

VPC LAB

VPC Configuration Lab

- **Objective:** To understand the fundamentals of AWS networking through the configuration of a Virtual Private Cloud (VPC).
- **Approach:** Students will create a new VPC, add subnets, set up an Internet Gateway, and configure route tables. The lab might also include setting up a simple EC2 instance within this VPC to demonstrate how resources are deployed in a custom network environment.
- **Goal:** By the end of this lab, students should be able to create and configure a VPC, understand subnetting, and the role of route tables and internet gateways in AWS.

1. Create a new VPC with the following settings.

VPC settings

Resources to create [Info](#)
Create only the VPC resource or the VPC and other networking resources.

☒ VPC only ☐ VPC and more

Name tag - optional
Creates a tag with a key of 'Name' and a value that you specify.

vpc-lab-03

IPv4 CIDR block [Info](#)
☒ IPv4 CIDR manual input
☐ IPAM-allocated IPv4 CIDR block

IPv4 CIDR
10.0.0.0/16
CIDR block size must be between /16 and /28.

IPv6 CIDR block [Info](#)
☒ No IPv6 CIDR block
☐ IPAM-allocated IPv6 CIDR block
☐ Amazon-provided IPv6 CIDR block
☐ IPv6 CIDR owned by me

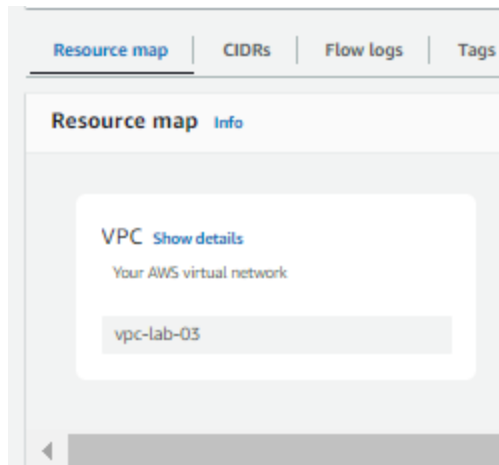
Tenancy [Info](#)
Default

Tags

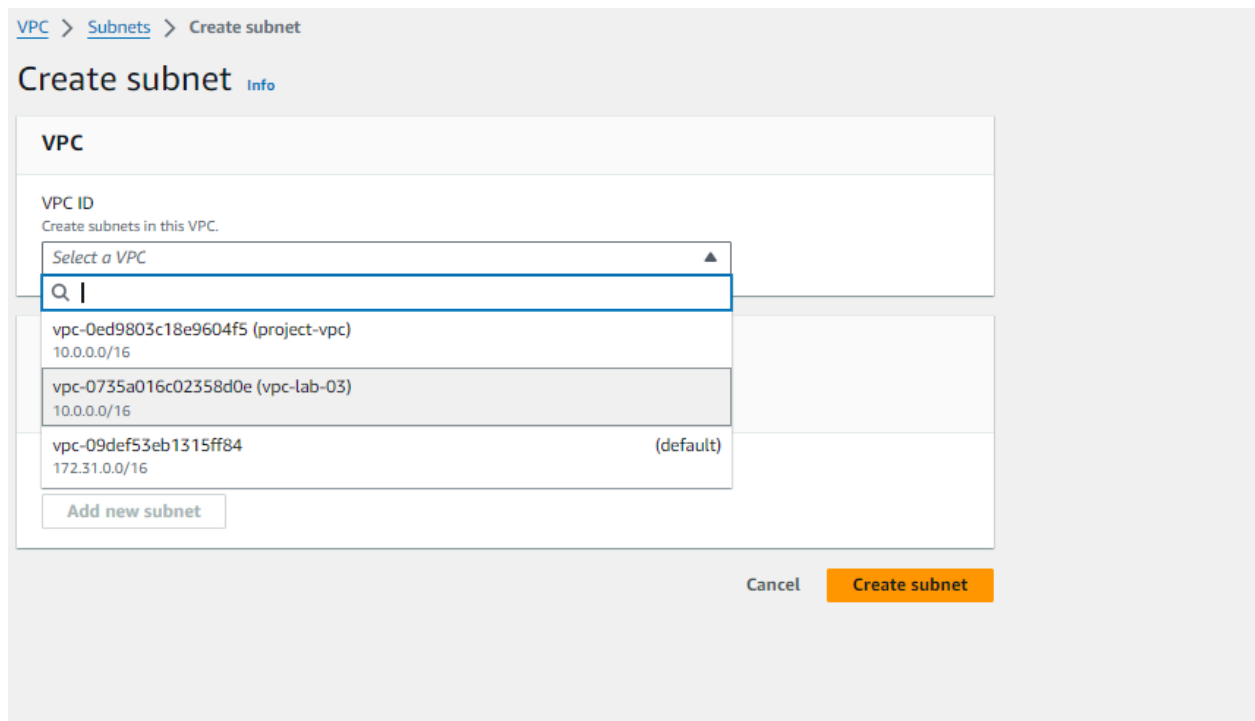
A tag is a label that you assign to an AWS resource. Each tag consists of a key and an optional value. You can use tags to search and filter your resources or track your AWS costs.

