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Date:9/1/24

## Prcatical 1:Infrastrucutre as a service using AWS

### Writeup:

- **Cloud Computing Architecture:** Cloud computing architecture refers to the structure and design of the components and systems that make up a cloud computing environment. It encompasses various layers and components that work together to provide cloud services. The architecture can be broadly categorized into the following layers:  
**Cloud Service Models:**
  1. **IaaS (Infrastructure as a Service):** Virtualized computing resources (e.g., Amazon EC2).
  2. **PaaS (Platform as a Service):** Development tools and runtime environment (e.g., Google App Engine).
  3. **SaaS (Software as a Service):** Fully functional software over the internet (e.g., Microsoft 365).
    - a. **Cloud Deployment Models:**
  4. **Public Cloud:** Services available to the public over the internet (owned by a third-party provider).
  5. **Private Cloud:** Resources exclusively used by a single organization.
  6. **Hybrid Cloud:** Combination of public and private cloud resources.
- **IaaS (Infrastructure as a Service):** Infrastructure as a Service (IaaS) is one of the three main categories of cloud computing services, alongside Platform as a Service (PaaS) and Software as a Service (SaaS). IaaS provides virtualized computing resources over the internet, allowing users to rent infrastructure components such as virtual machines, storage, and networking.
- **AWS (Amazon Web Services):** Amazon Web Services (AWS) is a comprehensive and widely used cloud computing platform provided by Amazon. It offers a broad set of services, including computing power, storage, databases, machine learning, analytics, networking, security, and more. AWS enables organizations to build, deploy, and scale applications and services in a highly flexible, cost-effective, and reliable manner.
- **AWS Services:**
  1. Compute Services:
    - Amazon EC2 (Elastic Compute Cloud): Virtual servers in the cloud, allowing users to run applications.
    - AWS Lambda: Serverless computing service, enabling running code without provisioning or managing servers.
  2. Storage Services:
    - Amazon S3 (Simple Storage Service): Scalable object storage for storing and retrieving data.
    - Amazon EBS (Elastic Block Store): Persistent block-level storage for use with EC2 instances.

- Amazon Glacier: Low-cost, secure storage for archiving data.
3. Internet of Things (IoT):
    - AWS IoT Core: Managed cloud service for connecting devices to the cloud.
    - Amazon FreeRTOS: Operating system for microcontrollers.
  4. Application Integration:
    - Amazon SNS (Simple Notification Service): Fully managed messaging service.
    - Amazon SQS: Managed message queuing service.
  5. Security:
    - AWS Identity and Access Management (IAM): Manages user identities and access to AWS resources.

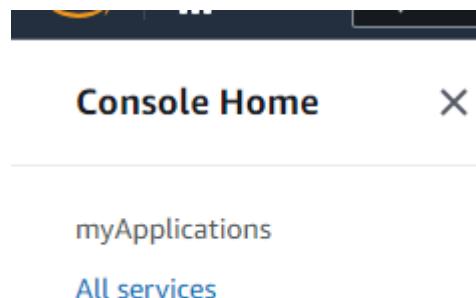
**EC2:** Amazon EC2 (Elastic Compute Cloud) is a central component of Amazon Web Services (AWS) and provides resizable compute capacity in the cloud. EC2 enables users to run virtual servers, known as instances, to host applications and services. EC2 instances can be configured with various computing resources, allowing users to scale their applications up or down based on demand. Here are key features and concepts related to Amazon EC2:

1. Instances:
  - Instance Types: EC2 instances come in various types optimized for different use cases, such as compute-optimized, memory-optimized, storage-optimized, and GPU instances.
2. Instance States:
  - Running: The instance is actively running and incurring charges.
  - Stopped: The instance is stopped, and users do not incur charges for compute resources. However, storage charges may apply.
3. Key Pairs:
  - SSH Access: EC2 instances are accessed using key pairs. Users must provide the private key when connecting to instances.

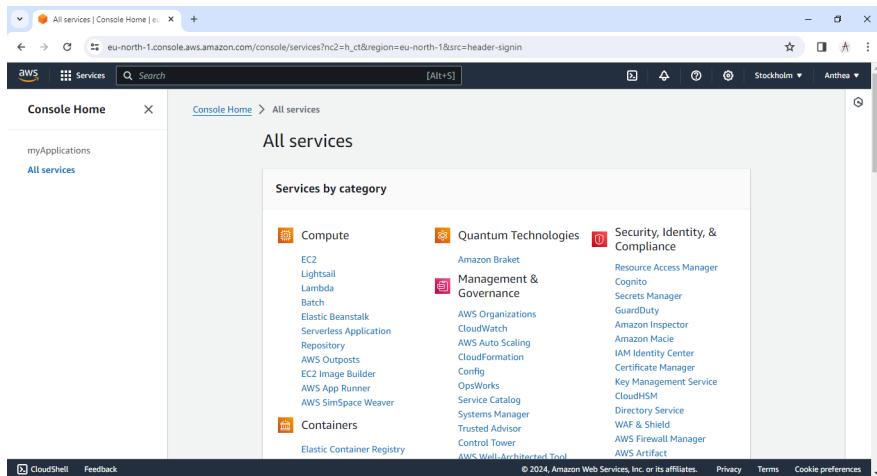
### Question 1:

#### STEPS:

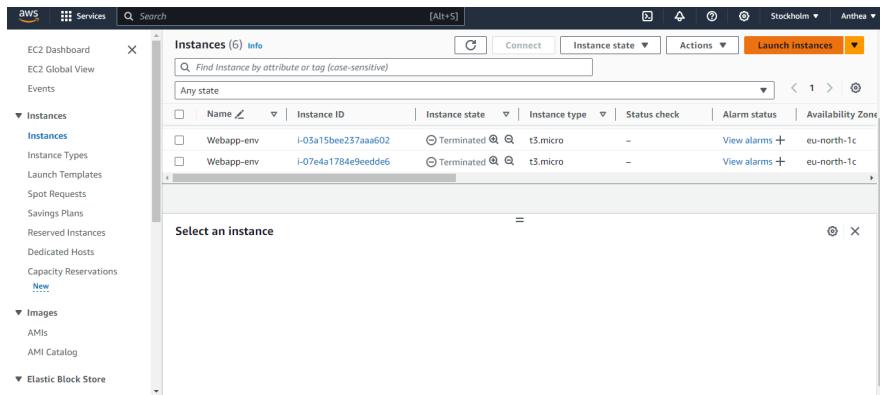
- 1) Sign into your AWS account
- 2) Select all services



