eba2e7bd (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

Amazon Linux

Free tier eligible

Amazon Linux 2 AMI (HVM) - Kernel 4.14, SSD Volume Type - ami-056b1936002ca8ede (64-bit x86) / ami-0b09f36be67d32fff (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

macOS

macOS Monterey 12.0.1 - ami-071bb7b6031fd9da7

The macOS Monterey AMI is an EBS-backed, AWS-supported image. This AMI includes the AWS Command Line Interface, Command Line Tools for Xcode, Amazon SSM Agent, and Homebrew. The AWS Homebrew Tap includes the latest versions of multiple AWS packages included in the AMI.

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

macOS

macOS Big Sur 11.6.1 - ami-0501e3120a93c062c

The macOS Big Sur AMI is an EBS-backed, AWS-supported image. This AMI includes the AWS Command Line Interface, Command Line Tools for Xcode, Amazon SSM Agent, and Homebrew. The AWS Homebrew Tap includes the latest versions of multiple AWS packages included in the AMI.

Select

64-bit (x86)

64-bit (Arm)

Select

64-bit (x86)

64-bit (Arm)

Select

64-bit (Mac)

Select

64-bit (Mac)

Рисунок 1 Вибір AMI

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 families Current generation Show/Hide Columns

Currently selected: t2.micro (- ECUs, 1 vCPUs, 2.5 GHz, ~ 1 GiB memory, EBS only)

	Family	Type	vCPUs	Memory (GiB)	Instance Storage (GB)	EBS-Optimized Available	Network Performance	IPv6 Support
<input type="checkbox"/>	t2	t2.nano	1	0.5	EBS only	-	Low to Moderate	Yes
<input checked="" type="checkbox"/>	t2	t2.micro	1	1	EBS only	-	Low to Moderate	Yes
<input type="checkbox"/>	t2	t2.small	1	2	EBS only	-	Low to Moderate	Yes
<input type="checkbox"/>	t2	t2.medium	2	4	EBS only	-	Low to Moderate	Yes
<input type="checkbox"/>	t2	t2.large	2	8	EBS only	-	Low to Moderate	Yes
<input type="checkbox"/>	t2	t2.xlarge	4	16	EBS only	-	Moderate	Yes
<input type="checkbox"/>	t2	t2.2xlarge	8	32	EBS only	-	Moderate	Yes
<input type="checkbox"/>	t3	t3.nano	2	0.5	EBS only	Yes	Up to 5 Gigabit	Yes
<input type="checkbox"/>	t3	t3.micro	2	1	EBS only	Yes	Up to 5 Gigabit	Yes
<input type="checkbox"/>	t3	t3.small	2	2	EBS only	Yes	Up to 5 Gigabit	Yes
<input type="checkbox"/>	t3	t3.medium	2	4	EBS only	Yes	Up to 5 Gigabit	Yes
<input type="checkbox"/>	t3	t3.large	2	8	EBS only	Yes	Up to 5 Gigabit	Yes
<input type="checkbox"/>	t3	t3.xlarge	4	16	EBS only	Yes	Up to 5 Gigabit	Yes

Cancel

Previous

Review and Launch

Next: Configure Instance Details

Рисунок 2 Вибір типу інстансу

1. Choose AMI2. Choose Instance Type3. Configure Instance4. Add Storage5. Add Tags6. Configure Security Group7. Review

Step 3: Configure Instance Details

Number of instances ⓘ1Launch into Auto Scaling Group ⓘ

Purchasing option ⓘ☐ Request Spot instances

Network ⓘvpc-06245b278f63b0268 (default)↕Create new VPC

Subnet ⓘNo preference (default subnet in any Availability Zone)↕Create new subnet

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

Hostname type ⓘUse subnet setting (IP name)↕

DNS Hostname ⓘ☒ Enable IP name IPv4 (A record) DNS requests☒ Enable resource-based IPv4 (A record) DNS requests☐ Enable resource-based IPv6 (AAAA record) DNS requests

Placement group ⓘ☐ Add instance to placement group

Capacity Reservation ⓘOpen↕

Domain join directory ⓘNo directory↕Create new directory

IAM role ⓘNone↕Create new IAM role

Shutdown behavior ⓘStop↕

Stop - Hibernate behavior ⓘ☐ Enable hibernation as an additional stop behavior

Enable termination protection ⓘ☐ Protect against accidental termination

Monitoring ⓘ☐ Enable CloudWatch detailed monitoringAdditional charges apply.