Key	Value - optional	
<input type="text" value="Name"/>	<input type="text" value="vpc-lab-03"/>	<input type="button" value="Remove tag"/>

You can add 49 more tags.



2. Create a new subnet public and private



3. Subnet settings should be used as follows.

Subnet settings

Specify the CIDR blocks and Availability Zone for the subnet.

Subnet 1 of 2

Subnet name

Create a tag with a key of 'Name' and a value that you specify.

The name can be up to 256 characters long.

Availability Zone [Info](#)

Choose the zone in which your subnet will reside, or let Amazon choose one for you.

IPv4 VPC CIDR block [Info](#)

Choose the VPC's IPv4 CIDR block for the subnet. The subnet's IPv4 CIDR must lie within this block.

IPv4 subnet CIDR block

256 IPs

< > ^ v

▼ Tags - optional

Key

×

Value - optional

×

Remove

Add new tag

You can add 49 more tags.

Remove

Subnet 2 of 2

Subnet name

Create a tag with a key of 'Name' and a value that you specify.

Upesh Private Subnet

The name can be up to 256 characters long.

Availability Zone [Info](#)

Choose the zone in which your subnet will reside, or let Amazon choose one for you.

US East (N. Virginia) / us-east-1e

IPv4 VPC CIDR block [Info](#)

Choose the VPC's IPv4 CIDR block for the subnet. The subnet's IPv4 CIDR must lie within this block.

10.0.0.0/16

IPv4 subnet CIDR block

10.0.1.0/24256 IPs

<>^v

▼ Tags - optional

Key

Value - optional

Q NameX

Q Upesh Private SubnetX

Remove

Add new tag

You can add 49 more tags.

Remove

Add new subnet

Create subnet

Subnet ID : subnet-024085931bb7e6e5e

Subnet ID : subnet-0c23142e554986349

< 1 > 

◀ [REDACTED] ▶
◀ ▶

4. You can now create an internet gateway.

[VPC](#) > [Internet gateways](#) > Create internet gateway

Create internet gateway [Info](#)

An internet gateway is a virtual router that connects a VPC to the internet. To create a new internet gateway specify the name for the gateway below.

Internet gateway settings

Name tag

Creates a tag with a key of 'Name' and a value that you specify.

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.

Key

Value - optional

Remove

Add new tag

You can add 49 more tags.

Cancel

Create internet gateway

VPC > Internet gateways > igw-0b6ee365cae48b1d1

igw-0b6ee365cae48b1d1 / for-vpclab-gateway Actions ▼

Details [Info](#)

Internet gateway ID igw-0b6ee365cae48b1d1	State Detached	VPC ID -	Owner 979147213970
--	-------------------	-------------	-----------------------

Tags Manage tags

< 1 >

⚙

Key	Value
Name	for-vpclab-gateway

4. Attach that internet gateway to VPC.

VPC > Internet gateways > Attach to VPC (igw-0b6ee365cae48b1d1)

Attach to VPC (igw-0b6ee365cae48b1d1) [Info](#)

VPC
Attach an internet gateway to a VPC to enable the VPC to communicate with the internet. Specify the VPC to attach below.