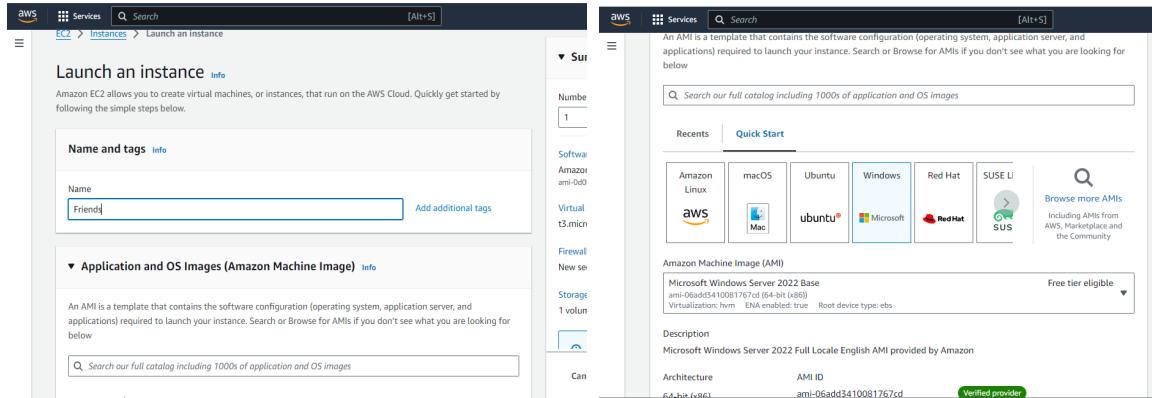
- 3) Select EC2

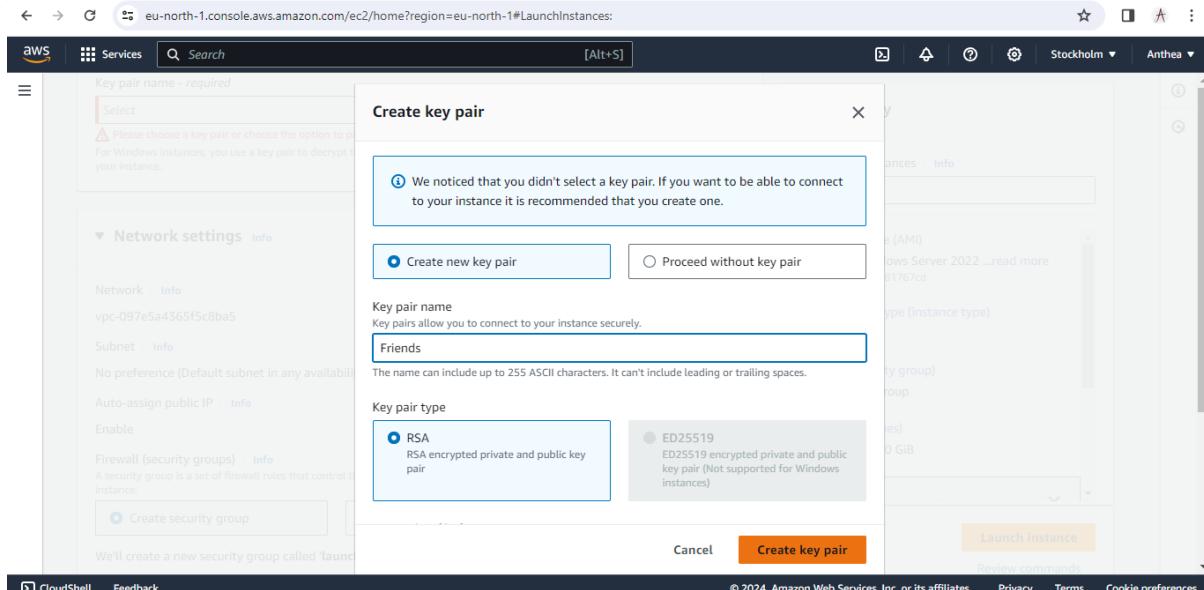


#### 4) Launch a Instance



5) Write name, Select windows and create a key value pair

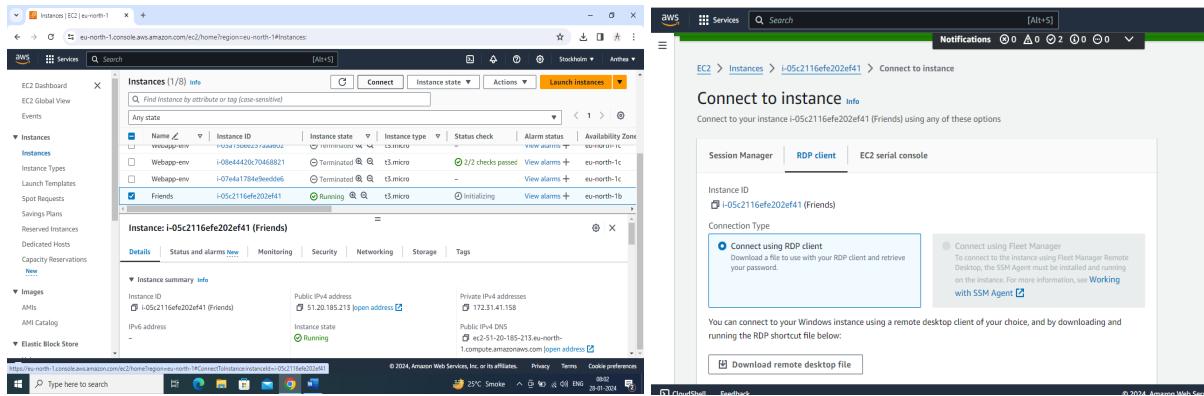




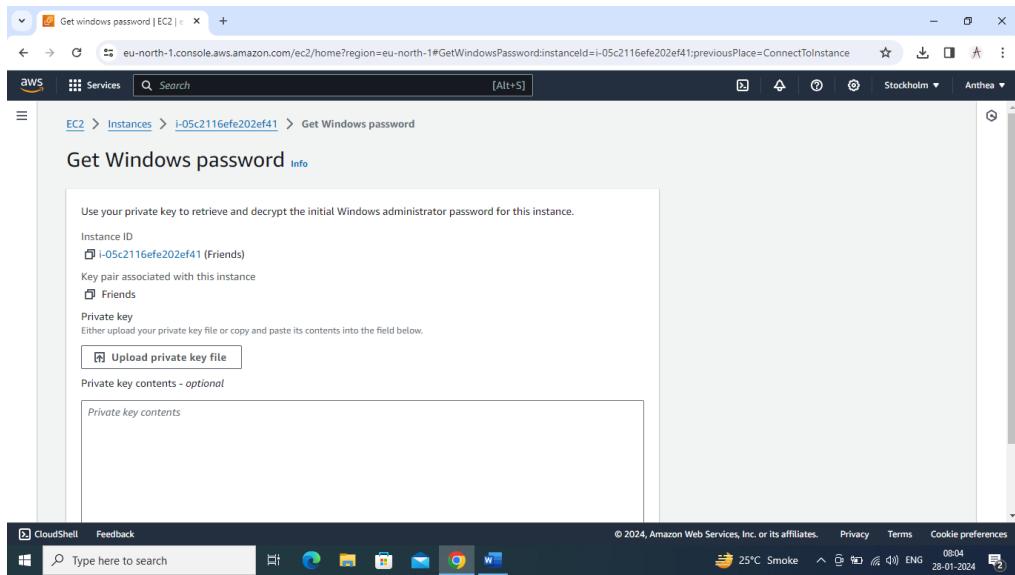
## 6) Launch the instance



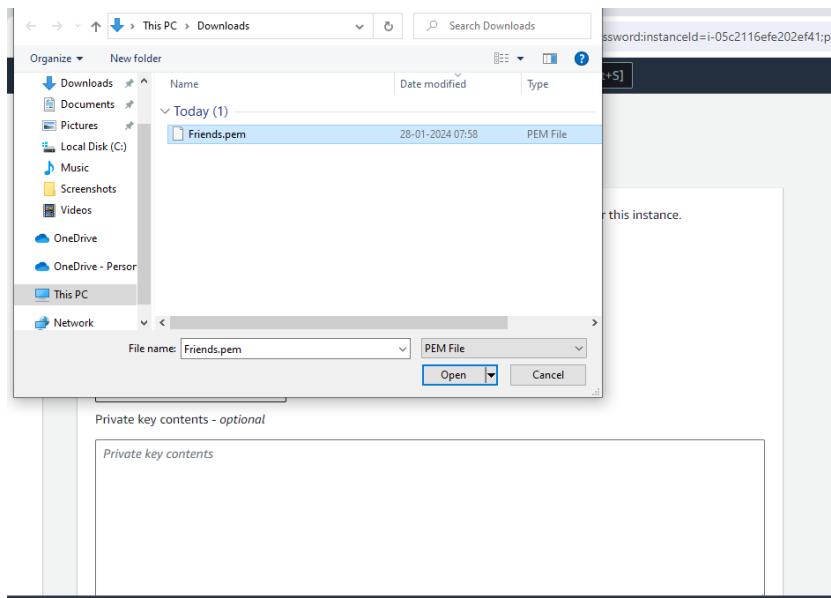