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

Рисунок 3 Налаштування

1. Choose AMI2. Choose Instance Type3. Configure Instance4. Add Storage5. Add Tags6. Configure Security Group7. 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 ⓘ	Encryption ⓘ
Root	/dev/xvda	snap-08c6656b1c27d23c5	8	General Purpose SSD (gp2) ↕	100 / 3000	N/A	<input checked="" type="checkbox"/>	Not Encrypted ↕

Add New Volume

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

Shared file systems ⓘ

You currently don't have any file systems on this instance. Select "Add file system" button below to add a file system.

Add file system

Рисунок 4 Додавання сховища

1. Choose AMI2. Choose Instance Type3. Configure Instance4. Add Storage5. Add Tags6. Configure Security Group7. 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 ⓘ (128 characters maximum)	Value ⓘ (256 characters maximum)	Instances ⓘ	Volumes ⓘ	Network Interfaces ⓘ
sKey	myKey	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

Add another tag (Up to 50 tags maximum)

Рисунок 5 Додавання тегу

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](#)

Рисунок 6 Конфігурація фаєрволу

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-1, 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 2 AMI (HVM) - Kernel 5.10, SSD Volume Type - ami-002068ed284fb165b
 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 n...
 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	-	1	1	EBS only	-	Low to Moderate

▼ Security Groups [Edit security groups](#)

Security group name: launch-wizard-1
 Description: launch-wizard-1 created 2021-12-20T00:48:36.515+02:00

Type	Protocol	Port Range	Source	Description
SSH	TCP	22	0.0.0.0/0	

▶ Instance Details [Edit instance details](#)

▶ Storage [Edit storage](#)

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

Рисунок 7 Деталі створеного екземпляра

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.](#)

Create a new key pair

Key pair type
☒ RSA ☐ ED25519

Key pair name

[Download Key Pair](#)

You have to download the private key file (*.pem file) before you can continue. Store it in a secure and accessible location. You will not be able to download the file again after it's created.

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

Рисунок 8 Завантаження пари ключів

Instances (1/1) Info

Search

Refresh

Connect

Instance state

Actions

Launch instances

<input checked="" type="checkbox"/>	Name	Instance ID	Instance state	Instance type	Status check	Alarm status	Availability Zone	Public IPv4 DNS	Public IPv4 ...	Elastic IP
<input checked="" type="checkbox"/>	test	i-003bd55a966e0b842	<div>Running</div>	t2.micro	<div>Initializing</div>	No alarms +	us-east-2c	ec2-3-141-104-114.us-...	3.141.104.114	-