Available VPCs
Attach the internet gateway to this VPC.

[▶ AWS Command Line Interface command](#)

Cancel Attach internet gateway

igw-0b6ee365cae48b1d1 / for-vpclab-gateway

Actions ▼

Details Info			
Internet gateway ID igw-0b6ee365cae48b1d1	State Attached	VPC ID vpc-0735a016c02358d0e vpc-lab-03	Owner 979147213970

Tags		Manage tags	
<input type="text" value="Search tags"/>		< 1 > ⚙	
Key	Value		
Name	for-vpclab-gateway		

5. Create the new route table now

[VPC](#) > [Route tables](#) > Create route table

Create route table [Info](#)

A route table specifies how packets are forwarded between the subnets within your VPC, the internet, and your VPN connection.

Route table settings

Name - *optional*

Create a tag with a key of 'Name' and a value that you specify.

VPC

The VPC to use for this route table.

Tags

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.

Key

Value - *optional*

You can add 49 more tags.

6. Use public subnet for explicit associations

Routes

Subnet associations

Edge associations

Route propagation

Tags

Explicit subnet associations (0)

Edit subnet associations

Find subnet association

< 1 > ⚙

Name	Subnet ID	IPv4 CIDR	IPv6 CIDR
No subnet associations			
You do not have any subnet associations.			

Subnets without explicit associations (2)

Edit subnet associations

The following subnets have not been explicitly associated with any route tables and are therefore associated with the main route table:

Find subnet association

< 1 > ⚙

Name	Subnet ID	IPv4 CIDR	IPv6 CIDR
Upesh Public subnet	subnet-024085931bb7e...	10.0.0.0/24	–
Upesh Private Subnet	subnet-0c23142e55498...	10.0.1.0/24	–

VPC > Route tables > [rtb-08c5fc60c3949e599](#) > Edit subnet associations

Edit subnet associations

Change which subnets are associated with this route table.

Available subnets (1/2)

Filter subnet associations

< 1 > ⚙

	Name	Subnet ID	IPv4 CIDR	IPv6 CIDR	Route table ID
<input checked="" type="checkbox"/>	Upesh Public subnet	subnet-024085931bb7e...	10.0.0.0/24	–	Main (rtb-001390b8d7cdfc73
<input type="checkbox"/>	Upesh Private Subnet	subnet-0c23142e55498...	10.0.1.0/24	–	Main (rtb-001390b8d7cdfc73

Selected subnets

subnet-024085931bb7e6e5e / Upesh Public subnet

✕

Cancel

Save associations

Routes

Subnet associations

Edge associations

Route propagation

Tags

Explicit subnet associations (1)

Edit subnet associations

Find subnet association

< 1 >

Name	Subnet ID	IPv4 CIDR	IPv6 CIDR
Upesh Public subnet	subnet-024085931bb7e...	10.0.0.0/24	–

Subnets without explicit associations (1)

Edit subnet associations

Find subnet association

< 1 >

The following subnets have not been explicitly associated with any route tables and are therefore associated with the main route table:

Name	Subnet ID	IPv4 CIDR	IPv6 CIDR
Upesh Private Subnet	subnet-0c23142e55498...	10.0.1.0/24	–

VPC > Route tables > [rtb-08c5fc60c3949e599](#) > Edit routes

Edit routes

Route 1

Destination

10.0.0.0/16

Propagated

No

Target

local

Find local

Status

Active

Add route

Cancel

Preview

Save changes

7. Use new route to be accessible through the internet

VPC > Route tables > [rtb-08c5fc60c3949e599](#) > Edit routes

Edit routes

Route 1

Destination

10.0.0.0/16

Target

local

Q local

Status

Active

Propagated

No

Route 2

Destination

Q 0.0.0.0/0

Target

Internet Gateway

Q igw-0b6ee365cae48b1d1

Status

-

Propagated

No

Add route

Remove

Cancel

Preview

Save changes

8. EC2 Instance

Launch an instance [Info](#)

Amazon EC2 allows you to create virtual machines, or instances, that run on the AWS Cloud. Quickly get started by following the simple steps below.