- 7) Go back to instances and refresh, it will initialize and then start running
- 8) Select the instance and click on connect, for connecting to RDP file



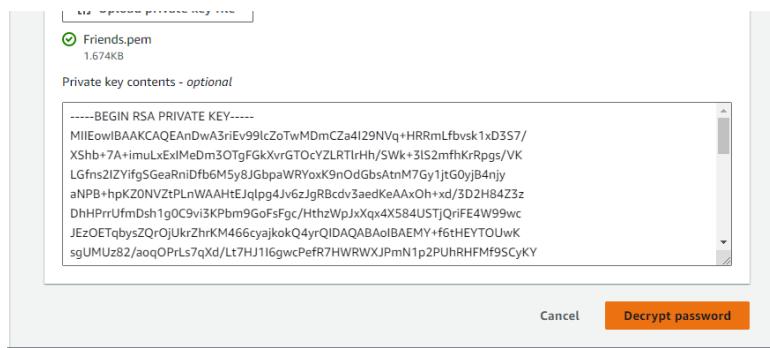
- 9) Click on get password
- 10) Upload key value file



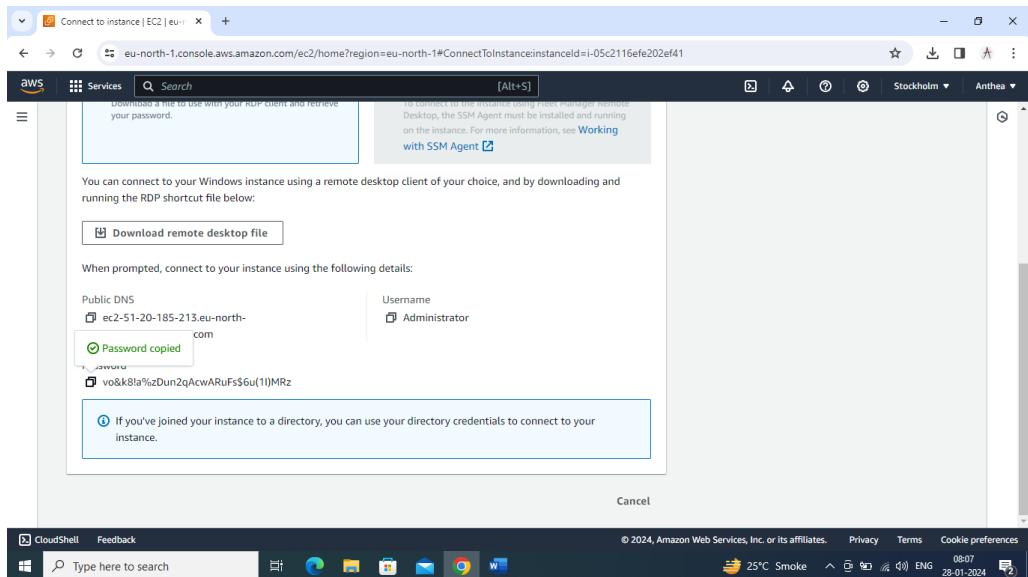
## 11) Upload the friends.pem file which was downloaded before