Рисунок 9 Результат запуску екземпляра віртуальної машини

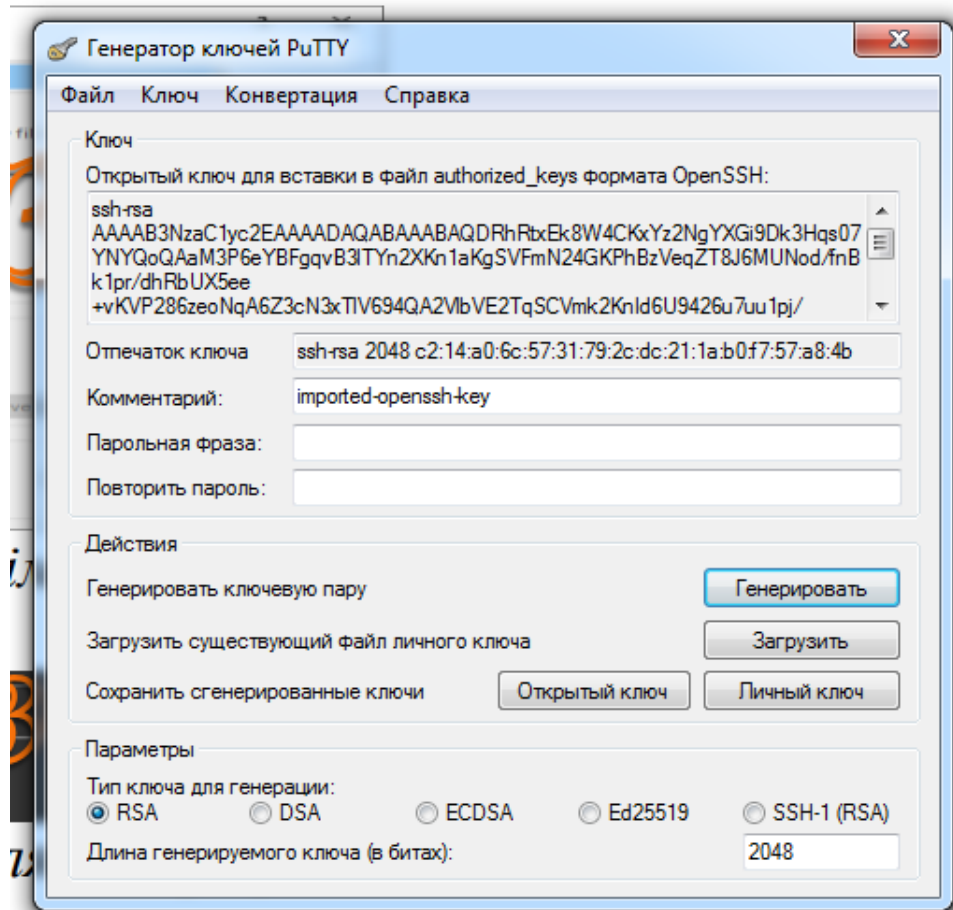


Рисунок 10 Конвертація ключів

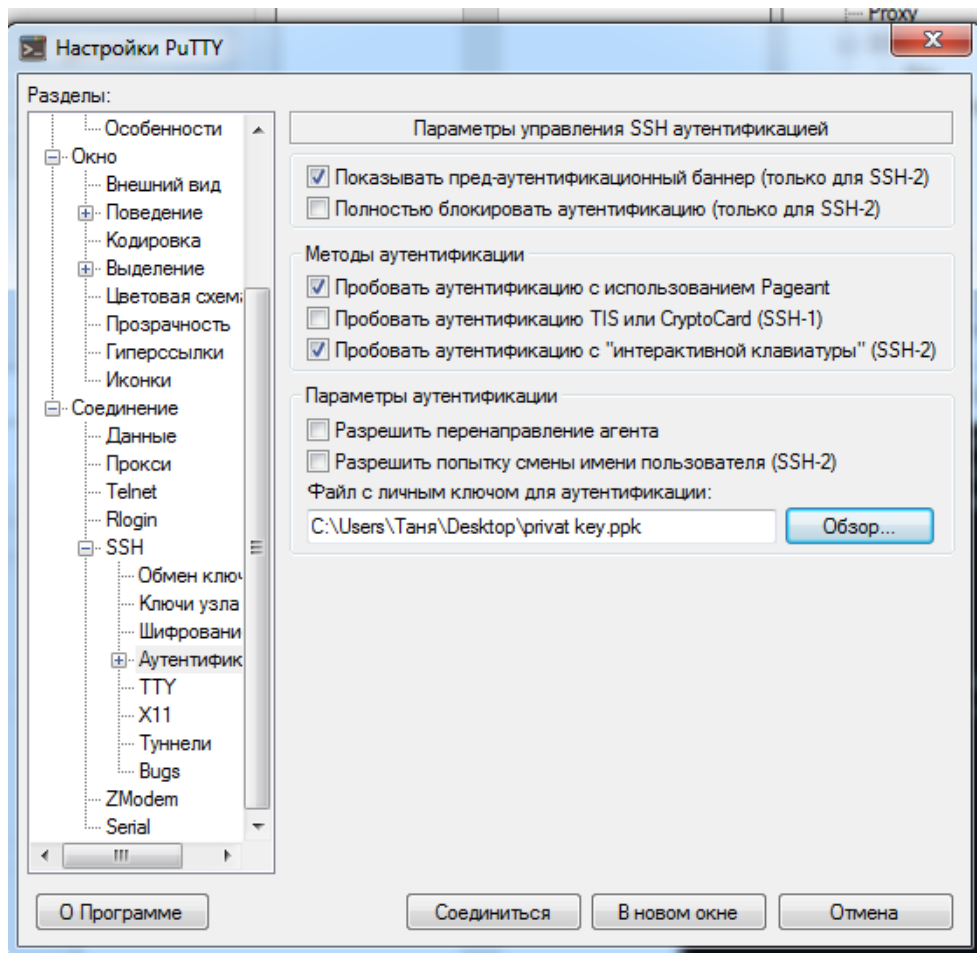


Рисунок 11 Импорт ключа в PuTTY

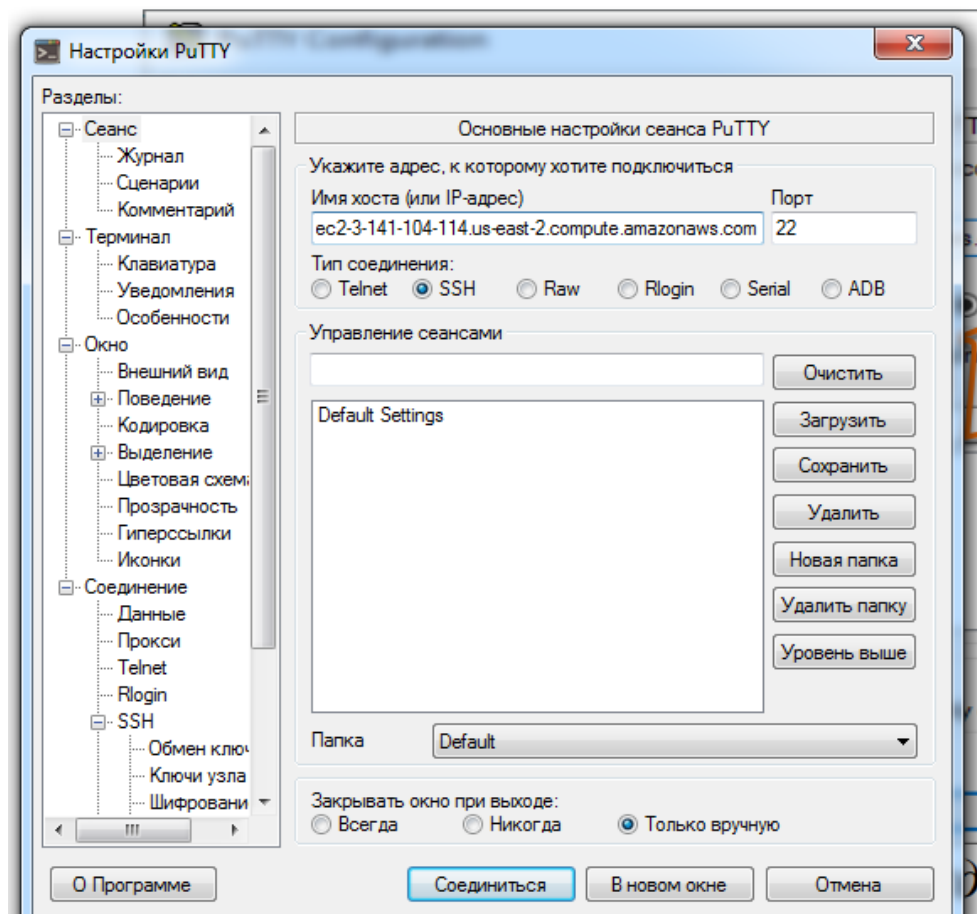