Name and tags [Info](#)


Name

MyVpcLabInstance

[Add additional tags](#)

▼ Application and OS Images (Amazon Machine Image) [Info](#)

An AMI is a template that contains the software configuration (operating system, application server, and applications) required to launch your instance. Search or Browse for AMIs if you don't see what you are looking for below

 Search our full catalog including 1000s of application and OS images

Recents

Quick Start



[Browse more AMIs](#)

Including AMIs from
AWS, Marketplace and
the Community

Amazon Machine Image (AMI)

Amazon Linux 2023 AMI

ami-0440d3b780d96b29d (64-bit (x86), uefi-preferred) / ami-0f93c02efd1974b8b (64-bit (Arm), uefi)
Virtualization: hvm ENA enabled: true Root device type: ebs

Free tier eligible



Description

Amazon Linux 2023 AMI 2023.3.20240219.0 x86_64 HVM kernel-6.1

Create key pair



Key pair name

Key pairs allow you to connect to your instance securely.

Enter key pair name

The name can include up to 255 ASCII characters. It can't include leading or trailing spaces.

Key pair type



RSA

RSA encrypted private and public key pair



ED25519

ED25519 encrypted private and public key pair

Private key file format



.pem

For use with OpenSSH



.ppk

For use with PuTTY



When prompted, store the private key in a secure and accessible location on your computer. **You will need it later to connect to your instance.** [Learn more](#)

Cancel

Create key pair

▼ Network settings Info

VPC - required Info

vpc-0735a016c02358d0e (vpc-lab-03)
10.0.0.0/16

▼

↻

Subnet Info

subnet-024085931bb7e6e5e
VPC: vpc-0735a016c02358d0e Owner: 979147213970 Availability Zone: us-east-1f
IP addresses available: 251 CIDR: 10.0.0.0/24

Upesh Public subnet
▼

↻ Create new subnet

Auto-assign public IP Info

Enable

▼

Firewall (security groups) Info

A security group is a set of firewall rules that control the traffic for your instance. Add rules to allow specific traffic to reach your instance.

☒ Create security group

☐ Select existing security group

Security group name - required

Vpclabsecuritygroup

This security group will be added to all network interfaces. The name can't be edited after the security group is created. Max length is 255 characters. Valid characters: a-z, A-Z, 0-9, spaces, and .-:/()#,@!+=&:()!\$*

Description - required Info

launch-wizard-5 created 2024-02-26T15:50:03.336Z

Inbound Security Group Rules

▼ Security group rule 1 (TCP, 22, 0.0.0.0/0)

Remove

Type [Info](#)

ssh

Protocol [Info](#)

TCP

Port range [Info](#)

22

Source type [Info](#)

Anywhere

Source [Info](#)

Q Add CIDR, prefix list or security group

0.0.0.0/0 X

Description - optional [Info](#)

e.g. SSH for admin desktop

▼ Security group rule 2 (TCP, 80, 0.0.0.0/0)

Remove

Type [Info](#)

HTTP

Protocol [Info](#)

TCP

Port range [Info](#)

80

Source type [Info](#)

Anywhere

Source [Info](#)