## 12) Decrypt password

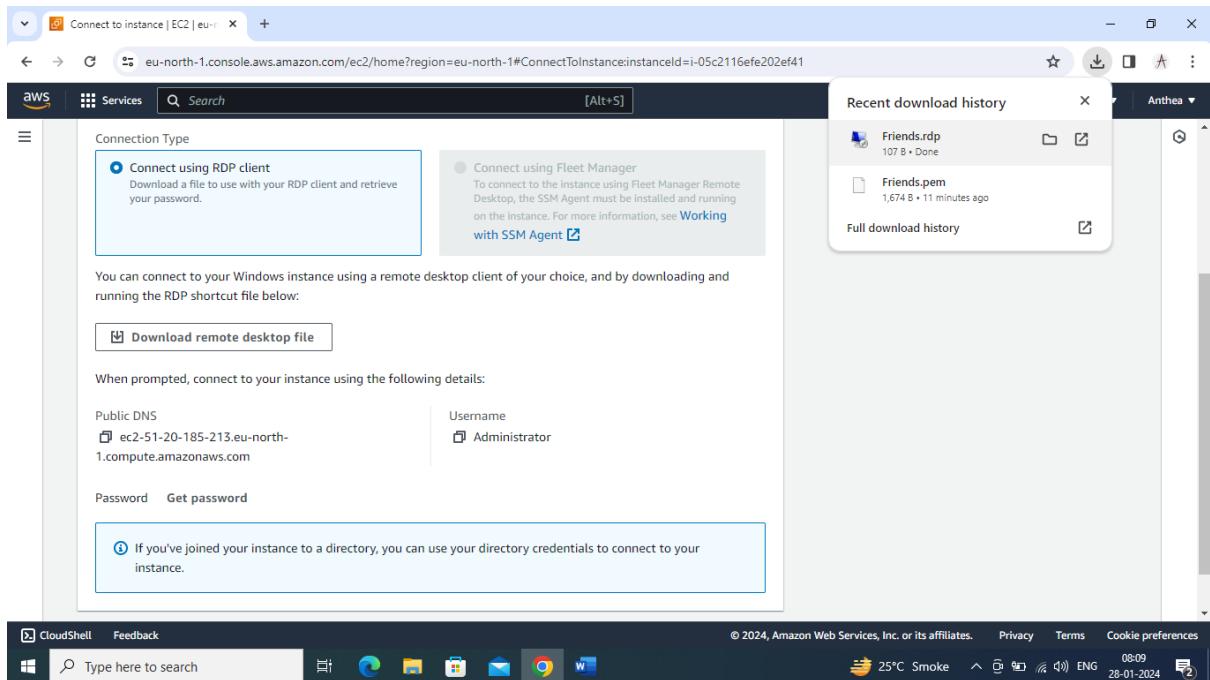


## 13) Save the password - vo&k8!a%zDun2qAcwARuFs\$6u(1l)MRz

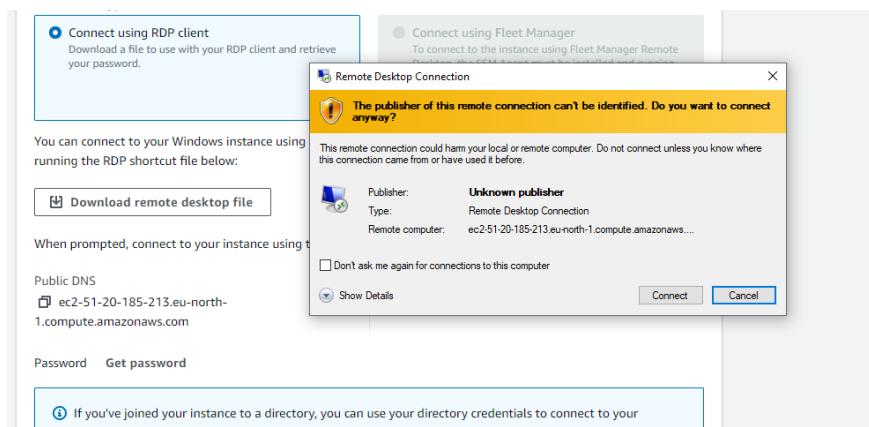


#### 14) Go back to instances ,connect and download the RDP file

The screenshot shows the AWS EC2 Instances page. The left sidebar is collapsed, and the main area displays a table of instances. One instance, named 'Friends' with the ID i-05c2116efe202ef41, is selected and highlighted with a blue border. The table columns include Name, Instance ID, Instance state, Instance type, Status check, Alarm status, and Availability zone. Below the table, a detailed view for the selected instance is shown, including its summary, status, and network information. The status bar at the bottom indicates the URL as https://eu-north-1.console.aws.amazon.com/ec2/home?region=eu-north-1#ConnectToInstanceInstanceId=i-05c2116efe202ef41.