Рисунок 12 Настройка соединения с виртуальной машиной

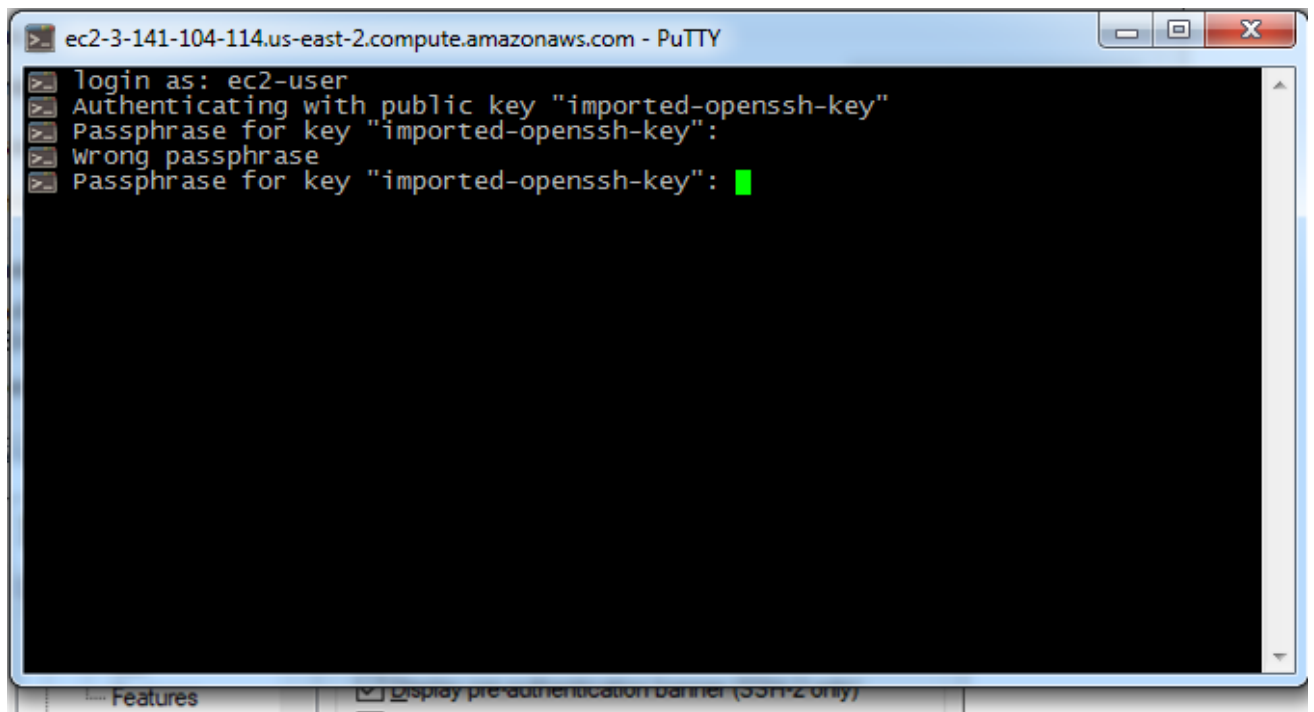


Рисунок 13 Логін на "віртуалку"

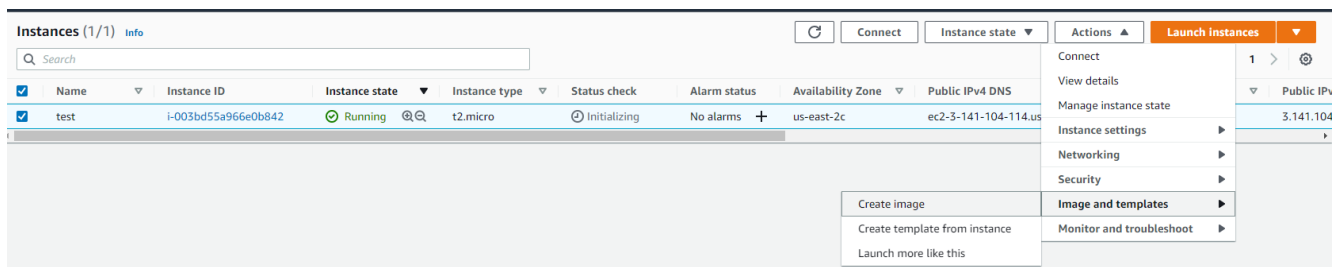


Рисунок 14 Створення образу віртуальної машини

Create image [Info](#)

An image (also referred to as an AMI) defines the programs and settings that are applied when you launch an EC2 Instance. You can create an image from the configuration of an existing instance.