Q Add CIDR, prefix list or security group

0.0.0.0/0 X

Description - optional [Info](#)

e.g. SSH for admin desktop

[EC2](#) > [Instances](#) > Launch an instance

○ Launching instance
Creating security groups

14%

► Details

Please wait while we launch your instance.
Do not close your browser while this is loading.


```
# Amazon Linux 2023  
https://aws.amazon.com/linux/amazon-linux-2023
```

```
Last login: Mon Feb 26 16:04:16 2024 from 18.206.107.28  
[ec2-user@ip-10-0-0-81 ~]$ sudo yum update  
Last metadata expiration check: 0:05:48 ago on Mon Feb 26 16:00:06 2024.  
Dependencies resolved.  
Nothing to do.  
Complete!  
[ec2-user@ip-10-0-0-81 ~]$ sudo yum install httpd  
Last metadata expiration check: 0:06:30 ago on Mon Feb 26 16:00:06 2024.  
Dependencies resolved.
```

Package	Architecture	Version	Repository	Size
Installing:				
httpd	x86_64	2.4.58-1.amzn2023	amazonlinux	47 k
Installing dependencies:				
apr	x86_64	1.7.2-2.amzn2023.0.2	amazonlinux	129 k
apr-util	x86_64	1.6.3-1.amzn2023.0.1	amazonlinux	98 k
generic-logos-httpd	noarch	18.0.0-12.amzn2023.0.3	amazonlinux	19 k
httpd-core	x86_64	2.4.58-1.amzn2023	amazonlinux	1.4 M
httpd-filesystem	noarch	2.4.58-1.amzn2023	amazonlinux	14 k
httpd-tools	x86_64	2.4.58-1.amzn2023	amazonlinux	81 k
libbrotili	x86_64	1.0.9-4.amzn2023.0.2	amazonlinux	315 k
mailcap	noarch	2.1.49-3.amzn2023.0.3	amazonlinux	33 k
Installing weak dependencies:				
apr-util-openssl	x86_64	1.6.3-1.amzn2023.0.1	amazonlinux	17 k
mod_http2	x86_64	2.0.11-2.amzn2023	amazonlinux	150 k
mod_lua	x86_64	2.4.58-1.amzn2023	amazonlinux	61 k
Transaction Summary				
Install 12 Packages				
Total download size: 2.3 M				
Installed size: 6.9 M				
Is this ok [y/N]:				

```

Total                                                                 9.8 MB/s | 2.3 MB    00:00
Running transaction check
Transaction check succeeded.
Running transaction test
Transaction test succeeded.
Running transaction
  Preparing      :                                1/1
  Installing     : apr-1.7.2-2.amzn2023.0.2.x86_64 1/12
  Installing     : apr-util-openssl-1.6.3-1.amzn2023.0.1.x86_64 2/12
  Installing     : apr-util-1.6.3-1.amzn2023.0.1.x86_64 3/12
  Installing     : mailcap-2.1.49-3.amzn2023.0.3.noarch 4/12
  Installing     : httpd-tools-2.4.58-1.amzn2023.x86_64 5/12
  Running scriptlet: httpd-filesystem-2.4.58-1.amzn2023.noarch 6/12
  Installing     : httpd-filesystem-2.4.58-1.amzn2023.noarch 6/12
  Installing     : httpd-core-2.4.58-1.amzn2023.x86_64 7/12
  Installing     : mod_lua-2.4.58-1.amzn2023.x86_64 8/12
  Installing     : mod_http2-2.0.11-2.amzn2023.x86_64 9/12
  Installing     : generic-logos-httpd-18.0.0-12.amzn2023.0.3.noarch 10/12
  Installing     : libbrotli-1.0.9-4.amzn2023.0.2.x86_64 11/12
  Installing     : httpd-2.4.58-1.amzn2023.x86_64 12/12
  Running scriptlet: httpd-2.4.58-1.amzn2023.x86_64 12/12
  Verifying      : httpd-core-2.4.58-1.amzn2023.x86_64 1/12
  Verifying      : apr-util-1.6.3-1.amzn2023.0.1.x86_64 2/12
  Verifying      : mod_lua-2.4.58-1.amzn2023.x86_64 3/12
  Verifying      : apr-1.7.2-2.amzn2023.0.2.x86_64 4/12
  Verifying      : httpd-tools-2.4.58-1.amzn2023.x86_64 5/12
  Verifying      : libbrotli-1.0.9-4.amzn2023.0.2.x86_64 6/12
  Verifying      : mod_http2-2.0.11-2.amzn2023.x86_64 7/12
  Verifying      : httpd-2.4.58-1.amzn2023.x86_64 8/12
  Verifying      : apr-util-openssl-1.6.3-1.amzn2023.0.1.x86_64 9/12
  Verifying      : generic-logos-httpd-18.0.0-12.amzn2023.0.3.noarch 10/12
  Verifying      : mailcap-2.1.49-3.amzn2023.0.3.noarch 11/12
  Verifying      : httpd-filesystem-2.4.58-1.amzn2023.noarch 12/12

Installed:
apr-1.7.2-2.amzn2023.0.2.x86_64          apr-util-1.6.3-1.amzn2023.0.1.x86_64
apr-util-openssl-1.6.3-1.amzn2023.0.1.x86_64  generic-logos-httpd-18.0.0-12.amzn2023.0.3.noarch
httpd-2.4.58-1.amzn2023.x86_64          httpd-core-2.4.58-1.amzn2023.x86_64
httpd-filesystem-2.4.58-1.amzn2023.noarch httpd-tools-2.4.58-1.amzn2023.x86_64
libbrotli-1.0.9-4.amzn2023.0.2.x86_64  mailcap-2.1.49-3.amzn2023.0.3.noarch
mod_http2-2.0.11-2.amzn2023.x86_64     mod_lua-2.4.58-1.amzn2023.x86_64

Complete!
[ec2-user@ip-10-0-0-81 ~]$

