



**Звіт до лабораторної роботи №4:**  
**«Встановлення Ansible та Terraform на робоче середовище»**  
з дисципліни «Інтеграція та адміністрування інформаційних систем»

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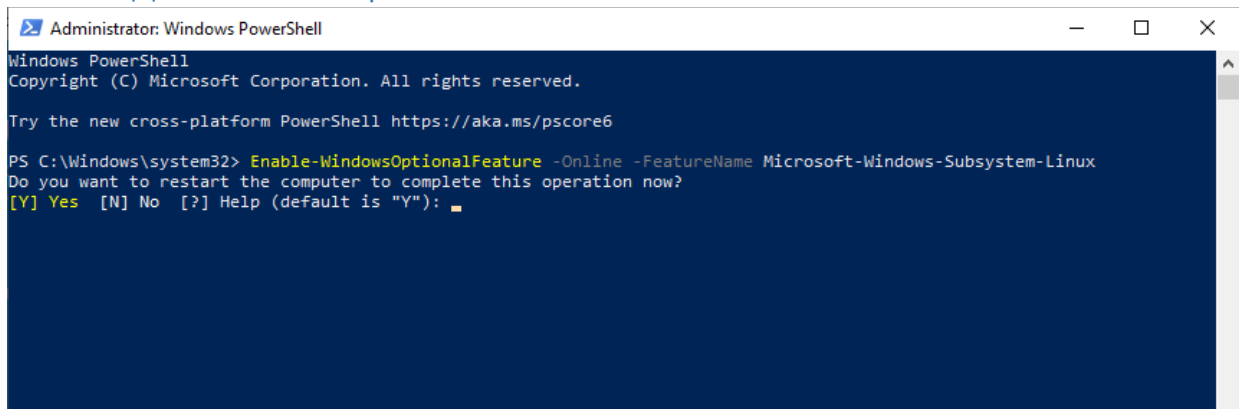
## Зміст

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## Мета роботи

Ознайомитись з поняттям IaC, встановити Ansible та Terraform, створити VPS з приватним та публічним сабнетом, а також автоматизувати створення VPS за допомогою Ansible/Terraform.

## Хід виконання роботи



```
Administrator: Windows PowerShell
Windows PowerShell
Copyright (C) Microsoft Corporation. All rights reserved.

Try the new cross-platform PowerShell https://aka.ms/pscore6

PS C:\Windows\system32> Enable-WindowsOptionalFeature -Online -FeatureName Microsoft-Windows-Subsystem-Linux
Do you want to restart the computer to complete this operation now?
[Y] Yes [N] No [?] Help (default is "Y"): 
```