Instance ID
i-003bd55a966e0b842

Image name

Maximum 127 characters. Can't be modified after creation.

Image description - optional

Maximum 255 characters

No reboot
☐ Enable

Instance volumes

Volume type	Device	Snapshot	Size	Volume type	IOPS	Throughput	Delete on termination	Encrypted
EBS	/dev/x...	Create new snapshot fr...	8	EBS General Purpose SS...	100		<input checked="" type="checkbox"/> Enable	<input type="checkbox"/> Enable

During the image creation process, Amazon EC2 creates a snapshot of each of the above volumes.

Tags - optional
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.

☒ Tag image and snapshots together
Tag the image and the snapshots with the same tag.

☐ Tag image and snapshots separately
Tag the image and the snapshots with different tags.

Рисунок 15 Ввід назви і опису образу

Owned by me		Search									
<input checked="" type="checkbox"/>	Name	AMI ID	AMI name	Source	Owner	Visibility	Status	Creation date			
<input checked="" type="checkbox"/>	-	ami-02dc1d128eba94647	images	292022959839/images	292022959839	Private	Pending			2021/12/20 02	

Рисунок 16 Результат створення AMI

```

1 terraform {
2     required_providers {
3         aws = {
4             source = "hashicorp/aws"
5             version = "~> 3.27"
6         }
7     }
8     required_version = ">= 0.14.9"
9 }
10
11 provider "aws" {
12     profile = "default"
13     region = "us-east-2"
14 }
15 resource "aws_instance" "web" {
16     ami           = "ami-830c94e3"
17     instance_type = "t2.micro"
18
19     tags = {
20         Name = "MyInstanceS"
21     }
22 }

```

Рисунок 17 Вміст файлу main.tf

```

+ delete_on_termination = (known after apply)
+ device_name           = (known after apply)
+ encrypted              = (known after apply)
+ iops                   = (known after apply)
+ kms_key_id             = (known after apply)
+ tags                  = (known after apply)
+ throughput             = (known after apply)
+ volume_id              = (known after apply)
+ volume_size            = (known after apply)
+ volume_type            = (known after apply)
}

Plan: 1 to add, 0 to change, 0 to destroy.

Do you want to perform these actions?
  Terraform will perform the actions described above.
  Only 'yes' will be accepted to approve.

  Enter a value: yes

aws_instance.web: Creating...
aws_instance.web: Still creating... [10s elapsed]
aws_instance.web: Still creating... [20s elapsed]
aws_instance.web: Still creating... [30s elapsed]
aws_instance.web: Creation complete after 31s [id=i-043b30b0fcd283045]

Apply complete! Resources: 1 added, 0 changed, 0 destroyed.

e:\programming\terraform\MyInstanceS>

```

Рисунок 18 Створення нового інстансу за допомогою Terraform

Instances (1/2)		Info									
		Filter instances									
<input type="checkbox"/>	Name	Instance ID	Instance state	Instance type	Status check	Alarm status	Availability Zone	Public IPv4 DNS	Public IPv4 ...	Elastic IP	
<input type="checkbox"/>	test	i-05d8de6e832ed1cbb	Running	t2.micro	2/2 checks passed	No alarms	us-east-2b	ec2-18-224-8-157.us-e...	18.224.8.157	-	
<input checked="" type="checkbox"/>	MyInstanceS	i-00fc277c398a416ee	Running	t2.micro	-	No alarms	us-east-2c	ec2-18-224-229-188.us...	18.224.229.188	-	

Рисунок 19 Результат створення віртуальних машин

Висновки

На цій лабораторній роботі я навчилась створювати віртуальні машини AWS, підключення до цих інстансів по SSH, а також автоматизувати створення EC2 за допомогою terraform/ansible.