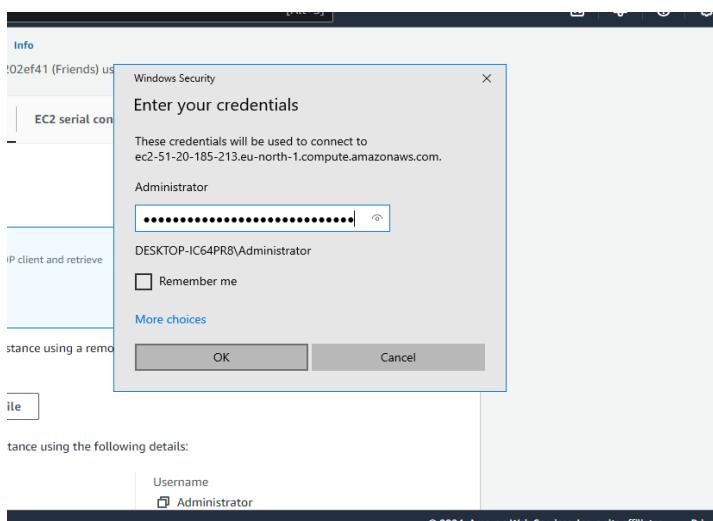
## 15) Open the downloaded RDP file



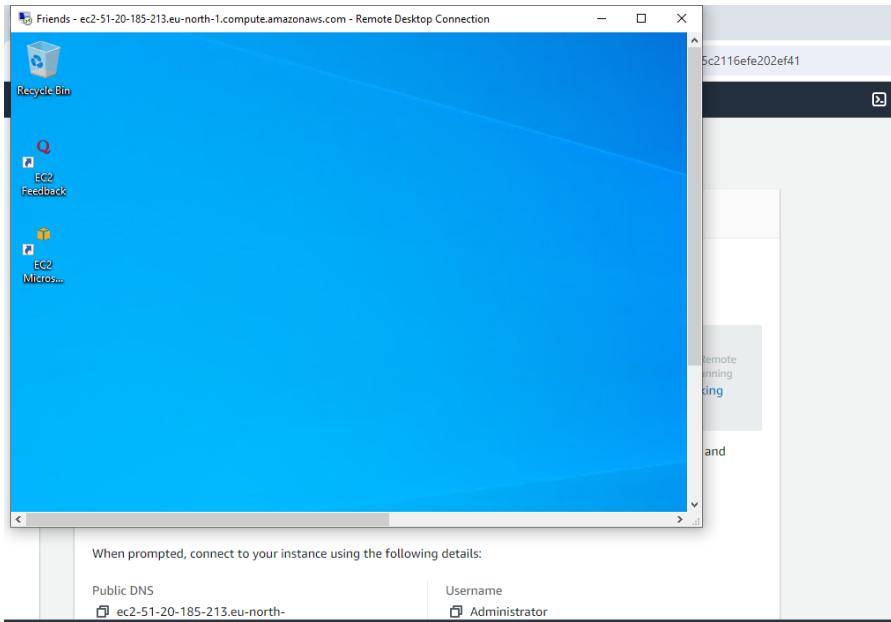
## 16) Connect rdp

17) vo&k8!a%zDun2qAcwARuFs\$6u(1l)MRz

18) Enter your creds



19)



20) Close RDP

21) Go back to instances > terminate the instance

Name	Instance ID	Instance state	Type	Public IP	Private IP
Friends	i-05c2116efe202ef41	Running	t3.micro	51.20.185.213	172.31.41.158
Webapp-env	i-0d75ab4196c8cc513	Terminated	-	-	-
Webapp-env	i-05f8bfda053c88814	Running	t3.micro	-	-
Webapp-env	i-054411a5560756757	Terminated	t2.micro	-	-
Webapp-env	i-054411a5560756757	Terminated	t2.micro	-	-
Webapp-env	i-054411a5560756757	Terminated	t2.micro	-	-
Webapp-env	i-054411a5560756757	Terminated	t2.micro	-	-
Webapp-env	i-054411a5560756757	Terminated	t2.micro	-	-

## Q2:STEPS:

22) Launch a new instance for LINUX

The screenshot shows the AWS EC2 Instances page. At the top, there's a search bar and a 'Launch instances' button. Below it is a table with columns: Name, Instance ID, Instance state, Instance type, Status check, Alarm status, and Availability Zone. There are four entries, all of which are terminated. The instance names are 'Webapp-env'. The instance IDs are i-08e44420c70468821, i-07e4a1784e9eedde6, and i-0dad66adabd27777. The instance types are t3.micro. The status check column shows 'Not running' or 'Not responding'. The alarm status column has a 'View alarms' link. The availability zone is 'eu-north-1c'.

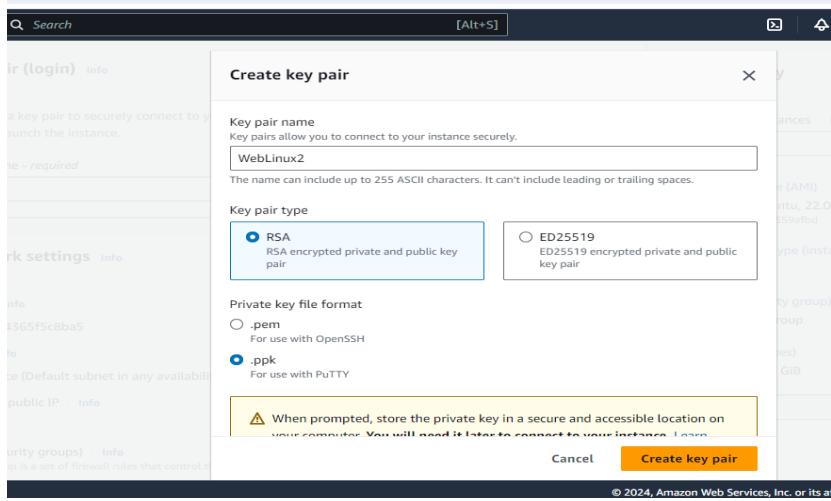
## 23) Write a web server name

The screenshot shows the 'Launch an instance' wizard. On the left, there's a sidebar with 'Services' and a search bar. The main area is titled 'Launch an instance' and shows the 'Name and tags' step. It has a 'Name' field containing 'WebLinux2' and a 'Software Image (AMI)' section with 'Canonical, Ubuntu, 22.04 LTS' selected. On the right, the 'Summary' pane shows 'Number of instances' set to 1, 'Virtual server type (instance type)' as 't3.micro', and 'Storage (volumes)' as '1 volume(s) - 8 GB'. At the bottom, there's a 'Launch instance' button.