Рисунок 1 Активація Linux subsystem

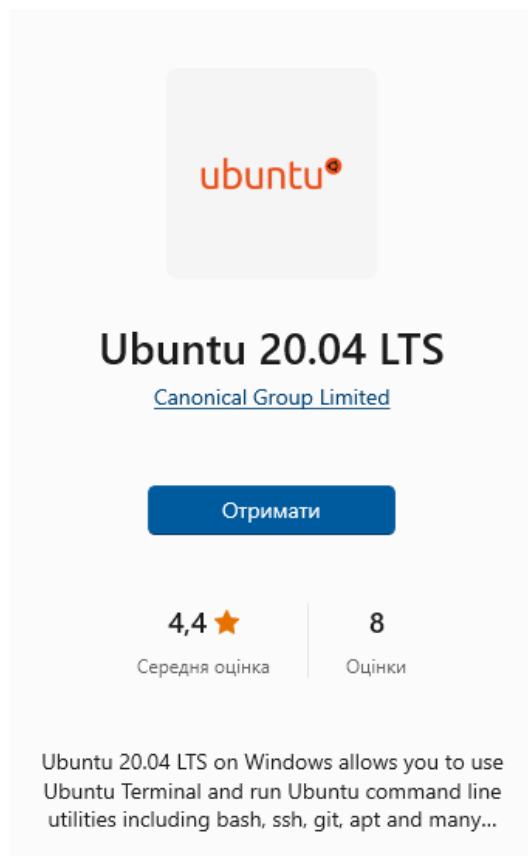


Рисунок 2 Отримання Linux з Microsoft Store

```
tkostk@DESKTOP-GOLVMLN: ~  
Installing, this may take a few minutes...  
Please create a default UNIX user account. The username does not need to match your Windows username.  
For more information visit: https://aka.ms/wslusers  
Enter new UNIX username: tkostiuk  
New password:  
Retype new password:  
passwd: password updated successfully  
Installation successful!  
To run a command as administrator (user "root"), use "sudo <command>".  
See "man sudo_root" for details.  
  
Welcome to Ubuntu 20.04.3 LTS (GNU/Linux 4.4.0-19041-Microsoft x86_64)  
  
 * Documentation:  https://help.ubuntu.com  
 * Management:    https://landscape.canonical.com  
 * Support:       https://ubuntu.com/advantage  
  
System information as of Sat Nov 20 20:08:29 EET 2021  
  
System load:  0.52      Processes:            7  
Usage of /home: unknown  Users logged in:      0  
Memory usage: 18%      IPv4 address for eth0: 192.168.0.105  
Swap usage:   0%  
  
1 update can be applied immediately.  
To see these additional updates run: apt list --upgradable  
  
The list of available updates is more than a week old.  
To check for new updates run: sudo apt update
```

*Рисунок 3 Перший логін в Linux subsystem*

```
tkostk@DESKTOP-GOLVMLN: ~  
tkostk@DESKTOP-GOLVMLN:~$ sudo apt install ansible  
Reading package lists... Done  
Building dependency tree  
Reading state information... Done  
The following additional packages will be installed:  
  ieee-data python3-argcomplete python3-crypto python3-dnspython python3-jmespath python3-kerberos python3-libcloud  
  python3-lockfile python3-netaddr python3-ntlm-auth python3-requests-kerberos python3-requests-ntlm python3-selinux  
  python3-winrm python3-xmltodict  
Suggested packages:  
  cowsay sshpass python-lockfile-doc ipython3 python-netaddr-docs  
The following NEW packages will be installed:  
  ansible ieee-data python3-argcomplete python3-crypto python3-dnspython python3-jmespath python3-kerberos  
  python3-libcloud python3-lockfile python3-netaddr python3-ntlm-auth python3-requests-kerberos python3-requests-ntlm  
  python3-selinux python3-winrm python3-xmltodict  
0 upgraded, 16 newly installed, 0 to remove and 86 not upgraded.  
Need to get 9644 kB of archives.  
After this operation, 90.2 MB of additional disk space will be used.  
Do you want to continue? [Y/n] _
```

*Рисунок 4 Встановлення Ansible*

```
C:\Windows\system32\cmd.exe
Microsoft Windows [Version 10.0.19043.1348]
(c) Корпорація Майкрософт. Усі права захищені.

C:\Users\Mazi>terraform -v
Terraform v1.0.11
on windows_amd64

C:\Users\Mazi>
```

Рисунок 5 Встановлення версія Terraform

### Allocate Elastic IP address [Info](#)

#### Elastic IP address settings [Info](#)

Public IPv4 address pool

- ☒ Amazon's pool of IPv4 addresses
- ☐ Public IPv4 address that you bring to your AWS account (option disabled because no pools found) [Learn more](#)
- ☐ Customer owned pool of IPv4 addresses (option disabled because no customer owned pools found) [Learn more](#)

Global static IP addresses

AWS Global Accelerator can provide global static IP addresses that are announced worldwide using anycast from AWS edge locations. This can help improve the availability and latency for your user traffic by using the Amazon global network. [Learn more](#)

[Create accelerator](#)

#### 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.

No tags associated with the resource.

[Add new tag](#)

You can add up to 50 more tag

[Cancel](#) [Allocate](#)

Рисунок 6 Виділення Elastic IP адреси

Elastic IP addresses (1/1)

Filter Elastic IP addresses

Public IPv4 address: 18.189.177.87

Clear filters

Actions

Allocate Elastic IP address

<input checked="" type="checkbox"/>	Name	Allocated IPv4 add...	Type	Allocation ID	Reverse DNS record	Associated instance ID	Private IP address
<input checked="" type="checkbox"/>	-	18.189.177.87	Public IP	eipalloc-0000cf580b09270df	-	-	-

Рисунок 7 Результат виділення IP адреси

Step 1: Select a VPC Configuration

VPC with a Single Public Subnet

VPC with Public and Private Subnets

VPC with Public and Private Subnets and Hardware VPN Access

VPC with a Private Subnet Only and Hardware VPN Access

In addition to containing a public subnet, this configuration adds a private subnet whose instances are not addressable from the Internet. Instances in the private subnet can establish outbound connections to the Internet via the public subnet using Network Address Translation (NAT).