```

```

Complete!
ec2-user@ip-10-0-0-81 ~]$ sudo service httpd start
Redirecting to /bin/systemctl start httpd.service
ec2-user@ip-10-0-0-81 ~]$ sudo service httpd status
Redirecting to /bin/systemctl status httpd.service
httpd.service - The Apache HTTP Server
   Loaded: loaded (/usr/lib/systemd/system/httpd.service; disabled; preset: disabled)
   Active: active (running) since Mon 2024-02-26 16:08:36 UTC; 41s ago
     Docs: man:httpd.service(8)
  Main PID: 26381 (httpd)
    Status: "Total requests: 0; Idle/Busy workers 100/0; Requests/sec: 0; Bytes served/sec: 0 B/sec"
    Tasks: 177 (limit: 1114)
   Memory: 13.3M
      CPU: 90ms
  CGroup: /system.slice/httpd.service
          └─26381 /usr/sbin/httpd -DFOREGROUND
            └─26382 /usr/sbin/httpd -DFOREGROUND
              └─26383 /usr/sbin/httpd -DFOREGROUND
                └─26384 /usr/sbin/httpd -DFOREGROUND
                  └─26385 /usr/sbin/httpd -DFOREGROUND

Feb 26 16:08:36 ip-10-0-0-81.ec2.internal systemd[1]: Starting httpd.service - The Apache HTTP Server...
Feb 26 16:08:36 ip-10-0-0-81.ec2.internal systemd[1]: Started httpd.service - The Apache HTTP Server.
Feb 26 16:08:36 ip-10-0-0-81.ec2.internal httpd[26381]: Server configured, listening on: port 80
ec2-user@ip-10-0-0-81 ~]$

```

8. Create a new instance using Windows tier architecture for using RDP.

[EC2](#) > [Instances](#) > Launch an instance

Launch an instance [Info](#)

Amazon EC2 allows you to create virtual machines, or instances, that run on the AWS Cloud. Quickly get started by following the simple steps below.