## 24) Select ubuntu

The screenshot shows the 'Launch an instance' wizard. On the left, there's a sidebar with 'CloudShell' and a search bar. The main area is titled 'Application and OS Images (Amazon Machine Image)' and shows a search bar with 'Search our full catalog including 1000s of application and OS images'. Below it is a 'Quick Start' tab. In the center, there are several AMI icons: Amazon Linux, macOS, Ubuntu, Windows, Red Hat, and SUSE Linux. To the right, there's a 'Browse more AMIs' section. At the bottom, there's a detailed view of the 'Ubuntu Server 22.04 LTS (HVM), SSD Volume Type' AMI, including its ID (ami-0014ce3e52359afbd), architecture (64-bit (x86)), and provider information ('Verified provider'). On the right, the 'Summary' pane shows 'Number of instances' set to 1, 'Software Image (AMI)' as 'Canonical, Ubuntu, ami-0014ce3e52359afbd', 'Virtual server type' as 't3.micro', and 'Storage (volumes)' as '1 volume(s) - 8 GB'. At the bottom, there's a 'Launch instance' button.

## 25) Create a new key value pair and select ppk



- 26) Download putty.exe from google  
 27) Select and download exe file 64 bit x86

**Package files**

You probably want one of these. They include versions of all the PuTTY utilities (except the new and slightly experimental Windows pterm).

(Not sure whether you want the 32-bit or the 64-bit version? Read the [FAQ entry](#).)

We also publish the latest PuTTY installers for all Windows architectures as a free-of-charge download at the [Microsoft Store](#); they usually take a few days to appear there after we release them.

**MSI ('Windows Installer')**

64-bit x86:	<a href="#">putty-64bit-0.80-installer.msi</a>	<a href="#">(signature)</a>
64-bit Arm:	<a href="#">putty-arm64-0.80-installer.msi</a>	<a href="#">(signature)</a>
32-bit x86:	<a href="#">putty-0.80-installer.msi</a>	<a href="#">(signature)</a>

**Unix source archive**

.tar.gz:	<a href="#">putty-0.80.tar.gz</a>	<a href="#">(signature)</a>
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<https://theearth.li/~sgtatham/putty/latest/w64/putty-64bit-0.80-installer.msi>

- 28) Create ppk key value pair and save the file  
 29) Allow all traffic

**Key pair name - required**  
 [Create new key pair](#)

**Network settings** [Edit](#)

**Network** [Info](#)  
 vpc-097e5a4365f5c8ba5

**Subnet** [Info](#)  
 No preference (Default subnet in any availability zone)

**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](#)

We'll create a new security group called 'launch-wizard-4' with the following rules:

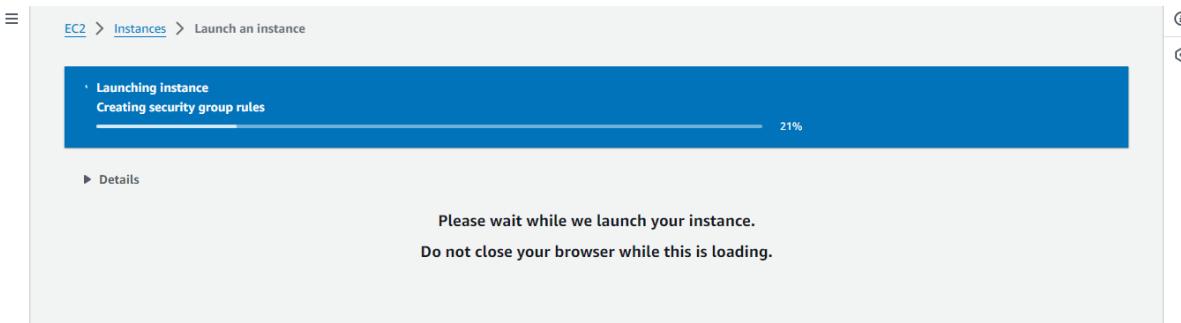
[Allow SSH traffic from](#) [Anywhere](#)  
Helps you connect to your instance 0.0.0.0/0

[Allow HTTPS traffic from the internet](#)  
To set up an endpoint, for example when creating a web server

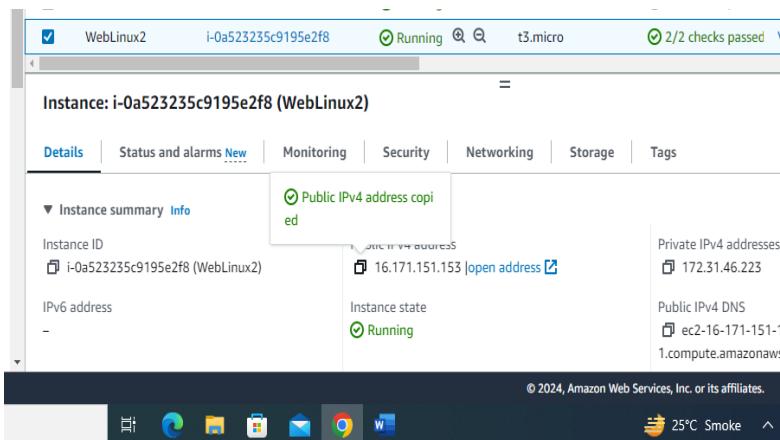
[Allow HTTP traffic from the internet](#)  
To set up an endpoint, for example when creating a web server