**Creates:**

A /16 network with two /24 subnets. Public subnet instances use Elastic IPs to access the Internet. Private subnet instances access the Internet via Network Address Translation (NAT). (Hourly charges for NAT devices apply.)

Select

Рисунок 8 Створення VPC з публічним і приватним сабнетом

Step 2: VPC with Public and Private Subnets

IPv4 CIDR block: 10.0.0.0/16 (65531 IP addresses available)

IPv6 CIDR block:

No IPv6 CIDR Block

Amazon provided IPv6 CIDR block

IPv6 CIDR block owned by me

VPC name: test

Public subnet's IPv4 CIDR: 10.0.0.0/24 (251 IP addresses available)

Availability Zone:

No Preference

Public subnet name: Public subnet

Private subnet's IPv4 CIDR: 10.0.1.0/24 (251 IP addresses available)

Availability Zone:

No Preference

Private subnet name: Private subnet

You can add more subnets after Amazon Web Services creates the VPC.

Specify the details of your NAT gateway (NAT gateway rates apply).

Elastic IP Allocation ID: eipalloc-0000cf580b09270df

Service endpoints

Add Endpoint

Enable DNS hostnames: Yes No

Hardware tenancy: Default

Рисунок 9 Налаштування VPC

```
C:\Windows\system32\cmd.exe
Microsoft Windows [Version 10.0.19043.1348]
(c) Корпорація Майкрософт. Усі права захищені.

C:\Users\Mazi>cd "C:\Program Files\Amazon\AWSCLI\bin\"

C:\Program Files\Amazon\AWSCLI\bin>aws
Note: AWS CLI version 2, the latest major version of the AWS CLI, is now stable and recommended for general use. For more
information, see the AWS CLI version 2 installation instructions at: https://docs.aws.amazon.com/cli/latest/userguide/
install-cliv2.html

usage: aws [options] <command> [<subcommand> ...] [parameters]
To see help text, you can run:

    aws help
    aws <command> help
    aws <command> <subcommand> help
aws: error: the following arguments are required: command

C:\Program Files\Amazon\AWSCLI\bin>
```

Рисунок 10 Провірка встановлення AWS CLI

```
C:\Windows\System32\cmd.exe
Microsoft Windows [Version 10.0.19043.1348]
(c) Корпорація Майкрософт. Усі права захищені.

e:\programming\terraform\test>terraform init

Initializing the backend...

Initializing provider plugins...
- Finding hashicorp/aws versions matching "~> 3.27"...
- Installing hashicorp/aws v3.66.0...
- Installed hashicorp/aws v3.66.0 (signed by HashiCorp)

Terraform has created a lock file .terraform.lock.hcl to record the provider
selections it made above. Include this file in your version control repository
so that Terraform can guarantee to make the same selections by default when
you run "terraform init" in the future.

Terraform has been successfully initialized!

You may now begin working with Terraform. Try running "terraform plan" to see
any changes that are required for your infrastructure. All Terraform commands
should now work.

If you ever set or change modules or backend configuration for Terraform,
rerun this command to reinitialize your working directory. If you forget, other
commands will detect it and remind you to do so if necessary.

e:\programming\terraform\test>
```

Рисунок 11 Ініціалізація проекту Terraform

```
C:\Windows\System32\cmd.exe

+ 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.terraform: Creating...
aws_instance.terraform: Still creating... [10s elapsed]
aws_instance.terraform: Still creating... [20s elapsed]
aws_instance.terraform: Still creating... [30s elapsed]
aws_instance.terraform: Still creating... [40s elapsed]
aws_instance.terraform: Still creating... [50s elapsed]
aws_instance.terraform: Still creating... [1m0s elapsed]
aws_instance.terraform: Still creating... [1m10s elapsed]
aws_instance.terraform: Creation complete after 1m15s [id=i-06cdf847197479551]

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

e:\programming\terraform\test>
```

Рисунок 12 Створення інфраструктури за допомогою Terraform



## Висновки

В даній лабораторній роботі я ознайомилась з поняттям IaC, встановила Ansible та Terraform, створила VPC з приватним та публічним сабнетом, а також автоматизувала створення VPC за допомогою Ansible/Terraform.