Name and tags [Info](#)

Name

VPCLAB2

[Add additional tags](#)


▼ Application and OS Images (Amazon Machine Image) [Info](#)

An AMI is a template that contains the software configuration (operating system, application server, and applications) required to launch your instance. Search or Browse for AMIs if you don't see what you are looking for below


Recents

Quick Start


Amazon Linux




macOS




Ubuntu




Windows




Red Hat



SUSE L





[Browse more AMIs](#)

Including AMIs from AWS, Marketplace and the Community

Amazon Machine Image (AMI)

Microsoft Windows Server 2022 Base

Free tier eligible ▼

ami-0f9c44e98edf38a2b (64-bit (x86))

Virtualization: hvm ENA enabled: true Root device type: ebs

Description

▼ Network settings [Info](#)

VPC - required [Info](#)

vpc-0735a016c02358d0e (vpc-lab-03)
10.0.0.0/16



Subnet [Info](#)

subnet-024085931bb7e6e5e Upesh Public subnet
VPC: vpc-0735a016c02358d0e Owner: 979147213970
Availability Zone: us-east-1f IP addresses available: 250 CIDR: 10.0.0.0/24



[Create new subnet](#)

Auto-assign public IP [Info](#)

Enable

Firewall (security groups) [Info](#)

A security group is a set of firewall rules that control the traffic for your instance. Add rules to allow specific traffic to reach your instance.

☐ Create security group

☒ Select existing security group

Common security groups [Info](#)

Select security groups



[Compare security group rules](#)

Vpclabsecuritygroup sg-0aba152998b461555 ✕
VPC: vpc-0735a016c02358d0e

Security groups that you add or remove here will be added to or removed from all your network interfaces.

► [Advanced network configuration](#)

9. Use get password to decrypt password from key pair and and download the rdp file. You can access the server from that RDP file.

[EC2](#) > [Instances](#) > [i-09199348442bf5aba](#) > [Connect to instance](#)



Connect to instance [Info](#)


Connect to your instance i-09199348442bf5aba (VPCLAB2) using any of these options

Session Manager

RDP client


EC2 serial console

 You may not be able to connect to this instance as ports 3389 may need to be open in order to be accessible. The current associated security groups don't have ports 3389 open. 


Instance ID
 i-09199348442bf5aba (VPCLAB2)

Connection Type


☒ **Connect using RDP client**
Download a file to use with your RDP client and retrieve your password.


☐ **Connect using Fleet Manager**
To connect to the instance using Fleet Manager Remote Desktop, the SSM Agent must be installed and running on the instance. For more information, see [Working with SSM Agent](#) 

You can connect to your Windows instance using a remote desktop client of your choice, and by downloading and running the RDP shortcut file below:


 **Download remote desktop file**

When prompted, connect to your instance using the following username and password:

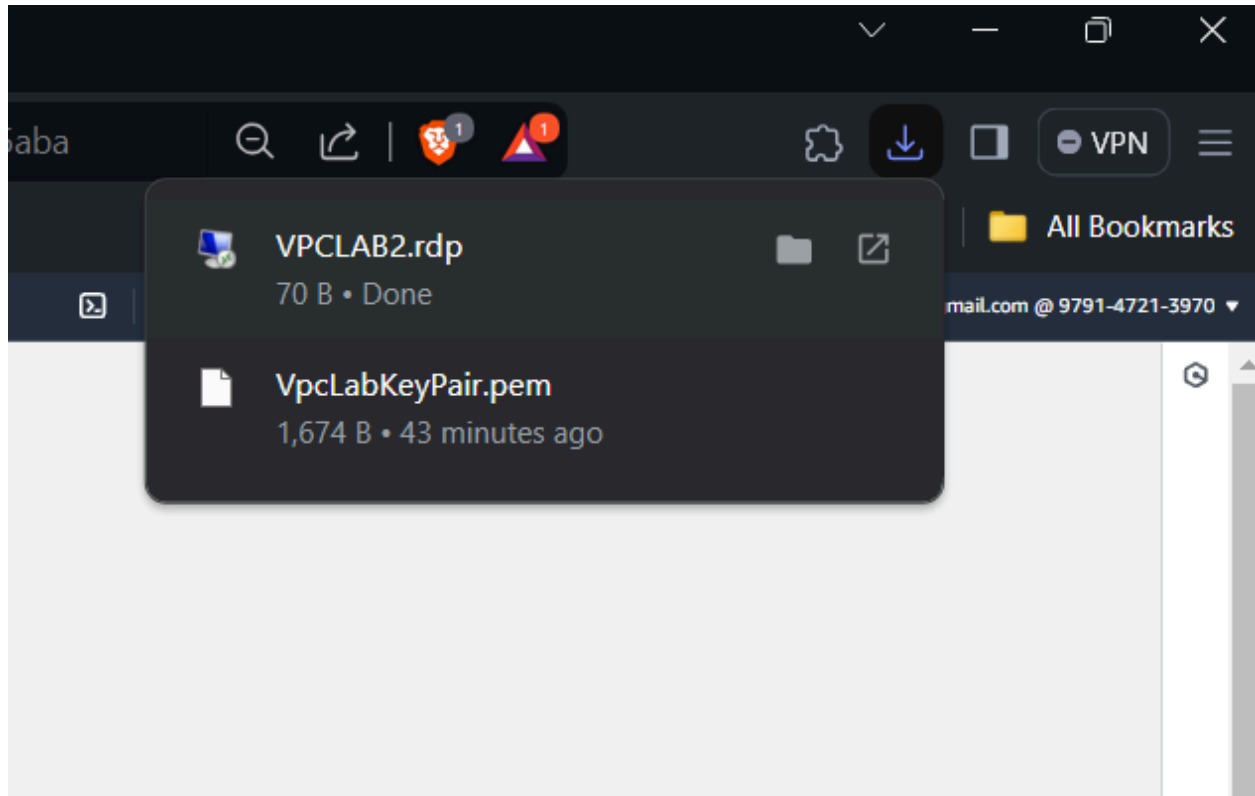
Public IP
 44.201.96.145

Username [Info](#)
 Administrator ▼

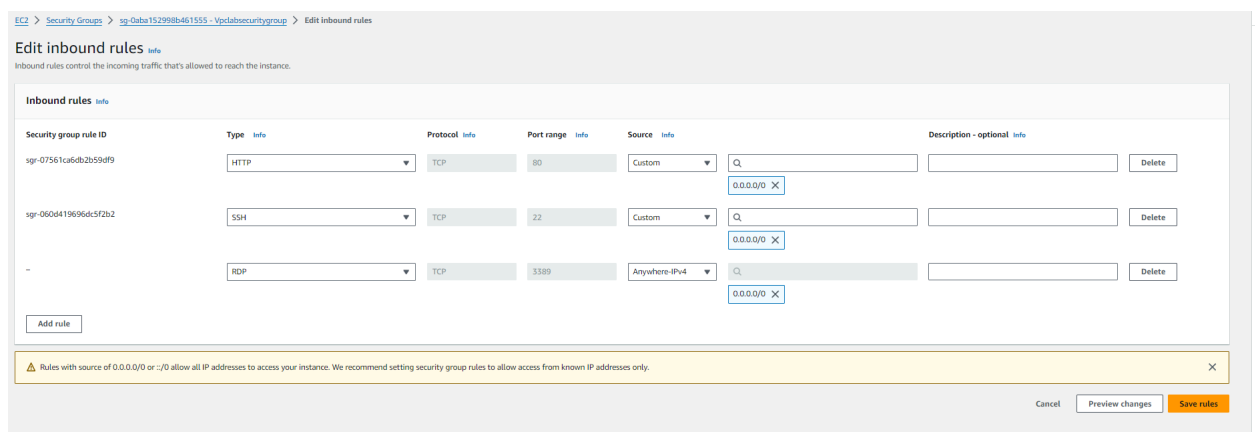
Password **Get password**


 If you've joined your instance to a directory, you can use your directory credentials to connect to your instance.

Cancel



10 . Change the inbound rules to adjust the RDP to be accessible from everywhere.





Hostname : EC2AMAZ-1ULH66I
Instance ID : i-09199348442bf5aba
Private IP Address : 10.0.0.49
Public IP Address : 44.201.96.145
Instance Size : t2.micro
Availability Zone : us-east-1f
Architecture : AMD64
Total Memory : 1024
Network : Low to Moderate