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

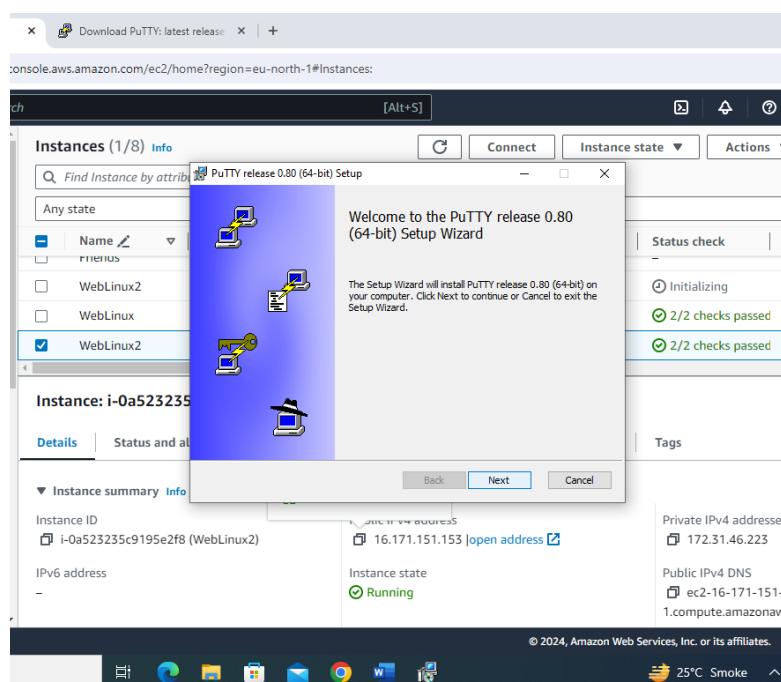
- 30) Launch instance



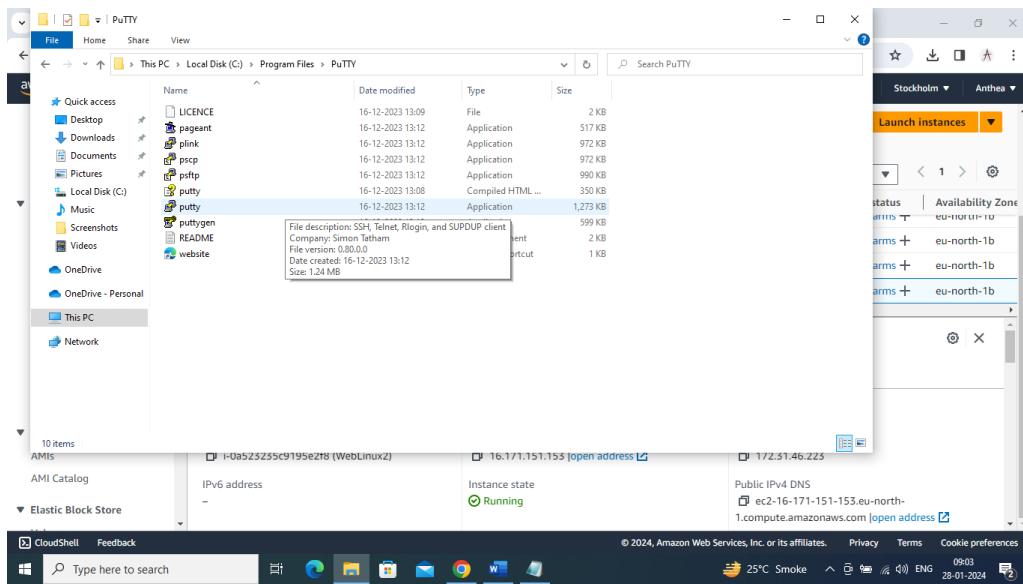
- 31) Go back to instances and refresh
- 32) Select and copy public IPV4 address and save the address
- 33) 16.171.151.153



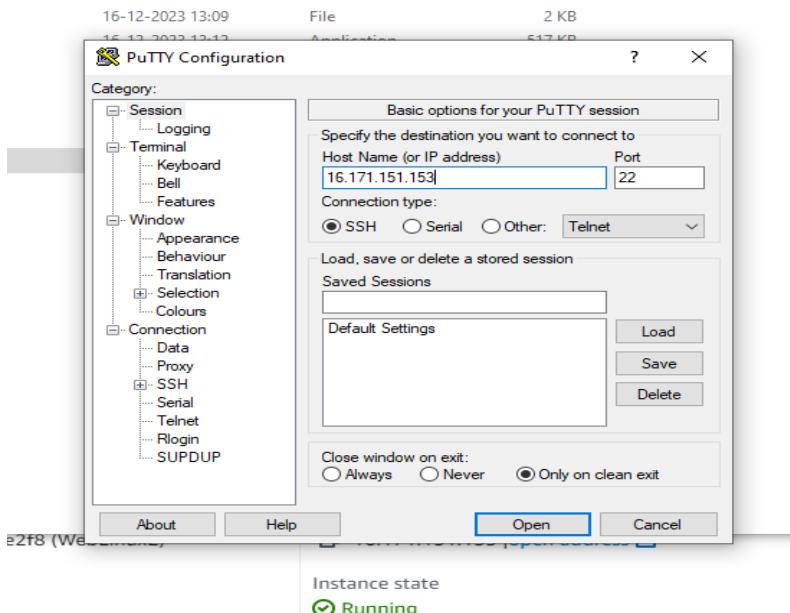
- 34) Open the downloaded putty



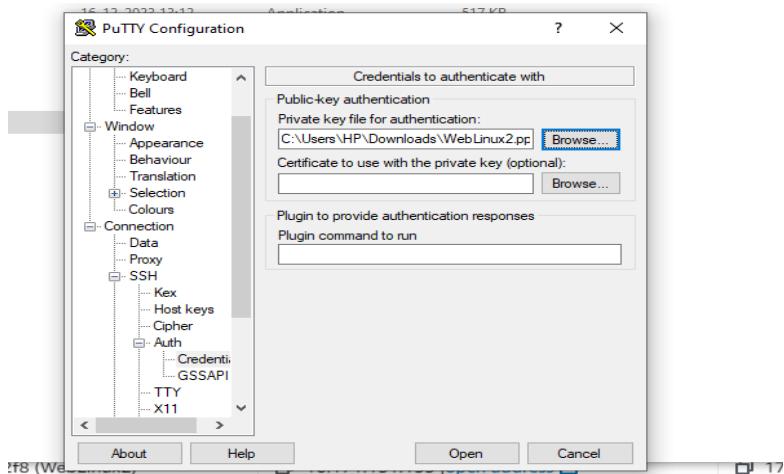
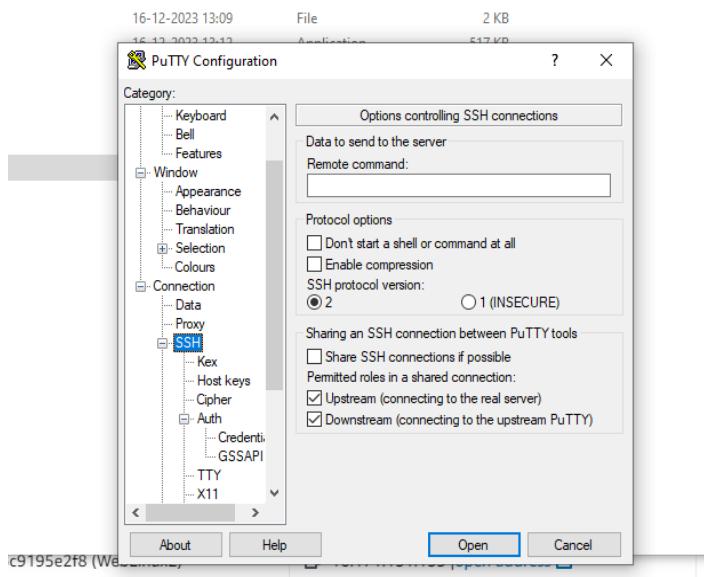
- 35) Go to program files and open putty



### 36) Paste the IP address

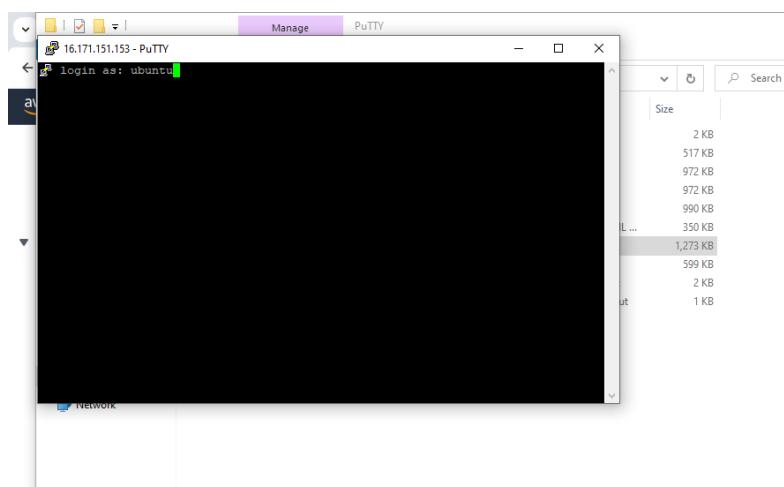


### 37) Category->connection-> SSH -> Auth -> Credentials ->Browse and select ppk file



38) Putty will launch

39) Login as ubuntu



40) Type commands

```

Last login: Sun Jan 28 17:10:06 2024 from 103.169.165.47
To run a command as administrator (user "root"), use "sudo <command>".
See "man sudo_root" for details.

ubuntu@ip-172-31-46-223:~$ commands
Command 'commands' not found, but can be installed with:
sudo apt install gnu-sed libcharmmbracelet-bubbletea-dev
WebLinux: command not found
ubuntu@ip-172-31-46-223:~$ WebLinux2
WebLinux2: command not found
ubuntu@ip-172-31-46-223:~$ sudo
usage: sudo -h | -k | -k | -V
usage: sudo -v [-ABKnS] [-g group] [-p prompt] [-u user]
usage: sudo -l [-ABKnS] [-g group] [-h host] [-p prompt] [-u user] [-u user]
[command]
usage: sudo [-ABBEHknPSj] [-r role] [-t type] [-C num] [-D directory] [-g group]
[-h host] [-p prompt] [-R directory] [-T timeout] [-u user]
[VAR=value] [-i|-a] [<commands>]
usage: sudo -e (-ABKnS) [-r role] [-t type] [-C num] [-D directory] [-g group]
[-h host] [-p prompt] [-R directory] [-T timeout] [-u user] file ...
ubuntu@ip-172-31-46-223:~$ anthea
anthea: command not found
ubuntu@ip-172-31-46-223:~$ 

The list of available updates is more than a week old.
To check for new updates run: sudo apt update

Last login: Sun Jan 28 17:13:38 2024 from 103.169.165.47
To run a command as administrator (user "root"), use "sudo <command>".
See "man sudo_root" for details.

ubuntu@ip-172-31-46-223:~$ ls
Command 'ls' not found, but there are 15 similar ones.
ubuntu@ip-172-31-46-223:~$ ls
ubuntu@ip-172-31-46-223:~$ mkdir mac
ubuntu@ip-172-31-46-223:~$ ls
mac
ubuntu@ip-172-31-46-223:~$ cd mac
ubuntu@ip-172-31-46-223:~/mac$ touch cloud.txt
ubuntu@ip-172-31-46-223:~/mac$ ls
cloud.txt
ubuntu@ip-172-31-46-223:~/mac$ cat

mac
ubuntu@ip-172-31-46-223:~$ cd mac
ubuntu@ip-172-31-46-223:~/mac$ touch cloud.txt
ubuntu@ip-172-31-46-223:~/mac$ ls
cloud.txt
ubuntu@ip-172-31-46-223:~/mac$ cat

hello world
hello world

ubuntu@ip-172-31-46-223:~/mac$ python3
Python 3.10.12 (main, Nov 20 2023, 15:14:05) [GCC 11.4.0] on linux
Type "help", "copyright", "credits" or "license" for more information.
>>> print('hello')
hello
>>>

```

41) Control+ D

42) Terminate the instance, close putty